



MSME TRAINING SERIES

#02: Tracking Your Emissions - Corporate GHG Accounting & Reporting

3rd November 2020 | 3 PM - 5 PM IST

INTRODUCTION SURVEY POLL

QUICKPOLL "Accounting for emission can help identify the most effective reduction opportunities". How would your rank this statement? Poll Results (single answer required): 1 - Strongly disagree 9% 2 - Disagree 0% 3 - Neutral 2% 4 - Agree 31% 5 - Strongly Agree 57%

GUIDELINES

- Attendees will remain in listen-only mode.
- Today's presentation is being recorded and will be shared with registered participants.
- Please use the "Questions" pane to type in your comments or questions during the webinar.



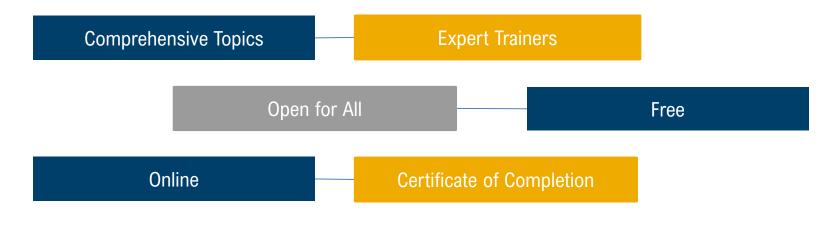


WELCOME & INTRODUCTION

Megha Nath, Senior Project Associate, WRI India

ABOUT THE TRAINING SERIES

- Part of the Carbon Market Simulation Project, facilitated by WRI India and supported by MacArthur Foundation
- Conducted in partnership with Confederation of Indian Industry (CII)



OBJECTIVES



AGENDA

Welcome & Introduction	Megha Nath, WRI India		
Context Setting: The Case for GHG Accounting for MSMEs	Varun Agarwal, WRI India		
Practical Insights: Engaging with MSMEs on GHG Emissions	Dr. Sunita Purushottam, Mahindra Lifespace Developers Ltd.		
Corporate GHG Accounting: An Overview of the GHG Protocol	Subrata Chakrabarty, WRI India		
Calculating GHG Emissions: Concepts, Data & Tools	Atik Sheikh, CII		
Practical Insights: An MSME's Journey on GHG Accounting	Shirish Khutale, Khutale Engineering Pvt. Ltd.		
An Introduction to GHG Management & Target Setting	Shubhangi Gupta, WRI India		
Closing Remarks	Shubhangi Gupta, WRI India		



CONTEXT SETTING: CASE FOR GHG ACCOUNTING FOR MSMES

Varun Agarwal, Project Associate, WRI India

BUSINESS CASE FOR GHG ACCOUNTING



Reduce Costs

Discover cost-efficient GHG reduction opportunities, e.g. energy efficiency.

Avail Government support, e.g. green finance schemes for MSMEs.



Build Preparedness

Meet and minimize business impact of potential Government regulations on GHG emissions.

Meet green procurement requirements of corporate buyers.



Participate in Markets

Voluntary offset schemes, e.g. NCCF's upcoming Carbon Registry-India.

Carbon Markets, e.g.
Proposed pilot for the
MSME sector under the
MoEFCC-World Bank
PMR project.



PRACTICAL INSIGHTS: ENGAGING WITH MSMES ON GHG EMISSIONS

Dr. Sunita Purushottam, Head Sustainability, Mahindra Lifespace Developers Ltd.





Sustainable Supply Chain

Our Strategy





Why Sustainable Value Chain?

Environmental and social impact of supply chain processes in construction sector is much higher than the direct operations of the company!!

Risks Minimizing the disruptions Social impacts Environmental impacts Reputation Legal and compliance IP infringement Loss of competitive advantage

Efficiencies
Material usage
Energy usage
Better logistics and
transportation
Labor productivity
Overall efficiencies in the
supply chain

Innovation More evolved products Faster to market More efficient products Less hazardous across the supply chain



VALUE CHAIN

Instead of Supply Chain?

MLDL Value Chain manning

Mahindra LIFESPACES

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Mrnr sains miain mahhma				JOYFUL HOMECOMINGS			
	Land acquisition	Planning and design	Raw materials & labour		oduct dover Use p	hase	
	Legal, Risk, Finance, Admin, Strategy			Enterprise risk management, Budget & financial implications, Compliance, Strategy			
Enabler	Human Resources			Making Sustainability Personal, Diversity, Reward & Recognition			
	Technology		Enablers for efficient processes				
	Procurement/Contracts		Sustainable contract, procurement				
	Sales & Marketing			Communication, leverage 100% green portfolio as USP			
Core	Business Development	Design	Contracts/ Procurement	Projects	CRM, FM	FM	Р
Primary activities	 Business strategy and planning Site selection Due Diligence Land acquisition 	 Building design/township planning as per green building norms Cost estimation and project planning Supplier onboarding Obtaining permit and licenses 	 Sourcing of raw materials Procurement from local sources Transportatio n Receive, Store and Handle materials Inventorizatio 	 Excavation and leveling Formwork and reinforcement for concrete Super structure Internal structure Installation of utilities Finishing 	 Site cleaning Quality testing Repairing and replacing Sales planning Customer segmentation Promotion strategies CRM 	 Facility Manage ment (FM) Custome r insights Delivery, Installati on and repair After sales 	ROFIT

MLDL Value Chain mapping



á	Land acquisition Planning Raw materials acquisition Raw materials & labour Constructi on Handover phase						
Core	Business Development	Design	Contracts/ Procurement	Projects	CRM, FM	FM	
ESG Considerations	 Displacement Ethical land acquisition Land use conversion Proximity to transportation 	architectureDesign for efficiencyDesign for circularity	 Alternate materials Certified high quality Local sourcing Training and skills 	 Labour rights Environmental and social compliances Resource efficiency Health Safety Quality 	 HOTO process Customer awareness 	Continued Engagement	

Build Responsibly

Deliver on time



SSCM as a driver for process improvements:

- In general, pollution and waste represent incomplete, ineffective, or inefficient use of raw material.
- Green supply chain analysis provides an opportunity to review processes, materials, and operational concepts.

waste

- As with continuous improvement programs, green supply chain analysis targets:
 - Wasted material
 - Wasted energy or effort
 - Under-utilized resources

waste

Green Process Improvement Approach Create Measure or innovation vs. Identify the identify the treatment opportunity bias toward cost of the streams waste

reduction

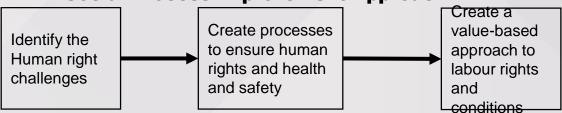
Source: Green and Competitive, Proter and van der Linfde, HBR, Sept.-Oct. 1995 Environmental Supply Chain Management, Carter and Narasimhan, CAPS Research, 1998

SSCM as a driver for human rights and health improvement



- Child Labor
- Forced Labor
- · Health and Safety
- Freedom of Association & Right to Collective Bargaining
- Discrimination
- Disciplinary Practices
- Working Hours
- Remuneration

