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# Green ITIL

## Capgemini explains how the ITIL life-cycle provides easily implemented opportunities to adopt sustainable IT

# Contents

## 1. Executive Summary

***It's a tough job, but someone's got to do it***

Today's IT manager needs to provide a competitive edge for the business, reduce energy consumption and increase the sustainability of IT services – *'it's a tough job, but someone's got to do it'.*

Powering business growth is a constant challenge for today's IT managers because competition is becoming increasingly global in nature and energy prices are rising at an alarming rate.

Add the fact that Information Communication Technology (ICT) now accounts for 2% of global $CO^2$ emissions[1] and it becomes clear today's IT managers are facing more constraints than their predecessors - the big challenges are:

- Increasing cost of power: "The cost of power consumption by data centres doubled between 2000 and 2006, to $4.5 billion and could double again by 2011[2].
- Social demands of employees and customers: "...people are demanding a reduction of the environmental footprint of equipment manufacture."[3]
- Changing regulatory control: WEEE* and RoHS** in Europe and RCRA*** in the US.

The Gartner Group has identified "Green IT" as one of the 10 most important topics concerning CIOs in 2008[4]. Gartner's predictions include:

- "By 2009, more than one-third of IT organisations will have one or more environmental criteria in their top six buying criteria for IT-related goods and services.
- By 2010, 75% of organisations will use full life cycle energy and $CO^2$ footprint as mandatory PC hardware buying criteria.
- By 2011, suppliers to large global enterprises will need to prove their green credentials via an audited process to retain preferred supplier status".

The good news is that reducing the carbon footprint of IT also leads to benefits. Over the past 20 years, government studies have found that organisations can save up to 20% on their energy costs by managing their energy use and investing in cost-effective energy efficiency measures. With the introduction of the Climate Change Levy (2001), the benefits of becoming more energy efficient means that some organisations can cut the amount of their levy[5].

While Gartner's predictions will probably become reality, there will be a significant time-lag before organisations can rely on a strategy of procuring more sustainable IT equipment as a means of reducing their energy costs and $CO^2$.

Relocation is one alternative. Some organisations are thinking about moving their data centres to Iceland[6] to harness the country's natural energy resources and reduce the costs of powering and cooling their IT systems. While this seems a reasonable plan for some CIOs, is this an affordable option for everyone?

Capgemini believes ITIL service management offers an adaptable method for making use of existing processes to deliver sustainable IT today. This document explores the use of the ITIL life-cycle as part of a wider organisational approach to sustainable IT. Leveraging ITIL to enable an organisation to:

- Identify and control the environmental impact of its IT services;
- Continuously improve its environmental performance, and;
- Implement a structured approach to setting targets and measuring performance over time.

Capgemini aims to help organisations develop and implement an approach to lowering the environmental impact of IT by proposing the utilisation of the ITIL framework to achieve sustainable IT.

* The WEEE Directive and WEEE Targets require organisations to recognise the principle of 'producer liability' for the production and disposal of IT equipment with recovery, re-use and recycling targets ranging from 50% to 80%.

** The RoHS Directive bans new electrical and electronic equipment containing more than agreed levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants.

*** The RCRA is the public law in the US that creates the framework for the management of hazardous and non-hazardous solid waste.

## 2 Adopting Green ITIL

Capgemini suggests that IT managers make use of the ITIL life-cycle to integrate environmental targets into the performance measures for new and existing IT services.

Using governance to link the CSR policy and the IT function, managers can convert an organisation's environmental vision and strategy into measurable targets as illustrated in Figure 1.

Our fundamental approach to identifying opportunities for improving IT sustainability begins with understanding an organisations current position. Capgemini uses a combination of energy matrices, the ITIL framework and its environmental service review methodology to calculate an IT function's existing score against best practise.

