Sustainable IT
Leads for Chief Information Officers

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This article deals with the challenges confronting Chief Information Officers (CIOs) in 2013, and particularly the challenges in the field of sustainable IT. Good cooperation between the CIO and the Chief Sustainability Officer is essential for making progress on the general organizational goals. It is also vital to have good and intensive collaboration between the CIO and the ultimate IT users and IT suppliers. The Dutch CIO covenant on energy savings is a step in the right direction, and demonstrates that some CIOs have the nerve to take on the challenge.

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Introduction

Information Technology (IT) has a negative impact upon the sustainability efforts of companies and governmental bodies. In the framework of sustainability and IT, obviously energy use must be examined. The use of IT accounts for more than two percent of the total amount of energy consumed worldwide. With this, IT can be classified as a major user, substantially contributing to CO_2 emissions worldwide. Nevertheless, this is not the only contribution of IT to the burden on the environment. The production and removal (e-waste) of IT devices also has a large impact on the environment.

Nonetheless, IT can also contribute positively to the sustainability efforts of companies and governmental organizations, in primary business processes and in internal operations. IT may account for two percent, but it influences the other 98 percent of the energy used by organizations. There are many examples of this from all over the organization, ranging from IT facilities that enable a "new style of working" to the optimization of planning processes so that less transportation and travel is required. As a consequence, IT plays an essential role in the reduction of worldwide energy use.

Many CIOs acknowledge that sustainable IT must be given priority

To ensure a good rollout of sustainable IT in an organization, cooperation between the Chief Information Officer (CIO) and the Chief Sustainability Officer (CSO) is vitally important. Until recently, they seemed to be total strangers to one another. However, when Dutch CIOs joined in signing the "CIO Covenant on Energy Efficiency" on 16 November 2011, they showed commitment to the task that now lies before them.

This article covers the challenges faced by CIOs in 2013 and, more specifically, the challenges that have arisen in the field of sustainable IT. The article goes on to deal with the involvement of the internal sustainability unit and its importance in making the right choices with regard to strategy and implementation. The text goes on to outline the importance and means of involving end users and/or suppliers in achieving sustainable IT goals. Finally, it draws conclusions with regard to the future agenda of CIOs.

Introduction: sustainable IT on the corporate agenda

Sustainability is now high on the agendas of many organizations. For multinationals, the Dow Jones Sustainability Index (DJSI) measures the quality of their sustainability policies. Communicating sustainability figures has become the norm: 95 percent of the 250 largest organizations in the world now report their sustainability results ([KPMG11]). Management geared to IT energy efficiency is becoming relevant in an increasing number of companies. For instance, organizations such as Rabobank and Disney Company have formulated concrete goals with regard to IT energy efficiency.

Organizations are also confronted with legislation oriented toward the environment or sustainability. This legislation has an influence on the IT character of an organization, of course, and applies to both producers and users of IT products. European rules restricting hazardous substances and the handling of e-waste (WEEE directive) apply to IT producers and IT importers. E-waste legislation influences the entire processing chain, and is primarily known to consumers in the Netherlands by the fee that has to be paid when an electronic product is returned for recycling.

In addition, there are voluntary initiatives such as the "Code of Conduct on Green Datacenters," for example (see: http://re.jrc.ec.europa.eu/energyefficiency/html/standby_initiative_data_centers.htm) and the recently signed fourth CIO covenant covering IT energy efficiency ([CIO11]). CIOs from major Dutch companies such as ABN Amro, AkzoNobel, DSM, KPMG, KPN, Nutreco, Rabobank Nederland, Schneider Electric and Vodafone have signed this covenant, which adopts a long-term approach to IT energy efficiency. In the first year, most attention will be paid to measuring energy use and including energy consumption figures in investment decisions. In the following years, the emphasis will lie on realizing the energy goals as specified by the committed organizations. These goals are specified by each organization individually. A logical subsequent step is that the CIOs in question will devote attention to areas other than IT energy efficiency, such as the recycling of electronic devices, for example, and thus increase their overall contribution to sustainability.