Social Process Improvement Approach



Source: SA 8000



Our Value Chain Ecosystem

Services



EPC / Design consultants/Management consultants

Maintenance services
IT services
Food & beverage services
Events

People



Contractors

Third party contract staff

Materials



Key material suppliers for construction Cement, Steel, Iron, Tiles etc

Vendors for Food/stationery/ IT products/Furniture/Gifts



Sustainable Value Chain

"To evolve a framework for engagement and integrate and institutionalize supplier/contractor processes with existing departmental and organizational processes"

Policies guiding our Value Chain Strategy

Mahindra LIFESPACES

JOYFUL HOMECOMINGS

Sustainability Policy



Mahindra LIFESPACES

MAHINDRA LIFESPACES - SUSTAINABILITY POLICY

Our resistor at Mahindra Lifespaces is fransforming urban andicapes by creating austamable communities. Our Sustainability Policy will enable us to relative our records a disease, responsible work environment and create would for our statement by National Personner, proctises and create through an integrated approach to design and project execution that is strongly noted in environmental and social considerations.

The Sustangibility policy is aligned with our other organisational policies around Environment, Health and Bahty, Corporate Social Responsibility, Seven Supply Olan Mangement, Quality, bould Opportunity and our Code of Conduct, it follows the Mahmilla ride principles and Gree relates, and is aligned to Mahmilla and

- · Building Crytume Business while
- + Rejustrative the Divisorment and
- + Engitting statesholders to Ities.

SCOPE OF THE POLICY

This policy shall be applicable to all the levels of organizations seems Movivelra infrapaces and its special purpose vehicles, joint ventures and a designature is shall also cover all our associates, weaters, commissions and partners across all our locations. The policy shall be effective from his spril, 2016

Matindta Citispaces is committed to conduct its business in an ethical and transparent manner throughout its geographical locations, in complaines with the highest procedure procedure. Its associates contribute in cleating a butter that is inclusive, innovative and diverse which enables us to create value for our investment. and cattorners while, upliffing the lives of community, vendors, and contractors, sinvingmental, local, and Governance (LEG) risks and opportunities are supported and monitored regularly and integrated with enterprise disk management.

The Currianty is committed to transforming helial, urban landscape through its residential developments under the Wahindha Lileascope and Husbinest Israels. and through its integrated others and industrial clusters under the Mahandra Woold City and Citicals is Mahandra Woold City and Citicals it withholds would City transit. We are to provide customers delight be ensuring quality delivery on time with due senant to ensurance and stakeholders in the value chars, the have a 100s certified Green portfallo and applied for platerum (GEC) Grins 4 - toor nating. Our Standard Operating Procedure Geifflig alds up in authorizing conflictation of though final billy assessment, are -pertitionation at disage, chapped also post conflictation after project conditions. We find a not developing too carbon solutions for our outcomen through our RAC in titutes on automability deege, materials and construction methods with long term, we appear to copie out one publishings, where the rotal energy consumption by a harding on an entrue basis is equal to the arrowed of rerowable energy generated on site.

We strive to create a safe, maturing and inspiring exciplinal environment for all our employees and other stawholders. The commitments to our employees are

- Safeguarding hould need suffery of our stakeholders in a priority at Maryeldes Lifespaces. We arm to conduct all our operations in a manner that ensures the sufery. of put employers commence, vendors contractors victors and all office attached ten-
- Materials Lifespaces is an equal opportunity employer and doesn't discriminate based on race, religion, came, gender, age, disability, inVALIS, and any other characteristics, like endeasour to continuously review and update the relevant HR policies . We also strive to upgrade the skills of all our employees through training programs, serious year-long engagements and communications.
- We enclose our to make all our office operations contained by Personal.

SHEP). We have defined policies in place to guide employee actions at our offices across functions.

- We atrite towards audionable construction by lovinging our integrated management system, to income
- Nesserse conservation: Through compositions and of materials, energy of leaving and down energy, water and proper waste management, with the long term. goal of making our sites zero weste to landfill, and carbon reutral by 2040.
- + Climate change abatement and pollution mitigation through various measures to adopt low carbon techniques and prevent poliution and protect community
- . Sindiversity conservation to expand our factorist in synergy with the ecological footonist.
- + Contractual worker welfare through vinous ofo programs that thous on hoolth and sofoty, smile, and connectional actuation
- + Sustainable supply chain through morning programs for the vendors/supplies on sustainability, building stringers pre-qualification criteria and integrating
- + Sustainable technology we are constitted to the adoption of state of the art technologies in the sector, to chave sustainable sporations of our project store. . Compliance - We encourage our contraction, condors, suppliers, service providers, and transporter to create compliance with applicable legal and other requirements that have a significant impact on health, safety and onvironment

Walanda's Elegacies is committed to ceeding sustainable communities by driving positive change in the neighbourhoods around our development, Through our CSR interventions, we organ with our surrounding communities to identify their coults and provide them with the required august in terms of health, education and self-building. We also professorar to process the sustainability approximation industry and arrived interchedure through advocacy, through coderolly, and

The Policy will be reviewed annually and amended where appropriate, Any modifications/ sharpes to this Holizy shall be made only with the appropriat for the Hourill of Errectors of Matrindra I Brigages, based on incommendations made by the Head of Austanablin



Sunaging Deactor & Chief Executive Officer Date: 30 June, 2016

Green Supply Chain Management



Mahindra Lifespace Devalopers Ltd.

ON 1/85/00491900PLC19840 Minintre Towers, 5th Floor, Dr. G. M. Shensle Mary, World. Muntai 600 018.

Tel: +91 22 67479500 / 8601 Fix: +81 22 24975004 aww.mahind/offisspecias.com

We at Mahindra Lifespaces are committed to establish industry benchmarks in Sustainable Development. We shall ensure that the project activities carried out and the products and services provided by us from all stakeholders are environment friendly and their impact on the environment is minimal and contribute to continual improvement of supply chain.

GREEN SUPPLY CHAIN MANAGEMENT POLICY [GSCM]

To deliver on our commitment we shall focus on our philosophy 'REDUCE, REUSE, RECYCLE, RESTORE as we work on the following key areas:

- . We shall encourage the Contractor, Supplier, Transporter, Service Provider and Business partners to ensure total compliance to applicable legal and other requirements which have significant impact on Health, Safety & Environment.
- We shall give priority to the purchase of locally available materials/products of high quality to minimize environmental impact.
- We shall give priority to the purchase of products which contain recycled/some part of recycled materials rather than virgin material to minimise environmental impact.
- We shall, give preference to the purchase of products from sources are less polluting and/ or use cleaner technology and take appropriate measure to reduce their manufacturing footprint (resources, energy and water).
- . We shall give preference to the suppliers, vendors and manufacturers who take the responsibility of collecting the waste/scrap materials from MLDL project sites and recycle them to remanufacture newer products (either same material / other material / components) to promote circular economy
- We will work with supplier, vendors and business partners for continual improvement of processes. We are open to hearing feedback from all stakeholders to strengthen our systems and processes.
- We strive to monitor the supply chain for climate change, environmental and social risks. which will help developing action plan for the same.



