

5.5 APPLYING GREEN IT STRATEGIES AND APPLICATIONS TO THE TELECOM SECTOR

TellUs is a hypothetical, large telecom company operating in the African region. This responsible for the core telecom infrastructure in the region, in addition to offering some land-based and **mobile services. Main focus of TellUs's business** has been the creation of the telecom platform that provides the backbone for communications infrastructure in that geographical region. The customers range from corporate people to **households. Although owned by the government, TellUs's board** is able to control its own directions and also has its own responsibility. The corporate board of TellUs comprises its business leadership(CxO level), representatives from the trade unions belonging to the large workforce and government representatives.

The core business of TellUs (i.e., creation of high-end communications infrastructure) involves technology innovation and adaptations that result in large-scale construction and implementation of physical and wireless communications networks. TellUs is owned by the government under financial as well as legal agreements. However, with the operational independence of the organization, and the receipt of a government directive on climate change, TellUs is now considering extending, embellishing, and putting into practice its environmental plans. Increasing awareness of the environment in the region implies that these corporate customers, including contents and service providers, have started demanding carbon reduction particularly in the networks that are used by them to provide their own contents and services.

An important aspect of this formal approach to the green telcom initiatives is to ensure it is not carried out by reducing business volume and service. The green enterprise transition **directive from TellUs’s CEO includes the need to synergize** between the carbon and cost efficiencies. This synergy between environmental and business benefits is expected to be achieved by optimizing the business processes of TellUs with the help of information technologies and systems.

An important motivating **factor in TellUs’s board decision** to control and reduce its carbon footprint is that it is a government owned organization that needs to showcase the **government’s** carbon reduction commitment. TellUs has the opportunity to impact many comparatively smaller organizations that have to use its platform and infrastructure services.

Such an impact opens up possibilities of reduced work travel across the metropolitan **cities where TellUs’s platform is** heavily used and, eventually, large-scale attitude, and behavioral change.

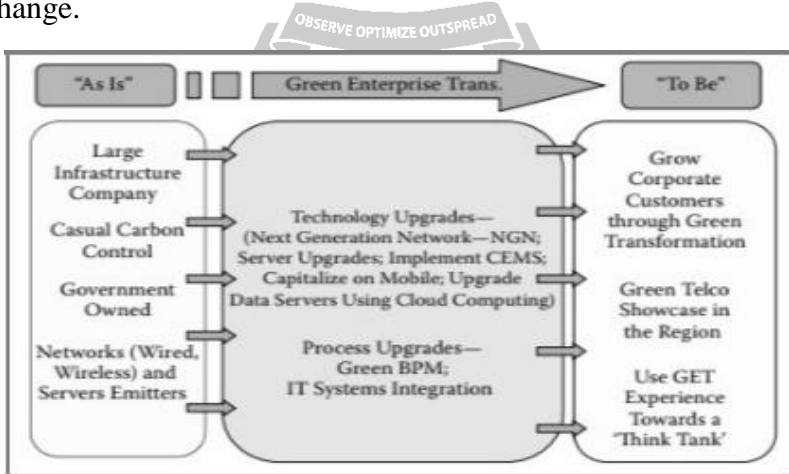


Fig 5. 6: GET forTellUs

The highlights of business and technology advantages of the GET approach of TellUs:

Growth in business with corporate customers, due to carbon reduction and corresponding boost in the image of TellUs.

Upgrades of hardware, software, and networks, but now closely aligned with environmental performance.

Ability to comply with policies, legislative, and regulatory frameworks that are put together by the government as **well as telecom's summit bodies and industrial consortiums.**

Ability to handle carbon taxes, particularly as a government organization. These carbon taxes are envisaged to be applicable directly to large, infrastructure organizations such as TellUs.

Preplanning on how to deal with corporate customers in terms of financial models that will enable sharing of carbon taxes between them and TellUs.

Ability to ensure there are no carbon penalties and fines.