The challenge to CIOs

A CIO's agenda for 2013 is already pretty full. CIOs are currently dealing with globalization and (out-)sourcing, security and cyber attacks, rapidly growing data use, and the limited availability of resources. However, many CIOs acknowledge that attention to sustainability, and therefore sustainable IT, must be given priority.

Sustainable IT has three specific goals:

- compliance with rules and regulations,
- cost savings, and
- contribution to a more sustainable world.

In implementing sustainability initiatives, a CIO is faced with at least two challenges. The first concerns measuring the realized IT energy efficiency. Power Usage Effectiveness (PUE) is the unit of measurement used by datacenters. To measure and monitor the sustainability results of all IT services (datacenters and IT outside datacenters), the level of CO_2 emissions is the most obvious unit of measurement, especially since it is already being used by many organizations as one of the yardsticks for measuring sustainability. Using this universal unit of measurement, the impact can be simply calculated and compared.

In achieving further reduction in energy use, renewable energy also contributes to sustainability. Therefore, in measuring total realized IT energy efficiency, it is also important to measure the percentage represented by renewable energy. Using as little energy as possible is, of course, the best option.

With regard to information on sustainable IT, an organization can define its own green labels, such as those displayed in Figure 1, for example.

Label	Score Card Information
A	Optimizing based upon sustainable IT KPI reporting
B	Use of energy reported, sustainable IT KPIs
C	Sustainable IT KPIs defined and reported
D	Initial energy consumption recorded
E	Initial, limited information concerning use of energy

Figure 1. **Sustainable IT labeling for sustainable IT reporting.**

In identifying the relevant aspects of sustainable IT, organizations themselves can determine the steps and the pace of sustainable IT development (Figure 2).

The second challenge facing CIOs is reducing the environmental impact of IT products: from mainframe to server to desktop or laptop, and including printers and mobile devices. It is fitting that CIOs take relevant environmental impacts and social aspects into account in their decisions regarding purchase, use and removal of IT products. This is a growing area of concern with regard to sustainability and the responsibilities of a CIO, in view of the diminishing lifespan and the growing number of end-user devices.

CIOs can compare the IT products of various suppliers. How much energy is required to create these IT products? What is their anticipated lifespan? To what extent are products recycled? In such comparisons, the focus is on how a supplier has set up its recycling program ("closed loop"), and on the origins of the raw materials used by the supplier in manufacturing the IT products in question. This is further affected by the increasing scarcity of raw materials and the expected influence of American legislation on the source of raw materials (*Dodd-Frank Act*).

Coping with these two sustainability challenges demands a significant effort on the part of the CIO and other employees. Accordingly, CIOs are advised to introduce plateau planning with a long timeline, in which the level of ambition gradually rises with the passage of time. To realize a meaningful contribution to sustainability, the CIO will have to collaborate intensively with the organization's internal sustainability unit. If successful, this will ensure a consistent sustainability strategy within the organization, and consolidate its efforts going forward.

Involvement of the internal sustainability unit

Good cooperation between the CIO and the Chief Sustainability Officer (CSO) is essential for effective contribution to the general organizational objectives. This cooperation begins with shared knowledge of the sustainability strategy and the sustainability goals of the organization, and an assessment of how IT influences the achievement of these goals. This influence may be either positive or nega-