Sangeeta Prasad

(Managing Director & CEO)

Date of revision:-15th July 2019.



Journey Supported by our Institutionalized Approach



In 2018-19, our sustainability policy was launched to institutionalize our approach to sustainability

- The policy enables us to realise our mission of 'Transforming Urban Landscapes by creating sustainable communities'
- It is aligned with our other policies and is aligned to the Mahindra & Mahindra Sustainability Framework.

Pillars of Sustainability Policy



Sustainable Products

100% green certified portfolio



Sustainable Sites

Resource conservation, climate change abatement and worker welfare



Sustainable Offices

Creating safe, nurturing and inspiring workplace



Sustainable Communities

Creating sustainable communities and promoting sustainability agenda within industry



Our policy on banning of single use plastics





Phase 1:

All offices Vendors, Events

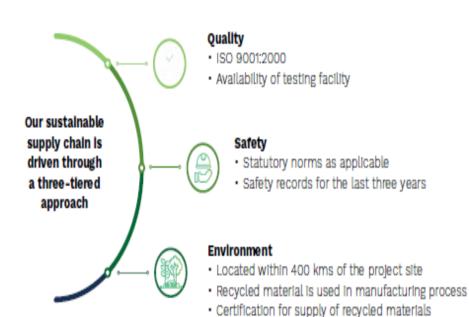
Phase 2:

Sites Contractors
Suppliers – plastic
packaging
inventory/takeback
and recycling
data/alternative
packaging



JOYFUL HOMECOMINGS

Our Current Approach



Green Supply Chain Management Policy



Developers Ltd. Minintre Towers, 5th Floor, Dr. G. M. Bhossie Marg. Wort. Muntai 600 018.

GREEN SUPPLY CHAIN MANAGEMENT POLICY (GSCM)

Tel: +91 22 67479500 / 8601 Fax +61 22 24975004

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Elements: steps taken



Material Suppliers

- 1. Local procurement
- 2. Work with suppliers that take back waste materials eg paint, adhesives containers



Contractors

- Pre-Qualification criteria -Quality, Safety, Environment, Energy
- 2. EMS clauses in General Contractual Conditions



What lies ahead as MLDL stakeholder?

Code of Conduct

Assessment

Signing code of conduct is compulsory for all empanelled stakeholder

Self assessment
Third party assessment

"Customers now are worse than the regulators!"



Code of Conduct

- Purpose Guidance to achieve increasing levels of maturity in areas of environment, labour and business ethics and governance
- Scope : All suppliers and contractors need to sign it along with MOU
- Levels :
 - Level 1: Minimum Must have to do business
 - Level 2: Qualifying Must move towards for continued improvement
 - Level 3: Leadership Good to have assured business

Self Assessment – To determine your Level and formulate action plan for improvement



Self Assessment

General Information of the Company

Facility Information | Workforce Profile | Employment Relationship

Environment

Management Systems | GHG Emissions & Energy Usage | Air Emissions | Water Management | Waste Management | Packaging & Recycling | Pollution Prevention | Resource Efficiency | Transportation

Social

Workplace Management | Occupational Health & Safety | Forced Labour | Child Labour | Discrimination | Freedom of Association & Collective Bargaining | Harassment & Abuse | Compensation | Hours of Work

Governance

Supplier/ Vendor Management | Stakeholder Engagement | Disclosure



CORPORATE GHG ACCOUNTING: OVERVIEW OF THE GHG PROTOCOL

Subrata Chakrabarty, Senior Manager, WRI India

WHY THE URGENCY?

We are failing!



GHG INVENTORY STANDARD



Corporate Accounting and Reporting Standard

92% of Fortune 500 companies used GHG protocol

ACCOUNTING AND REPORTING PRINCIPLES



03-11-2020

EXERCISE #1

GHG accounting and reporting should be based on which of the following principles?

- A. Relevance
- B. Completeness
- C. Consistency
- D. Transparency
- E. Accuracy
- F. All the above

Answer:

F. All the above

ACCOUNTING PRINCIPLES

Transparency

Relevance

Accuracy

Consistency

Completeness

Data and
Methodologies
should be
documented and
disclosed. All
exclusions shall be
clearly identified,
disclosed and
justified.

The reported GHG emissions shall appropriately reflect emissions occurring as a result of activities and consumption patterns.

The calculation of GHG emissions shall not systematically overstate or understate actual GHG emissions. Uncertainties in quantification process shall be reduced to the extent possible and practical.

Emissions
calculations shall
be consistent in
approach,
boundary, and
methodology. Any
deviation from the
preferred
methodology
should be
disclosed and
justified.

Account for all required emissions sources within the inventory boundary. Any exclusion of emission sources shall be justified and clearly explained.

TRADE-OFFS ON USING PRINCIPLES

- Trade-offs between the five principles may be required.
 - Completeness is preferred, even if it means using a lower quality or less accurate data source
- In tradeoffs, user should strive to achieve appropriate balance among the principles and objectives of conducting a GHG inventory.
- Revisit the accounting principles when clarity is required.

SETTING ORGANIZATIONAL BOUNDARIES



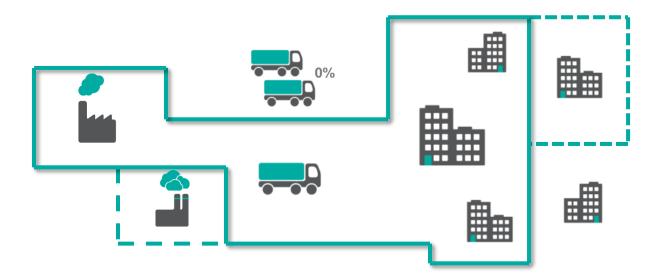
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WHY ORGANIZATIONAL BOUNDARIES ARE IMPORTANT?

- Boundaries: Imaginary lines encompassing the GHG emissions to include in a company's GHG inventory
- Complex business structures
 - Wholly owned operations
 - Joint ventures
 - Subsidiaries
- In setting organizational boundary, a company must select an approach and consistently apply to identify businesses and operations to account GHG emissions.

ORGANIZATIONAL BOUNDARY DETERMINES

- Which company operations to include in GHG inventory?
- What % of each operations to include?



