

Sustainability through Green IT

Sustainability through Green IT And How ISO 50001 Supports It

Sustainability, in my words, is simply “Live and Let live”.

I must progress but in that attempt I must not forget those around me. Those around me can be people (less than me, better than me, just like me), plants animals, water and air – all need to be taken care of.

There is an official definition also:

“the capacity to endure”. For humans, sustainability is the long-term maintenance of well being, which has environmental, economic, and social dimensions, and encompasses the concept of union, an interdependent relationship and mutual responsible position with all living and non living things on earth.” Source: wikipedia

United Nations defines Sustainable Development as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs.”

Information Technology (IT) through out this paper doesn't mean IT/ ITes industry only. All industries today are heavily dependent upon IT. IT in this paper refers to the IT portion of all those industries. This also can be referred to as ICT (Information and Communications Technology).

In a recent Seminar, I asked the audience to tell me one polluting industry. Within minutes almost everyone responded with answer like cement, textiles, chemical, fertilizers, metals , mining, sugar, paper, auto, aviator, steel, forestry, agriculture, automotive, rubber, tyres, shipping, telecom, etc. And I have asked this question in last two years to at least two thousand people in about 50 settings (seminars, conferences, classrooms, and online communications). Responses have been same. Nowhere, anyone has named IT as a polluting industry. But, is it?

By my definition, Yes!

Pollution, according to me, is not dust, dirt and smoke (only). Pollution is the overall load an activity puts on Mother Nature.

We didn't see chemicals and smoke associated with IT. So we never thought IT was polluting. What about “overall load” of IT?

Overall load of IT on nature is huge. It's good to understand ‘cradle to grave’ lifecycle to appreciate this concept. There are 6 stages in the cycle of an IT equipment (e.g. a laptop) as shown in Figure1.

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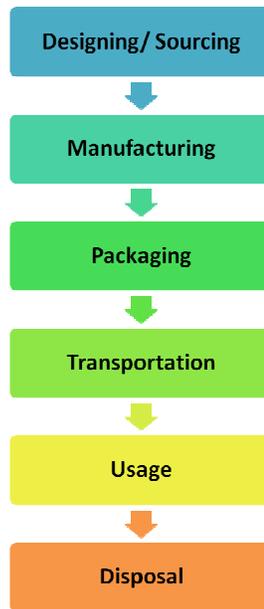


Figure 1: Lifestages of an IT equipment

The load at various stages can be in terms of energy used (hence the carbon footprint), water used, material used, waste (of different types) produced (during each stage), toxics used /produced. Now see Table 1, you get a glimpse of IT’s overall load on Mother Nature.

Phase	Sourcing	Manufacturing	Packaging	Transportation	Usage	Disposal
Load						
Material (toxic/non toxic)	√	√	√			
Energy	√	√	√	√	√	√
Water	√	√				√
Waste	√	√	√	√		√

Table 1: IT’s overall load on mother nature

The most visible part (to the user, most of us) is “usage” portion which has the least load (only power consumption).

Consider the following points also:

- a. Some of the precious and rare material (gold, copper, silver) are estimated to last for a few more decades only (Figure 2).

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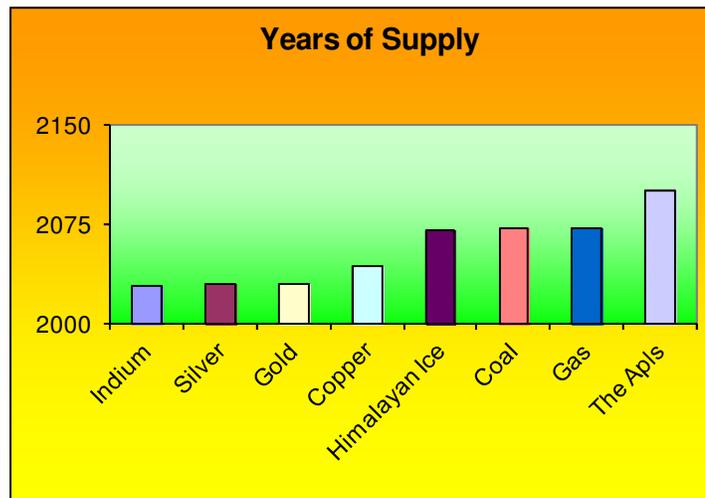


Figure 2: Some materials used in IT equipment are not forever

- b. ICT's global carbon footprint in 2002 was estimated to be 0.5GTCO₂e (SMART 2020 report) – there is a lot of ICT outside the datacenters – that perhaps was not accounted for in these figures!
- c. World's e-waste estimates stand at 40 million tonnes (<http://www.treehugger.com/clean-technology/e-waste-infographic-raises-more-questions-it-answers.html>).
- d. Global emissions of IT industry (from data centres only) are as much as that of the Aviation Industry and amount to approximately 2-6% of the global overall emissions.

