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FROM "GREEN IT" TO "GREENING WITH IT" IN 2009
A WHITE PAPER ON THE FINANCIAL CRISIS AS AN OPPORTUNITY TO ENSURE
ACCELERATED CO₂ REDUCTIONS WITH LOW CARBON IT SOLUTIONS

Objective and outline

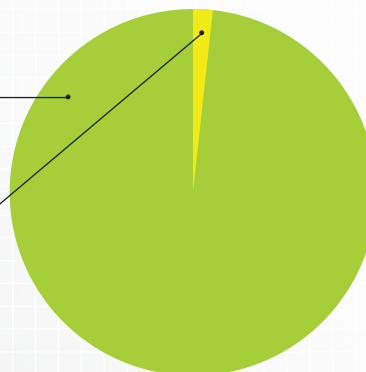
There is no agreed vocabulary that distinguishes between the emissions savings related to IT equipment and the savings that IT solutions can contribute to in society. In this paper “Greening with IT” and “Green IT” are used. In many instances, the term Green IT is used to refer to both, which has resulted in confusion at conferences, in policy regulation and in reports.

GREENING WITH IT - THE 98% POTENTIAL

refers to the low carbon IT solutions like virtual meetings, smart buildings, smart grid and dematerialization that can help to reduce overall GHG emissions from all sectors significantly.

GREEN IT - THE 2% EMISSIONS

refers to more energy efficient IT equipment that helps to reduce the emissions from the IT sector itself.



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THERE IS A WINDOW of opportunity for the IT industry to demonstrate the role of technology in the transformation to a low carbon economy while enabling enterprises to thrive. The industry has less than two years to deliver tangible outcomes or risk losing credibility. However the industry cannot act alone and requires support from policy makers and IT users; not least to develop a standard method to calculate the CO₂ reductions resulting from the use of IT.

The IT industry needs to move from discussing opportunities to realizing opportunities. But before the industry can act, policy makers must ensure that new ways of providing the same services can compete on a level playing field without tax incentives for more carbon intense solutions. Policy makers can also create opportunities for IT to be part of wider transformative solutions, rather than simply encouraging the use of technology to make incremental improvements to existing business solutions. The industry similarly needs to be bold and push for transformative technologies, rather than the incremental improvements that have dominated to date. The winners in a low carbon economy will be those that embrace change and are willing to do things in a different way.

The objective of this white paper is to explore technology as a fundamental part of business and government strategy for reducing CO₂ emissions. The current situation is a Catch 22. Some low carbon IT services exist and there is a need for them, but the market is not large enough for IT companies to make significant investments in developing and promoting these technologies. As a result the current uptake is low and therefore does not warrant further investment. To help break

this deadlock and place low carbon IT solutions at the centre of government and business climate change strategy, this paper introduces the concepts “asymmetric”- and “dynamic”-triangles to describe the relation between IT providers, IT users and policy makers. (see figures 2 and 9)

It is necessary to identify profit drivers for reduced greenhouse gas (GHG) emissions and encourage businesses and governments to move away from a risk dominated perspective to a profit driven one when setting goals and strategies to reduce climate impact. This paper describes some of the key barriers to such a shift in perspective and provides a framework to discuss possible ways forward to “greening with IT”. At the centre of the discussion on solutions to climate change is the question of how technology can make a significant contribution to reducing GHG emissions. Answering this question requires policy makers to stop focusing on the emissions caused by IT, the 2%, and on solutions that only deliver incremental improvements to existing systems. Instead policy makers need to understand the systemic effects of changes in policy and practice and focus on the remaining 98% of needed reductions that could be enabled by IT. To illustrate, while better logistic systems help current transport flows to become more efficient, the long-term result is usually increased overall flows. Instead policy should focus on the solutions that deliver truly systemic and transformative reductions from a service perspective, in particular for buildings and transport, but also dematerialization in resource intensive sectors.

One characteristic that makes IT services an interesting and valuable component in the shift to a low carbon economy is that there are very few cases where they require any kind of

Context

The effects of climate on companies' operations are now so tangible that the issue is best addressed with the tools of the strategist, not the philanthropist.

[...] an operational response to climate change in outbound logistics or after sales might involve more efficient engines on delivery and service vehicles [...]

By contrast, strategic approaches could involve reconfiguring the activity entirely: In outbound logistics, firms might replace physical books or manuals with electronic versions, and in after-sales service, they could supplant physical visits by service technicians with remote diagnostics and treatment programmes.

*M. E. Porter and F. L. Reinhardt,
Harvard Business Review, October 2007*

subsidy. Organisations are motivated to use IT services to improve efficiency and/or reduce costs, with the bonus that this can result in reduced emissions, as they are in fact low carbon solutions. However, changes to the fiscal system are needed to increase uptake because the current economic system does not provide a level playing field; instead it subsidises high carbon activities such as infrastructure construction and car ownership.

The paper begins with an overview of the current situation, where the potential of IT to make significant contribution to carbon abatement has been defined and recognised, but thus far there has been little action. Next the asymmetric triangle is introduced as a framework to understand and tackle the current challenging situation. After a description of the factors responsible for the asymmetric triangle, the new dynamic triangle is presented as a way to highlight what is needed to ensure the adoption of low carbon IT solutions. The paper ends with a discussion about possible ways forward.

There is an urgent need to move beyond the incremental improvements prevalent today, and enable innovative ways that will deliver similar or better utility, but with radically lower associated GHG emissions.

Comparing the business as usual scenario (see *Figure 1 on following page*) with the reduction path needed to avoid dangerous climate change makes it clear that this is a challenge of enormous proportion. A challenge that cannot be addressed by changes on the energy supply side alone by reducing the carbon intensity of electricity, it will require reductions in demand as well. The levels of reduction in

demand cannot be achieved through incrementalism. With increased income in emerging markets, growing population and the need for GHG emissions from food production it is clear that the emissions from consumption, buildings and transportation must reach zero as soon as possible. For this to happen new ways to provide services, including dematerialization, are necessary.