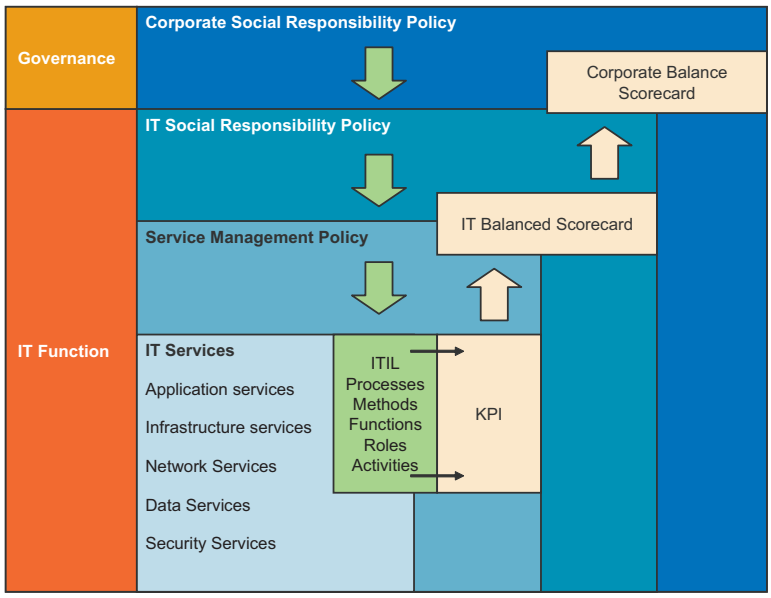
Once a score is identified, we develop an activity plan, with milestones and metrics, to implement energy saving initiatives. These initiatives then become ingrained within the ongoing service improvement philosophy.

Capgemini proposes this service-led approach as a complimentary approach to a technology focus where the emphasis is on component performance. This is because a service-led approach more readily links IT services to business services and therefore value. In a service-led approach, any IT that does not contribute to business services becomes a carbon overhead irrespective of its performance.

### 2.1 The Governance Link

IT governance controls the successful implementation of an organisational strategy – and environmental policy – by linking it with IT strategy. It achieves this control through SMART (specific, measurable, achievable, realistic and time-bound) performance targets designed to demonstrate the ongoing value of IT. The purpose of IT governance is to enable the link between CSR and IT to operate efficiently.

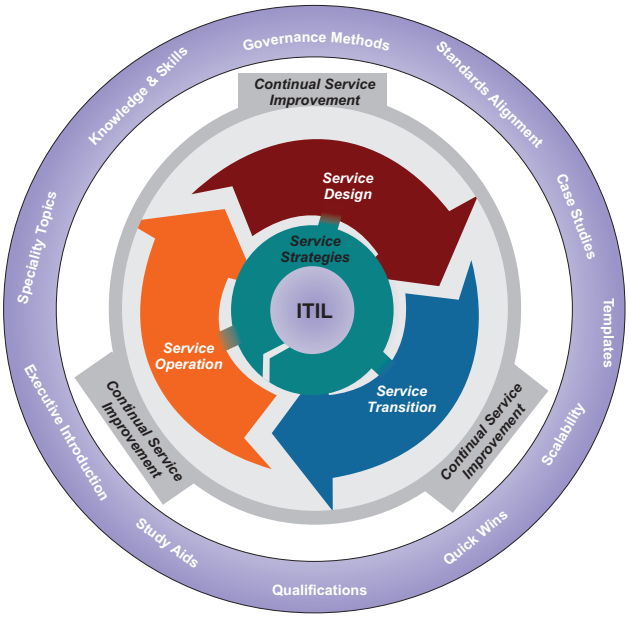
**Figure 1 – ITIL, the link between CSR policy and measurable targets**




IT governance achieves the delivery of strategic outcomes including environmental targets through its interface with service management. IT governance acts as the decision authority and empowers service management with the decision rights to carry out the delivery of IT in more sustainable way; sourcing services internally from retained functions or externally from outsource providers.

The recognised industry best practice standard for service management is ITIL. ITIL is a lifecycle approach with strategy at the heart of the framework as illustrated in the model below:

**ITIL V3 © Crown copyright**



ITIL service management offers the opportunity for IT to adopt an organisation's environmental policy in a pragmatic way through a number of life-cycle phases: strategy, design, transition, operation, improvement and retirement. It then falls to IT governance to assess how well the organisations environmental objectives have been reached by reviewing historic performance against SMART targets.