When the scope of concern moves from usage only to Cradle to Grave (some call it “womb to tomb”, other name it as “design to disposal”, while expectations of some other people is “Cradle to Cradle”) the concept is called lifecycle accounting (LCA). See one example from Apple (Figure 3).



Figure 3: Apple's LCA

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Green IT or Green ICT means differently to different people e.g.

- Green Computing
- Efficient Computing
- Green computing or green IT, refers to environmentally sustainable computing or IT.
- 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. (wikipedia)

In my words “Information Technology that is light on all resources (hence puts the least over all load on mother nature), is called Green IT.”

Hence Green IT helps in achieving Sustainability (growing and leaving enough for the others).

But Green IT is mistakenly understood to be CSR (Corporate Social Responsibility) activity. So, most organisations tend to go slow on this - Social responsibility is what we will do when we have spare time, money and effort. Moreover, CSR act to many organisation means giving money to get some work done. These are not good approaches.

I would like to say that Green IT must be embedded in the mainstream Business Strategy. Green IT is no more a good to do activity but an activity to do! There is money in it and this is pure business!

Figure 4 and Figure 5 attempt to show the Benefits of adapting green IT practices.

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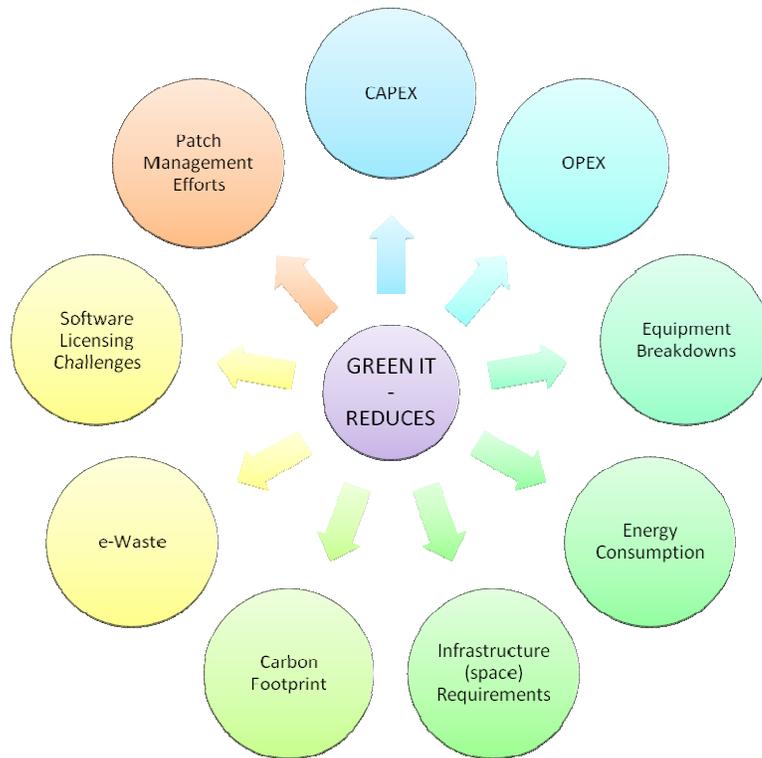


Figure 4: Benefits of Green IT:1



Figure 5: Benefits of Green IT:2

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Table 2 lists some cases of Green IT Deployment (available in public Domain)