If we only look at existing ways of providing services the economic re-emergence of countries such as China and India will be a threat. If we change perspective and focus on the need for new innovative solutions for delivering the utility from products and services, then it becomes clear that cross industry and inter-disciplinary collaborations that deliver new low carbon solutions represent a major commercial opportunity. And of course a platform from which to create a low carbon economy.

It is from this perspective on global emissions that the need for innovation from the IT sector delivering low carbon solutions becomes obvious.

If we add a financial and economic crisis into the mix, it becomes imperative that we move beyond the business case for environmental investments in the IT sector being based only on cost cutting and enterprise reputation risk management. Instead those investments must be driven by new revenues. At the same time it is obvious that all companies and governments need to look beyond incremental improvements towards more transformative solutions and new business models. Two challenges that must be addressed as we move forward:

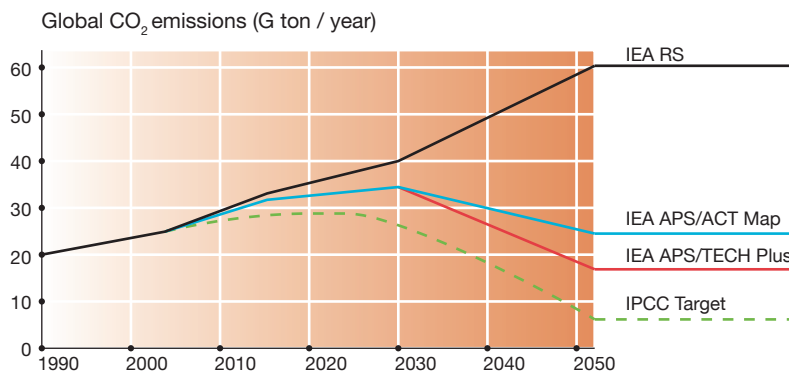


Figure 1

Scenarios showing that incremental improvements are not sufficient to avoid dangerous climate change¹

4

1. The need for accelerated uptake of low carbon IT solutions

Most investments in smart/low carbon IT solutions have so far been based on an increase in productivity and/or revenues, as well as an increase in employee and customer satisfaction. The fact that low carbon IT solutions provide such benefits that they are used because of other positive effects is good. But it has also made IT services invisible in the climate debate, and the need for accelerated uptake is not obvious for most companies and governments.

2. Companies and governments need to focus more on transformative solutions

The climate crisis requires companies to think beyond incremental changes and internal obstacles in order to be part of the solution instead of part of the problem. Action is needed now during the recession. The stimulus packages are particularly important; it is critical that such major investments support the creation of a resource efficient 21st century infrastructure, rather than a marginally improved 20th century infrastructure. The window of opportunity for low carbon IT solutions to prove their potential is limited, beyond which such solutions and the sector will be irrelevant as a major part of the solution to the climate crisis. A number of actions can be used as proxies to assess if companies are moving in the right direction. In 2010 no climate credible company can have a travel policy that starts with the assumption of the necessity for travel, rather than addressing the utility of travel. All will have meeting policies and meeting departments making virtual meetings a default option when companies arrange meetings.

However the most important factors to the development of low carbon solutions in the mid to long-term will be regulation and financial investment. Assuming a service perspective, where companies and governments focus on the services instead of the products², which has the potential to deliver transformative change, it is possible to estimate the role for new low carbon solutions. Over the next 30 years more than \$200 trillion will be invested globally to provide society with essential infrastructural services such as light, heating, cooling, transport, etc in cities alone.³ Even using conservative estimates this would allow more than \$30 trillion to be directed into low carbon IT solutions. It has been estimated by Booz and Co. that these investments in low carbon IT solutions could easily deliver the same, or better, services but in a more climate friendly way resulting in emission reductions of 100 GT over the next 30 years. This corresponds to an average reduction of over 3 GT per year (global annual emissions today being approximately 30 GT).

With significant amounts of money available for low carbon IT solutions, and an urgency to implement projects that deliver significant GHG reductions, the question for policy makers, IT providers and the corporate executives of enterprises with carbon intensive business models, is how this potential for low carbon IT solutions can become reality. ■

¹ http://www.bellona.org/filearchive/fil_Bellona_Paper_-_Scenarios_for_global_CO2_emissions-29May07.pdf

² See figure 6 Product To Service Illustrations

³ Source: Forthcoming report from Booz and Co. for WWF-Sweden, to be published in September

An asymmetric triangle

IN THE YEAR 2006 the world woke up to climate change as it moved from an issue being discussed by a few to a mainstream issue. 2007 was the year when the need for significant emission reductions became obvious to most. 2008 was the year when the need for leadership was discussed and the IT sector started to promote low carbon IT solutions in a more active way. This year, 2009, with a massive focus on climate change and a shift in interest from the polluting companies to those with solutions, could be the year when low carbon IT solutions finally take off. Before 2012 the IT industry has to show demonstrable evidence that it can deliver on the promise, otherwise policymakers and business leaders will most likely lose interest and look elsewhere for low carbon solutions.

In order for policymakers, enterprises and IT providers to work together it is important to understand why despite the many examples of low carbon IT solutions, we are still far from the scale and pace required to have a major impact on ever increasing CO₂ emissions. This is a relevant question given that much of the material produced about low carbon IT services shows that many of them save money, increase productivity and make companies less dependent on fossil fuels. All things that should make them attractive even if climate change was not an issue. With the reality of climate change, it would seem that the main challenge today should be to meet an enormous demand for these services. As there is obviously neither an enormous demand, nor a strong promotion of low carbon IT solutions, the barriers that prevent IT moving from being a marginal contributor to becoming a significant contributor must be identified.

Based on WWF's earlier work, in discussions with a number

of leading thought leaders and results from the world's first market survey concerning low carbon IT solutions, a number of challenges have been identified. Obviously the challenges vary within and across industry sectors and by region. However, there are some fundamental challenges that need to be resolved if low carbon IT solutions are to become reality. There is currently a recognition of the potential risks and profits of low carbon solutions, but this is not sufficient to justify major investments by the IT sector into exploiting the theoretical opportunities of the low carbon economy. Most IT users (public and private sectors) are not clear what a low carbon future will look like and almost all governments still focus on the major emitters and not the solution providers.

