



2013

The Task Force presents:

Green IT

Final Report

Prepared for

**The INTOSAI
Working Group on IT Audit**



April 14, 2013

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Preface

The Green IT project was initiated by INTOSAI Standing Committee on IT Audit at its 19th meeting in May 2010. The Committee agreed that Green IT posed new risks and challenges for auditors as well as Governments. The project will be coordinated by the Office of the Auditor General of Norway, who will be assisted by the SAI of the Sweden and includes the SAI's of the United States, United Kingdom, Canada, Australia, Netherlands and India as project members.

The main objective of the project will be to describe and give a definition on the term Green IT and the different aspects in which Green IT will be important – emphasis to be put on aspects related to the audit of IT in the government and the audit entities

A Project Initiation Document (PID) for this project was prepared in February 2011. This scoping report completes the initial assignment from the INTOSAI Working Group on IT Audit, and will serve as a basis for deciding priorities for further work in the area of Green IT. The project team will present for approval this scoping report at the 20th WGITA meeting in South Africa in April 2011.

At the 21st meeting in KL Malaysia the project present a status report and the WGITA decided that the project should prepare a final report to the 22nd meeting in Vilnius that summarized worked done.

The task force group has finalised its work given by the IT Audit Committee and hope it will give the Committee a basis for deciding priorities for further work in the area of auditing Green-IT.

Office of the Auditor General of Norway, April 2013

1. Introduction

At its 19th Meeting, held in China in May 2010, the INTOSAI Working Group on IT Audit reported on the results of a survey to identify the subject matter of future projects to be undertaken by the working group. Green IT was identified as one of the project to be undertaken by the working group.

A Project Initiation Document (PID) for this project was prepared in February 2011. This scoping report completes the initial assignment from the INTOSAI Working Group on IT audit and will serve as a basis for deciding priorities for further work. The project team will present for approval this scoping report and a power point presentation summarizing the project at the 20th WGITA meeting in South Africa in April 2011.

2. Background

The current stage of the project is the preparation of this scoping report. The intent of this scoping report is to provide background information to help ensure that the information gathered from the survey is based on a common understanding. It includes the organization of the task force, a definition of Green IT and elaborates on main challenges and risks. The final part of the scoping report sets out our proposals for projects to pursue different subject areas of audit interest within Green IT. These projects are intended to provide value to both financial and performance auditors and to allow INTOSAI members to take lessons learned back with them to their respective organizations.

The next stage of the project will be to collect information from various SAIs reports, on audit tools, references, information sources and the different training methods used with regard to Green IT.

3. Project objective

The objective of this project is to describe and give a definition on the term Green IT and the different aspects in which Green IT will be important – emphasis to be put on aspects related to the audit of IT in the government and the audit entities, but the project could also cover Green-IT within a SAI as a subproject.

4. Organization

This project will be led by the SAI of Norway and the SAI of the United States, United Kingdom, Canada, Sweden, Australia, Netherlands and India are members of the project team.

The group intends to confirm their responsibilities of each participating SAI for this project at the meeting in South Africa.

5. What is Green IT?

Green computing or green IT, refers to environmentally sustainable computing or IT. In the article *Harnessing Green IT: Principles and Practices*, San Murugesan defines the field of green computing as "the study and practice of designing, manufacturing, using, and disposing of computers, servers, and associated subsystems—such as monitors, printers, storage devices, and networking and communications systems—efficiently and effectively with minimal or no impact on the environment." [1]

The goals of green computing are similar to green chemistry; reduce the use of hazardous materials, maximize energy efficiency during the product's lifetime, and promote the recyclability or biodegradability of defunct products and factory waste. Research continues into key areas such as making the use of computers as energy-efficient as possible, and designing algorithms and systems for efficiency-related computer technologies

Modern IT systems rely upon a complicated mix of people, networks and hardware; as such, a green computing initiative must cover all of these areas as well. A solution may also need to address end user satisfaction, management restructuring, regulatory compliance, and return on investment (ROI). There are also considerable fiscal motivations for companies to take control of their own power consumption; "of the power management tools available, one of the most powerful may still be simple, plain, common sense."

6. Main Challenges

The IT industry is one of the most rapidly growing emitters of greenhouse gas pollution and industrial consumers of electricity. Without a significant increase in the use of renewable energy, the IT sector's carbon footprint will continue to grow at a concerning rate, increasing the demand for electricity produced from coal and other forms of dirty energy.

Given the projected growth of the IT sector, companies must effectively tackle their own operational emissions and those associated with their products by setting goals to reduce absolute greenhouse gas emissions on a well-defined timeline. [2]

In the topic of Green IT we can group the audit activities around these four domains:

- Strategic level
- IT investments
- Use of IT and IT solutions
- Disposal of IT equipment

Organization around the world – from governments to stakeholders and customers – are under increasing pressure to take steps that will help reserve the damaging effect that humanity may be having upon the environment

IT, in particular, is under significant pressure to make a substantial contribution towards a greener planet.