S. No.	Organisation	Green IT Activity	Benefit/ Benefit Area
1	Doha Bank	Green System Implementation	<ul style="list-style-type: none"> • Carbon footprint reduction • Best Green Bank award
2	European Commission	VDI Implementation	<ul style="list-style-type: none"> • Zero learning efforts • Energy saving • User satisfaction • Software licensing
3	Surrey County Council	Datacenter efficiency measures	<ul style="list-style-type: none"> • Compliance to CRC Energy Efficiency Scheme • Financial savings • Carbon reduction • Contribution to UK's emission reduction targets
4	Cambridge University Hospitals	Private Cloud	<ul style="list-style-type: none"> • Stable, resilient and high performance IT • DR automation • Reduced downtime • Improved patient care
5	Euronet	Enterprise virtualisation	<ul style="list-style-type: none"> • Increase in application performance • Reduction in transaction rejection rate • Increased transaction processing per day
6	The Funding Corporation	Data backup solution and virtualisation	<ul style="list-style-type: none"> • Improved DR • Reduced backup times • Reduction in number of servers • Financial savings
7	Stevens and Bolton LLP	Network infrastructure upgrade	<ul style="list-style-type: none"> • Efficiency improvement • Reliability improvement
8	Flybe Airline	DR Solution	<ul style="list-style-type: none"> • Improved datacenter efficiency • Reduced recovery times
9	WTB Group	Outsourcing	<ul style="list-style-type: none"> • Scalable high availability infrastructure • Improved DR
10	Viva Infomedia	Cloud implementation	<ul style="list-style-type: none"> • Scalability and cost effectiveness • Quick archival • Meeting peak time surges
11	MD Synergy	Google Apps	<ul style="list-style-type: none"> • Enhanced collaboration

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S. No.	Organisation	Green IT Activity	Benefit/ Benefit Area
12	ICICI Securities	Paper management	<ul style="list-style-type: none"> • Cost savings • Increased employee productivity
13	HDFC Bank	Server consolidation	<ul style="list-style-type: none"> • Better monitoring and manageability • Quick rollout of IT resources • Real estate saving • Differentiator and competitive edge
14	Shoppers Stop	ITaaS	<ul style="list-style-type: none"> • Reduced number of servers • Savings in licensing costs • Improved CPU utilisation • Reduced number of servers • Reduced number of administrators • Reduced power and cooling requirements
15	Essar	e-Print	<ul style="list-style-type: none"> • Reduction in provisioning times • Anyplace to any printer printing • Enhanced document security • Improved convenience to employees
16	Sevenhills Health City Hospital	Paper management	<ul style="list-style-type: none"> • Improved patient care • Reduced operational costs • Reduced human errors • Anytime anywhere access to patient records • Cost savings
17	Intelenet	Video Touch Mart	<ul style="list-style-type: none"> • Quick go-to-market solution • Increased revenues
18	Royal Orchid Group of hotels	Cloud implementation	<ul style="list-style-type: none"> • Faster customer services • Improved collaboration
19	Manikchand Group	Blade server implementation	<ul style="list-style-type: none"> • Reduced power consumption • Reduced capex and opex
20	Gujarat Government	e-Governance	<ul style="list-style-type: none"> • Improved productivity • Improved mother and child health delivery service
21	Infosys	Enterprise digitisation	<ul style="list-style-type: none"> • Improved DR • Improved search, retrieval and space requirements
22	Australian department of Defence	Switch off (when not in use)	<ul style="list-style-type: none"> • Reduced electricity consumption • Reduced emissions

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S. No.	Organisation	Green IT Activity	Benefit/ Benefit Area
23	Dell	Switch off (when not in use)	<ul style="list-style-type: none"> • Reduced energy consumption • Reduced costs
24	Microsoft	Server virtualisation	<ul style="list-style-type: none"> • Reduced server numbers • Reduced energy consumption • Reduced emissions • Reduced maintenance costs • Reduced power consumption
25	Sustainability Vitoria	Blade server implementation	<ul style="list-style-type: none"> • Reduced power consumption
26	Toyota Australia	Office automation through IT	<ul style="list-style-type: none"> • Reduced costs • Reduced emissions • Reduced electricity consumption
27	Intel	Server consolidation	<ul style="list-style-type: none"> • Reduced datacenter requirements • Costs savings
28	TCS	Paper management	<ul style="list-style-type: none"> • Reduced paper consumption • Reduced cartridges consumption
29	Infosys	Large Green IT Program	<ul style="list-style-type: none"> • Cost savings • Reduced datacenter maintenance costs • Reduced number of servers • Reduced TCO • Reduced energy consumption
30	Coca Cola bottling	Datacenter virtualisation	<ul style="list-style-type: none"> • Reduced number of servers • Reduced cabling costs • Reduced space requirements • Reduced power requirements • Reduced cooling requirements
31	Aircel	Datacenter consolidation	<ul style="list-style-type: none"> • Reduced number of datacenters • LEED certification for datacenter • Reduced carbon footprint
32	T John Group of Institutions	Green IT initiatives	<ul style="list-style-type: none"> • Reduction in energy consumption • Reduction in cooling requirements • Reduction in maintenance costs • Reduction in break downs
33	Orbis Financials	Virtualisation	<ul style="list-style-type: none"> • Savings in hardware costs • Savings in power and cooling requirements • Savings in maintenance costs
34	L&T	Private cloud implementation	<ul style="list-style-type: none"> • Reduction in provisioning time • Increased infrastructure capacity
35	Infosys	Cloud implementation	<ul style="list-style-type: none"> • Reduction in costs and power