### 2.2 Lowering the Environmental Impact of New and Existing Services

The ITIL framework allows environmental targets to be built into new and existing services through its lifecycle phases of strategy, design, transition, operation and continuous service improvement.

Service portfolio management is a primary activity of the first stage, service strategy. Business outcomes and financial targets are key inputs for service portfolio management in the development of new services.

Environmental targets are ideally suited as inputs for service portfolio management when provisioning new, more sustainable, IT services. This is because managers can assess predicted performance targets against environmental policies before agreeing to commission a new service.

The remainder of the lifecycle takes over once the service is commissioned. The new service and its environmental targets pass through the design, transition and operations phase before eventual retirement. During the operations phase, continual service improvement seeks to make gains on financial and environmental performance and once at the end of its useful life, the service is retired.

The continuous service improvement phase of the ITIL life-cycle provides the opportunity to analyse service trends, review baselines and benchmark results in order to identify improvements in process or performance. Continual service improvement liaises with strategy, design, transition and operations in order to plan improvements that result in desired outcomes for existing services as well.

### 2.3 A Service-Led Approach

It is important to consider the environmental impact of the whole IT service rather than the individual configuration items that form the service. This is because focusing on the environmental impact of an individual component is too simplistic. IT managers must focus on integrated IT services supporting business services in order to deliver sustainable IT.

Mapping IT configuration items to an existing IT service will identify equipment that is vital for the delivery of a business service. By identifying the equipment that forms the IT services supporting the business, managers will identify components that add the most value and items that are more of an overhead.

Configuration items which cannot be mapped to a business service need to be assessed and removed if possible. As a result of a similar exercise to map its configuration items to IT services a global bank removed over £1 million in annual service charges[7] a fact which demonstrates that the benefits are not just environmental.

Configuration items required for services that are sub-24/7 can also be investigated for energy saving opportunities. If office lights are switched off overnight, it is possible that idle technology can be set to hibernate, provided that it is not mission critical.

By taking an end-to-end view of IT/business services rather than focusing on configuration items, IT managers are able to ascertain the full environmental impact of an IT/business service, improve energy efficiency and cut costs.

### 2.4 Controlling Adherence to CSR Policy

While ITIL service management enables the IT manager to develop ways to reduce the environmental impact of IT services and align the IT strategy with the organisation's CSR vision, it is the ITIL processes such as incident, change, configuration, capacity and service level management which control the adherence to these aims. This is achieved by monitoring services against the targets, established through the IT governance link and implemented in the service strategy phase.

Carbon reduction activities and measures must be developed collaboratively rather than proscribed. This is particularly important in customer-supplier relationships in order to avoid unfulfilled expectations or missed opportunities. Implementing control measures and targets through the ITIL service management life-cycle requires people, process and tools.

**People**

Organisational behaviour is managed by policy e.g. travel, procurement, expense and equipment usage policies (including desktop monitors and printing).

To change behaviours, policies must be introduced and/or updated to achieve desired outcomes. An organisation's travel policy can be used to proscribe a desired target for the frequency of travel or justification for travel i.e. to meet a customer or to take part in an internal meeting.

The same applies to services: it is the people involved in each step of the service management life-cycle that must be aware of the environmental policy and targets in order for the measures to be implemented and monitored successfully.

Targets must be aligned to the overall CSR policy for the organisations strategic aims to be realised. People agree, implement, monitor, review and report on performance and are a key enabler.

**Process**
The control of processes is managed by Performance Indicators. Environmental targets can easily be adopted as part of the established processes performance indicators. The simplest approach is to absorb environmental targets into existing performance monitoring and reporting activities or incorporate a scoring mechanism as part of the process, for example:

- Incident Management scoring: provides a measure of the environmental impact of incidents using a scoring mechanism where 1 can be defined as low impact and 5 high impact.
- Change Management scoring: offers the ability to track the number of RFCs submitted where the environmental impact of the change is considered and a score awarded based on pre-agreed criteria.
- Configuration Management scoring: provides data on the number of configuration items in the CMDB with energy efficiency data.

