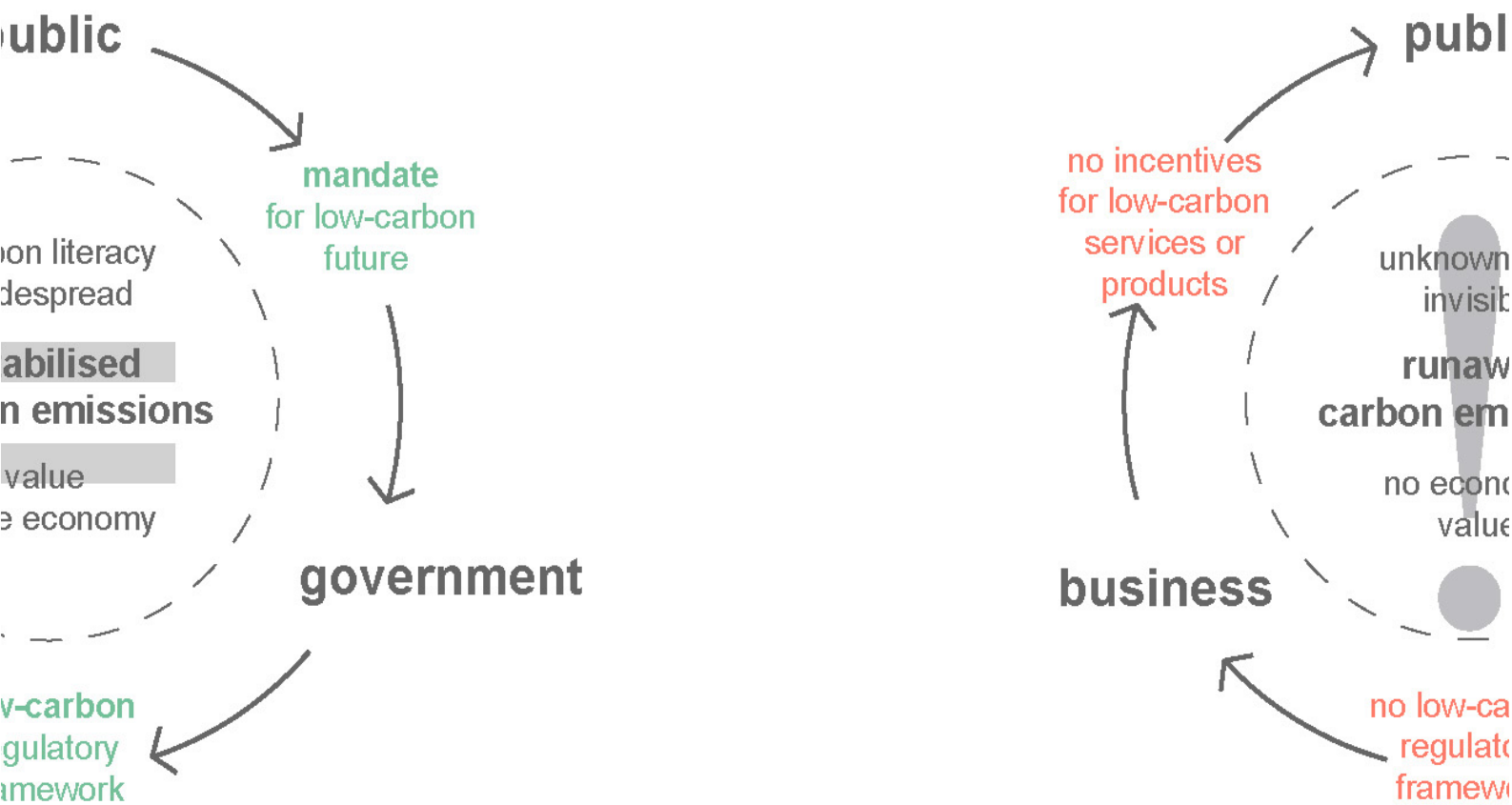
What would a genuinely carbon neutral BT look like?



carbonsense

This paper was written by Robert Webb and Antony Turner with additional research by Lia Abady, Peter Martin and David Fleming, in response to a brief from BT.

CarbonSense thanks the many people who have provided ideas and observations or have in other ways informed the drafting of this document. A list of interviewees and contributors appears on page 29.

Graphic design by XCO2
www.xco2.com

CarbonSense 2006
www.carbonsense.org

Preface

The challenge of the 21st century will be for human society to regain a healthy relationship with our 'living' earth. The signs are clear that right now we are failing in that task. Unless we change our ways, it is likely that comfortable civilisation as we know it will disappear.

Climate change is not just an environmental problem - it is a societal problem. The simple truth is that humanity is changing the atmosphere - every day we add around 70 million tonnes of invisible carbon dioxide, the very gas that we know controls the temperature of the planet.

Until recently we have put no value on the atmosphere. That is changing. The carbon emission rights of large power stations and factories in Europe are capped and can be traded. This system will probably be extended to air travel by the end of the decade. Respected organisations are looking at how personal tradable carbon 'shares' could work in practice. What is clear is that carbon is becoming part of our language, and that we will have to get used to counting in carbon and keeping carbon accounts. I believe that we will all need to become carbon literate so that every action we take at a personal, business or government level makes sense both economically and ecologically. That is why it has been a privilege to be chosen by BT to carry out this project looking at carbon neutrality.

At our first meeting with BT's Leadership Panel it was suggested that we should combine vision with hard facts. Our approach has also been inspired by my friend Stephan Harding, who teaches at Schumacher College. Stephan finds it easier "to speak of our animate Earth much as a bushman storyteller spins tales about the magical beings that made the world to a small group of fellow humans under the stars in some remote area of wild country." This intuitive and intimate approach must, he suggests, be combined with the rational explanations.

In drafting this document about what a genuinely carbon neutral BT would look like, we have tried to follow this path by weaving vision and intimacy into the facts and figures.

Antony Turner
Founder & Director, CarbonSense
March 2006

Summary

What does a carbon neutral company look like?

Note: This summary is aimed at those who already understand many of the issues and terminology. Others can find more guidance in the main text.

A carbon neutral company reduces its own carbon emissions as far as possible, and offsets the remaining emissions.

There is no clear understanding of what level of reduction should be achieved, against how much offset. But to be credible, a company must have real and thorough commitment to reducing its own emissions at source as far as possible.

Carbon neutrality is a simple concept, but the details are complex.

The concept of carbon neutrality is fairly straightforward in theory, but in practice the details are complex and in some quarters they are controversial, for three reasons:

- Uncertainty over the idea of **Carbon Offset** (Isn't it just buying your way out of trouble?)
- Worries over the **Project Quality** of offsets - questions are about ensuring additionality and avoiding double-counting.
- **Boundary Issues** - how to define the boundaries of the activities being considered? (should you include all supplier's carbon?; can you include customer savings?)

Carbon cap and trade legislation will be needed to achieve real change…

Carbon neutrality is a voluntary undertaking, and currently likely to remain so. On its own, voluntary carbon offset will not achieve the necessary reductions to stabilise the climate. Driving the necessary change will require national and international cap and trade legislation, whereby companies or individuals have to remain within an annual carbon emissions limit, and can buy or sell emissions credits. An alternative policy mechanism would be high taxes on carbon with rebates given elsewhere in the tax system.

…but carbon neutrality is still a worthy short-term objective…

Despite the uncertainties, carbon neutrality is a worthy goal. Companies committing to carbon neutrality are raising the carbon literacy of their own staff and customers as well as making a contribution within the wider debate, and contributing financially to carbon reduction projects. In the absence of agreed external standards on boundaries and on types of projects supported, companies have to stand up and be counted: to propose their own standards and methodologies and be prepared to debate them.

…in the journey to becoming carbon positive.

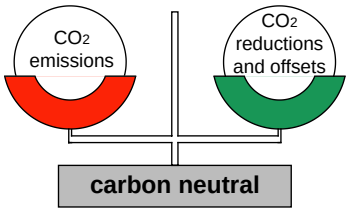
Becoming carbon neutral is part of the process towards being carbon positive. A carbon positive company will be fully engaged in driving the growth of the low-carbon economy, and will shape its own business model, and its products and services to maximise its contribution to reducing CO_2 emissions and promote technologies which support quality of life with low CO_2 emissions.

What would a carbon neutral BT look like?

The Information & Communications Technology (ICT) sector would benefit if carbon was properly valued in the economy - as this will increase the value and need for ICT services. This provides clear motivation to build on BT's existing strong CSR policy and record of innovation, and for BT to lobby for carbon emissions legislation and engage in leading by doing.

BT has already made strides towards managing and reducing its own direct emissions.

BT has already reduced its own emissions through energy efficiency and purchase of renewable energy, and is also seeking planning for renewable energy on its own sites, and trialling small scale wind turbines and biodiesel.



A carbon neutral BT would aggressively build its own renewable energy portfolio...

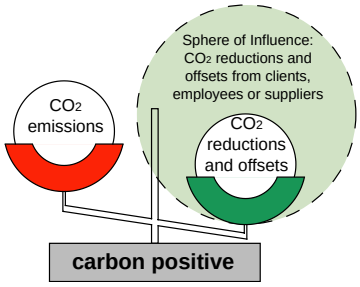
This should include a range of technologies including large-scale wind turbines, small-scale wind, solar PV, biodiesel, biomass, and others where appropriate.

would aggressively manage its energy consumption...

While absolute energy consumption will depend on customer usage and types of service provided, BT should benchmark according to utility measures, for example energy use per unit of data transfer, and manage all systems for maximum energy efficiency.

and would purchase offsets to cover its remaining emissions.

The boundaries need to be defined clearly by BT itself, referring to some of the published frameworks. We suggest that this will include its own direct corporate emissions in offices, transport, and its electricity use to run the network where the services are provided through customers, perhaps excluding that part of the network wholesaled to other telecoms providers.



A carbon neutral BT is on the journey to become carbon positive...

BT is ideally placed to become carbon positive as its products and services can contribute to displacement and reduction of travel. Moreover its products and services will become an ever more important backbone of social and economic life within a carbon-constrained world.

These actions will enhance the brand...

There is strong evidence that the public and business communities are seeking out positive solutions to climate change. Companies that make a clear pledge to contribute to positive solutions will gain support and improve brand values.

... and will help maximise future business opportunities.

There are strong opportunities for BT in carbon and energy monitoring, and in developing, and helping others develop, innovative products and services and business models which reduce carbon emissions from the economy, by substituting ICT for more energy intensive modes of business and communication.

Contents

Part 1: Introduction

Carbon and Climate Change

Climate change is the biggest problem that our civilisation has had to face in 5,000 years.