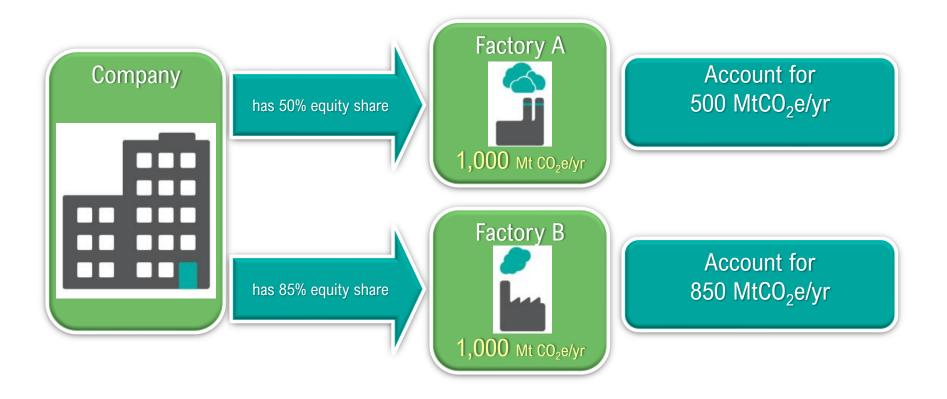
CONSOLIDATION APPROACH

- Consolidation: Combines GHG emission data from separate operations
- 2 consolidated approaches:
 - Equity Share Approach
 - Control Approach
 - Financial Control
 - Operational Control
- Consistently apply selected approach across entire organization

EQUITY SHARE APPROACH

- Accounts for GHG emissions from operations according to its share of equity in the operation (economic interest)
- Independent of Financial or Operational control

EXAMPLE

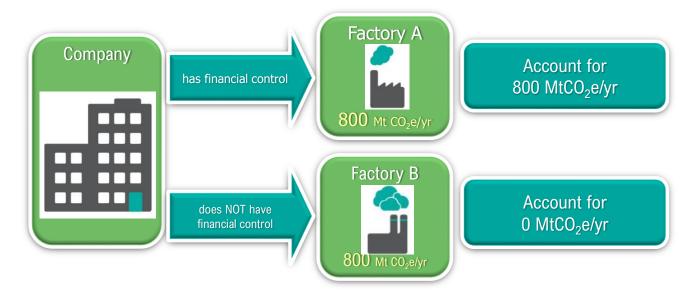


CONTROL APPROACH

- Accounts for 100% of the GHG emissions from operations over which company has control
- <u>Does not</u> account for GHG emissions from operations in which company owns an interest but has no control
- Two consolidation approaches:
 - Financial Control
 - Operational Control

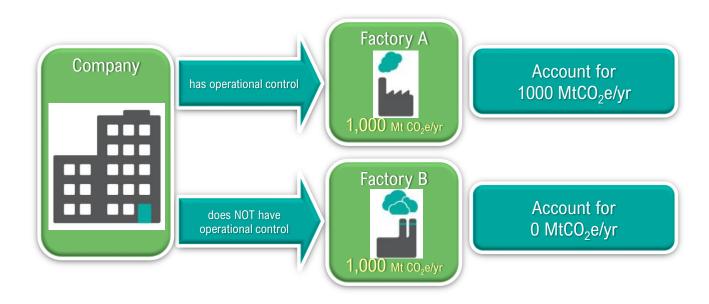
FINANCIAL CONTROL

- Company has financial control if it can direct financial and operational policies with a view to gain economic benefits
- Account for 100% of emissions from operations under financial control



OPERATIONAL CONTROL

- Company has operational control if it has the authority to introduce and implement operating policies
- Account for 100% of emissions from operations under operational control



FEW POINTS TO BEAR IN MIND...

- Having operational control does not mean that a company necessarily has authority to make all decisions concerning an operation
 - Big capital investments will likely require approval from all the partners that have joint financial control
- Sometimes a company can have joint financial control over an operation, but not operational control
 - In such cases, refer to the contractual arrangement to understand authority over operations

CONTINUED...

Category	Definition	Equity Share	Financial Control
Group Companies/ Subsidiaries	Includes incorporated and non- incorporated joint ventures and partnerships over which the parent company has financial control.	Equity share of GHG emissions	100% of GHG emissions
Associated/ Affiliated Companies	Includes Incorporated and non- incorporated JVs and partnerships	Equity share of GHG emissions	0% of GHG emissions
Franchises	Separate legal entities	Equity share of GHG emissions	100% of GHG emissions
Fixed Assets Investments	The parent company has neither significant influence nor financial Control	0%	0%

EXERCISE #2

Company ABC has full control of operations A and B, and a 30% non-operated equity in operation C. ABC's organisational boundary using the **operational control** approach is:

- A. All emissions of A and B.
- B. All emissions of A and B, and 30% of C's total emissions.
- C. All emissions of A, B and C.

Answer:

A. All emissions of A and B.

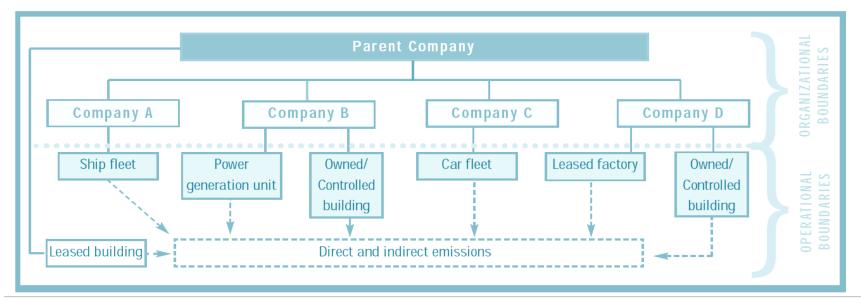
According to the operational control approach, ABC must fully account for emissions only from operations under its control (A and B, in this example).

SETTING OPERATIONAL BOUNDARIES



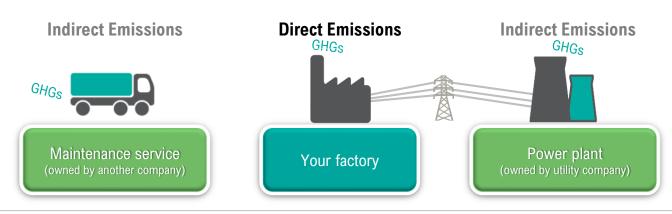
WHY OPERATIONAL BOUNDARIES ARE IMPORTANT?

- To determine which sources of emissions to include
- To classify sources to avoid double counting
- To help manage GHG risks and create opportunities along value chain



DIRECT AND INDIRECT EMISSIONS

- <u>Direct</u>: GHG emissions from sources owned or controlled by the reporting company
- Indirect: GHG emissions that are the consequence of the activities of the reporting company but occurs at sources owned and controlled by another company



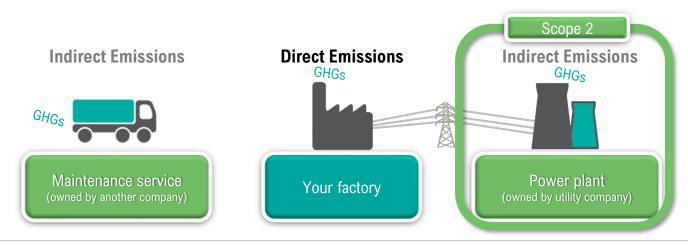
SCOPE 1 EMISSIONS

- Some examples: Electricity generation, physical or chemical processing, etc.
- Inclusion in GHG inventory: Required