- For decades we've collectively cooled our data centers to a particular temperature (20 degrees Celsius, typically) and never seriously questioned the reason why. However, computer hardware has moved on, no longer needing such a precisely maintained operating environment, and this is an unnecessary waste of energy. By reaching for the thermostat and turning it up a little, up to between 24 and 25 degrees, we can see significant cost and carbon footprint savings
- What about reviewing the computer hardware we buy as corporate? How does the standard model we buy stack up against green standards such as Energy Star or EPEAT. How long will a more energy-efficient desktop model need to be operated to make it worth paying the small extra sum for such credentials at the point of purchase?
- Consolidate your servers and go further and consolidate your data centers too
- Power down workstations automatically at night
- Tackle the "print mountain" at your office – whether through simple technology changes or through ways of working changes
- Take a look at how your company disposes of its end-of-life IT – what opportunities exist to recycle or reuse?

<http://www.itgovernance.co.uk/download/Grasping-Green-IT.pdf>

<http://www.energystar.gov/>

<http://www.epeat.net/>

7. Worked Done

After the meeting in South-Africa, we have mailed the task force members, asking some questions:

Has the Government in your country put Green IT on the agenda?

If yes; how has this been done and in what areas/what aspects have been addressed;

- Governance
- Reducing footprint of agencies IT operations
- Improving processes for monitoring of society's footprint
- Reducing footprint of agencies processes

Is there establish any indicators to measure how this work is succeeded?

Has your SAI done any work on the topic of Green IT?

If yes; what have been your focus and what were the results of your audit?

Feedback on these questions has come from 3 of the task force members

- SAI Canada, GAO and SAI Norway

7.1 From SAI Canada

From Canada, they have a *Policy on Green Procurement* – from April 2006.

The policy applies to all departments within some exceptions.

The federal government is a significant purchaser in Canada. As such its activities impact the national economy and can influence both the price and the availability of goods and services, including construction services, in the marketplace.

Through the increased promotion of environmental sustainability, and by integrating the application of environmental performance considerations in its procurement process, the federal government is in a position to influence the demand for environmentally preferable goods and services and the ability of industry to respond to the escalating use of environmental standards in global markets.

As part of its on-going commitment to improve the environment and the quality of life of Canadians, this policy seeks to reduce the environmental impacts of government operations and promote environmental stewardship by integrating environmental performance considerations in the procurement process.

In October 2010, the first Federal Sustainable Development Strategy (FSDS) was released, rendering environmental decision-making more transparent and accountable to Canadians.

Federal Electronic Waste Strategy

As part of its 2007-09 Sustainable Development Strategy, the Public Works and Government Services Canada has committed to implement a government-wide strategy to reduce the environmental impact of electronic and electrical equipment by 2010. This strategy will address the lifecycle management of these assets through the planning, acquisition, use/maintenance and disposal phases.

Link: <http://www.ec.gc.ca/dd-sd/>

7.2 From SAI Norway

In Norway we have an Action Plan on - Environmental and Social Responsibility in Public Procurement from 2007

The Government wants the public sector to lead the way as a responsible consumer and demand environmentally sound products and services which have been manufactured in accordance with high ethical and social standards. To this end, the Government has drawn up a three-year action plan for environmental and social responsibility in public procurement.

The Government has adopted a specific environmental policy for central government procurement that enters into force on 1 January 2008. All government institutions shall follow up this environmental policy and incorporate it into their internal management systems.

One of the priority product groups is ICT equipment

And a goal is to choose ICT equipment with low energy consumption, low content of pollutants and easily upgradeable. Attach importance to e- cooperation when choosing equipment

Link: <http://www.regjeringen.no/en/dep/fad/documents/Reports-and-plans/Plans/2007/Environmental-and-Social-Responsibility-.html?id=476600>

7.3 From SAI US

In United States they have an executive order 13423 on - Strengthening Federal Environmental, Energy, and Transportation Management – from January 2007

The order sets goals in the areas of energy efficiency, acquisition, renewable energy, toxics reductions, recycling, renewable energy, sustainable buildings, electronics stewardship, fleets, and water conservation. In addition the order requires more widespread use of Environmental Management Systems as the framework in which to manage and continually improve these sustainable practices.

It also set goals for federal agencies to improve energy efficiency and reduce greenhouse gas emissions, among others. In addition, a section of the executive order contains four broad green IT-related requirements that federal agencies are to follow:

- meet at least 95 percent of agencies' requirements for new electronic products with EPEAT-registered products, unless no applicable EPEAT standard exists;
- enable the Energy Star feature on agency computers and monitors
- establish and implement policies to extend the useful life of agency electronic equipment; and
- use environmentally sound practices with respect to disposition of agency electronic equipment that has reached the end of its useful life.