In order to move beyond the current deadlock there are two kinds of asymmetries that must be addressed and both can be explained visually in triangles. The first asymmetry is between rhetoric and implementation among all key stakeholders (in this case the IT providers, IT users and policy makers). The second asymmetry is between the different stakeholders.

Figure 2 (following page) illustrates a number of challenges that together create uncertainty, which contributes to the log jam:

IT providers

1. The IT industry talks a lot about low carbon IT solutions, but marketing materials, homepages and presentations continue to have a significant bias towards the traditional Green IT/2%. So even in the rhetoric the industry still has a bias towards trying to sell the 2%/Green IT as the most important climate contribution for customers. One of the reasons for this is that

the market is still too limited; the economics of the “Greening with IT” solutions are still not at the point where they can support a broad market. The absence of carbon pricing and other specific incentives for transformative solutions is a significant inhibitor, which contributes to the level of uncertainty.

2. When it comes to actual implementation measures to address the emissions from IT itself, the 2%, companies are doing well, as most IT companies are motivated to sell energy efficient products. With increased electricity prices and end user companies caring more about total cost of ownership (TCO) there is a tangible market for providers to develop more Green IT. But when it comes to the Greening with IT/98% it is a different story. It is hard not to agree that there is significantly more talk than actual implementation. A joint Gartner-WWF study showed that almost no IT providers have analyzed the market size nor do they have coherent strategies to increase the portfolio of low carbon IT solutions.⁵ Few have even a catalogue showing customers the goods and service they have in this category. Even fewer have assessed the GHG savings that customers have achieved with their low carbon services.

3. Stronger policy engagement is also necessary where concrete suggestions are presented. Good examples exist in the US in relation to the stimulus package but much more must be done.⁶ It is important that these suggestions are not only directed at climate policy, such as the negotiations under UNFCCC, but also at economic policies.

Figure 2 The asymmetric triangle⁴

Rhetoric

is derived from the Greek *ῥητορικός* (*rhētorikós*), “oratorical”, from *ῥήτωρ* (*rhētōr*), “public speaker”, related to *ῥήμα* (*rhēma*), “that which is said or spoken, word, saying”, and ultimately derived from the verb *ἔρω* (*erō*), “to speak, say”. In this paper “rhetoric” refers to what is spoken and written about either “Green IT” or “Greening with IT”.

Implementation

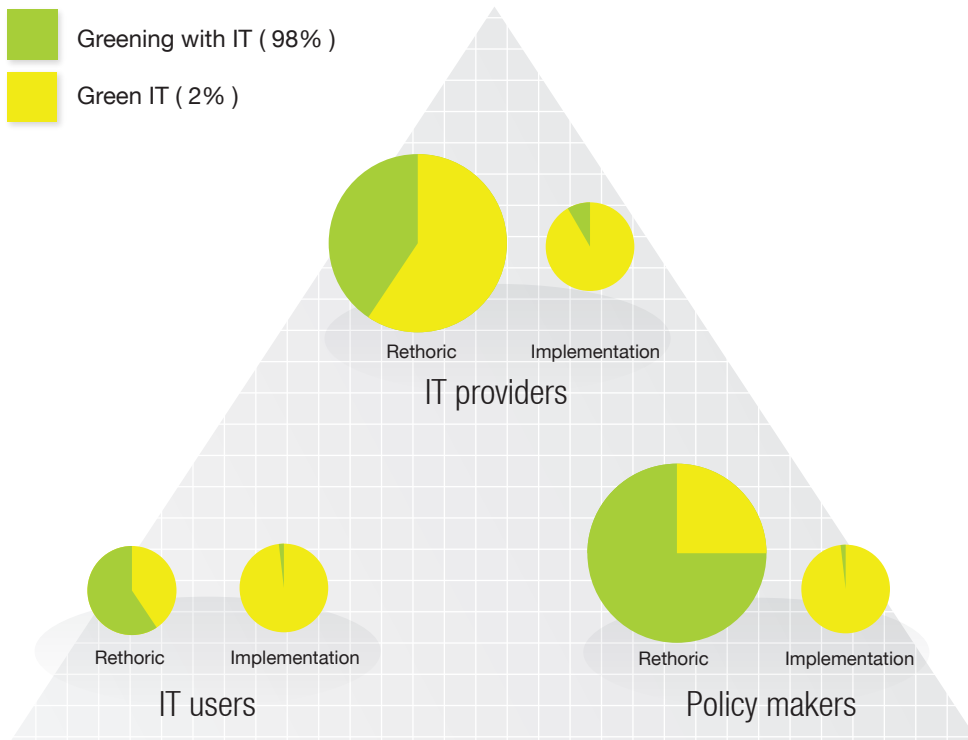
is the realization of an application, or execution of a plan, idea, model, design, specification, standard, algorithm, or policy. In this paper Implementation refers to delivered solutions, either “Green IT” or “Greening with IT” due to action from IT providers, IT users or Governments.

IT users

1. For non-IT businesses and organizations the general talk and interest concerning IT, both green IT and greening with IT, is not as prominent as compared to IT providers’ interest. Businesses and organizations obviously see IT as a tool or enabling service, rather than something that could represent a platform for innovation in a low carbon economy, and it is regarded as just one of many tools they have available. When businesses and organizations talk about IT and low carbon contributions it is usually in the context of cost cutting and savings, the use of telework and videoconferencing, smart buildings or new smart industry solutions. Few companies put any significant focus on their IT equipment for business solutions from a low carbon perspective.