SCOPE 2 EMISSIONS

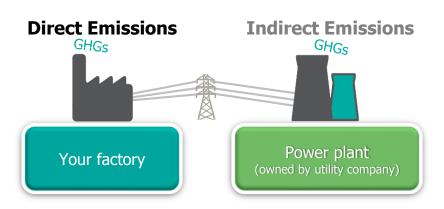
- Example: Purchased electricity, steam, heating and cooling
 - For office-based businesses, Scope 2 emissions is usually most significant
- Inclusion in GHG inventory: Required



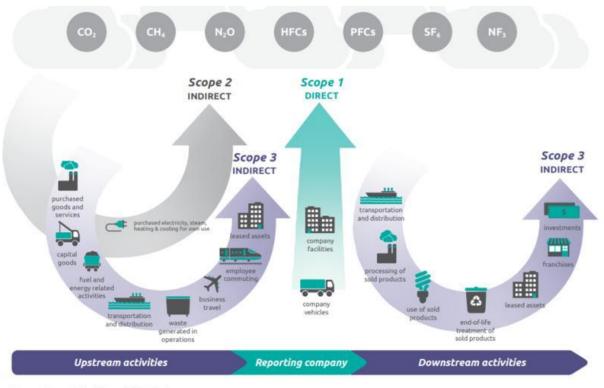
SCOPE 3 EMISSIONS

- All emissions (except scope 1 and scope 2)
 - Example: Transport in vehicles not owned/controlled by reporting company
- Inclusion of GHG inventory: optional





SCOPE 1,2 AND 3



Source: Figure 1.1 of Scope 3 Standard.

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EXERCISE #3

What are the gases that must be accounted in a GHG inventory as per the GHG Protocol?

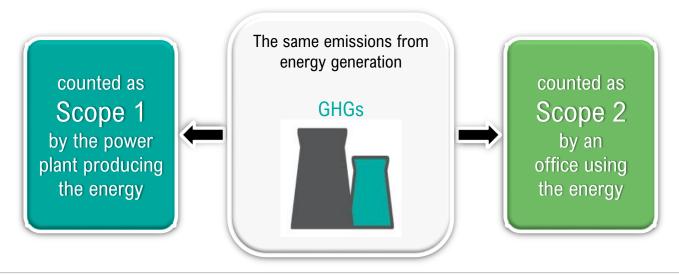
- A. CO2, CH4, N2O, HFCs, PFCs, SF6, and NF3.
- B. H2O, O2, CH4, N2O, HFCs, PFCs, and SF6.
- C. CO2, CH4 and NF3.

Answer:

A. CO2, CH4, N2O, HFCs, PFCs, SF6, and NF3.

DETERMINING SCOPE

- Determine by ownership or control of emission source
- NOT determined by type of emission source



EXERCISE #4

Emissions from the generation of purchased electricity (grid) that is consumed by your company is accounted as:

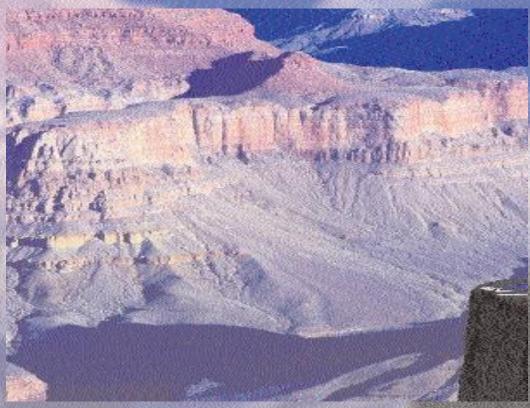
- A. Scope 1
- B. Scope 2
- C. Scope 3

Answer:

B. Scope 2

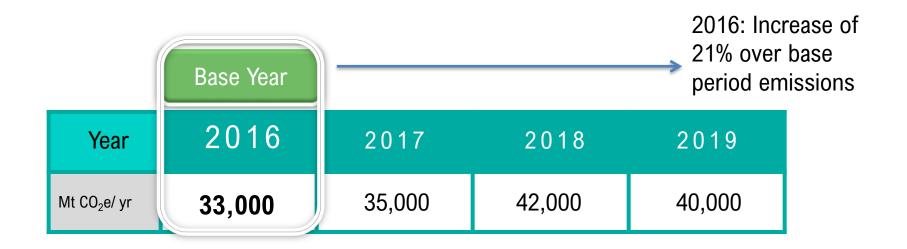
Direct emissions are accounted in the Scope 1 category, indirect emissions from purchased energy in Scope 2, and other indirect emissions in Scope 3.

TRACKING EMISSIONS OVER TIME



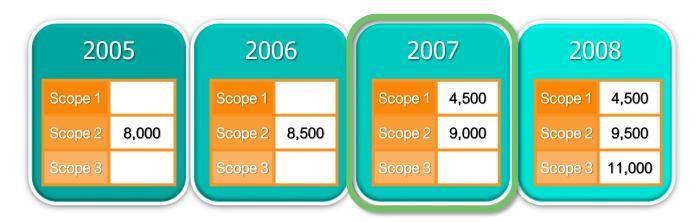
BASE YEAR

■ Base year is the reference point in the past with which current emissions can be compared.



CHOOSING A BASE YEAR

- Select the earliest year for which verifiable emission data for required scopes is available
- Specify the rationale for choosing a particular year as base year;
- If emissions fluctuate dramatically on annual basis, consider averaging over a series of consecutive years as your base year.



RECALCULATING BASE YEAR

- Retroactively recalculate base year emissions to reflect company changes that could compromise consistency and relevance of emissions data
- Develop a base year emissions recalculation policy and apply it in a consistent manner
- State the basis and context for any recalculations

RECALCULATE BASE YEAR FOR...

- Significant change in structure of organization
 - Merger, acquisitions and divestments
 - Outsourcing and Insourcing of emitting activities
- Significant changes in calculation methodology
 - Improved emission factors
 - Improved activity data
- Discovery of significant errors or small errors that are collectively significant

SIGNIFICANT THRESHOLD

- Significant Threshold: a criterion used to determine whether a change is significant enough to warrant recalculation
 - Take into account, the cumulative effect of small acquisitions and divestments on base year emissions
- The GHG Protocol does not specifies a significant threshold
- Each company needs to define the significant threshold that will trigger base year recalculations

STRUCTURAL CHANGES

- Refers to transfer of ownership and/or control of emitting activities from one company to another
 - Mergers, Acquisitions, and Divestments
 - Outsourcing or In-sourcing of GHG emitting activities
- If the structural changes happens with middle of the year, base year GHG emissions needs to be re-calculated for entire year.

EXERCISE #5

Which of the following aspects could act as a trigger for the organization to recalculate its base year inventory?