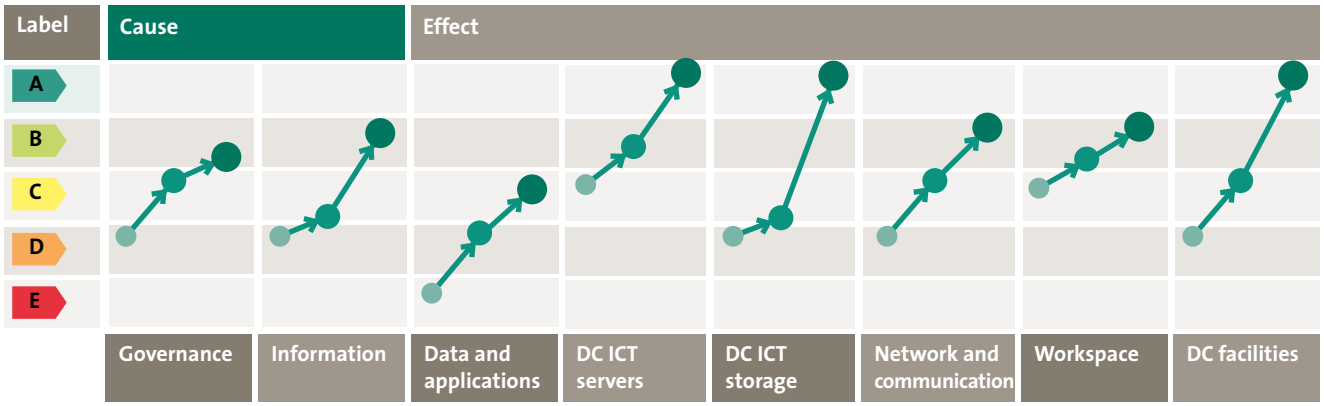

Figure 2. **Aspects of sustainable IT and the aspired growth.**

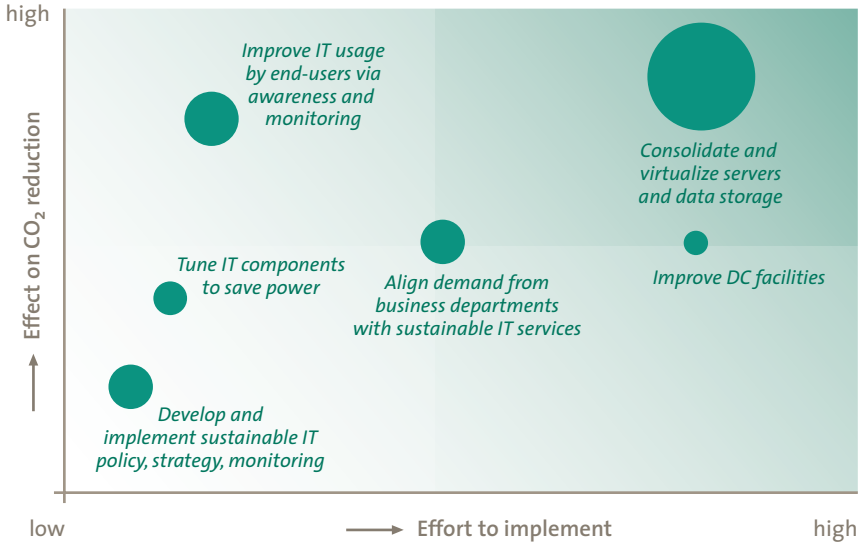

Figure 3. **Potential for sustainable IT.**

tive. When this has been determined, the way in which IT can contribute to realizing the organization's goals will have to be made operational. An operational structure must take into account technical aspects (such as a data-center that has recently been opened, for example) and the organizational culture. In any chosen solution, there will be roles and responsibilities for the end users, the IT suppliers and the administrators.

It is also advisable to investigate any areas in which profit or benefits could be gained. Figure 3 displays a number of enablers for sustainable IT.

Involvement of end users

An important part of any sustainability initiative is informing end users about the energy use of, and e-waste from, end-user devices such as laptops, monitors, printers and mobile devices (mobile phones and tablets). With the introduction of Bring Your Own Device (BYOD), providing information to end users is becoming increasingly important. On the one hand, an organization no longer needs to purchase so many mobile devices, whereas on the other hand, the organization has less control over the selection, lifespan and e-waste of such devices.

The trend over the past few years has seen the number of devices decline due to a reduction in the number of workplaces (an employee no longer has both a desktop and laptop, but only a laptop) and the centralization of printing facilities. That reduction trend has now ground to a halt. Employees increasingly carry a laptop, a tablet and sometimes even several mobile phones. For this reason, it is important to instill an awareness of security and e-waste among end users.

The CIO can contribute to instilling this awareness among the employees by training end users. Such training would be action-oriented: teaching the employee how to consume less energy at the workplace, or what criteria are important in selecting an IT device.