To assist the agencies in accomplishing Executive Order 13423 requirements, the Council on Environmental Quality (CEQ) provided implementing instructions and directed the agencies to develop Electronic Stewardship Plans. The implementing instructions elaborated on the goals in the executive order and included certain targets that agencies should set for implementing each requirement

Link: <http://www.epa.gov/oaintrnt/practices/eo13423.htm>

In 2009, Executive Order 13514, “Federal Leadership in Environmental, Energy, and Economic Performance,” expanded on the agency requirements of Executive Order 13423. The executive order required federal agencies to submit to the Chair of CEQ and the Director of the Office of Management and Budget (OMB) a 2020 greenhouse gas pollution reduction target within 90 days and to increase energy efficiency, reduce fleet petroleum consumption, conserve water, reduce waste, support sustainable communities, and leverage federal purchasing power to promote environmentally responsible products and technologies. The executive order requires agencies to meet broad sustainability goals, such as

- 30 percent reduction in vehicle fleet petroleum use by fiscal year 2020;
- 26 percent improvement in water efficiency by fiscal year 2020; and
- 50 percent non-hazardous waste diversion by fiscal year 2015.

With regard to green IT, a section of the order contains five broad goals. Three of these are similar to those in Executive Order 13423, but the goals also include requirements related to power management and data center consolidation.

Link: <http://www.epa.gov/oaintrnt/practices/eo13514.htm>

As far as we have been noticed from the task force members, it is only GAO that has done some audit on the topic of Green IT.

In July 2011, GAO presents a report on GREEN INFORMATION TECHNOLOGY
The findings highlighted that Agencies Have Taken Steps to Implement Requirements,
but Additional Guidance on Measuring Performance Needed

The six agencies in GAO's review
(the Departments of Agriculture, Commerce, Energy, and Health and Human Services;
the Environmental Protection Agency; and the General Services Administration) have
developed sustainability performance plans and taken additional steps to implement the
executive orders' requirements.

For example, they have increased their acquisition of certified energy-efficient IT
equipment, established and implemented policies to extend the useful life of agency
equipment, and developed environmental policies for disposing of electronic equipment.
However, the overall effectiveness of the agencies' efforts cannot be measured because
key performance information is not available. Specifically, the agencies have not
identified the information needed to measure the progress or results of their efforts.

For example, the agencies have generally not established baselines (starting points) or
developed performance targets that are consistently defined in terms of quantifiable
benefits, such as a reduction in energy.

GAO identified a number of leading practices used by federal, state, and local
government and private-sector organizations that are relevant to green IT. These practices
include enhanced leadership, dedicated funding, prioritization of efforts, and improved
employee training, as well as acquiring IT equipment with the highest energy efficiency
ratings; consolidating equipment and services; reducing use of paper; and using new,
more efficient computers.

For more information, see: www.gao.gov/products/GAO-11-638

8. Project Activities/Sub-Projects

The following was the tentative description of the sub-projects and activities identified by the scoping study. The assignment of responsible project leaders and completion dates beyond the first two items will be determined as the project is further defined.

1. Prepare a Project Identification Document (PID)

- Produce a PID - introducing the project topic

Project Leader: SAI Norway

Due Date: February 2011

Status: Done

2. Prepare a Scoping Report

- Produce a Scoping Report introducing the project topic
- Include:
 - Introduction and Background
 - Participating members of the task force
 - Goals and projects

Project Leader: SAI Norway

Due Date: late 2011

Status: ongoing

3. Collection of reference material on Green IT

- Compile a set of Risks and list of important questions to ask when auditing in the field Green IT

Project Leader: SAI xxx

Assist:

Due Date: 2013 INTOSAI WGITA meeting

4. Collection of various SAI's work on Green IT

- Research various Supreme Audit Institutions methods, information sources, audit tools and references concerning Green IT
- Compile a list of audit tools used by various SAIs
- Organize the data collected and post on INTOSAI website or their new information management system
- Copy of audit reports and other similar reports published by SAIs regarding Green IT, including extracts where Green IT was only a sub-criteria within the scope of the audit

The goal of this project would be to have a "one-stop-shop" where SAIs can share their knowledge of Green IT, and related audit tools.

Project Leader: SAI xxx

Assist:

Due Date: 2013 INTOSAI WGITA meeting

5. Produce Interim Progress Reports for Task Force

- Each participating SAI will provide an interim report on their individual progress and share it with the task force.
- The interim reports will be completed in 2013.

Project Leader: SAI Norway

Due Date: late October 2013

6. Produce Final Reports for the Task Force

- Each participating SAI will provide a final report on their individual projects and share it with the task force.
- These reports will include project details, accomplishments, and obstacles faced
- The final reports will be completed in 2014

Project Leader: SAI Norway

Due Date: 2013 INTOSAI WGITA meeting

At the meeting in Kuala Lumpur, January 2012, the WGITA decided to prepare a final report to the 22nd meeting in Vilnius, Lithuania 2013, that summarized worked done. Therefore is some of the tasks in the scoping study not completed.

Appendix 1: References

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3. IT Governance,
<http://www.itgovernance.co.uk/download/Grasping-Green-IT.pdf>
4. Energy Star, kilde, *tittel*, år
<http://www.energystar.gov/>
5. EPEAT
<http://www.epeat.net/>

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