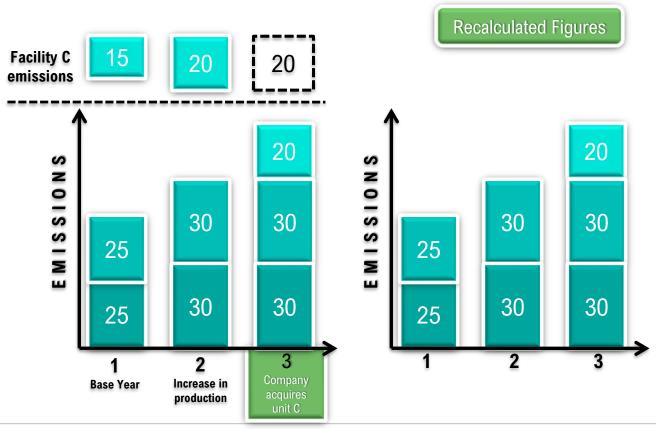
- A. Significant change in structure of organization
- B. Significant changes in calculation methodology
- C. Discovery of significant errors or small errors that are collectively significant
- D. All of the above

Answer:

D. All of the above

The organization's base year inventory must be representative of its current boundaries and calculation approach, and must be recalculated in case of a change in either of these.

RECALCULATION: ACQUISITION



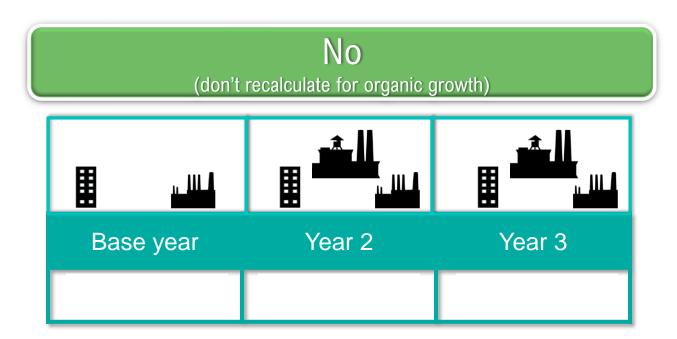
65

CHANGES <u>NOT</u> REQUIRING BASE YEAR GHG EMISSIONS RECALCULATIONS

- Changes involving facilities that did not exist in the base year
- Out-sourcing and/or In-sourcing of activities previously reported under a different scope
- Organic growth or decline

EXAMPLE

- The demand for Company A's products increases.
- It opens a new factory in year 2 to meet this demand.



EXAMPLE

• It acquires an older factory from Company E in year 2 to meet this demand.

Should the base year emissions be recalculated? Yes (recalculate for acquisitions) Year 2 Year 3 Base year 50,000

THANK YOU!



Subrata Chakrabarty

Senior Manager: Climate Program

subrata.chakrabarty@wri.org

Twitter: @subrataNE

QUESTIONS & ANWERS



CALCULATING GHG EMISSIONS: CONCEPTS, DATA & TOOLS

Atik Sheikh, Counsellor, CII

Agenda

- Identification of Emissions Sources
- Calculating GHG Emissions
 - Activity Data
 - Data Collection
 - Emissions Factors
 - Global Warming Potential





What are Greenhouse Gas?

- Greenhouse gases covered by Kyoto Protocol
 - Carbon dioxide (CO₂)
 - Methane (CH₄)
 - Nitrous oxide(N₂O)
 - Hydro fluorocarbons (HFCs) (series)
 - Per fluorocarbons (PFCs)
 - Sulfur hexafluoride (SF₆)
 - Nitrogen trifluoride (NF₃)



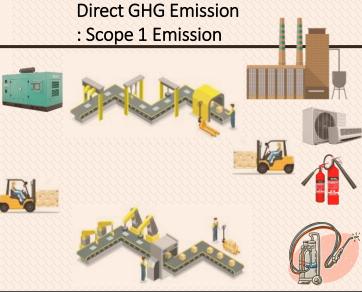
Greenhouse Gas Inventory:

An estimation of entity's emission of greenhouse gas

transportation agriculture natural gas systems Carbon dioxide Methane landfills CO, CH cars Nitrous oxide fossil fuel combustion N₂O manufacturing coal and crude oil agricultural soil hydrofluorocarbons **HFCs** management substitute of ODS semiconductor **PFCs** Greenhouse manufacturing electrical transmission perfluorocarbons aluminium production SF₆ Solar Panel Gases sulfur hexafluoride magnesium prod LCD Manf.

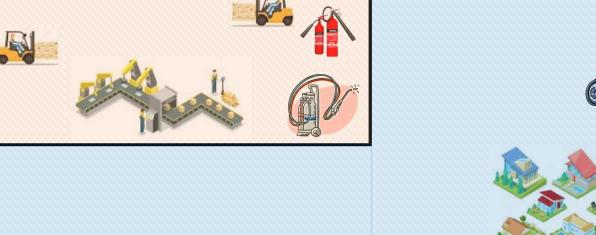
Indirect GHG Emission : Scope 3 Emission











Source Identification

Scope 1 – Direct Emissions

- Gas/Coal Consumption in Boiler
- Gas consumption in paint shop
- Gas Consumption in heat treatment furnace
- LPG consumption in canteen
- Emission from company owned vehicles
- Acetylene in cutting/welding
- Refill of Refrigerant (HFC type)
- Refill of Fire Extinguisher (CO₂),

Scope 2 – Electricity consumption Grid

Identification for Sources



Car Manufacturing Company

Scope 3 – Indirect Emissions

- 1. Raw Material Receipt
- 2. Car Dispatch to dealers
- 3. Employee commute
- 4. Business commute
- 5. Raw material emissions(steel, aluminum, etc.)
- 6. Supplier Emissions And many more...

