

HOW GREEN IS YOUR ITIL?

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INTRODUCTION

The phrases Global Warming, Green IT, Sustainability, Corporate Social Responsibility, Environmentally Friendly, Carbon Footprint, CO₂ Emissions, and Climate Change etc. are now a part of our everyday language both in our workplace and at home.

This paper will explore whether ITIL can assist in addressing these issues.

Often the Green issue is seen as a concern of the government, engineers, industrialists, technicians, facilities management and those involved with looking after our infrastructure. But should this also be a concern for those of us in Service Management?

THE PROBLEM

Before we address that question, let's explore what the "problem" is.

According to Gartner, ICT accounts for 2-4% of global CO₂ emissions. This is equivalent to the aviation industry and is unsustainable. (Gartner, 2007).

More than 1 billion people participate online today. Each year the network consumes > 100 billion kWh of electricity. (Windebank, John (Sun Microsystems Inc.), 2008)

Performing two Google searches from a desktop computer can generate about the same amount of CO₂ as boiling a kettle for a cup of tea, according to new research. (Leake & Woods, 2009)

A single server is responsible for about the same amount of CO₂ as a typical car driven for a year. Let's think on that for a moment. A 440 watt server using 3,942 kWh per year generates 5.3 tonnes of CO₂. An average car like a Toyota Camry running at 20,000 km a year generates 4.4 tonnes CO₂ and a commercial airliner travelling from Sydney to Perth (or New York to Las Vegas) 6 times will also generate 4.4 tonnes CO₂. (Windebank, John (Sun Microsystems Inc.), 2008)

So, is this a problem or a concern for us in Service Management?

PREDICTIONS

Gartner identified GREEN IT as one of the 10 most important topics for CIOs in 2008. (Gartner, 2008) They predicted:

By 2010, 75 per cent of organisations will use full life cycle energy and CO₂ footprint as mandatory PC hardware buying criteria.

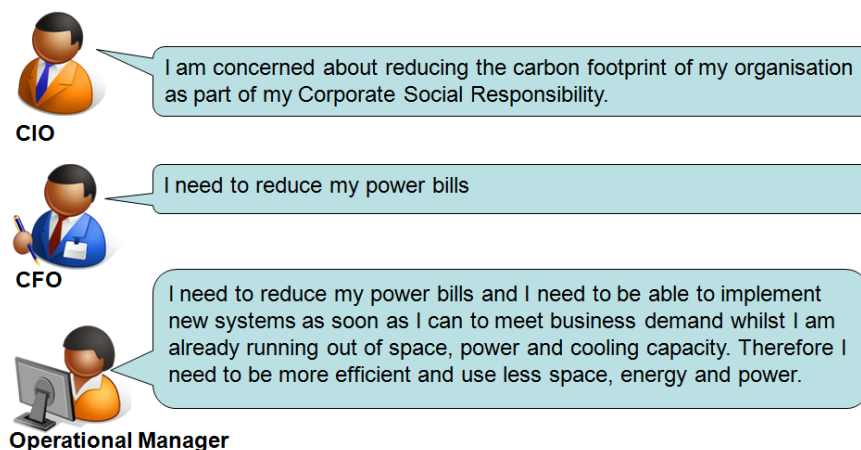
By 2011, suppliers to large global enterprises will need to prove their green credentials via an audited process to retain preferred supplier status".

By 2014, most IT business cases will include carbon remediation costs.

It may not be that long before governments legislate in regards to permitted CO₂ emissions from the ICT industry (if they have not already done so in some countries). Today, most technology providers will have little or no knowledge of the full energy lifecycle and CO₂ footprint of their products. Therefore they will not be ready for any sort of audit against their Corporate Social Responsibility (CSR) policy or legislative requirements. So, now is the time to begin.

According to Steve Hamm in BusinessWeek March 2008, the technology industry is facing an energy crisis. "The cost of power consumption by data centers doubled between 2000 and 2006, to \$4.5 billion (USD), and could double again by 2011, according to the U.S. government. With energy prices spiking, the challenge of powering and cooling these SUVs of the tech world has become a major issue for corporations and utilities". (Hamm, 2008).