**Tools**
The choice and approach to managing environmentally friendly IT tools occurs through the life-cycle of selection, procurement, support and disposal. The efficient selection of enterprise architecture is often a centralised function which selects products based on features, integration, reliability, maintainability serviceability and security. The inclusion of environmental considerations is an enhancement to this process and would take into account the supply chain production methods, embedded energy (energy used in the manufacturing process) and disposal of the components. The desired outcome being the selection of tools based on criteria that include environmental considerations.

While our fundamental approach advocates a blend of people, processes and tools, this paper focuses on ITIL processes as a low cost method of controlling the environmental impact of IT services.

Making use of existing ITIL processes to control the implementation of sustainable IT activities not only allows an organisation to extract greater value from its investments in good practice, it also provides a reporting mechanism that will assist in monitoring the adoption of CSR targets.

**Example – Incident management**
Incident Management provides the opportunity to assess the environmental impact of IT service recovery. To measure performance, environmental targets need to be incorporated into existing service level agreements where each resolution category has a carbon score. The aim is to establish an incident management environmental impact baseline, so that it can be measured, monitored and then improved.

The incident management categories must be defined using an organisation's existing service management delivery model to identify where its carbon generating activities occur. The following illustrate the broad questions that need to be asked e.g.:

- Does the organisation use outsourced remote support?
- Are site visits required?
- Are there internal support resources based on-site?

Results are then measured by incident resolution classification, where the least carbon generating resolutions are assigned 1 (i.e. industrialised, mutualised off-shore centres resolving application incidents remotely) and those which are high carbon generating are scored 5 (i.e. long distance travel for site visits, replacement equipment containing high levels of environmentally unfriendly materials, equipment manufactured and shipped from overseas).

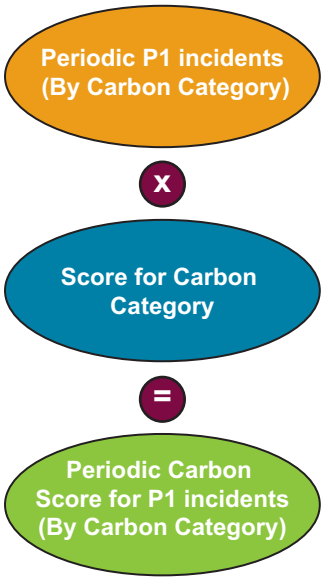
An illustration of an incident management classification table is provided to demonstrate the information likely to be included in a more sustainable service level agreement.

**Illustration of P1 Incident Management Carbon Scoring Measures**

| Incident Category | Incident Carbon Category* | Carbon Score* |
|---|---|---|
| P1 | Category A | 1 |
| | Category B | 2 |
| | Category C | 3 |
| | Category D | 4 |
| | Category E | 5 |

* Examples used are purely for the purposes of illustration and should not be considered normal targets – each organisations metrics will be different and will reflect a unique set of circumstances.

Using this method results in a monthly and annual score that can be used to measure the impact of incidents over time.




The objective is to develop a mechanism that allows an organisation to begin measuring the environmental impact of its incidents over time and then identify the means to decrease this impact through continual service improvement – looking for initiatives and innovations which reduce the number of incidents. Problem management trend analysis can also identify those incidents, or groups of incidents, that have produced the highest carbon scores.

**Example – Change Management**
Change management provides an approach for considering the environmental impact of Requests for Change (RFCs) before they take place. This allows an organisation to test each RFC and either accept or reject it using a rationale that includes environmental impact as well as financial, business and technology.

The scope of activity is not limited to the RFCs passing through the process. There are a number of initiatives which Capgemini advocates to mitigate the environmental impact of change management and comply with organisational CSR activities.

**Examples of these include:**

- Change Validation: each RFC submitted for approval should be assessed on its environmental impact and compliance with the CSR targets. A scoring mechanism allows the change manager to rank the RFC in terms of its adherence with policy as part of the assessment of priority. This allows for an RFC to be understood in terms of its environmental impact (positive/negative).
- Change Advisory Board (CAB) Meetings: to minimise the environmental impact of Change Management, all CAB meeting are carried out virtually to avoid the need for CAB members to travel.
- Change Reporting: change management data feeds into the continual service improvement process to assess the environmental impact of an IT service over time. This data also feeds the service level management reporting function. Over time, the expectation is that changes to IT services reduce the environmental impact of a service in line with CSR targets.
- Change Management Tool: all change management information is held electronically with no requirement for paper-based records.