Fuel Combustion

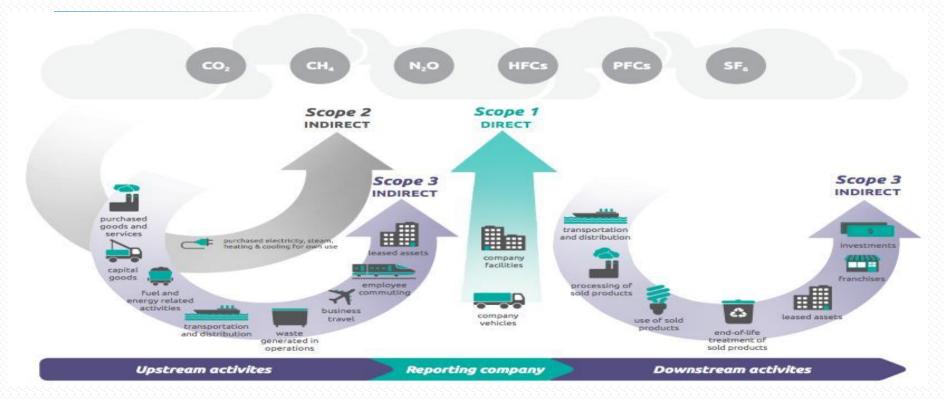
Wherever there is GHG Usage

Process Emissions





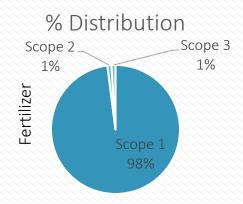
Emission Sources



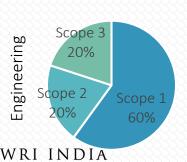


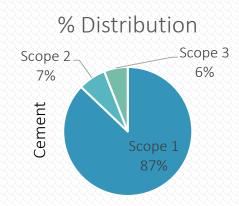


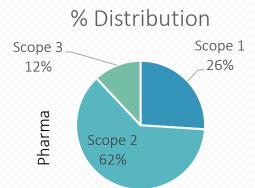
Emissions – Profile

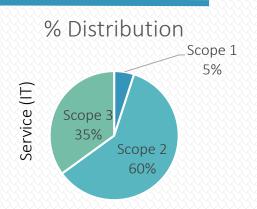


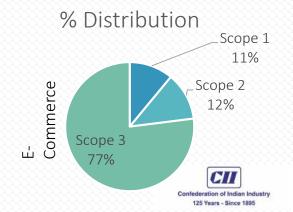








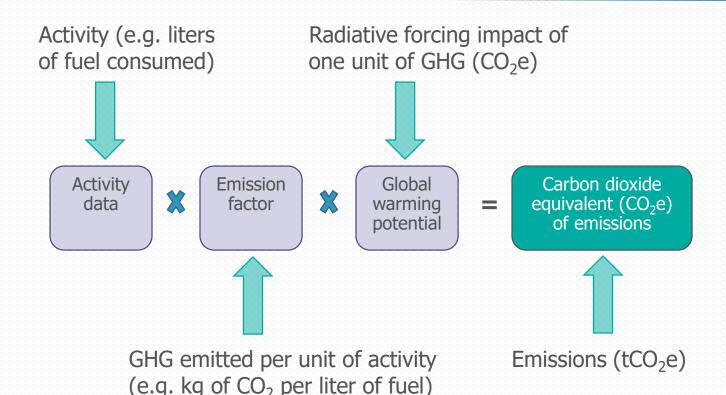




GHG Calculation



Components of an Emission Calculation







Examples of Activity Data

- Liters of fuel consumed
- Kilowatt-hours of electricity consumed
- Kilograms of material consumed
- Kilometers of distance traveled
- Hours of time operated
- Kilograms of waste generated
- Kilograms of product sold















Data Selection

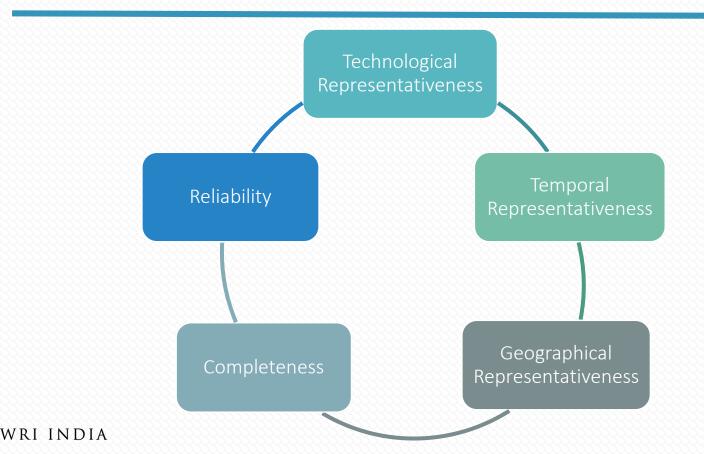
- Companies may use two types of data:
 - Primary data
 - Data from specific activities within a company's value chain (i.e., asking suppliers/customers for their emissions data)
 - Secondary data
 - Data that is not from specific activities in a company's value chain (industry average)

Many companies use a combination of primary and secondary data





Data Quality Indicators



Scope 1: Data Sources

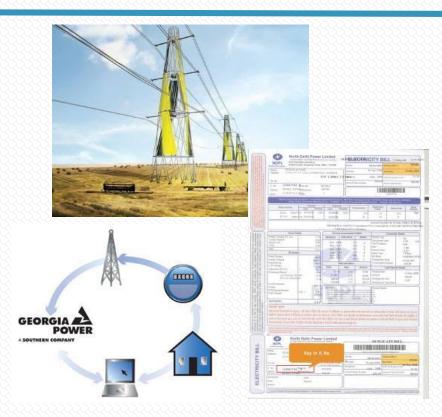


- Purchase Receipts
- ERP Records/Entries
- Fuel Log Books
- Ledger/Journal Entries
- Safety records
- Meters





Scope 2: Data Sources



- Electricity Bills
- Online Metering
- Meters
- Log Books





Scope 3 – Data Sources

- Suppliers
- Material receipts
- Product dispatch
- Transporter
- Customers







Data Collection

- Data Collection should be well coordinated activity
- What, Where and Why?
- A data collection system should be established
 - Since GHG study is not one time activity





EXERCISE #1

What is the relevant activity data for calculating CO2 emissions from a coaloperated company furnace?

- A. Number of hours per day furnace is operated
- B. Furnace capacity
- C. Quantity of coal (tonnes) consumed in furnace

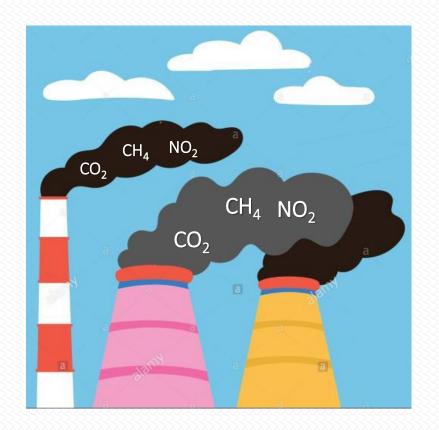
Answer:

C. Quantity of coal (tonnes) consumed in furnace.

CO2 emissions from coal consumption in the furnace can be calculated as: CO2 emissions (T) = Coal consumed (T) * emission factor (T) (T)



Emission Factors



Emission Factors

- Activity data needs to be converted into a Measurable Quantity of GHG Emissions
- Emission Factors converts activity data into GHG emissions
- Emission factors are used to calculate emissions from all three scopes
 - Activity data X Emission Factor = GHG Emissions
- It's a Metric!

```
Eg. 1000 lt. diesel consumed at Plant A for DG sets per year.

1000 \text{ lt.} / \text{yr.} \times 2.64 \text{ kg CO}_2 / \text{lt.} = 2640 \text{ kg CO}_2 / \text{yr.}
```





Emission Factors

- Based on choice of emission factor, methodology employed to calculate emissions is categorized into
 - Tier1 Global
 - Tier 2 National
 - Tier 3 Site Specific



Emission factors that are available at global

level

• Eg. IPCC dataset

• Diesel:2.64kg/lt

• Petrol:2.27kg/lt

		CO ₂			Ī
	Fuel	Default Emission Factor	Lower	Upper	Ī
Crude Oil		73 300	71 100	75 500	İ
Orimulsion		r 77 000	69 300	85 400	Ī
Natural Gas Liquids		r 64 200	58 300	70 400	Ī
	Motor Gasoline	r 69 300	67 500	73 000	Ī
Gasoline	Aviation Gasoline	r 70 000	67 500	73 000	Ī
Gas	Jet Gasoline	r 70 000	67 500	73 000	Ī
Jet Kerosene		r 71 500	69 700	74 400	Ī
Other Kerosene		71 900	70 800	73 700	Ī
Shale Oil		73 300	67 800	79 200	Ī
Gas/Diesel Oil		74 100	72 600	74 800	Ī
Residual Fuel Oil		77 400	75 500	78 800	Ī
Liquefied Petroleum Gases		63 100	61 600	65 600	Ī
Ethane		61 600	56 500	68 600	İ
Naphtha		73 300	69 300	76 300	İ
Bitumen		80 700	73 000	89 900	İ
Lubricants		73 300	71 900	75 200	İ
Petroleum Coke		r 97 500	82 900	115 000	Ī



- Emission factors that are specific to a country
- Eg. CO2 Baseline Database for the Indian Power Sector

Weighted average emission factor, simple operating margin (OM), build margin (BM) and combined margin (CM) of the Indian Grid for FY 2018-19 (adjusted for cross-border electricity transfers), in t CO₂/MWh

Average	ОМ	ВМ	CM
0.83	0.97	0.88	0.92

Average is the average emission of all stations in the grid, weighted by net generation.