2. The 2% emissions still remains a strong focus for the chief information officer (CIO) in most businesses and organizations as far as the use of IT is concerned. When it comes to greening with IT the situation is very different. Few companies have any strategies that include low carbon IT solutions, or even implement ad-hoc solutions, as they execute their climate strategies. When companies implement these solutions, such as virtual meetings, flexible work and dematerialization, it is not part of a strategy for low carbon IT solutions. The fact that the low carbon IT solutions are not implemented in order to reduce CO₂ emissions is not a problem in itself, but without a “carbon understanding”, synergies and possibilities to achieve even further reductions are often overlooked. The reasons for

4 The OECD report “Towards green ICT strategies: Assessing policies and programmes on ICT and the environment”, <http://www.oecd.org/dataoecd/47/12/42825130.pdf>, gives a very good overview of IT initiatives around the world. The initiatives are a mix of rhetoric and implementation, but they give a good indication of priorities and similarly indicate that most initiatives focus on rhetoric, not implementation. The numbers support the assessment of this paper as initiatives between rhetoric and implementation are covered. By a rough estimation of the initiatives in the OECD report that are categorized as both “Green IT” and “Greening with IT”, the following results can be extracted: For business 87% of efforts are on “Green IT” and 13% are on “Greening with IT” and for Governments 75% of efforts are on “Green IT” and 25% are on “Greening with IT”.
5 http://www.gartner.com/DisplayDocument?ref=g_search&id=791020,
http://www.pamlin.net/written/documents/WWF_Gartner-Assessment_of_global_lowcarbon_IT_leadership.pdf
6 <http://www.behindthegreen.org/about/desc/>



this differ between companies, but frequently it is caused by the “silo” behaviors within most enterprises, where:

- The CIO or IT Manager knows about technology and is responsible for IT and nothing more.
- Those in charge of low carbon strategies are not familiar with the potential of IT.
- The corporate organization does not support interaction between departments in general.

Many low carbon IT solutions require cross company, inter-disciplinary strategies. Few companies structure their climate strategy in a way that makes it easy for low carbon IT solutions to be included.

Policy makers

1. There is no consistency in the awareness or position of key policy makers. On the one hand, senior policymakers frequently talk about the need for innovation and transformative change, infrequently about incremental change. On the other hand, the civil servants below them, who are responsible for the implementation of rules and regulations that affect the IT industry, still tend to focus on incremental improvements and develop regulations concerning the 2% rather than the 98%. It appears that the understanding among senior policymakers is increasing with regards to the need for transformative solutions in the 98% area that result in significant CO₂ reductions. We are similarly starting to see increased interest among those

responsible for low carbon IT solutions. The stimulus package in the US, the communication “on mobilising Information and Communication Technologies to facilitate the transition to an energy-efficient, low-carbon economy”⁷ from the European Commission, the policy development in relation to the next five year plan in China and the low carbon IT strategy in Japan all provide very interesting opportunities and indicate that we might see a significant shift already during 2009.

2. Even if there are promising signs, when it comes to actual regulation and implementation today it is as if the world was turned upside down. Almost all of the regulation and policy measures, from procurement rules to laws governing the IT industry concerns the 2%, rather than the 98%. As mentioned above there are some glimmers of change in the latest communication from the European Commission, which is the latest of some very interesting policy developments that could be groundbreaking if implemented and supported in a strategic way by companies and member states. The “territorial” borders within government administrations still seem to be a major obstacle. The Ministry of Industry (where the responsibility for IT often sits) is not used to thinking about low carbon solutions and promoting leadership that helps the planet. Similarly, there is often a challenge for the Ministry of the Environment to think about commercial enterprises as part of a solution - as a result, their approach is often one where the key focus is to have companies reduce their CO₂ emissions, regardless of the potential for CO₂ reductions that their services can provide. ■

⁷ http://ec.europa.eu/information_society/activities/sustainable_growth/docs/com_2009_111/com2009-111-en.pdf

Creating a dynamic triangle for low carbon IT solutions

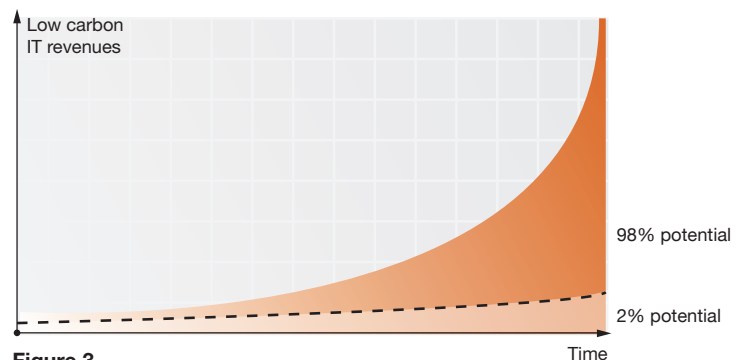


Figure 3
Green IT and Greening with IT Revenue Potential

IN ORDER TO TURN the current log-jam into a situation where Greening with IT can take centre stage, and become a really important part of the investments needed to reduce CO₂ emissions, the three stakeholder groups all need to contribute. While leadership is needed from the IT providers it is important that policymakers provide a supportive framework, and that IT users are incented to integrate low carbon solutions into their strategies.

Below are concrete suggestions for IT providers, IT users and policymakers. WWF is considering using these kinds of questions to establish a group that could become leaders that can support an accelerated uptake of low carbon IT solutions (low carbon feedback⁸).

IT providers

The support for general work in associations such as TechAmerica, DESC and GeSI, is good and should continue. But in order for Greening with IT to become more than reports, policy recommendations and seminars, direct action is needed by the IT providers themselves.

1. IT providers must use and disclose their own CO₂ savings from low carbon IT solutions

If IT providers do not develop and use the solutions they talk about themselves it is hard to see why others should believe that low carbon IT solutions are such a good idea.

2. Assess the business potential in the 98% for low carbon IT solutions

If the potential is significant all IT companies that claim leadership in the low carbon IT service area should assess the business potential. Obviously the details of this assessment might not be possible to disclose, but a general overview is important.

3. Create leadership groups and support independent monitoring of low carbon IT solutions

The market for selling IT equipment and IT solutions will continue to grow and be a lucrative business and not all current IT companies will choose to focus on the new Greening with IT/98% business opportunities (See Figure 3).⁹ To add clarity to the communication from the industry it is important to create new industry groups of IT providers that focus exclusively on the Greening with IT opportunities.

4. Produce a low carbon catalogue that is updated on a regular basis

IT providers should provide a catalogue with the low carbon services they can provide. This will help IT users find the kind of solutions they need. Continuing to claim greening with IT is important and yet not being able to produce a meaningful catalogue with solutions that are available for customers is not credible.