The current problem and the industry predictions, would suggest that this is certainly a concern for Service Management. It's not just about saving the planet and the environmental issues, albeit they are extremely important. The nature of the concern also depends on who you are within the organisation.



The CIO is concerned with reducing the carbon footprint as part of the CSR. The CFO wants to reduce costs and the Operational Manager needs to respond to business demand for new and enhanced systems whilst already constrained by space, power and cooling capacity.

So it does concern Service Management, as Service Management is concerned with all of the above. If that is the case, then does ITIL as "best practice" guidance for Service Management assist in addressing the challenges?

IS ITIL GREEN?

The industry is split. Some say it isn't and some say it is. In an article posted on the British Computer Society website in March 2009 called "Green ITIL", it stated:

"Whilst providing the tools and processes required to determine IT's true corporate value, Version 3 failed to address arguably this decade's greatest corporate challenge, regardless of industry - the environment, and therefore represents a missed opportunity".

"As a growing number of organisations are now recognising carbon equals cost; reducing landfill, increasing recycling and reuse and driving down power consumption provide clear opportunities for financial gain".

"It is, therefore, unfortunate, that the latest version of ITIL, Version 3, fails to address the environmental impact on IT service delivery". (British Computer Society, 2009)

On the other hand, Capgemini – a global consulting organisations states:

“Capgemini believes ITIL service management offers an adaptable method for making use of existing processes to deliver sustainable IT today”.

“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”. (Capgemini, 2008)

In an article entitled “The New Colour of ITIL: Green”, Kalm and Waschke said:

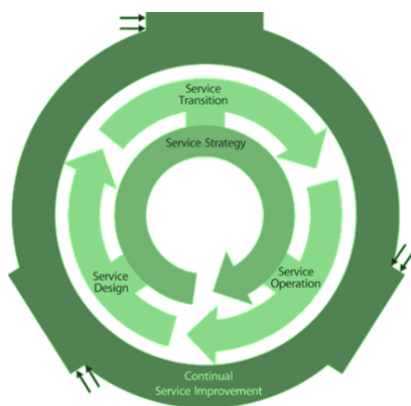
“IT organizations can tackle their energy consumption challenges as part of their existing ITIL implementations rather than as some additional management burden”. (Kalm & Waschke, 2009)

The author supports the latter thoughts on whether ITIL is Green. Although ITIL may not explicitly talk about the environment and associated issues, it is **implicit** in it’s guidance that by adopting best practice Service Management, these issues can be addressed.

This paper will demonstrate how ITIL guidance can help.

HOW GREEN IS ITIL?

So, if ITIL is Green, then how Green is it?



We need look no further than the Service Lifecycle. At every stage of the lifecycle there is implicit guidance that can assist.

The ITIL framework allows environmental targets to be built into new and existing services through the lifecycle stages of strategy, design, transition, operations and continual service improvement.

SERVICE STRATEGY

As a part of strategy generation you need to understand the market place in which you are operating and therefore have a clear statement on your approach to sustainability within that market space.

Incorporating the organisations CSR policy into IT strategy targets is the way in which that environmental vision and strategy can be cascaded down through the organisation and actions delegated. 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 determine whether we are meeting the objectives and whether IT is becoming more sustainable.

The ITIL lifecycle provides the means to monitor, measure, assess and report on IT strategy sustainability targets.

A CSR balanced scorecard should be derived from the organisational balanced scorecard. The outputs used to measure the performance of each ITIL process should be fed into that CSR balanced scorecard. The CSR balanced scorecard is used to measure the organisation’s performance in adopting a greener approach to the delivery of IT and business services. It is the means to assess how intended strategy and realised strategy are achieving environmental aims.

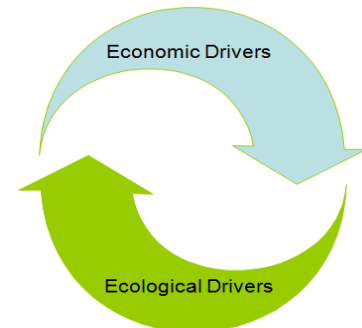
SERVICE PORTFOLIO MANAGEMENT is a primary activity in Service Strategy. Business outcomes and financial targets are key inputs for service portfolio management in the development of new services.