Capitalizing on incentives. Properly and accurately measured carbon emissions and their subsequent reduction may also create opportunities for government incentives in terms of financial rewards as well as support for growth.

Make good use of mobile technologies and services which, while requiring additional power to operate, also create opportunities to significantly reduce carbon.

Ability to enhance network efficiency and effectiveness of the communications equipment.

Create and promote policies to help the corporate customers with their own Green IT strategies, such as recycling of handsets.

Ability to dynamically create and manage policies through sophisticated CEMS.

5.5.1 Strategic Approach to Green ICT

The infrastructure of TellUs have substantially large numbers of data servers, communication switches, and related networking equipment, large physical buildings across multiple regions. TellUs has service-oriented interfaces with the IT systems of the energy vendors. The setup is different from hospital or manufacturer of packaging industry. The end-user is not directly visible. The major carbon emissions come from the power consumed by the overall infrastructure including communications network and data servers rather than individual user devices. Device level power management systems as well as training the users can bring about reduction in carbon emissions. Power-smart add-ons to manage the operating systems of these devices will also enable improved measurement and control of carbon through these large number of end-user devices.

The carbon produced by the organization is primarily through its infrastructure platform and related services. These are large-scale communications services across the region consumed by corporate customers and content providers. The strategies for carbon measurement, reporting and control need to

focus directly on these large-scale infrastructures like communications towers, telecom switches, wired and wireless relaying equipment, associated routers, data servers and the many IT supporting hardware. Specialized software will also be equipped with these infrastructures. These systems enable the business to operate but, at the same time, generate carbon that contributes to the overall carbon footprint of the organization. Siloed data in these applications, which requires continuous interaction amongst these data bases, is a source of major, wasteful carbon.

With an infrastructure organization like TellUs, the strategies for Green IT are brought forward in time as compared with the generic suggested timelines. Thus, the strategies that are created, in a generic Green IT approach for 3 years, are hurried forward and brought to bear results within an year. The long-term 5-year strategies are brought closer in time to around 3 years.

From a technology viewpoint, the focus should be on the data centre and IT systems right at the outset. The longer-term strategy of Green IT for the organization, in a 3-year period, will be re-architecture and design of the communications infrastructure. While this communications infrastructure is of immense value in the GET for TellUs, the actual transformation of the network is likely to take 3–5 years. This network redesign will closely involve both business and technology expertise as it will require an investment that goes beyond that only for a GreenIT project. The GET of an infrastructure company such as TellUs will include substantial influence on all its customers and partners. Changes will include implementation of TCCO metrics even to servers and New Generation Network (NGN) across its

operating life. Green collaborative architecture of its systems through a web services based portal with underlying data warehouse. These long-term Green IT strategies also incorporate dedicated use of renewable energy sources.

5.5.2 SWOT Analysis of TellUs

Strengths

Government owned and supported organization that is aware of the upcoming legislations in the carbon context.

Excellent channel relations including corporate partners and government representatives.

Influential, monopolistic organization with no competition in infrastructure.

Ample opportunity for steady revenue that frees the organization to focus on its Green IT effort.

Weaknesses

Inflexible infrastructure as is expected in a large telecom in a developing region

Large IT systems that are based on past, legacy databases and applications.

Bureaucratic decision-making process, that is invariably a part of a government owned body; but such decision making creates challenges in terms of timings and follow up actions as the organization transitions.

Physically dispersed infrastructure, with buildings, communications towers, and supporting data servers, all

physically spread across the geographical region, making coordination extremely challenging.

Opportunities

Combining business with green transformation will lead to show casing of the Green IT strategy created by the CGO that does not discount one goal over the other.

Business shift to mobile platform resulting in reducing needs for physical wired connectivity and corresponding reduction in the required infrastructure.

Growing content and service providers who will need the increasing sophistication of theNGN platform.

Threats

Resistance to change.

Long time for visible results of the GET

Total inexperience in GET in the region as this would be the first large project of its kind that will bring together the knowledge and expertise of Green It with that of telecommunications. External, overseas consulting help will be required to ameliorate this risk.