In addition, a CIO can facilitate video conferencing. This limits travel and thus not only saves employees travel time but also saves energy. In organizations that are not accustomed to video conferencing, the introduction of such possibilities may be very beneficial. This also extends, naturally, to encouraging opportunities to work at home, although this is already an option at many organizations.

It is important to involve end users. The CIO ought to periodically measure sustainable IT awareness among employees, calculating such things as the number of devices, the lifespan of these devices, and their actual use. It is also useful to encourage end users to switch devices off, restrict printing on paper, etc.

Involvement and assessment of suppliers

Further, it is essential to work intensively with suppliers. In fact, sustainability is becoming one of the criteria by which suppliers are chosen. If some suppliers cannot live up to the expectations of an organization, the organization may have no option but to find suppliers with more sustainable products. The current market has an abundance of IT suppliers, most of whom have invested heavily in sustainability. This presents a great opportunity for CIOs to capitalize on this situation and improve their overall environmentally friendly profile.

For decades, companies have been engaged in contracting out an increasingly large part of their IT infrastructure. This includes not only purchasing hardware and software but also maintaining IT services: the management and upkeep of information systems and application development. These external suppliers form an important link in the chain. If an organization wishes to truly improve its overall environmental profile, these suppliers must have a role in making IT more sustainable.

The moment when an investment decision is being made is the ideal time to impose sustainability demands on

In the market, sustainability is explicitly used as a selection criterion

potential IT suppliers. Which demands does an organization wish to make upon its future suppliers? In formulating a sourcing strategy, it is vital to pay attention to these sustainability requirements. This can be further elaborated in the Request for Proposal (RFP). The significance an organization attaches to sustainability becomes crystal clear in how it formulates the maximum scores on parts of the RFP. Of course, the quality of the service proposed and the price are important. Organizations that take sustainability seriously allocate between 7.5 and 12.5 percent of the total points to sustainability. This makes sustainability an important factor but not the deciding factor. If it were given too much weight, that could mean having to award the contract to a supplier who scores high on sustainability but delivers qualitatively poor service or charges above-market price.

In the market, sustainability is explicitly used as a selection criterion. For example, organizations assess potential suppliers on their IT energy efficiency according to the CO_2 performance ladder of the *Stichting Klimaat-vriendelijk Aanbesteden & Ondernemen* (Foundation for Climate-Friendly Contracting and Enterprise, see www.skao.nl). ProRail developed this CO_2 ladder, and has now transferred ownership of the ladder to the Foundation.

Organizations vetting potential suppliers in an RFP process can also impose minimum demands. These may include certification (ISO 14001 and EMAS, for example) or attention to content-related aspects (such as the Energy Star 4.0 standard or "ecodesign requirements"). Further, the proposal tendered might include the condition that, if the successful supplier's certification expires during the period covered by the contract, this could constitute a reason to terminate the contract. This gives some certainty that a selected supplier will take care with its certification.

Finally, in assessing potential suppliers, consider asking for commitments to improve organizational sustainability during the contract period. This kind of obligation, to formulate and follow annual improvement plans, can be added to the RFP. It is important that an organization takes into account, when making an assessment, the extent to which a potential supplier has been successful in following through on such commitments in the past: so ask for sustainability references!

Conclusion

Sustainable IT is becoming increasingly prominent on the CIO's agenda. This prominence is based on new rules and regulations, the need for cost savings, and the growing intrinsic necessity for organizations to foster sustainability throughout their consolidated operations.

The CIO can contribute by paying attention to IT energy efficiency. However, this is merely the first step. In the future, e-waste will certainly become an item on the sustainability agenda of the CIO.

The CIO can make more sustainable choices within his or her direct sphere of influence. These initiatives can enhance awareness of sustainable IT among users, thus making a significant contribution to IT energy efficiency.

Suppliers can make their own contribution to the objectives in the field of IT energy efficiency. By imposing sustainability criteria, CIOs can oblige potential suppliers to improve and contribute to IT energy efficiency. In selecting suppliers in the future, IT energy efficiency will play an increasingly important role.

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