Environmental targets should also be inputs for service portfolio management when provisioning new, more sustainable IT services. Managers can then predict performance targets against environmental policies before agreeing to commission a new service.

FINANCIAL MANAGEMENT needs to understand what an economic way to be ecological is.

Economic drivers can be achieved by Ecological drivers and vice versa. They go hand in hand.

Organisations can educate business customers about energy-efficient settings for servers and PCs (sleep mode etc.) and offer rebates on energy-efficient servers, so the ecological drivers become economic ones and vice versa



Through **DEMAND MANAGEMENT**, we should negotiate with power suppliers to get discount on power at off-peak hours. This will then allow this to feed into charge-back structures to assist influencing customers to move their workload to time that make both economic sense but also reduce the demand on increased capacity.

SERVICE DESIGN

New services AND their environmental targets pass through the rest of the lifecycle following Service Strategy.

We know that **SERVICE LEVEL MANAGEMENT** whilst negotiating with the customer must deal with both the business and the supporting supply chain to agree service level agreements (SLA), operating level agreements (OLA) and underpinning contracts.

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

If the sustainability of IT services is a strategic consideration – and it should be - negotiation with customers and business users must be guided by the CSR policy in organisations

By using the CSR policy in this way, the aim is to evolve the process of agreeing SLAs 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 a 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.

A key objective of service level management is to identify idle services and challenge the business to reduce its energy consumption.

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.

It is recognised that negotiating more environmentally friendly SLAs 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.

Within **SERVICE CATALOGUE MANAGEMENT**, power output and consumption should be a part of the Service Catalogue.

Power metering should be integrated into the catalogue so that it can be reported on at both an asset level, service level and business unit level. This can show the power hungry business units which are utilising services that may have been poorly designed and contributing to the carbon footprint of the organisation.

This should be looked at in relation to the CSR of that business unit. This also comes down to organisation Service Strategy and policy.

From an **AVAILABILITY MANAGEMENT** perspective, resources need to be available when they are needed. This doesn't mean however that the resources required for peak periods need to be there all the time.

Availability Management can look at functionality such as Capacity Upgrade on Demand (CUoD), on/off capacity on demand and backup capacity. These tools bring processors and memory online only as needed to ensure that the organisation isn't paying for capacity they don't need – and that they are not using power they don't need to keep that capacity running.

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. Its purpose is to focus on future business requirements, current service delivery capability and future capability – 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 which includes environmental considerations.

Key activities of the process include trend analysis, planning and modelling. All of these activities are ideal for integrating the environmental requirements of the CSR policy and influencing the capacity requirements of the business by encouraging reduced consumption, reuse and recycling of capacity.

Both proactive and reactive Capacity Management activities can address environmental issues.

Proactive Capacity Management: GREEN IT makes use of the capacity management process to plan the introduction of sustainable IT services. To 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, Demand 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. It can limit idle usage.

On average, data centre servers operate at 15% capacity. You wouldn't run a restaurant and only use 15% of your tables or run a hotel and only occupy 15% of the rooms. It doesn't make economic sense besides ecological sense! It is not sustainable. It is poor Capacity Management.

IT equipment alone does not account for all the power a data centre uses. On average the IT equipment only accounts for 30% of the power consumed. The other 70% goes to cooling, power infrastructure, lighting etc. So when power is being planned for, the overall needs of the system in which the IT equipment resides must be taken into account as well.

There is another important reason to manage Capacity as well. In general, as the levels of utilisation of electrical systems goes down, so do their efficiencies. Thus, a UPS running at 50% utilisation will be less efficient than a UPS running at 90% of stated capacity. This is also true for power supplies, cooling and other systems. The old approach of "over sizing" various systems to "play it safe" can result in higher energy costs and need to be replaced with a more deliberate management approach.