5. Engage in a proactive way and suggest concrete changes in current rules and regulations that would encourage increased use of low carbon IT solutions

Policymakers, both those in charge of IT/industry development and those in charge of climate policies, need support in order to formulate domestic and international policies that encourage leadership and the integrated use of innovative low carbon IT solutions. Instead of general statements about the need for support, those IT providers that promote low carbon IT solutions should provide detailed and transparent suggestions that can be implemented in relevant regulations. For example in transport bills, building codes, taxation, procurement regulation and international negotiations.

6. Support change agendas for key sectors with thought leaders that bridge the 2% and 98% agenda (building/construction/transport/communication, retailing, biotech/biomimicry, finance)

⁸ For a discussion on low carbon feedback, see http://assets.panda.org/downloads/global_strategy_for_the_1st_billion_tonnes_with_ict_by_wwf.pdf
⁹ <http://www.publictechnology.net/modules.php?op=modload&name=News&file=article&sid=16909>
<http://www.itnews.com.au/News/42666,demand-for-blades-and-x86-boxes-drives-server-sales.aspx>

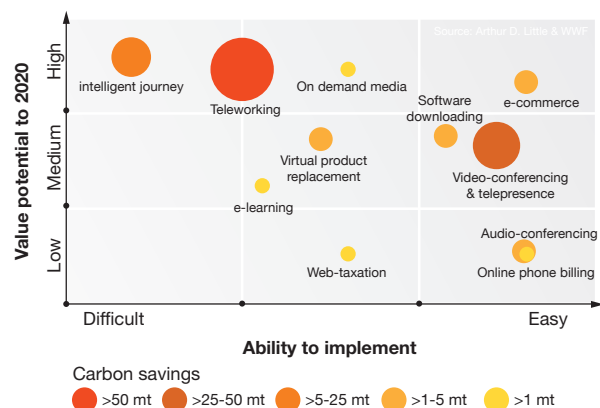


Figure 4
Carbon Management - A Business Opportunity

The leading IT users need support and assistance to understand how they can expand their IT strategy beyond the Green IT/2% to Greening with IT/98%.

IT providers can help develop “low carbon IT management maps” (see Figure 4) that outline the different opportunities for companies in different sectors to build on the IT infrastructure they have and develop a strategy for productivity gain and reduced CO₂ emissions where low carbon IT solutions play a key role.

7. Calculate the impact of the services

For credibility, to set more sophisticated targets for sales/strategy and to be able to claim credit for overall positive contribution, numbers are pivotal to be able to prove that the services provided contribute to more reductions in CO₂ than the delivering products cost to develop in the first place.

IT providers must be able to calculate the impact of their services (See Figure 5 on following page). At the very least an IT provider that is leading in the field of low carbon IT services should be able to calculate the savings from their services. This should help IT users to calculate the savings as they use the low carbon IT services and enable approximate combined calculations of multiple low carbon IT services.

IT providers that aim to become Climate Positive, i.e. to help reduce more CO₂ emissions than they emit, must make a full assessment of their impact related to services, both positive and negative in order to ensure that they are not cherry picking only their positive contributions.

IT users

One obvious challenge with low carbon IT solutions is that they cut through different company departments, including: IT, R&D, Real Estate, Sales, Human Resources, Strategic

Planning, senior management team, etc. As no company organizes its corporate strategy, let alone the climate strategy, in a way where IT solutions are a separate category, there are different possible ways forward.

There are three common ways to address this:

- The CIO takes on a climate responsibility to implement low carbon solutions in collaboration with other functional and business unit heads. That initiative may be linked to energy and cost saving programs within the whole company, and not just the IT cost centers.
- The group or person that is responsible for the company's climate strategy creates a transformative part of the strategy, which integrates low-carbon IT solutions.
- The team responsible for strategic development or increased productivity engages in a low carbon initiative where they explore ways to improve the company's performance and revenue streams while reducing GHG emissions as a way of becoming a winner in a low carbon economy.

This would not release the log jam, because to achieve that simultaneous action is needed from IT companies, IT users and policymakers. But it would allow IT users to engage in a systematic discussion with IT providers and identify potential use of low carbon IT solutions. Furthermore, companies that demonstrate new innovative ways of doing business in a low carbon way would need support from policymakers to ensure their leadership is financially rewarded.

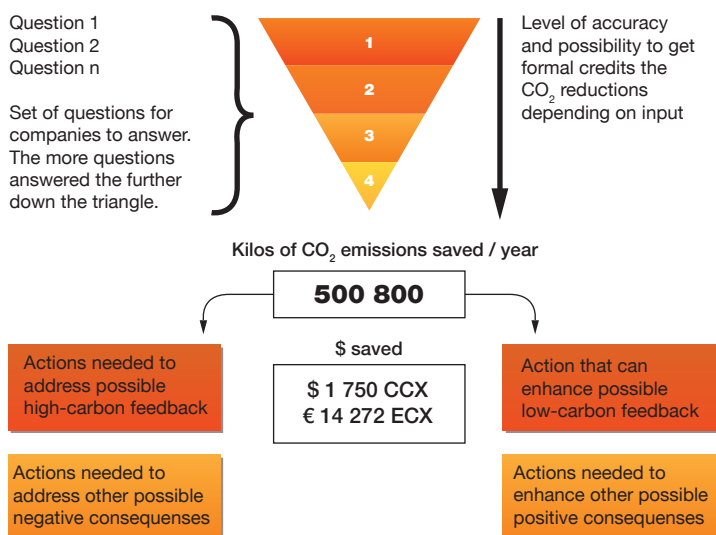
Below are a number of concrete suggestions for public and private sector organizations as users of IT.

1. Move from product to service

Ecologists have been talking for years about the environmental benefits and resource efficiencies achieved by moving from

Figure 5¹⁰

Calculation interface for companies using low carbon IT solutions



product or asset ownership, to business models based on delivery of services. In such models the basic utility or value of the product is achieved but without physically owning it. The move from owning telephone answering machines to answering services from the Telco being a simple example, and of course public transport being a model everyone can relate to.