Sir David King, UK Government Chief Scientific Advisor

Climate change poses one of the most significant challenges in the 21st century... We must adjust our thinking about actions to reduce emissions of greenhouse gases - to see them as adding real, long term value, not simply imposing costs. This is a primary benefit of market based approaches and should be reflected in an enduring policy framework supporting all low carbon technologies.

Letter from the World Economic Forum to the G8 2005 summit in Gleneagles, signed by BT Chief Executive Ben Verwaayen and 23 other global business leaders

Climate change is a critical threat to the continued existence of our civilisation. The climate change that we are now seeing - also known as global warming - is caused predominantly by human activities. The largest single factor is the emission of carbon dioxide (CO_2) from the use of fossil fuels. Directly or indirectly, every activity which uses fossil fuel energy will cause the generation of CO_2 emissions and thus contribute to climate change.

The Earth Summit, held in Rio in 1992, led to the creation of the United Nations Framework Convention on Climate Change and its Kyoto Protocol, which has now been ratified by 158 nations, committing them to a total of 5% reductions in CO_2 emissions on 1990 levels by 2010. There is also a raft of activity at national and local levels.

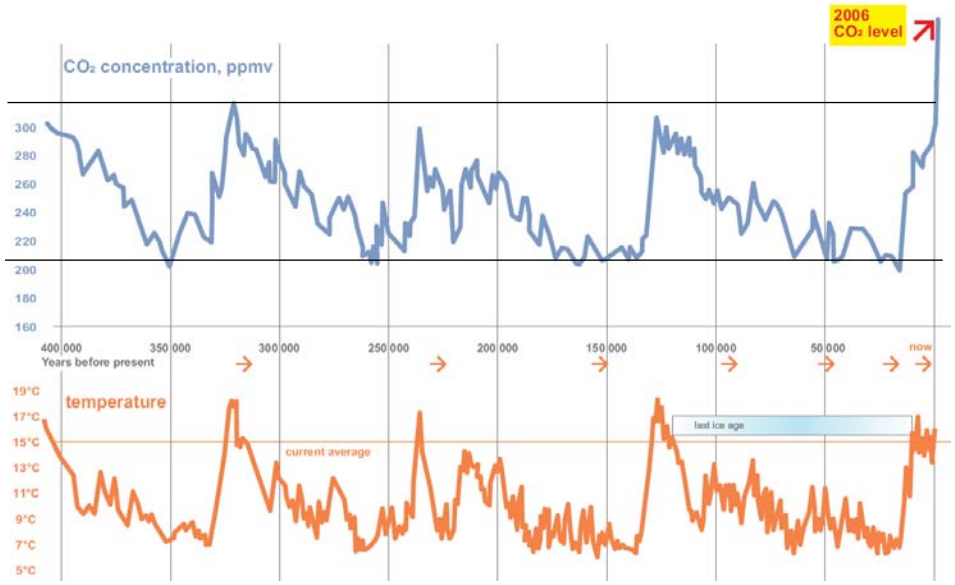
The scientific evidence for ongoing change is gathering day by day. Recent examples include thawing of permafrost, melting of arctic and antarctic ice, slowing of the gulf stream ocean current, and the increased frequency of hurricanes in 2005. The loss of the Greenland ice sheet would mean a 7m sea level rise.

Many experts are now concluding that we may have less then ten years before climate change becomes unstoppable, due to positive feedback processes like the release of methane from the permafrost and deep sea (methane is also a powerful greenhouse gas). Scientists are calling for developed country emissions cuts of 60-80% to stabilise climate while allowing growth within developing countries.

It seems clear that the current international processes to address climate change are moving too slowly, hampered by the difficulties of international diplomacy and the inherent short-termism of democratic governments.

People and businesses everywhere are asking, 'How can we speed this up?', and seeking ways to contribute to action. We are seeing the beginning of a new industrial revolution - a quiet revolution, creating the seeds of a low-carbon economy. The concept of carbon neutrality is a key part of this transformation.

Drilling through 3,600 metres of ice at the Vostok station in Antarctica has revealed trapped air bubbles that provide an accurate record of atmospheric conditions over the last 420,000 years. The graphs show the clear relationship between CO_2 and earth's average temperature over that period. CO_2 level is now 380 parts per million (ppm), a level probably not seen for 20 million years.



Thank you all for coming along this evening.

Since I joined in 1995, BT has gone through quite a transformation.

People often ask me what is the single achievement I am most proud of, expecting me to say the record profits in 2012.

In fact it is a project which began back in autumn 2006 when we introduced the first pilot employee carbon credits scheme in the UK. Codenamed "Project Polar bear". It began as a CSR project but just snowballed into a company-wide initiative to be not just carbon neutral (a bit geeky?) but carbon-positive.

Before we knew what was happening there was huge buy-in from staff and our positive press coverage went through the roof. The relief - when John Smith, the Head of Marketing at Nacter called me and suggested we do a JV to set up a carbon credit card - was immense I can tell you!

The turning point came after all the management teams had been through 'carbon engagement' training and really started to see the business opportunities - Virtual Mirror, Telemeet and all the others.

The installation of turbines on Newgate Street helped us to lobby the politicians to get the new microgeneration-friendly bill through Parliament - the start of the roll-out of wind and solar power to nearly all our exchanges. And initiating our UK carbon management services in 2008 helped our International Division become the world leader in this field that they are today.

It hasn't hurt the bottom line of course - but my proudest achievement is this little carbon card ...

Notes from a retirement speech, 2015

Towards carbon literacy

An example of promoting carbon literacy. Solar energy output from a photovoltaic array is represented as a shower of photons in this LED display board at Broadgate, designed by More Associates.

There is no doubt that we are transforming the physiology and metabolism of the planet

Professor John Schellnhuber
Research Director
Tyndall Centre for Climate Change Research

World civilisation is dependent on fossil fuels and is starting to recognise the consequences. However we are still predominantly carbon illiterate. Carbon dioxide, the primary greenhouse gas caused by burning fossil fuels, is invisible to all and unknown to many and there are few economic penalties for its release.

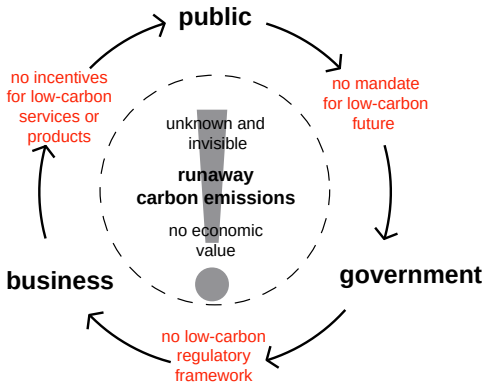
A 'vicious circle' of inertia precludes a suitable societal response to the problem. Governments are afraid to set appropriate regulations, business has little incentive to de-carbonise products and services, and the public will not give governments the mandate to take bold actions.

The key question is how to break this vicious circle and create action. Government in the UK, while showing much rhetorical leadership, is currently failing to achieve a joined-up response, and has a tendency to put the burden of action on others.

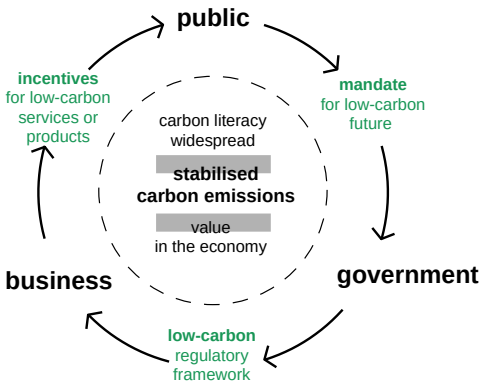
Consumers are becoming more aware but it is unrealistic to expect major change until carbon is properly priced in the economy - which requires government action.

We believe that business has the ability to break the cycle by helping raise consumer awareness, challenging government and looking for business opportunities in a carbon-constrained world.

The challenge that society now faces in the UK and in all developing countries is how to rapidly move towards being carbon literate, and how to properly value carbon in our economies.



carbon illiterate society



carbon literate society

The climate change writers Mark Lynas & George Marshall, in an article entitled "Why we don't give a damn" ask why we are paralysed in the face of the climate crisis. The answer they say "lies in our evolutionary heritage: we defend ourselves against specific predators and rival tribes of humans. We are 'hard-wired' to mobilise rapidly in response to clear and immediate dangers. But as threats become less certain, or causally complex, it becomes harder to find the urgency to tackle them."

They point out that: "Climate change, unfortunately, matches our evolutionary weaknesses. It is hard to blame someone else for a problem we are all causing, hence the almost universal efforts to make global warming fit familiar perpetrator-victim polarities. The south blames the north, cyclists blame drivers, activists blame oil companies, and almost everyone blames George Bush."

"And everyone is waiting for someone else to act first; the more people there are on the scene, the less individual responsibility we feel. In the case of climate change, we are all simultaneously bystanders, perpetrators and victims."

Emerging policy issues

Our industry is now beginning to develop business opportunities out of low or zero-carbon technologies. These opportunities will increase as policy-makers set a price on carbon or otherwise incentivise emissions reductions.

Tony Hayward, Chief Executive, BP Exploration & Production

If society is to get to grips with the climate change challenge and become carbon literate what are the roles of government and the United Nations? What policies are being considered to cope with Climate Change? In July 2005 the UK Government announced that Sir Nicholas Stern, a former World Bank chief economist and senior Treasury official was to lead a major review of the economics of climate change. The report, due in summer 2006, will take a global view of the economic risks and possible benefits of climate change and assess the potential of economic instruments to address them. The findings will carry weight internationally since they will be part of the basis for UN discussions, due to begin this year, on the future of Kyoto.

One aspect that this review will surely look at will be different economic instruments available to government. David Hirst, sustainability consultant and inventor has examined the differences between taxes and cap and trade systems. He believes that: "If we have to adjust the taxation rules and policies as often as we find they are not achieving the emissions reductions we seek, we will get inefficient investment, wasted debate and resentment. Cap and Trade, with a science based Cap, and a clear, fair, per person allocation as soon as politically possible looks more likely to succeed than any other policy yet devised."

In 2004, Colin Challen MP introduced a Bill in Parliament for a domestic Cap and Trade system (DTQs), the Royal Society of Arts currently has a two year project looking at how such a scheme could work in the UK, and the Sustainable Development Commission has recently written a report on DTQs and hosted an online consultation (for more details on DTQs, see box below).

To be effective such a system would have to operate under a global policy framework. Such a framework has been suggested by the UK based Global Commons Institute - 'Contraction and Convergence'. 'Contraction' refers to the need to reduce global emissions of greenhouse gases to a level that scientists regard as acceptable, creating a global carbon 'budget' that is reduced over time until a stable point is reached. Under this framework national emissions will converge year by year towards an agreed target based upon each country's population. In effect, by a target date, perhaps 2050, every citizen of the world should have an equal right to pollute.