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S. No.	Organisation	Green IT Activity	Benefit/ Benefit Area
			requirements
36	Oxford Bookstore	Cloud implementation	<ul style="list-style-type: none"> • Ease of implementation • Lowered TCO • Savings in efforts • Reduced OS build time • Reduced restoration times
37	123 Greetings	Server virtualisation	<ul style="list-style-type: none"> • Reduced cost of doing business • Reduced deployment costs • Elasticity during seasonal spikes
38	Max New York Life Insurance Co.	Virtualisation	<ul style="list-style-type: none"> • Huge RoI • Increased server utilisation • Improved ITDR
39	Geometric	VDI deployment	<ul style="list-style-type: none"> • Enhanced user experience • Increased security and controls • Cost savings • Reduced maintenance • Elongated refresh cycles
40	Apollo Munich Health Insurance	Server consolidation	<ul style="list-style-type: none"> • Reduced TCO • Increased operational efficiency • Increased business uptime • Increased customer satisfaction
41	Godrej Consumer Products Limited	Server virtualisation	<ul style="list-style-type: none"> • Increased server utilisation • Reduced costs • Lowered power consumption • Rapid provisioning of resources • Reliable and modularly scalable solution
42	Sardar Patel Institute of Technology	Private cloud deployment	<ul style="list-style-type: none"> • Reduction it Spend • Increased security • Optimum usage of bandwidth
43	Bajaj Finserve	Cloud deployment	<ul style="list-style-type: none"> • Increased business volumes • 100% decision accuracy in underwriting function
44	Intel	Cloud deployment	<ul style="list-style-type: none"> • Cost savings • Reduced provisioning times • Reduced number of servers • Shift from capacity planning to demand forecast model
45	Emerson	Virtualisation	<ul style="list-style-type: none"> • Reduced number of servers • Reduced number of datacenters • Decreased cost of server

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S. No.	Organisation	Green IT Activity	Benefit/ Benefit Area
46	APJ Surendra Corporate Services	Virtualisation	operations <ul style="list-style-type: none"> • Increased CPU utilisation • Cost savings
47	Pennar Industries	CRM automation on cloud	<ul style="list-style-type: none"> • Better management of information • Getting closer to the customer • Cost savings
48	Nagarjuna Fertilisers	Mobile content management solution	
49	Mind Tree	Managed Print Services	<ul style="list-style-type: none"> • Reduced paper consumption • Reduced printing costs • Reduced telecom costs
50	Eaton	Voice over global area network	
51	Dr. Reddy's	SAP implementation	<ul style="list-style-type: none"> • Cost savings in charge back transaction processing
52	National Stock Exchange	Office automation	<ul style="list-style-type: none"> • Improved compliance to regulatory requirements
53	K Raheja Corporation	Virtualisation	<ul style="list-style-type: none"> • Reduced number of servers • Improved performance • Reduced cooling and power requirements
54	PVMI	SAP implementation	<ul style="list-style-type: none"> • Turnaround time improvement in claims settlement • Reduced manpower requirements • Improved customer experience • Improved business reputation
55	Premier Inn	Hosted model deployment	<ul style="list-style-type: none"> • Savings in CAPEX • Savings in OPEX • Zero checkout time
56	Don Bosco NGO	Cloud implementation	<ul style="list-style-type: none"> • Ability to manage spikes during disasters • Finding missing children and putting a smile back into the faces of children and their parents
57	Vedanta	Private cloud implementation	<ul style="list-style-type: none"> • Cost savings • Improved customer services • No CAPEX on new projects
58	HyperCITY	Oracle retail solutions	<ul style="list-style-type: none"> • Improved stores management • Centralised inventory • Better management of pricing
59	AEGON Religare	Underwriting automation	<ul style="list-style-type: none"> • Reduced cost per policy • Faster policy issuance