5.5.3 Motivators and Dimensions

Developing and influencing a responsible business ecosystem, together with reduction in cost of operations is emerging as a major motivator for TellUs to undertake GET. Other motivators includes government legislation and social pressure. This telecom company by upgrading its technological platforms, will not only grow its corporate customer base but

also influence all its partners in its business ecosystem to be carbon compliant.

The technical nature of the challenge, particularly the communications networks, also indicates that the Green enterprise transformation will be best achieved by immediate focus on technologies. These technologies include the IT systems and hardware, as well as the communications networks.

The company's corporate board has sanctioned the formation of the GET board. The current CTO (chief technology officer) has been appointed as the CGO for the transformation. Knowledge of the inner working is very crucial for technological upgrades. The CGO, together with select members of the Greenenterprise transformation board, has extracted the existing, information Green IT strategy and has created a full programme to undertake transformation.

The diagnose, plan, enact, and review are the four phases also established in business transformation. These transformation phases are interspersed with metrics that help in stating the goals (KPIs) as also measuring whether the stated goals have been achieved or not.

5.5.4 Diagnosing of the TellUs

The current carbon footprint and its carbon readiness is being conducted by the Green Enterprise Transformation Board.

This activity is authorized by the corporate board after in-depth discussions with the trade unions representing the large workforce of the organization.

This diagnosis phase examined the data centre, the communications networks, the equipment lifecycle processes and the supporting H R function.

TellUs's as-is business processes were not modeled or optimized. Due to lack of formality associated with modeling and documentation of business processes there was substantial wastage and resultant carbon emissions.

The current investigations are into the assets such as networks infrastructure, information systems, and data bases also indicated a close nexus between the unoptimized business processes and these technology hardware and software.

Formal diagnosis phases also revealed that the transformation of the telecommunication networks and information systems to achieve green maturity has to be closely aligned to business model to ensure that it is not achieved at the cost of business growth.

Green IT strategy for TellUs includes transformation of communications networks, IT hardware, I T systems, and business processes.

The organizational culture has to also undergo change, which will be brought about through training and education.

TellUs will undertake transformation in Strategy, Infrastructure and Product (SIP) processes as the seare the most technology-intense processes.

These changes in these processes will also change other processes and affect the internal staff as well as people from the corporate customer groups.

Starting with the strategic aspect of the lifecycle, the GET will then undertake changes and alignment to infrastructure lifecycle management and eventually product lifecycle management processes.

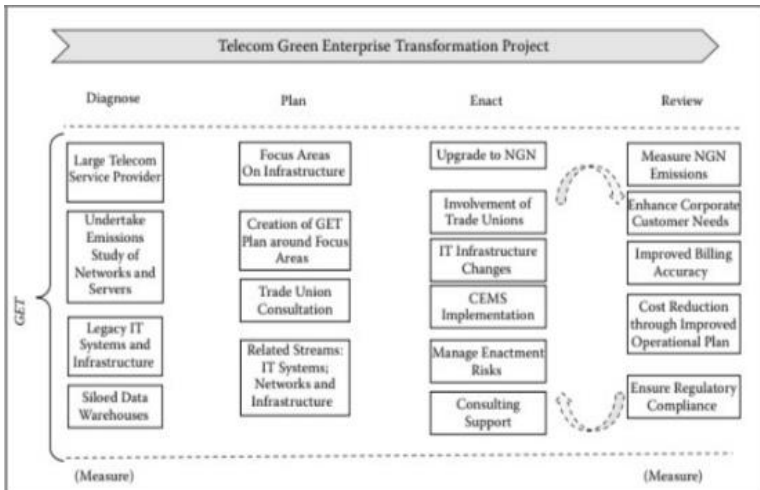


Fig 5.7 GET for TellUs

Green IT metrics and measurements apply to all of these enhance telecommunication operations map (eTOM) based processes.