**Example – Configuration Management**
Asset and configuration management has an important part to play in the environmental compliance of IT because it is responsible for managing information on the components that form the IT services. The attributes of configuration items should include indicators such as energy labels used by 'White Goods' manufacturers or the EU Energy Star® used to label energy efficient office equipment[8].

In future, Capgemini believes CSR policies will state an organisation's intended choice of IT infrastructure using energy label rating 'A' or equivalent Energy Star® rating. Such a declaration will set a measurable environmental target. It then becomes the role of configuration management to report on the compliance of the IT infrastructure with the CSR policy on energy efficiency.

**Example - Capacity Management**
Capacity management is a key element of the service design phase of the ITIL lifecycle and provides an organisation with the ability to plan how it introduces IT capacity in a more sustainable way and to limit idle usage through demand management and service level management. Its purpose is to focus on future business requirements, current service delivery capability and current delivery – in order to provide the most energy and cost efficient IT services for the business.

The capacity manager is responsible for tuning activities, deriving forecasts, influencing demand and producing the capacity management plan. Key activities of the process include trend analysis, planning and modelling. All of these activities are ideal for integrating the environmental needs of the CSR policy and influencing the capacity requirements of the business by encouraging reduced consumption, reuse and recycling of capacity.

**Proactive Capacity Management**
In our experience environmentally friendly IT makes use of the capacity management process to plan the introduction of sustainable IT services as part of the service design stage of the ITIL lifecycle.

To successfully integrate CSR policy and capacity management activities, IT functions must possess strong forecasting capabilities and understand the future capacity needs of the business and the impact of emerging technologies; the ability to effectively forecast capacity will result in better planning and the timely implementation of more energy efficient technology.

**Reactive Capacity Management**
A more reactive approach to capacity management focuses on influencing demand today and requires the assistance of the service level management to negotiate with the end customer.

A strong ITIL relationship exists between capacity management and service level management. This interface allows the capacity management process to influence demand via the service level management process. By making use of this interface, it is possible to include environmental service capacity requirements in the service level management process, especially as part of the negotiations for new and existing service level agreements.

The challenge for capacity management is to ensure service level management is equipped with environmental impact scores in addition to business case data in service cost model to support negotiations with the customers. This allows for the sustainability of an IT service to be considered when negotiating SLAs and when purchasing new equipment.

**Example – Service Level Management**
In negotiations with customers, service level management must deal with the business and the supporting supply chain to agree service level agreements, operating level agreements and underpinning contracts.

The important factor is the existence of joint CSR policy. In situations where services are outsourced to one or a number of partners, the CSR policy needs to be agreed between the parties for it to become truly effective in supporting the creation of more sustainable IT services.

Service level agreements are typically agreed through the service level management process which defines the requirement, agrees the contract, monitors performance, reports and reviews the outcomes. Of particular importance in this process is the activity of negotiation.

Negotiation with customers and business users must be guided by the CSR policy in organisations where the sustainability of IT services is a strategic consideration. By using the CSR policy in this way, the aim is to evolve the process of agreeing service level agreements from one based on 'business impact' and 'price' to one which also considers the environmental impact of an IT service.

For example, supporting IT services typically operate over the entire working week even though they are often only required by the business Monday-Friday during office hours.

While providing service 100% of the time during the week may satisfy the business and be an acceptable cost, it may be unacceptable from an sustainability point of view on the grounds that the service is generally idle during evenings and weekends when the users are away from the office. The key objective of service level management is to identify idle services and challenge the business to reduce its energy consumption.

Office cultures vary and there will always be a proportion of the workforce that continues to work outside office hours. It will fall to the service level management to negotiate with the customer as to whether the environmental impact of this level of service is appropriate given the wider CSR policy.

Where organisations want to actively discourage energy waste and influence demand, the service level management process can apply financial measures to reduce the demand for idle services – using energy surcharges.