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S. No.	Organisation	Green IT Activity	Benefit/ Benefit Area
60	Dewan Housing Finance Corporation	Cloud based security	<ul style="list-style-type: none"> • Improved employee productivity • Elimination of spam • Reduced virus related issues • Savings on manpower • Redeployment of resources to other key activities
61	KPIT Cummins	VDI deployment	<ul style="list-style-type: none"> • Reduced desktop management costs • Quick provisioning • Reduced data loss risks
62	Standard Chartered Bank	iPhone deployment	<ul style="list-style-type: none"> • Improved productivity • Better work-life balance for employees
63	Godrej Agrovet	SAP implementation	<ul style="list-style-type: none"> • Reduction in manpower resources • Improvement in gross margins • Improved overall efficiencies
64	Jindal Agro	ERP on cloud deployment	<ul style="list-style-type: none"> • Reduced CAPEX • Streamlined internal business processes • Better understanding of customer needs
65	NDPL	Interoperability framework deployment	<ul style="list-style-type: none"> • Better inventory control • Reduced revenue cycle • Cost savings • Increased market share • Reduction in manpower requirements
66	SBI	Data warehousing	<ul style="list-style-type: none"> • Cost savings • Increased product offerings • Increased cross selling and up selling opportunities
67	Bharat Oman Refineries	Unified communications deployment	<ul style="list-style-type: none"> • Reduced communication costs

Table 2: Green IT deployment cases from the Corporates

A detailed analysis of these cases brings out few key points:

- a) Green IT practices can be deployed by any organisation of any size and type in any sector and anywhere in the world. These ARE NOT for the big ones only!
- b) A relationship between Green IT and CSR is not visible at all! This proves that Green IT needs to be in mainstream business strategies.

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c) While 'cost saving' is one of the key benefits, other benefits that emerge out of these cases include

- Reduction in carbon footprint/ emissions/ GHG emissions
- Reduction in energy consumption
- **Increased user satisfaction**
- **Increased compliance to legal requirements**
- Increased resilience/ IT DR/ BCM arrangements
- **Improved patient care**
- Enhanced application performance
- Reduced number of servers and datacenters
- **Enhanced capability to meet seasonal spikes**
- Improved collaboration
- Increased employee productivity
- Reduced provisioning times
- **Competitive edge**
- Increased security
- **Increased revenues**
- **Faster customer services**
- Improved mother and child care
- Reduced paper consumption
- **Reduced TCO**
- **LEED certification of datacenter**
- **Reduced cost of doing business**
- **Huge RoI**
- Elongated refresh cycles
- **Increased customer satisfaction**
- **100% decision accuracy**
- **Getting closer to the customer**
- Reduced print loads and paper usage
- **Improved business reputation**
- **Zero check out time**
- Putting smiles back on the faces of missing children and their parents
- **Reduced cost per policy**
- **Better work-life balance for employees**
- **Better understanding of customer needs**
- **Reduced revenue cycle**
- **Increased product offerings**

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If I were to filter these further then my choices would be those highlighted above – as directly close to the business.

All that I wish to write now is **‘Where there is will – there is way!’**

The remaining portion of the paper discusses ISO 50001 (Energy Management System): its benefits and its linkages with green IT and Sustainability.

ISO 50001, one the latest products from International Organization for Standardization, was released in 2011. It was earlier known as BS EN 16001. It is expected that this standard can influence up to 60% of the world’s energy use.

Benefits of ISO 50001 are multiple as shown in the Figure 6:

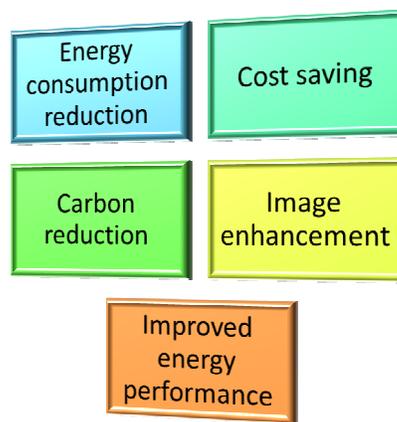


Figure 6: Benefits of implementing ISO 50001

Like all other management Systems, this also revolves around PDCA (Plan Do Check Act) cycle of continual Improvement. This is depicted in Figure 7.