Organisations need to review and formalise their Capacity Management process. At a policy level there needs to be guidelines and standards in place in regards to the organisation direction for green IT, and expectations around energy consumption and then the process is designed and implemented accordingly.

SUPPLIER MANAGEMENT - A critical section of the green IT action plan will be changing procurement criteria and processes to favor green products and greener suppliers. This activity starts with a clear documentation of current procurement practices.

SERVICE TRANSITION

Service Transition utilises **SERVICE ASSET AND CONFIGURATION MANAGEMENT (SACM)** to get an understanding of the assets used by a service so they can be managed. A full understanding of any redundant assets can be identified and removed not only getting financial savings from licence fees etc., but also liberating spare capacity.

A first step towards this is to do a complete inventory of servers, software and applications, including the interdependencies between them all via SACM. You need to firstly understand how each physical and virtual server is used, what software is running on it, which business applications it supports and what its actual value is to the business. Then you can work out what to remove, refresh or virtualise unused, unnecessary and inefficient assets. This will help reduce energy requirements and power use, and set you well on the road to becoming GREEN. It will also have financial savings from licence fees and liberate spare capacity.

5%-20% of servers in a data centre are orphaned / comatosed. They are burning power but have become disconnected to any service that is being consumed. No-one has checked when an application is decommissioned, whether anything else was running on that server and whether the server could be retired too. It is most likely that these servers are the older ones and therefore using both more power and more space. The key again is Configuration Management to understand what applications are running on which servers and knowing when they can be switched off.

SACM 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.

Capgemini suggests: The attributes of configuration items should include indicators such as energy labels used by 'White Goods' manufacturers used to label energy efficient IT equipment. In future, Capgemini believes CSR



policies will state an organisation's intended choice of IT infrastructure using energy label rating. This 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. (Capgemini, 2008)

The USA Environmental Protection Agency (EPA) has come out with a scheme to rate servers with its Energy Star energy efficiency logo. Computer servers earning the logo will be on average 30% more efficient than standard servers. A single server may use as much electricity as six domestic fridges. The EPA estimates that if all servers sold in the USA over the coming year met its new specifications, then energy cost savings would total \$800 million and reductions in greenhouse gas emissions would be equivalent to those from over one million cars. This classification scheme will be extended next to storage systems. (White, 2009)

A measure for SACM could include the number of configuration items in the Configuration Management Database (CMDB) with energy efficiency data recorded as an attribute.

Following on from Capacity Management there needs to be process integration with Project Management and Change Management.

We need to understand what current capacity is and the potential impact that new or changed services are going to have at both initial implementation and over time.

CHANGE MANAGEMENT needs to ensure that the environmental impacts of Requests For Change (RFC) are considered. RFCs should be accepted or rejected using a rationale that includes the environmental impact of that change as well as the financial, business and technology impacts that we generally look at today.

There are a number of activities to mitigate the environmental impact of change via the Change Management process and ensure that there is compliance with the CSR.

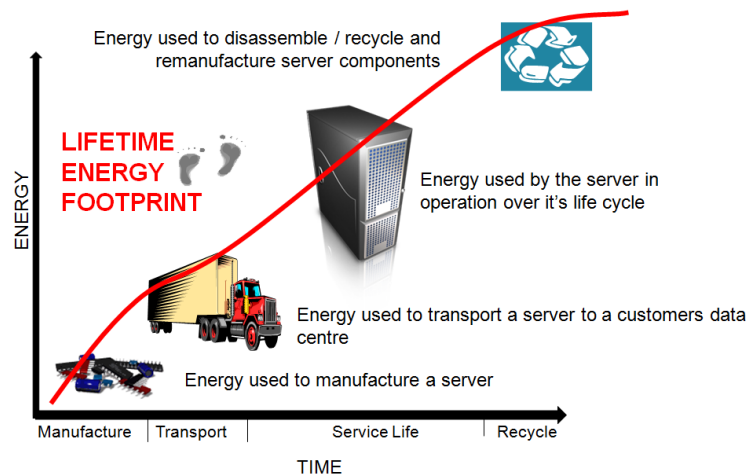
Change Validation: each RFC submitted for approval should be assessed on its environmental impact and compliance with the CSR targets. Some type of scoring mechanism would allow the change manager to rank the RFC in terms of its adherence with policy as part of the assessment of priority. This allows 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 Measures: ability to track the number of RFCs submitted where the environmental impact of the change was considered and RFC accepted or rejected in line with CSR.