Energy surcharges are additional costs applied to idle services, outside normal working hours, and are used to encourage a reduction in energy consumption. Only with senior management support can energy surcharges reasonably be used to deter idle services.

It is recognised that negotiating more environmentally friendly service level agreements is more complex for global organisations where services are fully utilised over a 24 hour period. While some services will offer little opportunity to make savings, it remains the responsibility of service level management and continual service improvement to identify opportunities to make IT services more sustainable.

**Critical Success Factors – Service Management and a Joint CSR Policy**
The existence of the service management function is a key success factor for sustainable IT, especially in a multisourced supply chain environment.

The service management function coordinates the integration of sustainable IT processes across multiple delivery towers. The Service Management function ensures that software, hardware and network capacity, and their associated service levels, are integrated as part of the end-to-end service and comply with the CSR policy.

A second key success factor is the existence of a joint CSR policy between all the stakeholders involved in the delivery of sustainable IT services. The existence of a jointly agreed policy between the parties ensures that negotiations between an organisation and its partners operate within a shared framework, where all parties are expected to work towards reducing the environmental impact of IT.

Through the existence of a green service management function, a joint CSR policy and the control offered by the ITIL processes and activities, organisations can communicate and monitor their adherence to environmental targets.

The ITIL service management model provides a reporting mechanism to capture performance data that can be fed into the CSR balanced scorecard; this equips senior management with a low cost loop-back mechanism upon

which to assess the performance of the overall CSR policy.

The CSR balanced scorecard is the corporate tool for assessing performance and demonstrating an organisation's green credentials to its stakeholders and wider community. If no CSR balanced scorecard exists, it becomes difficult to demonstrate progress.

### 2.5 Reporting into the CSR Balanced Scorecard

Incorporating organisational CSR policy into IT strategy targets is the mechanism for the downward delegation of environmental vision and strategy. The use of the ITIL lifecycle provides the vehicle to achieve this in practise.

It is important to ensure that the results of the vision and strategy are fed back to the senior stakeholders in order to assess progress and ascertain whether outcomes are meeting objectives and IT is becoming more sustainable.

The ITIL lifecycle provides the means to monitor, measure, assess and report on IT strategy sustainability targets. Individual outputs used to measure the performance of each ITIL process need to feed into a CSR balanced scorecard that is derived from the overall organisational balanced scorecard.

The CSR balance scorecard is used to measure the organisation's performance in adopting a greener approach to the delivery of IT and business services and is the means to assess how intended strategy and realised strategy are achieving environmental aims.

## 3 Conclusion

IT managers today need to achieve sustainability IT targets that are directly linked to an organisation's environmental vision and strategy. This is to counter the big challenges facing the IT manager:

- Maintain the competitive business edge
- Reduce energy consumption
- Increase the sustainability of IT services.

Searching for a solution that is reliant on equipment with a smaller build/run carbon footprint is a long-term component-focused plan likely to deliver benefits in the future; but there is an opportunity cost of doing nothing in the mean time.

Capgemini proposes a service-focused approach which utilises the ITIL lifecycle as a means for realistically incorporating CSR policies as targets in the delivery of new and existing IT services. The lifecycle approach incorporates activities to reduce the environmental impact of IT services at each stage of the lifecycle: strategy; design; transition; operation-disposal.

It recommends a service mind-set through which organisations can adopt measures to embed compliance with regulatory requirements such as WEEE and RoHS into the day-to-day IT processes.

The ITIL lifecycle provides all the necessary control mechanisms to ensure the adoption of sustainability targets utilising processes such as Change Management, Incident Management, Configuration Management, Capacity Management and Service Level Management.

Data captured to measure the performance of operations provides a feed for reporting the ongoing adherence to sustainability targets and environmental policy. Capgemini recommends the use of this data as inputs for a balanced scorecard designed to measure the performance of green ITIL.

Enhancing the existing ITIL framework to support the implementation of environmental management activities will not only make good use of existing process today, it will save the time and cost of developing and implementing alternative approaches that rely on environmentally friendly products becoming available and affordable tomorrow.

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All links correct at time of going to press.

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