4.6 GREEN IT TRANSFORMATION DELIVERABLES

The following are the IT deliverables:

Green IT Business Case: documents the ROI, the budgets, and overall justification for the project

Enterprise Emission Measures: documents the existing carbon e missions across the organization

Green Enterprise Emission Measures: resulting at the end of the GET

Enterprise Architecture Document: that documents the enterprise architecture, using an existing or modified framework

SLA

Various docs relating to suppliers; outsourcing partners; legal

4.6.1 Phases in GET

There are four phases in GET:

Diagnosis phase

Planning phase

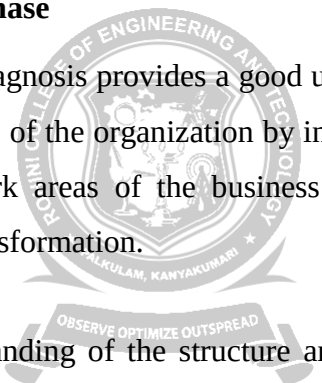
Enacting phase

Review phase

The deliverable in each phase is discussed here.

GET: Diagnosis Phase

Accurate diagnosis provides a good understanding of the current state of the organization by investigating into the various work areas of the business from the point of view of transformation.



An understanding of the structure and dynamics of the organization, as well as its ability to achieve goals, manage risks and ascertain the leading dimension of transformation is developed here.

The state of an organization, with respect to its carbon emissions is based on the current emissions at this early stage.

The demographics of the organization, its motivator, goals, size, and type would all affect its current state, as ascertained during this diagnostic activity.

Diagnosis also includes a review or stock take of existing assets across all work areas.

Diagnosis indicates the state of maturity of the organization.

Once the transformation is complete along all dimensions and through all the work areas, the organization can be said to be in a matured green state.

In this state the Business Transformation Office (BTO) is now fully set up and organized. The Business Transformation Board (BTB) is functioning and reporting to the corporate base. The Business Transformation Champion (BTC) is also busy managing stakeholder expectations. The diagnosis phase also ascertains and progresses the lead dimension of the organization for GET.

The diagnosis activities are carried out at these levels in any organization:

Equipment lifecycle carbon efficiency

End user computing's carbon efficiency

Data centre carbon efficiency

IT as low carbon enabler

All of these levels possess unique challenges and deliverables in the GET.

Equipment lifecycle carbon efficiency

Activities	Challenges
✸ Lifecycle evaluation ✸ ascertains current Green maturity. ✸ updates the business case on the Green IT project. ✸ Reviews the existing procurement and disposal attitude ✸ Identify operational carbon emissions (CE). ✸ updates P&L carbon emissions. evaluates the business case risks reviews policies with business partners Reviews recycling policies and practices are revised. A certain the greenness of equipment using energy stars Optimization of operations is ascertained. Revise Waste disposal policies and practices	✸ Uncertain data on Current Carbon Emissions across Lifecycle/ Procurement ✸ Impact on SLAs a major challenge ✸ Minimal Industry experience in Changes to Software for Carbon Emissions

End user computing's carbon efficiency

Activities	Challenges
✸ Green IT champion creates and updates the business case on the Green IT project. ✸ end-user provides input into a survey to help ascertain the attitude toward Green IT. ✸ Measurements of carbon emissions are undertaken per device ✸ IT governance board is involved in permitting the creation of a device inventory; measurement of overall carbon emissions. The corporate governance evaluates the overall end-user policies on Green IT. Corporate governance also evaluates business case for Green IT as presented by the Green IT champion	✸ Patterns of usage based on End-User roles ✸ Existing Device Inventory may include irrelevant materials ✸ Existing Current Green technologies include software for **—computers off‖ etc.**

Data centre carbon efficiency

Activities	Challenges
✸ updates the business case on the Green IT project. ✸ takes an inventory of I T equipment from the point of view of calculating the current CE. ✸ Measurements of CE are undertaken per server(or similar unit of hardware measure). IT governance board (or similar governing body) reviews the existing SLAs Corporate governance (board or similar governing body) evaluates the overall end-user policies on Green IT. Corporate governance also evaluates the cost of running the data centre, and the costs associated with the Green initiatives related to the organization list of current virtualization or server consolidation techniques in use is made. physical environment and the facilities is recorded.	✸ Patterns of Carbon Emissions can be daily, monthly, yearly. ✸ Data/Information Ownership is a major challenge of Virtualization

IT as low carbon enabler

Activities	Challenges
✸ Evaluates existing organizational Green practices ✸ Ascertains the overall enterprise green maturity. ✸ Updates the business case on the Green IT project. Updates the divisional use of IT and models the current business processes. Examines software and hardware inventories. Evaluates the existing enterprise Green IT policies and ascertains or confirms the greening dimension. Telecommuting/teleconferencing. Collaboration tools and SaaS. Supply chain.	✸ Overall organization presents a bigger challenge than I T ✸ Green IT champion has to convince business management, corporate governance

GET: Planning and Scoping Phase

The strategic thinking and innovative capability of the organization are translated into actionable activities and their sequences in setting up the Green transformation project.