In conjunction with SACM, Change Management needs to consider the lifetime energy footprint of a server. So let's look at that for a moment.



The energy footprint is not just in the service life of the server. Energy is consumed in:

- Manufacturing the server (Embodied Energy)
- Transporting the server to the customer data centre (Embodied Energy)
- Server in operation over it’s lifecycle (Operational Energy)
- Energy used to disassemble, recycle and remanufacture server components.

All of this adds up to a lifetime energy footprint for the server. Therefore, ALL of these activities need to be considered when looking at the energy footprint of IT equipment.

SERVICE OPERATION

Service Operation includes **INCIDENT, PROBLEM AND KNOWLEDGE MANAGEMENT**.

Despite remote working solutions, how many IT support staff still get called in to work, out of hours, to fix things that have failed? How do they get to their location of work in those circumstances?

In most instances it would be by car which equals CO₂ emissions. If we get Incident and Problem Management and Knowledge Management right, that wouldn’t need to be the case. Reducing the number of recurring Incidents and providing workarounds that can be acted upon at first point of call, removes the need for support staff to attend to fix issues.

When thinking about the environmental impacts of Incident Management ask questions such as:

- Does the organisation used outsourced support?
- Where is it located?
- Are site visits required?
- Are there internal support resources based on site?
- If not, how far do they have to travel to attend on site?

CONTINUAL SERVICE IMPROVEMENT

Continual Service Improvement (CSI) seeks to make gains on financial and environmental performance.

The value of CSI should go without saying. It has already been mentioned that it feeds back into every other stage of the lifecycle identifying better ways to become more sustainable.

It provides an opportunity to analyse service trends, review baselines and benchmark results in order to identify improvements in process or performance. CSI liaises with strategy, design, transition and operations in order to plan improvements that results in desired outcomes for existing services as well as new services.

PEOPLE AND TOOLS

PEOPLE

There are other process within ITIL that could be looked at to assist with sustainability and reduction in energy usage but this paper has covered some of the key ones. The other things that haven't been discussed so far which warrant a mention are **PEOPLE and TOOLS**.

People utilise energy to travel to and from work so consider remote working options (where appropriate) to reduce the energy consumption and CO₂ emissions.

Set targets that drive behaviours – travel policies, printing (on both sides), desktop monitors (sleep mode), turning PCs off at night and so on.

Research indicates that if the worlds 1 million PCs were powered down for just one night it would save enough energy to light up the Empire State Building inside and out for more than 30 years. (ClimateSavers, 2009)

People involved in each stage of the lifecycle must be aware of the environmental policies and targets in order for the measure to be implemented and monitored successfully.

Organisations need to be explicit about what's expected. Green criteria can be built into existing performance management systems, balanced scorecards, and the like that teams are already using to measure, incent, and reward performance.

Consider revising the employee competency or maturity model to include sustainability competencies and skills, so people can see how they rate and what they need to do to move to the next level.

In regards to training, consider your training options. Utilise Computer Based Training (CBT) rather than people travelling to other locations for training where appropriate. Consider "train the trainer" approach.

Assess the demand for a particular type of training across the organisation rather than responding to iterative requests for the same training from an external service provider which results in everyone travelling to the provider's site on different dates. Consolidate and run the training in house. Not only will you get it cheaper but also save on carbon emissions from travel.

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 – which we talked about earlier - (energy used in the manufacturing process) and disposal of the components.

The desired outcome is the selection of tools based on criteria that include environmental considerations.

VIRTUALISATION & CARBON OFFSET

This paper would not be complete without some mention of virtualisation and carbon offset.