DTQs have been the subject of intensive interdisciplinary research over the last two years by Richard Starkey and Dr Kevin Anderson from the Tyndall Centre for Climate Change and their Technical Report was published in December 2005. The originator of the concept of DTQs was Dr David Fleming, a London-based policy analyst who first published the idea in 1996. He has since revised and renamed his ideas Tradable Energy Quotas (TEQs).

From BT special commemorative publication, 2016

... In 2006 BT was already beginning to become aware that it was uniquely placed to make a real difference in the search for less carbon intensive business and lifestyle models. Its early commitment to reducing its own direct emissions through efficiency, renewable energy and carbon offset put it in a position to realise many of the key new business opportunities arising out of the carbon crunch, as we can all see through the company's current high position in the FTSE100. The company is proud to have been amongst the first who saw that climate change was not only a critical threat to civilisation, but also that it could be managed and ameliorated through an innovative and responsible capitalism.

In 2005, BT was already 4th on the December 05 BusinessWeek / ClimateGroup list of the top ten global companies in leadership for carbon reduction, and top of telecoms sector in the Dow Jones Global Sustainability Index for the fifth year in a row. By 2015, BT has now gone further to build a reputation as one of the leading companies driving the growth of low-carbon trade and innovative communications.

The volume of the atmosphere in comparison to the Earth, were the atmosphere to be rolled up into a sphere.
Image: Adam Nieman, Science Photo Library

Part 2: What does a carbon neutral company look like?

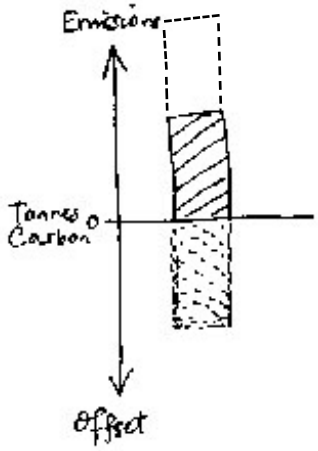
What is a carbon neutral company?

Greenhouse gases are a group of gases contributing to climate change for which CO_2, being the largest in quantity, stands as signifier.

Throughout this report we use the term carbon as shorthand for all greenhouse gas emissions.

A carbon neutral company is one where net CO_2 equivalent emissions from its activities are zero. In principle, a product or service can also be made carbon neutral.

The basic options for achieving carbon neutrality are likely to be a combination of reducing emissions, and - since it will be very difficult to reduce emissions to zero - investing in carbon offset projects. These are projects that enable greenhouse gases to be absorbed or introduce efficiencies or renewable energy to reduce the need to burn fossil fuels.



Carbon neutrality means that emissions are reduced; and that remaining emissions are offset (creating or investing in another activity that absorbs the same amount of emissions).

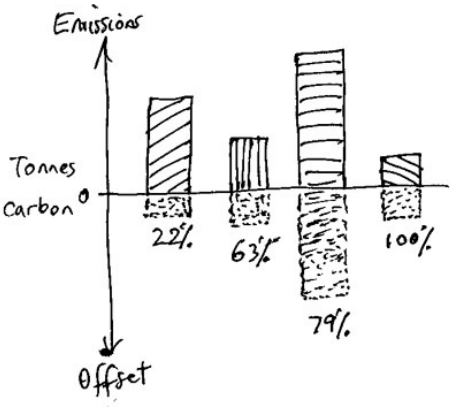
It's very murky out there [in the world of offsets]; companies like BT should lobby government to provide clear reporting guidelines that clarify who owns the emissions rights to stop double or even triple counting.

Russell Marsh of Green Alliance

However there are complex and difficult questions around carbon neutrality: Is it an altruistic aim, or can it add value to a company's brand or open up business opportunities? What should be counted as the emissions of a particular company, product or service? There are differing views on the boundaries of a company's activities, and whether a company's own product, if it reduces carbon emissions, can be included in the reckoning.

How does offsetting work? Does it involve carbon trading? This may involve the purchase of emissions reductions, often from a project far away from the source of pollution. How are these various actions monitored? How are they perceived?

Many of these questions are examined in more detail in the following section in order to shed some light on what, in practice, is meant by a 'carbon neutral company'.



Some companies offset a proportion of emissions, or those relating to a particular product

How might a company achieve carbon neutrality?

The most destructive effect of the carbon offset idea is that it allows us to believe that we can carry on polluting.

George Monbiot, Guardian

The most interesting questions arise when a company asks itself how far it will go, and how fast, and how much money it should spend, and what combination of strategies it should adopt. What balance of internal vs external measures should a company take? (i.e. energy efficiency vs offset) We return to this in the second section with respect to BT.

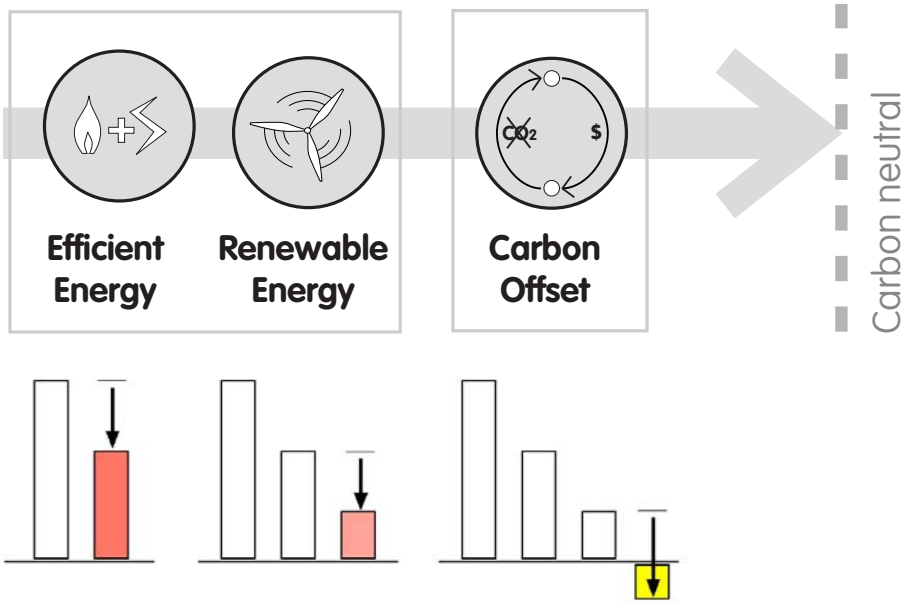
We propose that there are three **strategies** for reducing carbon emissions from a company's activities:

* **Energy Efficiency**: achieving the same performance / service with smaller energy use.
* **Business process & employee engagement**: changes in working practices which reduce travel and energy use.
* **Renewable Energy**: either on company property and/or purchased from suppliers.

There is then a final step to become carbon neutral by offsetting any remaining emissions:

* **Carbon Offset**: investing in projects or buying Emissions Reduction certificates on the global market.

A carbon neutrality strategy involves cutting emissions through a series of steps, and then offsetting any remaining emissions.



From a 2013 novel by Zak Gurishi

Her daughter had left the country with her young family, but Vera had less need to follow them thanks to the video mirror her daughter had given her to pair with her own. The mirror is always on and hangs next to the front door, reflecting the activities of one hallway into that of the other.

Vera in her kitchen in Surrey hears, as she makes her bedtime cup of mint tea, the morning sounds and glimpses of colour, drifting from the hall as the children are marshalled for school... As she stirs she listens to the squabbles over missing shoes, laughter and squawks of protest as one child pinches another and is rebuked by their mother, and finally as they are ready to go she pops her head into the hall and calls to them as if they are in her own hallway: 'good bye children, have a lovely day'.

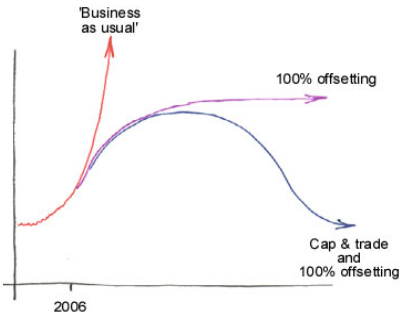
She watches the now singing children walk out the front door calling 'bye gran' and out into the bright New Zealand morning sun, as she turns to walk up the stairs to bed. Behind her, her daughter turns to blow a kiss to the mirror, and whisper 'love you mum'. And then the hall is left once again in peace, its mirror reflecting the quiet haziness of an empty suburban hallway halfway across the world.

What is carbon offset and trading?

The public's common perception of carbon offset... which needs to be addressed

Just planting trees isn't going to get us out of the problem.

Russell Marsh of Green Alliance.



Above: cap and trade is ultimately required for offset to **reduce** global emissions

Carbon offset is achieved by buying and 'retiring' (i.e. not selling on) Emissions Reductions that another party has achieved or will achieve, effectively investing in the project which is going to achieve the reductions. The project may be geographically remote but 'the atmosphere does not care where the reductions come from'.

Markets for carbon offsets

The process of selling carbon emissions reductions has the potential to unlock the power of the market by creating a trading system, allowing the lowest-cost reduction strategies to come to the fore. It has been demonstrated as a successful tool in the example of the US market in acid rain emissions in the 1980s. Of course, for this to work to the full extent requires 'cap and trade' legislation so that multiple players in the economy are given the requirement to cap emissions, and the opportunity to trade. Offset therefore has a valuable role in introducing the concepts of carbon trading.

Suspicion of carbon offset

Many people we have spoken to have demonstrated some suspicion or uncertainty about carbon offset, particularly non-technical people. It is seen as being an easy way out, which salves the conscience but doesn't solve the problem at its root. Some of the voluntary companies seem even unwittingly to encourage a negative reaction: a leading architect we spoke to talked disparagingly of a meeting with 'big-suited' sales-people promoting the marketing benefits of offset - and the architecture firm did not subsequently buy an offset product.

Many are suspicious about offset and associate it wholly with tree-planting - for which the carbon benefit is now understood to be very difficult to quantify.

Offset is an abstract concept, and voluntary offset on its own is not going to reduce global emissions - in the best scenario it will merely stabilise them. To gain public support, companies engaging in carbon neutrality must engage in directly reducing their own emissions, and use offset as a final step.

Carbon offset markets

Emissions Reductions can be bought and retired by a company, government or individual to meet legal or voluntary targets. There are two types of carbon offset available:

1 Certified Emissions Reductions - (CERs) and Emissions Reduction Units (ERUs)
Projects which have been certified and approved under the rules created in the Kyoto Protocol, under the Clean Development Mechanism (CDM) or Joint Implementation (JI).
2 Verified Emissions Reductions - (VERs)
Projects not under any legal framework, verified according to voluntary standards.