Creative ways of bring about the change, including maximum use of internal and external resources, are explored in this phase.

It is important to note that this road map remains a live document which means later, during enactment phase, this same road map is also

modified depending on the nuances of the project

refined through the feedback gleaned during transformation.

The road map includes the Green transformation plan, the Green pilot project (which can be embedded within the transformation plan for small projects), the overall work area plan, the plan for the lead work area and the quality plan (which will include verification and validation of the changes).

The deliverables resulting from the road map are the plans themselves as also the project task list, the performance and ROI measures, the ranking of risks and the plans to audit the results of the transformation.

The roles involve in transformation planning include the GTC, the project manager, the quality manager, work area lead, business manager, and the IT auditors.

The planning and scoping phase of GET explores the output of the previous diagnosis phase to identify and formalize the planning of the transformation project.

Once the significant aspects of the business are identified, planning outlines the tasks to be performed for transforming each work area.

While the risks are managed in practice during enactment, the planning phase identifies and ranks these risks, and also incorporates the effect of changes on the organization.

Balancing between costs and benefits, technology and business; and balancing risks with outcome.

Each organization has to separately identify and document its green success criteria in this planning phase and formulate the right metrics and measurements that would be used to ascertain its success.

Work areas are organized, leaders for those work areas are nominated, and interrelationships between work areas are highlighted in planning phase.

Planning for the Green IT project starts with the Green IT champion—who finalizes the leading area of the organization that will undergo transformation.

The leading area will start becoming obvious through the diagnosis, but it is important to decide formally whether the end-user efficiencies should lead the way, or whether it should be the equipment lifecycle and procurement, or the data centre.

Enterprise Lifecycle Plan

Roles and activities	Deliverables: Input and Output	Challenges
Green IT Champion: Works with the business management, to plan the changes to product/ equipment lifecycle and procurement that will make the organization greener **Business Management:** Plans, along with the Green IT champion, to procure, use, and dispose equipment in a carbon-sensitive way. **IT Governance:** Oversees the planning process for hardware and software upgrades throughout the business lifecycle. **Corporate Governance**:	**Input** Green IT Business Case: Includes justification for the new equipment, their TCCO, and replacement costs. **Output** **Green IT Transformation Plan:** Includes plans for green recycling, updates on the Energy Star and other ratings, green procurement strategies, optimized operations, and waste disposal. **Procurement and Disposal Plan:** Specifically focused on procurement of	✸ procurement, disposal lifecycle is an integral part of overall business ✸ Changes to SLAs with external arties/ business partners require upfront planning.

Participates in the planning process on how the policies for corporate purchases and disposals will change.	equipment and their decommissioning. **SLA With Business Partners/External Parties:** will change the current lifecycle and moves toward a green lifecycle.	

Planning for End-User Efficiencies

Roles and activities	Deliverables: Input and Output	Challenges
Green IT Champion: Involved in leading and coordinating the planning activities; reporting to the board **End-User Representative:** Planning for the training as well as planning and	**Input** **Green IT Business Case:** Contains justification for the project. **Industry Standards:** Such as EPEAT are incorporated in the plan to ensure green procurement	✸ Estimations on Green IT costs and savings vital for corporate support ✸ Plan for training in attitude change: based on roles.

budgeting for the time and eff ort required to change to green practices. **IT Management:** Plans for the upgrades to the software and the hardware that will be required for the green eff ort.	and usage **Output** **GreenIT Transformation Plan:** Updated with step-by-step instructions on how to carry out the transformation enactment later. **GreenIT Enterprise Standards:** These are the new, expected, green standards within the organization for expected carbon emissions per end-user device, per day/month/year, and so on	

Enterprise IT Data Centre Efficiencies

Roles and activities	Deliverables: Input and Output	Challenges
Green IT Champion: Works to upgrade the Green IT transformation plan with the data centre details **Data Centre Director:** Plans, a long with the Green IT champion, to u pgrade the building, power supply, and air-conditioning/cooling upgrades. Server virtualization, which is a vital part of green initiative, is also a part of this planning process **IT Management:** Continues to participate in the planning process, including plans for changing to the current	**Input** **Green IT Business Case:** Provides justification for the investment in data centre upgrades; costs associated with server virtualization and optimization are listed. **Industry Standards:** Relating particularly to DCiE/ PUE metrics. **Output** GreenIT Transformation Plan: GreenIT Enterprise Standards:	✸ Plan for virtualization must include data/ information ownership, backup plans ✸ Green data is a new suite of data within the organization

data centre practices **Corporate Governance:** Participates in the planning process		

Planning for IT as a Low-Carbon Enabler for the Enterprise

Roles and activities	Deliverables: Input and Output	Challenges
Green IT Champion: Works with the business management, IT governance and, most importantly, corporate governance to plan out strategies for transformation to a green enterprise. **Business Management:** Plans, along with the Green IT champion, to promote green activities across	**Input** Green IT Business Case **Output** **Green IT Transformation Plan:** Gets updated here with plan for the entire organization. **Task Plan:** Step-by-step tasks to be carried out in implementing the Green IT project plan.	✸ **Challenges** Return on investment is the major question that corporate governance asks, and planning in this dimensions must help enable answering that question. ✸ Organization-wide risks need to be estimated and prioritized

the business unit which, in turn, would result in a green organization. **IT Governance:** Oversees the planning process for technology upgrade across the organization. **Corporate Governance:** Participates in the planning process on how the corporate policies need to change together with possible changes to the business model and the organization structure.		