The transformation of IT systems and resources provides opportunities to measure the KPIs of the TellUs processes supported by the IT systems.

Optimization of the process also ensures cost- and time-effective delivery of services.

Training and education will lead to carbon consciousness throughout the organization.

This implies clear understanding among the staff.

Changes to the IT systems and applications include review of the database, setting up of integration interfaces through SOA and accurate reporting in terms of both carbon and non carbon data.

5.5.5 Planning for GET

eTOM provides an excellent and comprehensive reference model for the telecom sector.

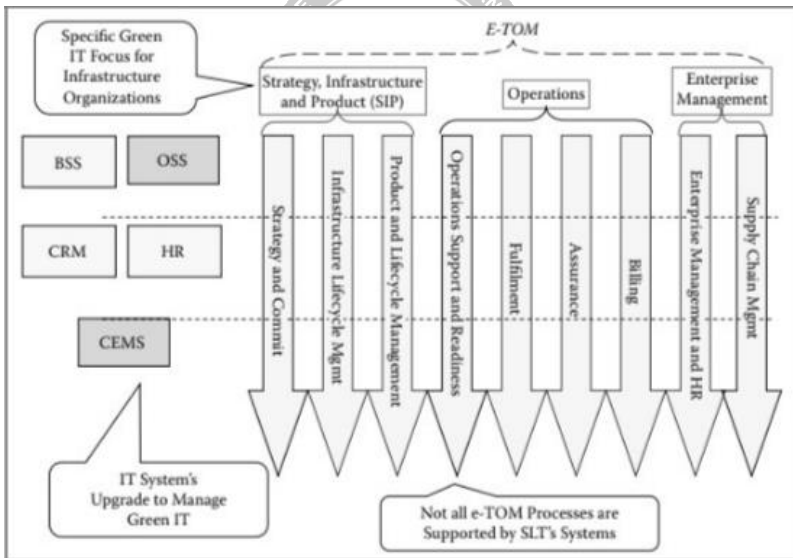


Fig 5.8: eTOM model for TellUs GET

The strategy and commit, infrastructure lifecycle management, and product lifecycle management are the major areas of focus.

The processes that support and align with these major areas are the marketing and offer management, service development and management, resourced envelopment and management, and supply chain development and management.

These processes derived directly from eTOM are supported by the various IT systems and applications of TellUs.

The proximity of technology-based changes with the process dimension.

In large, infrastructure-based GET, such as in TellUs, all four dimensions are involved.

Thus though one dimension, such as the technology dimension, takes lead, other dimensions immediately follow and support the transformation.

The modernization effort is aimed to not only reduce carbon but also optimize processes for its corporate customers, including content providers.

Planning for green process reengineering will involve **grouping the processes based on the —operations group**. The process groups formed during planning phase will continue during enactment and review.

5.5.6 Enterprise Data Centre Transformation Plan

TellUs has two large data centres in two major cities in the region.

Both data centres operate on a 24×7 basis as it needs to support the corporate customers, service and content providers, as well as internal HR.

Together, there are 12 high-end servers, with four additional servers as backup servers for emergency.

The data centre does not currently have a space allocation strategy and the data and application requirements are growing at the rate of 1Gig per day.

The data centre director has made some attempt to measure PUE (power usage effectiveness) and the results are a PUE of 2.4.

There are a few local servers within the organization.

Implementation of CEMS will include incorporation of the aforementioned KPIs that bring together carbon and **measurement of IT system's performance.**

The reduction in data usage, duplication, and storage will also reflect corresponding carbon reduction.

Processes associated with content and service providers will enable them to use the upgraded communication platform in new and innovative ways.

The Green IT strategies of TellUs will align the transformation to the NGN with the business strategies of the content and service providers.

Increase in contents and demand for greater network coverage—especially on the 3G networks implies need for high-capacity networks. NGN, providing some

capacity, needs to be balanced with the carbon footprint of NGN.