Voluntary market

In the Voluntary market, companies and individuals are currently buying offset in order to do the right thing, gain experience of the process, and assist with 'carbon branding'. Examples of companies offering this service are The CarbonNeutral Company and Climate Care in the UK, and Carbonfund and Climate Neutral in the US.

Legislated market

The full power of emissions trading is only achieved when a large number of agents are included in the market, and they work to legislated caps in emissions, creating the need to purchase offset and the opportunity to sell - carrots and sticks. This is what the Kyoto Protocol attempts to achieve on the world scale, as does the EU Emissions Trading Scheme for the EU.

There is considerable activity in both Certified and Voluntary Emissions Reductions: the carbon broker co2e.com claims that "in excess of 250 million tonnes of CO_2 equivalent (tCO_2eq) has been transacted". They also say "Analysts have forecasted the size of the future global greenhouse gas market to range from **US$10 billion** to **US$1 trillion** by 2010." Meanwhile the Financial Times estimated the market size to be $2 trillion by 2012 (Dec 05). There is currently huge variation in price of offset depending on the market and type. At the time of writing, CER credits currently range in value from €5-11/tonne. ERU credits are trading in the order of €23/tonne. EUA (EU Emissions Allowance) traded through the International Emissions Trading market are averaging at a cost of €30 per tonne of CO_2. Credits in the voluntary market currently trade in the order of €3-25/tonne.

A brief history of BT as a carbon pioneer

1992	BT established it's first CO_2 target.
1993	Helping the Earth internal energy campaign
1997	'Why not change the way we work' advertising campaign.
2002	CO_2 emissions reduced to 1 million tonnes
2004	BT becomes the worlds largest green energy customer and reduces its remaining 760,000 tons of carbon emissions by 40% at a stroke
2005	BT commissions Carbonsense to advise on carbon neutral futures
2006	Respected UK scientist James Lovelock launches new book - 'The Revenge of Gaia' portraying breakdown of civilization due to climate change
-	BT publishes "BT - towards Carbon Positive" as Hot Topic Report
-	Top ten BT executives go on tree planting weekend with key business clients to brainstorm carbon business objectives.
-	Project Polarbear created, the UK's first corporate carbon offset scheme available to staff.
2007	Fourth Assessment Report by the International Panel on Climate Change says climate change unstoppable unless carbon emissions are monetarised globally.
-	Viral marketing campaign based on low carbon comms game wins award
-	BT Installs small wind turbines at 20 key sites across the portfolio
-	BT becomes the UK's largest customer for microwind turbines and biofuel installations, helping to drive costs down for the consumer.
-	BT creates partnership with startup company HomeCoach to provide domestic carbon management services to all customers, using BT DSL lines and set-top boxes for data gathering.
2008	Launch of the VirtualMirrorTM videophone, whose eye contact, low cost and superior image quality finally start the avalanche of videophone use.
-	BT announces major renewables investment programme across all sites, including large wind on remote sites, as well as biofuels, small wind and CHP in urban sites.
2009	BT's last paper bill issued to customers - with tree seeds embedded in the paper for instant carbon capture.
-	The world's first Personal Carbon Card created, as a trial customer loyalty and carbon management incentive scheme, in partnership with a leading oil company, a leading home energy supplier and a leading international bank.
2010	UK leads the world by passing legislation to introduce personal carbon cap and trade system
-	UK Carbon Shares drives huge market growth for BTSaveIT carbon management services and VirtualMirror telemeeting devices
2012	Kyoto Mark II makes personal carbon trading near universal within an internationally agreed framework of Contraction and Convergence in per capita climate change emissions.
2016	Stephan Harding launches new book - 'Is Gaia healing?', with forward by Ben Peterson, new Chairman of BT, portraying how the earth is starting to recover due to the rapid de-carbonisation of society worldwide.

What are the scale and boundaries of a company's carbon emissions?

There is concern over double-counting emission reductions - a prime example being aviation. Francis Sullivan of HSBC points out that a problem for HSBC are the carbon emissions from business air travel - 88,000 tonnes per year, or 8% of HSBC's total carbon emissions. *"We're one of BA's biggest customers,"* Mr Sullivan says, *"and about 2.76 tonnes of CO_2 comes out of the plane's exhaust every time one of our executives flies to Hong Kong. That will cost us $10 to offset - but you could argue we're paying to offset BA's CO_2."*

ENDS Report No 369, October 2005

How do you measure the climate change footprint of a company? All sources of fossil fuel energy use should be included, but the key question is how to define what is measured and what is not - where is the boundary?

As a start all office and, where applicable, core manufacturing functions should be included, and are relatively easy to track via the company's energy bills. But are the suppliers' CO_2 emissions included? What about their suppliers? If customers' use of products can be shown to help decrease CO_2 emissions, does this reduce the company's footprint? What if the products increase or create CO_2?

There is not an accepted definition of what should be included in the calculation of a company's emissions. For example, the Greenhouse Gas Protocol of the World Resources Institute defines three 'scopes' while in the UK the Carbon Neutral Company, which is in the business of selling offsets, has set out a Protocol which is to be followed by any company seeking to gain the CarbonNeutral label.

Neither of these protocols set out to define how two companies in a trading relationship may or may not set the boundary between themselves for carbon accounting purposes, nor do they define rules to account for customers' reductions in emissions. In practice, companies around the world are not all taking the same view and there may be dangers in the approach that some are taking.

The Climate Group's 2005 'Carbon Down Profits Up' report highlights that whilst BASF cut its GHG emissions per unit of sales volume by 61% over the 12 years to 2002, it is only aiming for a cut of 10% over 2002-2012. However, looking at BASF's GHG emissions alone (29.5 million tonnes of CO_2 in 2004), it says, does not give the full picture. "When reductions in customers' emissions resulting from use of BASF products are considered - equivalent to 18 million tonnes of CO_2 saved per year - the firm's effect on the climate looks far more benign. Most of these customer savings come from heat insulation products, with fuel additives and plastic car parts providing additional benefits."

From a report on customer usage of BT carbon management services - 2009

BT now extends into all customer homes its offer and services on carbon management. Its central data servers collate information on household carbon and energy use and enable the customer to be as proactive or uninvolved as they wish.

John, a taxi driver from Romford, lets BT's carbon servers automatically buy or sell permits for him as required from month to month, using the LSE live auction service and crediting or debiting his account as necessary - and he never even looks at the bill summaries.

Yvonne, a teacher from Newcastle, is much more engaged. She has taken advantage of BT's partner Homecoach carbon service and actively auctions her own credits on ebay. Homecoach spent a few hours with her in her home reviewing her lifestyle and doing a brief but accurate energy survey of the building. Their report contained a whole range of options on energy efficiency improvements, including details on the level of disruption and the projected savings. She chose to use her small inheritance from the death of an aunt to carry out almost all of the changes, and has seen the investment pay off handsomely through trading the permits thus generated on the markets.

A similar approach to GHG accounting has been taken by Japanese electronics company NEC. The firm has pledged to become carbon neutral by 2010, applying the commitment to its products as well as its own activities. It has calculated that it can cut its own emissions to 1991 levels (0.9 million tonnes CO_2/year) and those arising from its products to 0.6 million tonnes/year. NEC believes that it can then achieve carbon neutrality by providing its customers with IT solutions that reduce their net CO_2 emissions by 4.5 million tonnes/ year.

In another, perhaps extreme example of this thinking, the World Aluminium Council has recently claimed that its members can

From Carbon Neutral Company - Protocol

Operators wishing to apply the CarbonNeutral Company or CarbonNeutral Organisation labels shall undertake to have assessed and offset the following sources of emissions for all sites owned or under direct management control:
· Direct emissions of GHGs (from combustion of gas, fuel oil, emissions from other processes) from sites;
· Indirect GHG emissions from the generation of imported electricity;
· GHG emissions associated with business travel and transportation of company-owned goods; and,
· GHG emissions associated with the disposal of waste.

The following sources of emissions may be excluded in the first year of assessment but shall be included in subsequent assessments and offsets:
· Minor sites, such as retail outlets or branch offices.

From the World Resources institute Greenhouse Gas Protocol

To help delineate direct and indirect emissions sources, improve transparency, and provide utility for different types of organisation and different types of climate policies and business goals, three 'scopes' are defined for GHG reporting and accounting purposes.

Scope 1: Direct GHG emissions
.. occur from sources that are owned or controlled by the company, for example, emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc; emissions from chemical production in owned or controlled process equipment.

Scope 2: Electricity indirect GHG emissions
Scope 2 accounts for GHG emissions from the generation of purchased electricity consumed by the company. Purchased electricity is defined as electricity that is purchased or otherwise brought into the organisational boundary of the company. These physically occur at the facility where electricity is generated.

Scope 3: Other indirect GHG emissions
Scope 3 is an optional reporting category that allows for the treatment of all other indirect emissions. Scope 3 emissions are a consequence of the activities of the company, but occur from sources not owned or controlled by the company. Some examples of Scope 3 activities are extraction and production of purchased materials; transportation of purchased fuels; and use of sold products and services.

The Greenhouse Gas Protocol, Revised Edition, World Resources Institute, March 2004

You could argue that BT could claim credits (in a carbon-constrained world) by encouraging home working and telecom solutions.

Janet Kidner, Battle McCarthy

achieve carbon neutrality - despite being major users of primary energy - thanks to CO_2 reduction achieved making cars from aluminium not steel (reducing weight and increasing fuel efficiency) - their calculations show an average saving of 26 tonnes of CO_2 per tonne of recycled aluminium used (14 tonnes saving for primary aluminium). "Alcoa is helping to lead the global aluminium industry in making aluminium climate neutral," said Randall M. Overbey, president, Alcoa Primary Metals Development. "Given the great attributes of aluminium - it is easy to recycle, strong and yet lightweight - the industry will be able to reach a climate neutral state by 2017. There's no other industry that we are aware of today that can make this claim, which will help solve global warming."

The person who buys the car that burns less fuel should get the credit.

Steve Hinton, AVBP

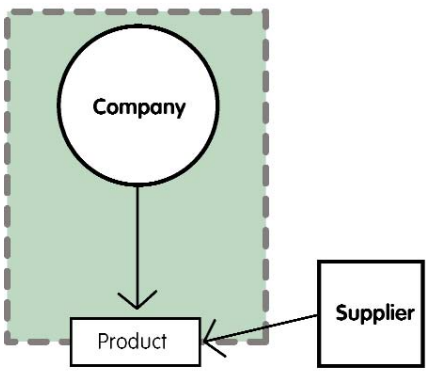
This stance has received some sympathy from US organisations who are working in the carbon neutrality field. Sue Hall, founder and executive director of the Climate Neutral Network, which administers the ClimateCool certification label agrees that if Alcoa sells aluminium to Ford, their contract theoretically could specify how any carbon reductions be allocated and owned across all three parties -- Alcoa, Ford, and Ford's customers. Sue Hall believes that in the voluntary emissions reductions markets companies would essentially look to incorporate the question of carbon ownership, if there are credits to be established, into the contracts between them.