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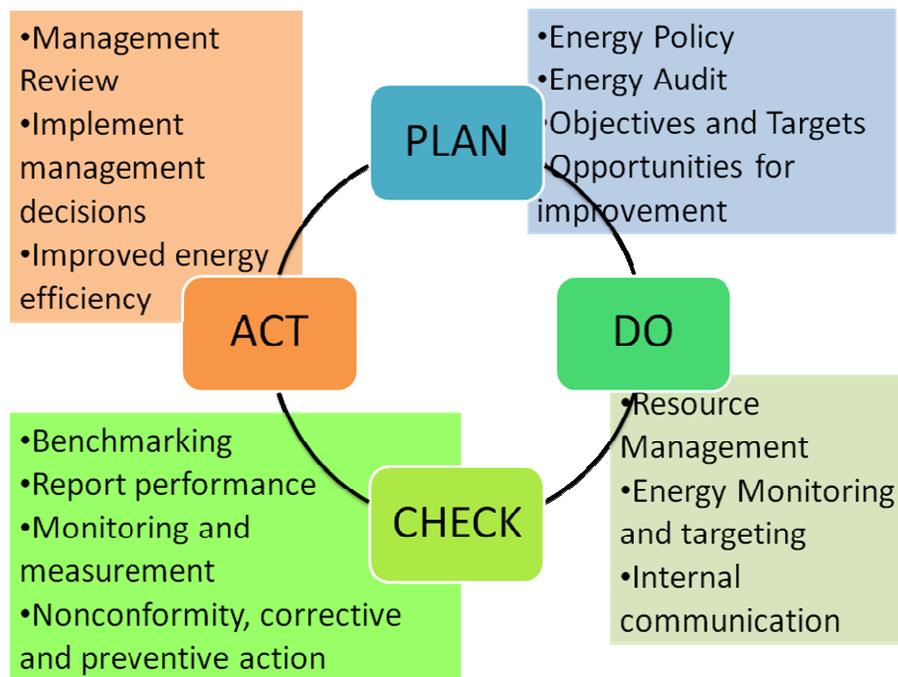


Figure 7: ISO 50001 within PDCA cycle (continual improvement)

Key features of ISO 50001

- Applicable to organisations of all types and sizes, in all sectors
- Can make positive difference in the very near future, while supporting longer term efforts for improved energy technologies

This standard intends to accomplish the following:

- Assist organizations in making better use of their existing energy consuming assets
- Create transparency and facilitate communication on the management of energy resources
- Promote energy management best practices and reinforce good energy management behaviours
- Assist facilities in evaluating and prioritizing the implementation of new energy-efficient technologies
- Provide a framework for promoting energy efficiency throughout the supply chain
- Facilitate energy management improvements for greenhouse gas emission reduction projects
- Allow integration with other organizational management systems such as environmental, and health and safety

The above is intended to be achieved through a framework which will enable organisations to:

- Develop a policy for more efficient use of energy
- Fix targets and objectives to meet the policy
- Use data to better understand and make decisions concerning energy use and consumption
- Measure the results

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- Review the effectiveness of the policy
- Continually improve energy management

Some cases of ISO 50001 deployments are listed below:

- a) Delta Electronics, China
- b) Schneider Electric, France
- c) Dahanu Power Station, India
- d) AU Optronics, Taiwan
- e) Municipality of Bad Eisenkappel, Austria
- f) Dainnipon Screen MFG. Co. Ltd., Japan
- g) Porsche, Germany
- h) Samsung Electronics, South Korea
- i) Sunhope Photoelectricity Co., Taiwan
- j) LG Electronics, India (BS EN 16001)
- k) Shree Cement, India (BS EN 16001)

IN CONCLUSION:

Green IT recommends use of energy efficient products and services. So does ISO 50001. Hence Green IT principles and practices support sustainability as a whole.

As understood, energy, cost, and carbon are interrelated. Carbon and cost are related to Sustainability. Green IT is related to carbon and cost. Hence the three (Sustainability, Green IT and ISO 50001) are interrelated.

Author: Daman Dev Sood, CIO & Head – Sustainability Practice, Continuity and Resilience
He can be reached at d.sood@continuityandresilience.com or info@continuityandresilience.com