Enterprises need to start considering business models in which their product could evolve to a service delivery model, where focus is on the utility delivered (the outcome), not the way it is delivered. This would for example allow faster development of innovative sustainable solutions and encourage responsibility for the whole lifecycle, the move from traditional newspapers to e-papers, the move from CDs to MP3 files are two examples on how disruptive this transition can be. Car sharing schemes and systems involving payment per copy/wash/square meter of floor are all examples that exist today, which require significant IT investments to work.¹¹ To illustrate further, if product information needs to be made available to customers, the focus should not be on the best ways to physically distribute a catalogue but perhaps on how customers can be attracted to richer online information. In this case a service perspective support dematerialization.¹² If a meeting is a required outcome, then the focus should be on the most effective way for that to happen, as opposed to putting together a travel itinerary. A service perspective opens up new innovative ways to meet needs. In this process a number of low-carbon IT solutions often become visible. An example is to change from a *Travel* to a *Meetings* department. This ensures that the company integrates virtual meetings where they are more efficient and practical. Similarly the use of flexiwork can be considered, even though it is more difficult

because it requires good leadership and trust. Finally and most difficult is to redefine the core business in service terms rather than in products terms (Figure 6).

The examples in figure 6 are quite “simple” and even bigger potentials for CO₂ reductions exist in new integrated solutions such as smart city planning, new industrial processes, vehicle-to-grid solutions and net producing buildings.¹³

2. Separate the responsibility/reporting between 2%/Green IT and 98%/Greening with IT

To ensure that smart IT solutions are not overlooked, the CIO or person responsible for GHG emissions, should be asked to separately report emission savings in different parts of the business, one of which might be IT itself. This would encourage discussions between the person responsible for IT low carbon solutions and other parts of the company. It could also avoid situations when investments in IT are reduced at the expense of missed opportunities for the broad deployment of low carbon IT solutions. As many companies will require increased use of IT to reduce their overall emissions to sustainable levels it is usually ill-advised for the IT infrastructure to have a mid-to long-term reduction target in isolation from the rest of the business.

3. Initiate a dialogue with a leading IT company that engages in greening with IT

The CIO, or person responsible for the company’s climate strategy, should ask current (and potential) IT providers to show how they can help improve productivity and reduce GHG emissions at the same time within the existing business model.

¹⁰ The figure outlines an approach developed with HP where it is possible to get different degrees of accuracy regarding the CO₂ savings from IT services depending on the data available and use. The model also includes guidance to ensure that low-carbon feedback is encouraged and high-carbon feedback is avoided as much as possible.

¹¹ <http://www.oecd.org/dataoecd/10/33/2090561.pdf>

¹² http://www.future500.org/case_03.php

¹³ For an overview of strategic IT solutions see WWF’s report “Outline for the first global IT strategy for CO₂ reductions”.

4. Clarify the role of innovation and technology in the company's low carbon strategy

When the company is developing or reviewing the low carbon/sustainability strategy and exploring new business models, representatives from leading IT providers should be asked to suggest solutions. (See Figure 7 on following page)¹⁴

5. Explore the role of low carbon IT solutions during the strategic planning

Low carbon IT solutions should not only be seen as a way to reduce GHG emissions, when the company develops the general strategy, there should be room to explore the possibilities that new technological solutions can provide. Using a GHG emission filter is good, but to open up for innovation in terms of how the company can deliver the services in a more resource efficient way is often as important.

As a company moves toward a more sustainable business model, sustainable IT solutions usually play an increasingly important role.

6. Move beyond only analyzing the emissions within your four walls

Analyze the energy and GHG emission requirements of the value chains in which you participate. Innovation for a low carbon economy will involve considering how large amounts of energy and carbon can be removed. For example, the printing business can consider the combination of digital "on-demand" printing and a shift to digital paper. The construction business can consider using ICT solutions to allow the construction of net energy producing buildings and become part of the solution. The transportation business can consider virtual solutions in order to see low carbon solutions as an opportunity, rather than a threat.

Shifting perspective		Could result in a shift	
From	To	From	To
Travel	Meetings	Airplanes	Videoconferencing equipment
Office work with a fixed amount of hours	Delivery of results	Office space	Laptops and IT solutions that allow people to work wherever they are, as long as they can deliver
Constructing buildings	Provision of smart living	Cement and coal	Servers and smart appliances so that people get services, such as comfortable in-door temperature, adequate light and delivery of fresh air in the most resource efficient way

Figure 6
Product to service illustrations

¹⁴ For more information see WWF's and Innovest's report "Fund Management in the 21st Century"

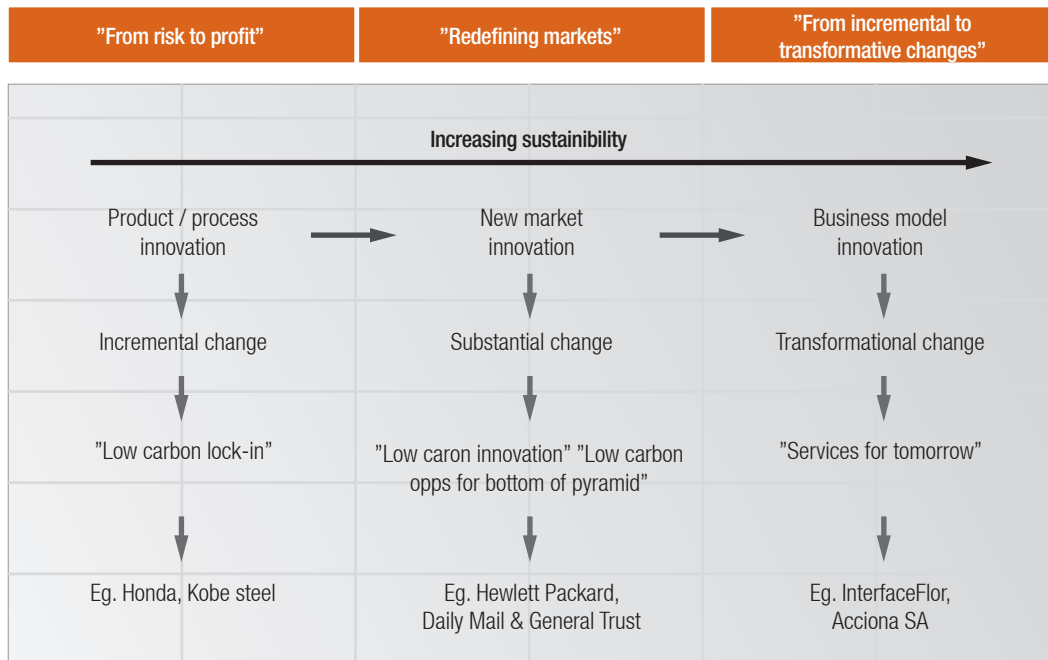


Figure 7
New Investment Paradigm in Low Carbon Future.