These examples highlight the dilemma posed by the unregulated carbon emissions marketplace and raise a serious question: where does an organisation draw the line between its own carbon emissions and those of its customers or suppliers?

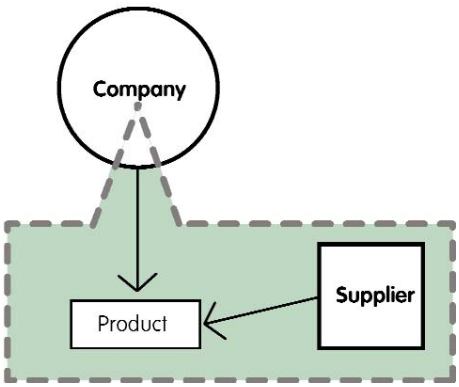
There is no authoratitive guidance on boundary issues. As we have seen, European organisations are tending to a narrower definition - the immediate activities of the company itself but excluding the impact of suppliers and distribution partners, and excluding that of customers. Companies in the US and elsewhere are tending to take a more flexible approach - where customer emissions savings as a result of a company's product are sometimes being claimed as offset against the company's own footprint.

Steve Hinton, management consultant with AVBP believes that the issue is simple: "The person who buys the car that burns less fuel should get the credit. Any additional cost to produce that car would be passed on to the buyer, but offset through reduced fuel costs, and perhaps someday, carbon credits, just as the cost of hybrid cars and any savings in fuel falls to the car buyer. Ford or Toyota or Honda should not claim carbon reductions realised by the driver of their cars. But they will get the increased sales of their fuel efficient, carbon reducing products consumers want. So, Alcoa gets the benefit of selling more aluminium to Ford because Ford is able to sell more cars to people who want to drive cars that burn less fuel."

Carbon neutral company



Carbon neutral product



The conventional view of a company's carbon neutrality does not include suppliers, hence its product will be only partially carbon neutral (especially where there is materials input)

What other companies are doing

We also will be developing materials designed to help consumers' understanding of what an offset is and how they can act on further opportunities - by offsetting the CO_2 emitted when they drive their vehicles.

In Europe and Japan…CO_2, the primary greenhouse gas, is already part of the consumer's lexicon. High fuel taxes, CO_2 linked fuel taxation, CO_2 linked personal taxation, specific CO_2 vehicle labelling and more widespread environmental awareness have already begun to shape consumer preferences towards more CO_2 friendly vehicles.

Ford Report on the Business Impact of Climate Change 2005

Companies around the world are rapidly waking up to climate change. BP have recently embarked on a remarkable public engagement campaign in the UK around understanding carbon. Swiss Re has led the insurance world by highlighting the risks and costs of climate change, and in 2003 they decided to 'walk the talk' by becoming carbon neutral - or in their terminology, greenhouse neutral. Their approach was to reduce their own emissions over ten years by 15% with a commitment to offset the balance.

GE, one of the world's largest corporations with a history of opposing environmental regulations has developed a new word for the way it says it is developing its business - Ecomagination. Ford, whose profits in the US have been largely obtained from selling outsize SUVs, has produced a report entitled 'The Business Impact of Climate Change' that honestly sets out the challenges. Lee Scott, the CEO of Wal-Mart, by far the world's largest retailer, has recently said that a new key environmental goal for Wal-Mart was "to be supplied by 100% renewable energy." Green pressure groups are closely watching these shifts in the corporate landscape, and will no doubt report loudly if words do not turn into actions.

There are also a growing number of organisations and campaigns bringing companies together to lobby and share experience. In the US, think-tank Pew Center on Global Climate Change runs the Business Environmental Leadership Council. Their corporate members who include Dupont, IBM and Intel pledge to assess their domestic greenhouse emissions and establish programs to reduce them but without naming public targets. The 2005 'Carbon Down Profits Up' Report from The Climate Group, of which BT is a member, states that: "Improving energy efficiency can help a company's profitability as well as the planet. But, for those leading the battle against climate change, it is just the first step."

A Scandinavian approach is provided by The Business Leaders Initiative on Climate Change (BLICC), an initiative which engages companies such as IKEA, who consider that they are at the forefront of efforts to address climate change and wish to share best practice and inspire others to meet this challenge.

Organisations in the UK committed to going carbon neutral.

Company	*Primary business activities & profit*	*Reasons for going carbon neutral*	*CO2 offset information*	*Comments & feedback*
HSBC	International banking – 'the world's local bank'. Pre-tax profit $21 billion	- Need to improve corporate social responsibility (C SR) image - Brand & business reputation - Relatively low cost compared to pre-tax profit	Offset 170,000 tons by purchasing verified emissions reductions (VERs). This pilot purchase covered 4th quarter 2004 emissions.	- thinking now progressed beyond the idea of carbon neutrality - now plan to find ways to de -carbonise customers as well as themselves - looking for investment opportunities that would allow generation of own emission reductions - Is HSBC becoming a carbon positive company?
Swiss Re	One of the world's leading reinsurance businesses	- Business requires clear understanding of risks from climate change - leadership position in sector - Business opportunities for Greenhouse Gas Risk Solutions team	Offsetting 37,000 tons / year in World Bank Community Development Carbon Fund.	- useful in positioning themselves - concerned about definition of 'carbon neutral' - need for a standard to minimise risk
Radio Taxis	Leading London taxi company with over 3000 black cabs	- Brand differentiation - Corporate customers becoming more environmentally aware	Offset 24,000 tons through The Carbon Neutral Company	- £1.2m new business as a result of going carbon neutral - £250k worth of PR - "we're ecstatic – it's paid for itself twice over!" – Michelle Nunan, Head of Marketing
Avis	Leading car re ntal company in Europe, Africa, Middle East & Asia with over 3,800 locations.	- Brand differentiation – 1st car rental company to go carbon neutral - Carbon neutrality fits with 'we try harder' ethos	Offsetting 22,000 tons / year (2003) covering own corporate direct emissions through The Carbon Neutral Company	- main benefit has been winning corporate business where carbon neutrality can be 'swing factor' - UK Met Office is good example - 2005 saw 50% increase in internet booked rentals buying carbon offsets

Sir John Bond, Chairman of HSBC, speaking to institutional investors at the Stock Exchange at the London launch of the 2nd Carbon Disclosure Project Report, April 2004

...climate change represents the largest single environmental challenge this century. It will have an impact on all aspects of modern life. It is therefore a major issue for our customers and our staff, as well as for every organisation on the planet, no matter how large or how small.

Sir John Bond, Chairman of HSBC Group Chairman, April 2004, launch of the Climate Group

The HSBC Story

HSBC, currently the world's second largest bank, "needed to catch up" according to one senior SRI fund manager. Two years ago the board decided to make the company one of the world's leading brands for service and corporate social responsibility.

In December 2004 the chairman Sir John Bond surprised the banking world by announcing that they were going 'carbon neutral' within eighteen months, although their direct contribution to climate change was relatively small. This had been done before by smaller companies with clearer business drivers, but not by a major international corporate. In April 2005 the company published its comprehensive 2004 CSR Report. The centre two pages map out their own role as a global bank in tackling climate change, as well as how they intend to go carbon neutral.

HSBC describes its strategy thus:
- firstly we manage and reduce our direct emissions
- secondly, we reduce the carbon intensity of the electricity we use by buying 'green electricity'
- finally, we offset the remaining emissions in order to achieve carbon neutrality.

In October 2005 the bank purchased carbon emission offsets effectively making the fourth quarter 'carbon neutral' for the bank. But, according to Francis Sullivan, the bank's environmental policy advisor, they have already decided that they are unlikely to repeat the experience at least on a quarterly basis.

The ENDS Report of October 2005 documents how HSBC learned from their foray into the unregulated end of the carbon offsets world and how their thinking has now progressed beyond the idea of carbon neutrality. "As a bank, we're able to deploy capital and help develop projects," says Francis Sullivan. "If you're looking for serious additionality, that's the way forward - trying to decarbonise our customers as well as ourselves."

The bank is now looking for investment opportunities that would allow it to generate its own VERs (Verified Emissions Reductions), and possibly to share them with its customers. Are HSBC moving beyond carbon neutrality into becoming 'carbon positive'?

Project	*Location*	*CO2e Reduction (tonnes)*	*Notes*
Te Apiti wind farm	North Island, New Zealand	125,000	Gold Standard certified project. 55 x 1.65 MW wind turbines
Organic waste composting	Victoria, Australia	15,000	Composting waste avoids methane emissions. Credits issued by Australian Greenhouse Friendly scheme
Methane capture	Sandbeindorf, Germany	14,000	Biogas plant uses cattle & pig manure to creating energy and renewable heat. Methane emissions reduced by 90%
Vensa Biotek biomass co-generation	Andrha Pradesh, India	16,000	Project generates 4 M W of electricity from clean burning of surplus biomass from sugar crops. Saves burning coal.

The quality of corporate strategies for managing the risks and capturing the opportunities associated with a carbon-constrained economy will likely become more important in investor decisions.

Ford Report on the Business Impact of Climate Change 2005

Institutional investors have woken up to the issues over the last three years largely thanks to the Carbon Disclosure Project representing a coalition of the world's largest institutional investment companies, with $21 trillion in assets. The project wrote, on behalf of these investors, to the Chairmen of the world's 500 largest companies, asking for information necessary for investors to evaluate the corporate winners and losers from a future impacted by climate change. Their latest Report shows that more than 90% of the 354 responding FT500 companies flagged climate change as posing commercial risks and/or opportunities to their business. Interestingly there was a dramatic increase in the number of U.S. corporations making information on their greenhouse gas emissions and climate change strategies available.

The Report also highlights the huge variations in response from large companies in the same sectors. For instance Washington Mutual bank commented that, "we have not experienced direct indicators suggesting that climate change will affect our current business model in the future." That contrasts with the view from Bank of America, which sees climate change as a "major risk to the ultimate stability and sustainability of our way of life" and has taken steps to "assess climate change risk on our business and take necessary action to limit risk and invest in change where appropriate."