GET: Enactment Phase

Enactment is the execution of the business transformation plan created in the previous phase.

This primarily includes risk management, monitoring of progress, measurements and reporting.

Following are issues to be considered during a GET enactment phase:

Identification of risks during execution of the transformation plan, their priorities, and how to ameliorate them.

Interrelationship amongst work areas, their dependencies and management of the lead work area as first priority.

Measurement of the GET outputs. Use of metrics created during diagnosis and formalized during planning are used here to ensure common measures for comparison with the help of CEMS.

Reporting to stakeholders and managing their expectations.

While a GET project can be driven through any of the work areas, ideally the lead area is dictated by the lead dimension of transformation.

Green information systems play a major role in measuring and reporting change related to the environment.

Each individual employee's carbon generation can be measured, collated, and reported with the help of information systems.

Feeding this information back to the employee through smart metering can bring about immediate change in behavior.

The information coming out of the Green ICT systems that bring about positive change includes reports of daily, monthly, and yearly GHG generation and using that data to impact practices in enactment.

Green ICT information systems need to produce numbers that not only focus on the environmental performance of the organization but also its overall efficiency and effectiveness.

Metrics allow the transformation to provide visibility to success by understanding green strategy.

The transformation plan may be utilized to help determine how best to measure progress and introduce accountability into the Green ICT initiatives, both at the enterprise and solution levels.

IT governance representatives (board) may be also put in charge of supporting measurement and reporting, as well as of identifying when a realignment of internal measures or systems is needed to ensure that the expected results are seen, evaluated, and realized.

Technology-Driven Enactment

The ICT-driven enactment of the GET involves ICT systems, applications, and databases at the centre. There are many in-house systems that are affected by the transformation. The factors that affect these management levels include the

standards, need for integration, the approach to testing and quality assurance, the contractual requirements and the deployment of the new ICT systems, applications, and databases. The adaptation of the organization to the new technology permeates all aspects of the organization.

Customer Relationships Management (CRM)

The CRM systems are updated during GET with the goal of combining green value to the customers. This value includes reliable and good quality service, personalized attention to customer need and support. A good CRM ensures that the customer is provided a single unified view of the business and not the possible internal fragments of the business.

Supply Change Management (SCM)

These applications undergo change to enable users, primarily employees of the organization, to perform many common warehouse, inventory, and shop floor related tasks. A technology-led transformation will monitor and control materials, their delivery and order status. Reduced movement of goods, holding of inventory and accurate production estimates are achieved by the Green SCM. Integration and migration are important technical consideration in these ICT systems, as substantial carbon data gets added to these systems.

Human Resource and Payroll Systems

HR systems provide opportunities for Green HR to be implemented. The HR systems are upgraded to offer greater support to individuals and departments in terms of training, rewards, and career. GET also changes the job roles, responsibilities, management, organizational structures, and hierarchies.

Business Partner's Systems

GET projects aim to improve the interactions of the business with its partner businesses. WS based technologies change the way the business sources services. Information and knowledge management within is changed to make it robust, accurate, reliable, and accessible.

Integration

A major challenge of ICT-driven GET is the handling of integration issues. While integration is always a challenge in even routine upgrades of systems, during GET this issue becomes particularly challenging as all the work areas of the business are likely to change. Integration of ICT systems has to also consider corresponding effect on people, their organizational structures, their device usage.

Business Process–Driven Enactment

Business process, partners, customers, operations, ICT systems and regulatory areas are the foundation of business transformation. Broadcasting and informative business processes are easy to transform as they have less security requirement but they are of less value to users. **Transactive processes**, the next a level of complexity, are mostly commercial in nature. **Operative processes** help in providing and ensuring efficiencies in different departments such as inventory, HR, and finance. **Collaborative processes** are most complex and require interfaces between business processes of external and internal business parties. The GET project should incrementally incorporate these levels of complexities of business processes. The integration of various systems, affects

the internal, as well as external business processes. These business processes and supporting systems in the current state of the organization are studied carefully to effectuate the necessary changes in those processes and systems that would result in a unified view to the users. Process modeling tools and techniques can be very helpful in this regard. Training is a crucial aspect of deploying new and reengineered business processes Training of employees needs to handle the transformational complexities. Similarly, training in-house needs to be complimented by potential training for business partners and customers involved in large and complex transactions.