Source: "Fund management in the 21st century, Innovest and WWF (2008)

Policymakers

IT providers and companies using IT solutions are important, but policymakers are the most important. No significant shifts can occur unless the economic incentives make it profitable to move towards a low carbon business model. Policymakers must create economic incentives that encourage a demand from consumers and enterprises alike for low carbon solutions. This is more important at present than funding R&D. IT providers will innovate low carbon solutions if there is a demand.

Below are a number of concrete suggestions for Policymakers.

1. Shift from product to service perspective

A very important change that needs to take place within most governments is a shift from the traditional and carbon intensive sectors to a low carbon service perspective that allows for new companies that can deliver these services in new ways. Instead of bailing out certain carbon intensive companies that contribute to increased investments in 20th century infrastructure with incremental improvements, policymakers should ask how a current service can be provided with a low carbon solution, e.g. instead of only looking at cars as something given the question should be how the service that the car is providing can be delivered in the best way. This service could be "allowing people to go to the office", or "participate in meetings" etc. From this perspective it becomes obvious that some of the resources that are invested in cars could be shifted towards laptops, IT infrastructure and software that allow people to work outside

a physical office. This logic could also result in a situation where policymakers and businesses start to question the 20th century idea of an office as a physical place and might realize that for many people the laptop can be defined as an office.

In the example of cars, governments need to consider how they should act in order to support those who can provide the necessary services in a way that secures job creation, innovation and reduced use of natural resources over time. If a government does not take on a service perspective, then well-intended measures to protect jobs in the car industry will keep old jobs (for a while) but is likely to undermine new and often more sustainable ways of providing the same service. Teleworking and smart public transport are both providing similar services and should be seen together. A similar approach is valid for airline companies and companies providing videoconference services.

Aside from the stimulus packages around the world, public procurement is a key tool where a services perspective should be introduced.

2. Move the focus from big emitters to solution providers

Most governments continue to approach the climate challenge almost exclusively as a problem, focusing on the incremental reduction of emissions by the major emitters. All policy related consultations with representatives or participants in any industry should include leading IT companies that focus on low carbon IT solutions. This would allow leading IT companies to demonstrate concrete solutions and encourage them to present verified examples where increased productivity and reduced CO₂ emissions go hand in hand.

3. Move from incremental improvements to transformative support

Governments must encourage transformative changes by demanding and creating policy frameworks that enable more than marginal improvements and not just incremental change in order to support those companies with solutions that really are needed. Targets should be formulated for solutions that help reduce emissions by at least 90% and that are more than 10 times better than the existing services (this would allow solutions such as e-paper and m-health to become visible) and incentive structures must be designed in order to support innovation and new ways of providing services. Examples would include targets for net producing buildings, which produce more electricity than they use and require a smart grid; teleworking and virtual meetings; smart appliances delivered as a service, with a small carbon footprint over its entire lifetime.

4. Remove high carbon subsidies

There are very few cases where Greening with IT requires any kind of subsidy, but what is needed is a technology neutral policy framework. Today there are many subsidies for high carbon technologies and activities, everything from the support for the construction of infrastructure, to taxes that often include subsidies for car ownership. Low carbon solutions lack the same structural support, or even a level playing field. There is no subsidy for owning a laptop that is used for telecommuting to reduce car usage, or fiscal measures to incent the use of e-books, or printing on demand. A government that is serious in its innovation and low carbon policy should review its current policy in order to make the

incentive structure more neutral. They also need to carefully consider the role of powerful lobbyists preserving 20th century high carbon solutions. And in particular avoid situations where smart new solutions are forced out of the market due to lack of a level playing field. In so doing, potentially perpetuating the status quo.

6. Set targets for low carbon IT solutions in at least six strategic areas

In order to track progress, governments should formulate targets related to new jobs, patents, new companies, export of low carbon IT solutions in strategic areas such as transportation, communication, buildings and city planning. These should include: virtual meetings, teleworking, smart appliances, smart buildings, smart city planning and smart industry.¹⁵ The important thing is not to enforce these targets but to ensure transparency and make it easier to discuss what are the drivers that support low carbon development and what are the barriers.

7. Support for low carbon feedback

Governments should formulate policies that encourage investments that result in low-carbon feedback, where investments to reduce CO₂ result in further reductions over time. They should similarly discourage investments that result in high-carbon feedback, where investments to reduce CO₂ result in increased emissions in sections of society over time. ■

15 For more about these solutions please see the WWF report "Outline for the first global IT strategy for CO₂ reductions": http://assets.panda.org/downloads/global_strategy_for_the_1st_billion_tonnes_with_ict_by_wwf.pdf

Focus and Ways Forward

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THE WORLD IS CHANGING fast and only a couple of years ago environmental and climate concerns were something that most companies barely acknowledged. Still most company strategies are built on a risk based reactive approach. Slowly an increasing number of companies are coming to realize that there is money to be made in the transformation toward a low carbon society and that a proactive approach is needed to grasp these opportunities.

The transition from a problem-based approach to an opportunity-based approach usually requires six shifts in focus as presented in Figure 8.

The key difference between a problem-based approach and an opportunity-based approach is the goal of the program. As long as the goal is to keep the risk down, and comply at lowest cost the external drivers will be reputation risk, brand image and legislation. This means that the best people to deal with this are the public relations (PR), legal or compliance functions, and environmental experts. They often focus on what is easy to see (stores/products) and the legal responsibility. The approach is primarily reactive as it is all about meeting outside pressure and protecting the core business.