Examples of carbon neutral products and services

			Emissions which are offset		
Name	*Description*	*Organisation*	*Own*	*Suppliers'*	*Customers'*
Phone Coop	Carbon neutral phone & internet service	The Phone Coop	Yes	Yes - Estimate proportion of network emissions	N/A
Cool Carpet	Carbon Neutral carpet tiles	Interface	No	Yes - Emissions determined by Life Cycle Assessment	N/A
West 3 Development	518 new homes	Berkeley Homes	No	Emissions associated with construction	Set up 'green' energy contracts for purchasers
Summer 2005 offset	Educational offset project wit h Eden visitors	Eden Project / BP	No	No	Estimated one year's car emissions
BA flight offsets	BA customers can offset flight carbon emissions	BA / Climate Care	No	No	Emissions associated with own flight
Customer Reward	Carbon neutral 'gift' through Honda's 200 UK dealership	Honda UK	No	No	1 month of carbon neutral driving

Carbon neutral products and services

The general view seems to be that just buying "tree credits" as per HSBC is not the answer although it does give positive feedback to CCl pricing regimes in terms of Traded Permits.

Peter Jones, Director, Severn Trent / Biffa

Over the last few years there has been an increase in the number of organisations that are offering carbon neutral products, services or events which reduce emissions and help inform and educate consumers or other businesses.

If the product or service has no or negligible carbon emissions for its working life then the assessment will require a life cycle analysis down the supply chain. Often this assessment will have a level of inaccuracy, but that's acceptable according to Bill Sneyd of The Carbon Neutral Company "provided you're being transparent and are clear about what you intend to do in the future."

But what if the product or service itself is responsible for emissions - do these have to be taken into account in the carbon neutral claim? In practice different offerings are taking different views on this.

Berkeley Homes have built a housing development of 500 homes which they describe as carbon neutral. They have calculated the emissions associated with the construction of the project, managed the project to reduce these by 18% and have offset the balance through The Carbon Neutral Company. In addition the residents were signed up to a 'green' energy supplier for their first year (though any premium is covered by the residents and they have the choice to switch suppliers after a year). Berkeley are making a clear distinction here - putting the operational energy as the resident's responsibility, which is fair enough. Some would question whether the project can justifiably be called carbon neutral: it's worth noting that the lifetime energy use of the project may be eight times more than the construction energy.

A good example of a manufacturer taking a leading position is Interface, which has reduced its own greenhouse gas emissions by 54% since 1994. In 2003 they launched their Cool Carpet(TM) program which offsets the entire life cycle emissions of the carpet because "cleaning up our own act was not enough". Interface has since sold over 15 million square yards of Cool Carpet globally, offsetting more than 250,000 tons of CO_2 with project developers such as Climate Care in the UK and certification via the Climate Neutral Network in the US. The offset covers emissions created by their suppliers, by Interface in the production process and by their customers related to maintenance and disposal.

Another proactive stance is taken by The Phone Co-op in the UK, which provides carbon neutral telephone and internet services by offsetting with Climate Care all the CO_2 generated by its activities and including use of the telecoms network. Phone Coop says it estimates the network emissions that it is responsible for by taking a percentage of BT's emissions based on the Phone Coop contract as a proportion of BT's turnover.
Another example of in-use energy offset is British Airways, which has launched a scheme with Climate Care where its customers can choose to offset the CO_2 emissions created during their flights.
Honda UK provides a 'gift' of a month of carbon neutral driving purchased through The Carbon Neutral Company. And increasingly we are seeing events such as rock concerts and tours, conferences and even the Winter Olympics of 2002 becoming carbon or climate neutral due to offsetting associated operational and travel emissions.

However, selling the offset concept to the uninformed public can be difficult. Working with BP in 2005, the Eden Project tried to get visitors to offset their annual car emissions. However they only managed to make sales to 1.5% of the people who saw the exhibit because they found they had to explain how driving contributes to climate change as well.

The carbon journey

It is useful in considering the idea of 'carbon neutrality' to step back and look at the concept. Is it the right end goal? Or is there something beyond which could be more compelling? We are in new territory here. The term 'carbon neutral' is itself very new. The language around carbon is evolving. There are no easy answers.

Journey
We believe that it is helpful to see carbon neutrality as a stage in a journey towards a state that we call 'carbon positive', which is beyond and probably requires carbon neutrality. Currently, most companies would be hard pressed to choose where on this journey they are. Indeed different parts of the business may well be in different places.

approach:	**carbon unknown**	**carbon managed**	**carbon neutral**	**carbon positive**
activities:	energy managed CO_2 unknown	CO_2 known, managed & reduced	CO_2 known, managed, reduced & balance offset	CO_2 known, managed, reduced & balance offset. & new business
people:	Energy Manager	Energy Manager CSR Manager	Energy Manager CSR Manager Brand Manager Board	Everyone in organisation & external sphere of influence – employees, customers & suppliers

carbon literacy

Carbon Unknown
Many organisations are still at the 'carbon unknown' end of the spectrum where these matters are the preserve of the Energy Manager or someone in the Estates Department. Occasional 'energy saving' events are held, posters are put up and stickers appear on light switches. No-one takes much notice. Energy to most people is pretty boring.

Carbon Managed
A number of larger organisations in the UK have thankfully gone past that stage and are now moving into the carbon managed stage, where the issue of energy is 'translated' into carbon. The CSR and/or Environment Managers become involved, and resources start to be deployed to genuinely reduce emissions. A Board champion is involved but may be limited in scope.

Carbon Neutral
Committing a business to carbon neutrality is a major step. The whole board needs to be behind the initiative. Companies taking this step would need to have clear strategies for ongoing carbon reduction. Brand Managers and Marketing Departments will be involved to manage the brand and reputational benefits.

Carbon Positive
The final stage in this journey is carbon positive, where the company looks to adapt its own business model and activities to minimise carbon emissions in society, and seek out business opportunities which help it do so. This will need managers and everyone in the business to be aware of the issues and take account of carbon in business decisions.

For some businesses there could be major benefits in moving into this space. They will be well placed to recognise potential new business opportunities and minimise risks in the carbon-constrained world. An organisation making this commitment will be attractive to work for and there is an abundance of evidence to show higher staff retention, increased productivity, creativity and team working occurs in organisations that care for community and environment.

Conclusion
The journey towards carbon literacy is not easy. But we will all have to make it. Individuals, communities, governments and organisations big and small. The challenge for organisations is how to do this in a way that is smart and good for business. The benefits may be huge.

Part 3: What would a carbon neutral BT look like?

A Quiet Revolution wind turbine from XCO2 at Newgate Street could also promote the brand through new LED technology allowing illuminated and animated signage

Large wind turbines are becoming increasingly acceptable. This first at Swaffham led to calls from residents for more - and a further two turbines have so far been built near the small Norfolk town, with more planned. How much wind could BT build on all its sites?

Our planning applications for large wind were blocked by the MoD. This seems to be a particularly British problem.

Angus Berry, Senior Energy Manager

What are the boundaries of BT's carbon emissions?

The direct transport substitution effects of home-based and centre-based teleworking have been repeatedly measured in the literature, showing statistically+ significant reductions in travel.

DTLR Study 2002

The key applications that are making an impact on our travel behaviour and the way we transport things are:
- e-work (remote work)
- e-business (b2b and b2c online transactions and service or product delivery)
- e-services (e-government, e-learning, telemedicine etc).

DTLR Study 2002

The US Centre for Energy and Climate Solutions has demonstrated both direct and indirect energy savings arising from the Internet. U.S. energy intensity (energy use per unit of GDP) routinely declined by 2 percent per year from 1973 to 1986, and at about 1% per year since then, and roughly 1/3 of the improvements were the result of strong growth in information technology and related sectors.

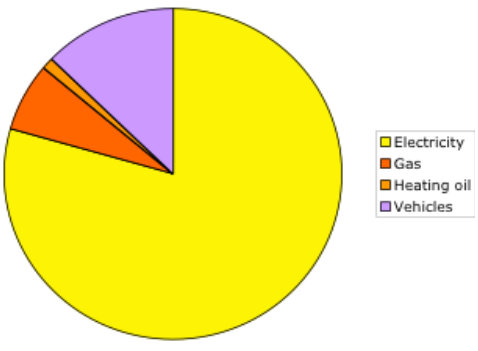
BT, like other telecommunications companies is already considered carbon-light relative to its contribution to GDP, relative to its turnover, and relative to other FTSE100 companies. However BT is still one of the UK's largest electricity customers.

As an ICT business BT's impact is we believe broadly beneficial in respect of carbon issues - because ICT has the capability to displace travel and in some cases, displace or rationalise the movement of goods. This issue is not simple - in some cases ICT can generate extra journeys - but research confirms clear savings are possible.

One report by SustainIT demonstrates that a project to encourage more widespread use of teleconferencing within BT itself has reduced travel and emissions (by an average of at least 32 kgCO_2 per teleconference). Elsewhere a group of European telecoms companies including BT have estimated that given rapid growth in teleconferencing as well as such activities as electronic billing and online filing of tax returns, a carbon reduction can easily be created which is ten times larger than the combined footprint of the companies themselves.

So would it be reasonable for BT to claim carbon neutrality based on the positive impact of its services?

There are two levels of judgement that need to be made on the boundary question. On one level, what a company does is important - whether its services increase or decrease emissions. For BT, it is important to acknowledge that ICT can reduce carbon and this must form a core part of BT's business thinking as it goes forward: there are big opportunities here.



This does not mean that BT's own carbon emissions can be merrily ignored, just as that of the world aluminium producers cannot be ignored. In other words, a company still has a responsibility to manage and reduce its own direct emissions even if its products can be used to reduce CO_2. Put more simply, a company's direct footprint does not include its customers' footprint.

On the issue of where precisely to draw the boundaries , BT must make a stand, since there is no accepted position.

BT's carbon emissions boundary

We propose that the boundary to BT's own carbon emissions includes:
- Office energy, transport and materials used for general office functions.
- Network energy use (the wires and exchanges and radio links that carry data)

BT is unusual as a former monopoly - i.e. it supplies network services wholesale to competitor telecom companies. Therefore it might be reasonable to pass on the cost of offset for that proportion of the network service to the wholesale company, though this would presumably have to be discussed with the regulator.

Under normal definitions suppliers to BT, who use energy to make product which is then incorporated into other product or sold on by BT, would not be included within BT's own footprint. The straightforward view says that this carbon is in the suppliers' footprint, not BT's. However, if BT commits to reduce emissions, then we suggest that it should also pressure its suppliers to do so, and if they are unable to, BT might even invest in their energy efficiency or purchase offsets on their behalf.

How should BT achieve carbon neutrality?

Last year through our use of conference calls and home working we avoided 315 million miles of vehicle travel, lowering CO_2 emissions by 20,000 tonnes, and saving the company £360 million.

BT Chairman Sir Christopher Bland, speaking on 7 October 05 at the launch of the 2005 Carbon Disclosure Project Report.

BT carbon figures show the extent to which the company has reduced emissions already: from 1.6mt to 0.76mt over the last decade, with a projected 0.3mt for 2005-06 (following the green electricity contract). These figures include emissions arising from the use of electricity to run the network, their offices and buildings, and vehicle fleet diesel.