TellUs's cost consideration in GET project includes costs of network upgrades, costs associated with formation of the project, and cost of procuring and implementing CEMS.

Data servers in the current setup at TellUs have been left running irrespective of usage.

Manual control is also used to reduce their emissions when they were not in use.

Post-GET server management will have to be automated through power management software.

TellUs is in a position to influence handset manufacturers as well, as a part of its influence on its business ecosystem, to put together plans for take back of mobile devices.

Mobile devices need to be recycled, ensuring regulatory policies that make the manufacturers responsible for taking back devices that would be e-waste.

5.5.7 Enacting GET for TellUs

The suggested timeline that considers two major iterations for enactment and review.

The first enactments and review focus on initial changes to the network.

Changes to the enterprise architecture based on TOM and the procurement and implementation of eco

Governance as the CEMS is also happening during this enactment.

IT systems and applications need to be mapped to the reengineered business processes—occurring in the second part of enactment.

Changes to the IT applications will impact the collaborative business processes of partners such as the content and service providers.

5.5.8 Data Centre Changes in GET

The actions in data centres are based on the planning for GET discussed in earlier section:

Implement integrated blade servers that will consume less power.

All new servers that are procured will be low carbon emitting blade servers that will have inbuilt virtualization capacity.

TellUs will actively seek renewable energy sources such as solar and gas, which can be combined with the current coal-based power generation.

Integration of connectivity among the servers within and across the cities, outsourcing of some of the hardware maintenance aspects of the data centre to ensure highly optimized services.

Implement natural cooling for data centre.

Optimization of signals creating opportunities to reduce demands on the servers, which in turn would reduce

power consumption for the servers and corresponding air conditioning

Implement eco-friendly air conditioning for the servers.

5.5.9 Next-Generation Networks in GET

Complete the implementation of NGN within TellUs's

entire communications network. This implementation is expected to take between 3 and 4 years to complete in the region where TellUs operates. This change to NGN will result in strategic reduction in carbon due to improved network efficient, intelligent routing methods, and consolidation of switching centres. This reduction in power consumption is envisaged to be effective even if there is increase in network traffic as expected over the coming years. The Green IT metrics used in the return on investment (ROI) calculations needs to consider not only the replacement costs of the network and equipment, but also the drop in emissions per user over increased number of users.

5.5.10 Equipment Lifecycle

The entire lifecycle of TellUs is subjected to Green POD. The activities relating to material and equipment lifecycle that will undergo change include carbon reduction consideration in current POD practices within the organization. The new servers will be procured based on their power consumption ratings as well as their total carbon cost of ownership. The disposal of IT hardware is through a series of ranked options including giving it to employees, then charity, and finally for safe disposal.

The business infrastructure of TellUs, such as its buildings and car fleet will be accounted for in the updated financial systems where Scope 1 emissions can be calculated and updated. Enacting changes to the procurement-operation-disposal process will be based on following considerations:

All procurement to be based on EPEAT/energy star based ratings

Highly optimized processes that would support procurement of IT hardware as well as communications equipment

Incorporation of carbon calculations and Green credentials to support procurement of the NGN.

Renegotiation of SLA with hardware and network equipment suppliers

Optimized operation of network, servers, and associated IT hardware

Apportioning operational carbon over the life of the equipment to arrive at TCCO

Ethical disposal of existing legacy network hardware

5.5.11 Attitude and Training

The following measures are essential to provide necessary training to the employees and bring a change in the attitude of the employees:

Creation and delivery of brief 2 -hour seminars on the relevance of Green ICT.

Detailed training to IT managers, network managers and data centre managers

External training to Green enterprise transformation board on the transformation process.

5.5.12 Review and Measure

There are two specific reviews after each iteration of enactment.

A significant learning that has happened is the need to understand the politics and underlying motivation of individuals participating in the transformation project.

The age-old management understanding of the risks associated with change hold utterly true in this transformation.

Quality assurance and testing activities were also required to be formally carried out on the new and integrated IT systems and content management.