VIRTUALISATION

Virtualisation can help reduce network appliances and increase utilisation of storage and servers, essentially having a major impact on all equipment. Virtualisation works at the server level by allowing multiple applications and operating systems to share servers that were previously only used for single applications, freeing up unused server capacity so that it is available for use with as many applications as needed. This can increase server efficiency from around 15% to 70%.

However, John Windebank of Sun Microsystems states that this will not reduce the number of physical servers as the increase in available capacity will be eaten up by the need to do more. (Windebank, John (Sun Microsystems Inc.), 2008)

It's like adding an extra lane on a freeway. Does it ease traffic congestion or make traffic go faster? No, it just gets used up. So although good it is not the silver bullet.

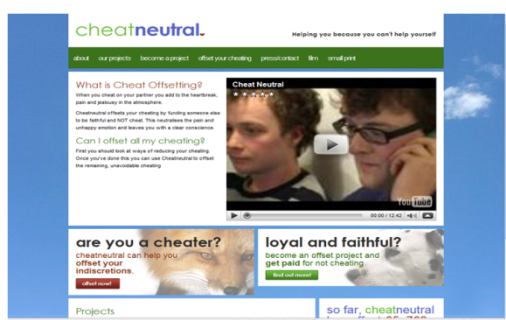
What virtualisation will do is increase the complexity for Configuration Management by 10 times. Also virtualisation will not only impact Operations but the entire Service Lifecycle from Strategy to CSI having addition impact.

CARBON OFFSET

Carbon offsetting certainly has a key part to play in all this but on it's own it doesn't solve the problem.

Carbon offsetting should be about offsetting the carbon emissions that an organisation absolutely cannot avoid. Carbon offsetting should not be about paying for the right to carry on emitting carbon. If the latter is the reason for carbon offsetting, all it does is delay the actions that we need to take. This doesn't motivate the organisation to take action by giving someone else the problem! The problem is not going to be solved if organisations and individuals say "I have made an impact/footprint but that's ok, I can pay someone else to fix it up".

This point is made by the creators of the website www.cheatneutral.com. Cheatneutral is a joke thought up in a pub but intends to make the point that carbon offsetting is fundamentally the wrong way to go about tackling climate change. The creators of the website talk about "Cheat Offsetting". Cheatneutral tries to make it seem acceptable to cheat on your partner the analogy being that carbon offsetting tries to make it acceptable to carry on emitting excess carbon.



The creators of the website say that when you cheat on your partner you add to the heartbreak, pain and jealousy in the atmosphere. Cheatneutral will offset your cheating by funding someone else to be faithful and not cheat. This neutralises the pain and unhappy emotion and leaves you with a clear conscience.

“Having Cheatneutral's services available could actually encourage you to cheat more. If the carbon offsetters persuade you that it's possible to offset your emissions, you'll carry on emitting excess carbon through your lifestyle rather than think about reducing your emissions. Cheatneutral is fundamentally the wrong way to go about solving problems with your relationships. Carbon offsetting is fundamentally the wrong way to go about tackling climate change”. (www.cheatneutral.com, 2009)

The website goes suggests what we should do instead including measuring our carbon footprint, think about reducing that footprint and taking action, learn about Contraction and Convergence (C&C) - a framework for agreeing a global cap on carbon emissions and provides many sources of additional information.

CONCLUSION

ITIL does address the environmental challenges facing us today and tomorrow. Although ITIL does not include a publication that explicitly discusses these challenges, it is implicit in it's guidance.

The framework allows organisations to build environmental targets to be put in place for new and existing services throughout the lifecycle stages.

What we need to do is:

- Embed GREEN in the Strategy, Design, Transition, Operations and CSI stages of the lifecycle.
- Embed GREEN into the organisational culture – make it everyone's business.
- Measure, monitor and improve on your contribution to energy consumption and CO₂ emissions. Turn on power metering.
- Include environmental considerations in everything you do, not just financial and business impact.
- Be ready for virtualisation but recognise that it is not the silver bullet.
- Identify the quick wins – like turning off PCs at night, turn off redundant and spare data centre capacity.
- Remember that economic and ecological gains i.e. financial, go hand in hand. They are one.
- Accept responsibility for climate change.

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