BT is thus already engaging in the first three of the carbon neutrality strategies. What are the issues going forward?

Energy Efficiency
There is a commitment to annual targets in reducing energy use, though it is acknowledged that the company's 21st Century Network may increase energy usage. Other examples include the use of fresh air cooling in equipment for new exchanges, the use of more efficient fans, and the use of Liquid Pressure Amplification on cooling systems for existing buildings.

There is a wider story than just going carbon neutral. They need to link in with marketing and comms strategy and make it part of the brand.

Janet Kidner, Battle McCarthy

Issues going forward: BT reduced energy demand by 16.5GWh in 2004-05 through efficiency. This is a large amount of energy, but still small compared to BT's total (0.6% of non-transport energy). If employees could be fully motivated and incentivised, it might be possible to achieve a much higher reduction year-on-year. Is BT willing to accept sufficiently long return on investment periods?

There are complex issues around benchmarking of energy efficiency in this sector however. BT's base energy demand is predicted to increase while the C21st network is rolled out - and are likely to increase with greater use of broadband. BT efficiency targets should probably be set on energy intensity rather than absolute energy demand - perhaps this should be measured as unit energy per unit of data transferred.

Business Process
There have been strong moves towards homeworking and teleconferencing amongst own staff at BT, and carbon savings have been demonstrated. Paperless billing is also offered as an option, with the incentive of a sapling planted for each customer who switches.

Issues going forward: Demonstrable savings achieved here, including reports of higher worker satisfaction. How much further should and could BT go? There will be a clear limit to homeworking in terms of practicality and the emotional need to work face to face, but what are they? How much further can teleconferencing reduce travel? In what ways can BT actively encourage this change?

Renewable Energy
From October 2004, BT has been purchasing large quantities of green electricity. It is also undertaking pilot studies for the use of renewables on its own buildings, including small wind turbines and biodiesel, and considering large wind.

	COST/ LIKELY COST	
	NOW	10 YEARS
Energy Saving	Low	Moderate
Green Energy	Low	Moderate
On-Site Renewables	Moderate	Low
Offsets	Low	Moderate

This table illustrates possible cost trends that could help inform carbon neutrality decisions. We believe that energy saving may become cheaper in ten years due to energy price rises and green energy will be even more expensive due to its scarcity. Onsite renewables will fall in cost, while offsets will probably rise.

... carbon is a great opportunity for BT to engage with the customer - they will have an always-on datalink into the home, which could monitor carbon from domestic energy, and via the website, offer trading of permits and access to carbon services. What is needed now to get the Domestic Energy Quota agenda moving is intervention from a leading business such as BT highlighting the entrepreneurial opportunities it could generate.

Nick Robins,
Head of SRI Funds, Henderson

Supply chain audits are probably the most appropriate for outfits like BT in terms of driving energy efficiency/green procurement and awareness. Presumably they could [also] set up an intra company Trading scheme as a mechanism to drive green behaviour by their employees - a sort of "externality pay rise" for low carbon staff?

Peter Jones, Director, Severn Trent / Biffa

A Google search on "carbon-constrained world" in January 2005 returned 20,800 listings

Issues going forward: Green electricity in short supply in the UK and it will probably not be possible to repeat the current contract after this three year period, or at least not without a considerable price increase. This is mainly because of planning constraints slowing the build rate of new wind energy capacity.

While BT is ensuring that its green energy is not double-counted by retiring the Renewable Obligations Certificates (ROCs), nationally there is no clear way of guaranteeing origin of energy, and BT has been lobbying for this. BT are also lobbying for a system of 'red biodiesel' to be created to make biodiesel competitive with standard red diesel industrial use.

The best way for BT to ensure continued renewable energy supply is to build renewable energy on sites that it owns or controls. How much renewable energy can BT generate on its own sites? How long a return on investment can BT accept to maximise generating capacity? Conversely, what level of energy insecurity can BT accept - given likely forthcoming shortages?

If BT cannot build sufficient renewable energy on its own sites, can BT forward purchase energy from planned wind farms, effectively investing in the project? This is effectively carbon trading, illustrating the need for the final step which follows efficiency, business resource management and renewable energy.

Carbon Offset or Trading

Carbon Offsets will need to be part of complete carbon neutrality, as there will always be some rump emissions, and it will not be possible to build sufficient renewable energy capacity on BT's own sites.

The questions are only about extent and timing. BT could start by offsetting one part of the business, so that communications can be targeted at the relevant customer type. BT might then aim to ramp up to 100% carbon neutrality, and aim to reduce the amount of offset that it purchases as its own emissions are reduced through increasing efficiency and renewables.

BT - THE CARBON 'SWOT'
In a carbon-constrained world

INTERNAL	STRENGTHS	WEAKNESSES
	- Already reduced emissions over 10 years - ICT is low energy / emission - Environment / CSR people fully engaged - Commissioned this report!	- Carbon issues not fully on management radar
EXTERNAL	OPPORTUNITIES	THREATS
	- Increased ICT demand: . teleworking desirable . increase cost of travel - Brand development - Carbon management / trading + monitoring - On-site renewable development	- More 'nimble' ICT group companies grab low-carbon service opportunities quicker - Escalating energy costs - Power & fuel shortages exceed standby generation capacity - BT products' energy use by consumers

What are the opportunities for BT's business in a carbon-constrained world?

Last century saw the introduction of the euro, perhaps this century will see the introduction of the carbon dollar.

BT Chairman Sir Christopher Bland, speaking on 7 October 05 at the launch of the 2005 Carbon Disclosure Project Report.

Every new business & technology idea BT has should be scrutinised for its potential carbon emissions impact. If it means increased emissions they should think again.

Liz Reason, R2BC

The dependence of the economy on ICT services will only grow as constraints on carbon increase, through supply limits or carbon trading legislation.

In fact it is clearly in BT's interest to see proper valuing of carbon in the economy (for example through a carbon cap and trade system), as it will increase the cost of travel and therefore also increase the value of ICT applications which can replace that travel.

In a carbon-constrained world, good ICT access will be essential not only to economic activity but also to quality of life and societal and cultural exchange.

But the majority of people and businesses are still only taking advantage of a tiny fraction of services available via the internet, so there is a huge opportunity for BT in the development and marketing of innovative communications services which reduce dependence on carbon-intensive travel, especially as travel becomes more expensive.

There may be also opportunities for BT to provide carbon management services business and domestic customers and including data monitoring and facilitation of carbon trading.

Perhaps the main opportunities for both business and brand development in this area lie in the overlap between the promotion of innovative ICT services, and provision of services to enable carbon monitoring and trading, which will in turn encourage a higher valuation and greater use of the ICT services.

We think that BT should thoroughly map out opportunities in this sector, and engage in test marketing activities based on some of the new services and carbon-oriented activities.

Good ICT access is currently something that people take for granted and don't necessarily associate with a particular brand. As it becomes more valuable, can BT brand low carbon ICT?

New Product Development - report from BusinessWeek magazine 2010

The research team at BT has developed a whole series of successful service and product packages based on the travel-displacement model, and following the huge worldwide success of the virtual mirror. Their business consultants have pioneered creation of the complex people-soft solutions required to unpick business models previously reliant on carbon intensive behaviour patterns like private travel.

John Jones is most proud of his work with Ivea, a business whose model was previously heavily reliant on travel by private car to out-of-town shopping centres. The new model - currently growing fast - is based on smaller town centre showrooms and sophisticated delivery networks. There is also a growing network of local home parties used to extend the reach further and displace that polluting individual trip to the store - as well as providing much better online ordering and full delivery services.

The parties work because the local home reps use VR immersion and rapid prototyping machines to churn out demo copies of furniture the buyers are considering. Having decided against a particular coffee table or chair because it doesn't go with their sofa in their living room, the potential purchasers merely shred the sugar based copy that the rapid-prototype machine squirted out for them, and combust it in their domestic stove.

Carbon trading - an opportunity for BT?

Carbon will be the currency of the coming age…

Carbon UK Report, Environmental Change Institute, University of Oxford

In spite of all the work on climate change, the public in general has yet to be mobilised behind a low carbon future. One tool that looks set to change this is personal carbon allowances or Tradable emission quotas, which would bring home to individuals their contribution to the issue. Just as the EU ETS has galvanised action in carbon-intensive industrial sectors, DTQs/ TEQs could help stimulate a wave of innovation, particularly for ICT companies as well as new 'carbon management' operators who would help households live within their quote and earn income from lowering carbon.

Nick Robins, Head of SRI Investment, Henderson

Though carbon trading and offsetting are currently controversial in some circles, carbon trading could prove to be the most effective mechanism for tackling climate change within a system of legislated annually reducing emissions caps.

In the UK the Sustainable Development Commission (SDC) recently recommended that the Government should "seriously consider the possibility of extending 'cap and trade' schemes for carbon dioxide (CO_2) across the whole economy, to cover individuals, as well as business and the public sector". Robust systems and standards would need to be established and this would also require public understanding of cap and trade schemes and carbon offsetting.

We suggest that the best way to raise understanding would be through providing direct experience of a carbon market through trial schemes, and by making very good information available about the kinds of emission reductions projects supported, how they are assessed and reductions measured, and how the additionality is defined.

We believe there are possibilities for BT to raise understanding and debate about personal carbon shares. This could involve light-hearted trials and games, for customers or staff, or be humorously explored through viral online games, or consumer trials. Imagine a consumer documentary where two families are given a carbon budget, set up and trained with sophisticated ICT, and observed for a month or so. Every time a family uses ICT to offset travel or other carbon emissions, that family wins points - and points mean prizes. With BT sponsorship and technical support, a programme like this could demonstrate the benefits of carbon trading and the value of ICT, as well as promoting the BT brand.

BT has millions of retail customers, each of whom emit an average of 10 tonnes of carbon per year. The market price to voluntarily offset carbon dioxide is currently somewhere between €3 and €25 per tonne. Although the current minimum trade through a carbon broker is 5,000 tonnes of carbon dioxide, BT could aggregate carbon savings on behalf of its customers and trade them at the market price. The potential value of a transaction to offset just one tonne for every BT retail customer is worth in the range €60m to €500m, on which BT might justifiably earn transaction fees, as well as customer loyalty.

Excerpt from popular TV programme Shedding That Extra Carbon, 2007

Penny Poyzer, presenter: And now, to wrap-up this week's show, Jenny will tell us about her experience in the course of a week with the Carbon Patrol crew.

Jenny, participant: I had no idea of how my lifestyle was contributing to climate change - people usually don't think that their day-to-day actions are affecting the planet. The Carbon Patrol crew has helped me do things differently. For example, thanks to the new BT system, I spend less time shopping, waste less, have more quality time and help reduce climate change as a BT Climate Volunteer. I'm so pleased to be doing the right thing and knowing that I really am making a difference!