Things will change when the focus shifts to opportunities to satisfy needs, make money, deliver shareholder value, i.e. the very idea why companies exist, and for some to meet the needs of a wider stakeholder group. The driver will then be new markets and customers. The responsibility moves into the core of the business model and to the top of the company's agenda. The focus becomes not only where the company's impact is most significant, it also shifts from an internal focus where it is about reducing the internal emissions to a situation where the focus is on helping others to reduce their emissions. In short it is a proactive, opportunity-led approach. It is important to note that that there is a continuum from problem to opportunity. Drivers for climate investments can be both very passive, such as following legislation. They can be reactive, such as in relation

	Problem	Opportunity
Goal	Low risk/ Low cost	Satisfying needs / New revenues
Driver	Brand/Legislation	New markets / Customers
Responsible	PR/CSR manager	SMT/CEO/Board
Focus	What is easy to see / legal responsibility	Where the company's impact is the most significant and where money can be made
Climate change	Reduce internal CO ₂	Help others to reduce their CO ₂
Approach	Reactive	Proactive (creating markets and influencing legislation)

Figure 8

From a problem-based approach to an opportunity-based approach

to customer demand, ensuring that the company is perceived as caring for the environment. The latter is often linked to brand image and reputation where companies invest as much as they think is necessary to have an acceptable brand in relation to the environment.

Moving forward requires a split-vision. There is a need to focus on delivery in strategic areas both in the short term and in the long run. Governments, especially the ministries in charge of industry and trade, should therefore formulate strategies and targets, in dialogue with business, that both include the relatively easy and quick deliverables e.g. virtual meetings and teleworking, as well as the more difficult long term e.g. smart buildings and smart city planning. In doing so a dynamic triangle delivering low carbon IT solutions could be achieved in a very short time with significant results within a year and transformative solutions becoming mainstream within three-five years. ■

Delivering Concrete Results Using The Triangle

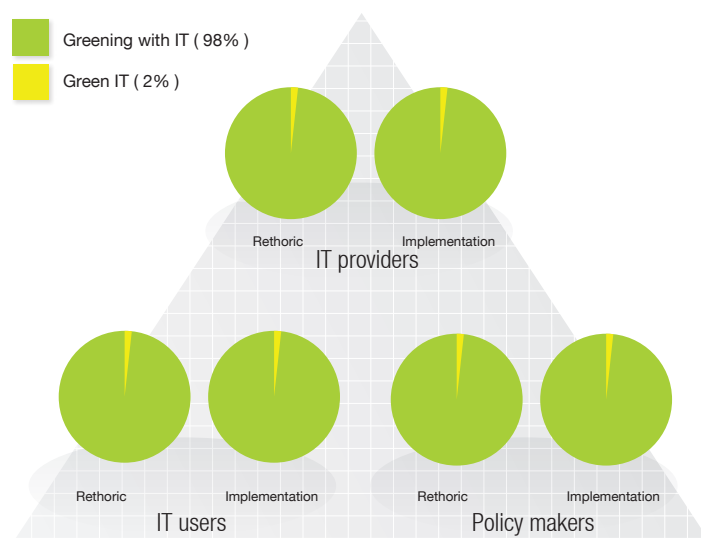


Figure 9 Dynamic triangle

WWF URGE POLICYMAKERS to use the triangle to ensure that all stakeholders are included when policies are formulated. In order to deliver concrete results three aspects are important to include:

1. A service perspective

where the triangle can help to identify solution providers that are currently often overlooked

- In order to ensure that transformation based on innovative solutions is encouraged, rather than just incremental improvements, a service perspective is important. For example:
- For transportation this would mean a focus on how commuting can be reduced, not only on how to improve current traffic flows. The former relates to teleworking, smart public transport, taxi and smart logistics. The latter only concerns improvements of current traffic flows.
- For buildings this would mean a focus on the services a building provides (e.g. shelter, light, and a comfortable, healthy environment), rather than how the existing ways to provide these services can be improved. A services perspective would start from city planning and architectural design all the way to optimal ways to provide light and heat in buildings. This may include solutions such as fiber optics for light and solar driven air conditioners.¹⁶ A product perspective would only include smart meters and smart control of existing ways to provide light, comfortable temperature, etc.

2. A revenue perspective

where the triangle can be used to ensure that all stakeholders have something to gain from the new policies

- The key reason for the slow uptake in low-carbon solutions

is the lack of significant revenues. It is important for policy makers to understand why users tend to use high-carbon solutions instead of innovative solutions. Current subsidies must be analyzed as innovative low carbon solutions are often outcompeted by high-carbon solutions because of significant subsidies to the high carbon solutions. Company cars are often subsidized and tax deductions are possible, at the same time as an extra room to work from home, using exclusive IT equipment with higher VAT, can increase taxes. New smart solutions such as e-paper are often subject to higher taxes than paper books and newspapers. To ensure a rapid uptake a technology neutral framework must be implemented that ensures that low carbon solutions are not at a disadvantage.

3. A low-carbon feedback perspective

where the triangle can be used to guide decisions so that companies move in a direction where they increasingly supply and use low carbon solutions

- One of the most important characteristics of low carbon IT solutions is that they help accelerate further GHG reductions as they encourage the further use of smart solutions and support increased investment in a low carbon infrastructure for the 21st century. The long-term consequences of the solutions are therefore important to assess. ■

¹⁶ Such as Parans Products for Fiber Optic Solar Lighting and ClimateWell.

TOGETHER WWF AND HP HAVE DESIGNED AND LAUNCHED AN INNOVATIVE PRIVATE SECTOR-NGO PARTNERSHIP



This paper is based on WWF's work with IT/ICT, particularly a joint initiative with HP where the key objective is to identify the first billion tonnes of CO₂ reductions through the use of IT. Previous publications include "The potential global CO₂ emission reductions from ICT use: identifying and assessing the opportunities to reduce the first billion tonnes of CO₂ emissions" and "Outline for the first global IT strategy for CO₂ reductions: a billion tonnes of CO₂ reductions and beyond through transformative change". The text is written by Dennis Pamlin, Global Policy Advisor, WWF and Suzanne Pahlman, Strategy and Innovation Consultant (www.connecore.com).