Still from the Penny Poyzer show No Waste Like Home

Carbon Branding

Paul Dickinson, Coordinator for the Carbon Disclosure Project, believes that future corporate change will come from the ICT sector, rather than the 'old' industries: "The combined profits of all the world's car manufacturers are less than those of Microsoft or Cisco".

Paul relates a discussion at a conference in March 2005, with a senior official in the US EPA (Environmental Protection Agency) regarding the likelihood of climate change regulations being introduced in the USA within the next ten years. The official's answer surprised him: "If Intel & Cisco were to campaign across the US for carbon tax or cap and trade, they would get what they wanted". Does this illustrate the political lobbying power of today's ICT sector?

According to a Carbon Trust report, the brand value risk from climate change to the UK telecommunications sector worth £116 billion is a mere 1%. Negligible compared to the airline industry with a significantly lower market value of £3.1 billion and 50% brand value risk from climate change.

Companies are increasingly engaging in what is being called carbon branding. According the New York based consultant, Robert Rabinowitz, a small but growing number of businesses are taking action on climate change through carbon branding. The business case for taking action in response to climate change has traditionally been made in negative or precautionary terms, but that is now changing. Multinationals such as BP, Avis, HSBC and Shaklee, as well as small start-ups such as TerraPass in the US, are beginning to take the lead.

According to Sue Hall, director of Climate Neutral, the idea is simple. Calculate the GHG emissions associated with the manufacture and use of a particular product. Purchase emission reductions equal to that amount. Stick a label on the product announcing that its use does not contribute to global warming. Then, send it into the marketplace to compete against non-climate-friendly products. According to Hall, this is "an audacious idea: that companies could achieve competitive advantage and deliver on some major business goals while eliminating their impact on the Earth's climate and delivering benefits to local communities. It's a classic triple bottom line idea."

Ken Perkins of Shaklee, a California-based manufacturer and marketer of personal care and household products was searching for opportunities in environmental excellence. "Climate change is the 21st-century environmental issue," Perkins says. Shaklee has offset 46,000 tons of GHG emissions over the past two years. It paid to upgrade boilers in Portland schools, saving the public school system $250,000 in future capital investment and fuel costs. The firm also funds a solar electrification project in Sri Lanka and India which aims to introduce energy efficient solar electricity to rural areas where less than 25% of the population has access to electricity. Perkins claims that Climate Neutral's "Climate Cool certification of our enterprise has increased our sales distributors ability to attract and retain customers."

The largest carbon branding effort to date is BP Australia's Global Choice program. When consumers buy Ultimate, BP's premium fuel, 1% to 2% of the purchase price is used to fund projects that offset the GHG emissions caused by the production and use of the fuel. Commercial customers, such as those with a vehicle fleet or a company fuel purchase program, can also buy offsets across BP's whole fuel range for a variable premium of up to 1.7 Australian cents (0.93 US cents) per litre. Since its launch in January 2001, the program has purchased 100,000 tons of offsets. BP anticipates that 500,000 tons of offsets will be purchased in the current year, equivalent to 1% of Australia's GHG emissions from cars. Now that's something like taking 120 000 cars off the road each year.

The cynic may dismiss some of these carbon branding examples, but there is no doubt that carbon branding helps spread carbon literacy, and increases the income stream for carbon reduction projects.

What impact could carbon neutrality have on building the BT brand?

The actions of leading companies such as BT are living proof that significant cuts in greenhouse gas emissions need not come at the cost of economic growth.

Prime Minister Tony Blair, 2004

Carbon offers a great potential for brand differentiation… Carbon is a huge opportunity for BT.

Dorothy Mackenzie, director of Dragon Brands

What is the potential brand impact of carbon neutrality? Our research shows that general awareness that there is a serious climate change problem is very high. It is also true that understanding of the issues and potential solutions is quite low. Nevertheless we find that there is very strong demand for clear information and simple steps people can take which will make a difference. Therefore the issue has huge potential for customer engagement and brand enhancement, both b2c and b2b. Any company providing clear information and guidance, and demonstrating a commitment to solutions, has an advantage to gain.

Those companies that have made moves towards carbon neutrality, have we believe not fully capitalised on the brand enhancement potential so far, having apparently chosen to focus the message in CSR circles (viz HSBC). The obvious and strange exception is BP, which may be winning some consumer sympathy with its current huge campaign in the UK with slogans such as: 'it's time to go on a low carbon diet'. Despite reporting emissions in the order of 90 million tonnes CO_2 equivalent arising from its own operations and some 15 times that resulting from the products it sells, BP is claiming to be a leader in finding and implementing solutions to climate change.

Other recent high profile examples include the GE 'Ecomagination' campaign, announcing an R+D investment increase in low-carbon technologies - aimed primarily at businesses and the financial markets. US oil company Chevron has also run a magazine/newspaper campaign called

Tele Meeting and Health

Report on the Six O'Clock News, late 2006
The consultant stands in front of a large lightbox, referring to the MRI-scans displayed there, and carefully explains the diagnosis and management strategy to the patient, 6- year old Josh, and his parents.

Only ten minutes later, the consultant is talking to another family, providing the immense value of his years of experience and hard work in the very specific field to which their child's condition belongs.

But as the camera pulls back, you realise that the consultant is alone in the room - the patient is 600 miles away, at the other end of a video link.

The reporter explains that this is a new BT telemeeting system, which enables full eye contact between the parties, and allows them to move around the room. Thanks to these advantages it works much better than the old video conference devices, which were expensive and unwieldy.

The consultant is at Great Ormond Street, a world expert in his field, and thanks to the system he is now able to see twice as many patients and the patients don't have to travel. Every NHS region in the UK is being equipped with the BT telemeet devices which are portable and use internet bandwidth.

The project has reduced travel emissions and cost for the patients, and has increased the effectiveness and availability of medical care. Thanks to sponsorship by BT of an initial trial, the programme is now being rolled out throughout the NHS.

If a brand like BT went carbon neutral it would help the general herd instinct and would be a powerful 'swing' factor.

Hilary White, Investor Relations, Avis Europe

Ten years ago, consumers were hungry for the ethical alternative and hungry for the information they needed to identify it. Now they are even hungrier. They are more prepared to use their purchasing power to support products that meet their standards - and equally prepared to veto those that don't. They increasingly want to play an active part in making these standards mainstream, using their influence to drive change.

Shopping with Attitude, survey carried out for the Co-op in May 2004 by NOP

"willyoujoinus.com", taking the form of a letter from the chief executive which acknowledges that climate change is a major problem, in contrast to current US government policy.

In the UK, DEFRA has recently launched a communication campaign - Tomorrow's Climate, Today's Challenge - with the strapline 'together this generation will tackle climate change'. All three of these campaigns hint at climate change solutions existing just around the corner, but mostly disappoint in failing to specify or describe a single one.

In contrast, a company like BT is in an ideal position to communicate on these issues and gain customer trust, as it is already providing broadly beneficial and low-carbon services - something which is not so clear for BP.

Businesses are particularly aware of the need to manage carbon issues - as the examples in this report demonstrate. There may be a need for more sophisticated communications and research on the carbon benefit of ICT, supported by integrated consultancy services to maximise the offered benefit of BT services across both ICT and carbon-reduction.

There are also huge opportunities for internal staff motivation and recruitment based on developed company and brand association with lowering carbon emissions. There is evidence that these issues are more and more important amongst graduates in choosing potential employers.

The recent BT TV campaign is memorable with its clever use of 3d graphics to vividly bring alive the benefits of the connected world. A BT message on climate change actions might build on this theme: **BT are reducing our emissions: let us show you how.**

Notes for a TV ad, 2007

BT drove growth through numerous and award-winning marketing campaigns promoting it as the low-carbon travel company. This is from that series.

Why travel - if you don't have to?

Opening: street of terraced houses, parked cars line the street. Morning. Speeded up timelapse photography shows sun rising, then the sudden rush of people leaving the street for work, all formally dressed and hurrying, head down. Most leave by car, some go to get the bus. Kids are also seen walking off to school. As the sun rises further, the street is deserted... and remains deserted, as clouds scud across the sky. As the sun falls, and evening approaches, the same scurrying workers return, rushing back home with heads down, lights flicker on and then off at bedtime.

Hang on - do I have to travel to work?

Opening: same street of terraced houses, but their are more trees and landscaping, and half the number of cars. Morning. Speeded up timelapse photography shows sun rising, kids leaving for work. People appear in windows. A coffee & snacks van appears (best capuccino in ...) People wonder out for a cup of coffee, in less formal and more colourful clothes. People stop to chat! People work with windows open, with doors open. People sit on benches in landscaped street. As the sun goes down the street goes to bed warmly, with lights staying on longer.

Get more done - have a better life. BT telework.

Recommendations

BT was recently described by Business Week magazine as a 'carbon leader'. This has come about because of the public stance that the business has been taking, and because of internal success in reducing CO_2 emissions.

The reductions in CO_2 emissions so far have come about because:

- BT has managed its energy efficiently
- BT's purchasing power has enabled it to maximise the 'green' energy content of its recent energy contract.

These factors will not be enough in the future. If BT wishes to remain a 'carbon leader' what should it do? We think there would undoubtedly be advantages both to the company and to society in BT becoming 'carbon neutral' as soon as possible. But this may only be a step towards maximising BT's longer term business opportunities as a carbon positive company. Our recommendations therefore are:

Take all or part of the business carbon neutral
This will send a clear signal to society and government and will build brand value. BT's carbon neutrality will depend on a combination of efficiency, renewables and offset. We would also like to see an aggressive programme to build renewable energy capacity on BT sites, and perhaps offsite also. As time goes on, the percentage met through offset will reduce as the gains through efficiency and renewables increase.

Map and engage in carbon-positive business paths
Set up Carbon Opportunities Task Force with board-level representation from Business Strategy, CSR, Energy, Environment, Brand, Marketing and HR. This group would map out business opportunities for BT arising from a carbon-constrained economy, and develop a programme of business development and marketing activity.

Raise carbon literacy up and down the supply chain and within BT
Engage suppliers and customers to decarbonise the supply chain. Use innovative training, marketing, and loyalty programmes in order to raise carbon literacy - both internally and also to wider groups including retail customers.

Engage proactively with the sector and government
At a high level, lead and encourage progress towards a carbon positive ICT sector throughout the UK, Europe and at the same time lobby the UK government and in Europe for the rapid introduction of more inclusive carbon cap and trade systems.

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XCO2: low carbon engineering. www.xco2.com

World Resources Institute: environmental think-tank. www.wri.org

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