OM is the average emission from all stations excluding the low cost/must run sources.

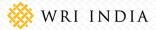
BM is the average emission of the 20% (by net generation) most recent capacity addition in the grid.

CM is a weighted average of the OM and BM (here weighted 50: 50).





- Emission factors using models and inventory measurement tailored to address firm circumstances, repeated over time, and driven by aggregated levels
- Eg. ultimate analysis of data for coal used at XXXX was 94.48 kg CO2/GJ





- Coal consumption = 2555867.32 Tonnes
 - NCV = 0.016GJ/kg
- Emission factors
 - Tier 1 (IPCC) = 94.6 kg CO2/GJ
 - Tier 3 (ultimate data analysis)= 94.48 kg CO2/GJ
- Total emissions
 - Tier 1 approach = 3868560.7 Tonnes CO₂
 - Tier 3 approach = 3863653.5 Tonnes CO₂
 - Difference = 4907 Tonnes CO2





EXERCISE #2

Which emission factor from the list below should a company use to quantify their Scope-2 emissions from purchased electricity from the grid?

- A. Grid emission factor (Kg CO2e / KWh) by CEA
- B. Thermal Power plant emission factor (Kg CO2e / KWh) by CEA
- C. DG set emission factor (kg CO2 / litre diesel) by CEA

Answer:

A. Grid emission factor (Kg CO2e/KWh) by CEA.

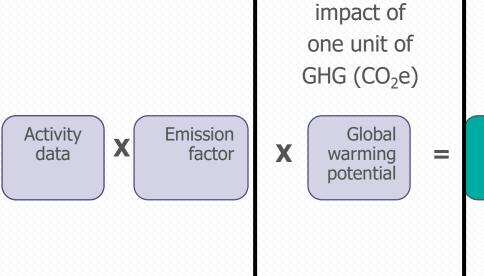
The Central Electricity Authority (CEA) regularly calculates and publishes the grid emission factor, based on the energy mix of the sources feeding the grid.





Component of an Emissions Calculations

Radiative forcing



Carbon dioxide equivalent (CO₂e) of emissions





GHG Emission-GWP

- Global warming potential (GWP): measure of how much a greenhouse gas contributes to global warming relative to CO₂
- Use GWPs to convert tonnes of a GHG to tonnes of carbon dioxide equivalent (CO2e) to calculate total emissions using a common unit
- Higher GWP = more warming capacity

Greenhouse Gases	Global Warming Potential (100 years)
Carbon dioxide	1
Methane	28
Nitrous oxide	265
Hydrofluorocarbons	138
Perfluorocarbons	6630
Sulphur hexafluoride	23900

EXERCISE #3

Global Warming Potential (GWP) of a gas measures the global warming impact of one unit of that gas relative to?

- A. One unit of CH4.
- B. One unit of H2O.
- C. One unit of CO2.

Answer:

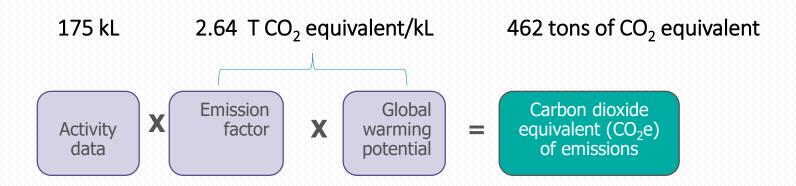
C. One unit of CO2





Calculation of GHG Emissions

 A diesel generator consumes 175,000 liters of diesel in a month to provide a power back up





GHG Accounting

- Data Collection
 - Through GHG data Collection Questionnaire
 - When Initially Starting the Inventory
 - Excel Sheet, Online Forms, Database, etc.
- With maturity, the companies should implement management system for data collection and management
 - Sofi
 - Enablon
 - ERP Systems
- Saves time and resources
- But requires yearly updates for sources, emission factors, etc.



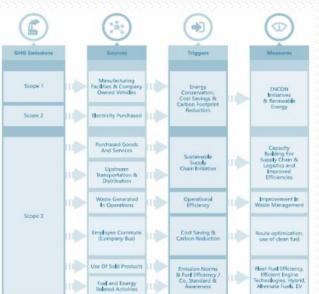


GHG Inventory - Reporting



0.71

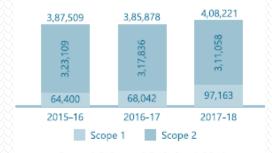
Sources & Triggers



Source: Annual Report

WRI INDIA

Annual Emissions (Absolute)

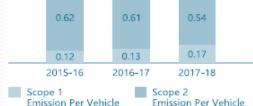


Scope 1 & Scope 2 Emission (tCO2e)

Scope 3 Category Number		Description of Scope 3 Categories	GHG Emission (1CO.)	
1	H	Purchased goods & services	89,986	
3	₽ð.	Fuel-and-energy related activities (not included in Scope 1 or Scope 2)	96,197	
4	勤	Upstream transportation & distribution :	3,808	
5	圓	Waste generated in operations	3.675	
7	0	Employee commute (company bus)	74,648	
n	1	Use of sold products	38,83,897	

Annual Emissions (Intensity – per product)

0.74



0.74

GHG Emission Per Vehicle Produced (tCO₂e / Vehicle)

Reporting Yearly Reduction



GHG Emissions Avoidance (tCO,e)

120 rears - aince 1695

ndustry

GHG Tool

- GHG Accounting Tool
- Sector specific tools available at and can be accessed at GHG Protocol Website
- https://ghgprotocol.org/calculation-tools#country specific tools id



EXERCISE #4

Calculate total CO2 emissions from the use of 1800T coal (Emission Factor: 1.4 TCO2/TCoal) and 10,000MWh Electricity (Emission Factor: 0.83 TCO2/MWh.)

A. 10,000 T CO2

B. 10,820 T CO2

C. 1,820 T CO2

Answer:

B. 10,820 T CO2

(1800T coal * 1.4 TCO2/TCoal) + (10,000MWh * 0.83 TCO2/MWh) = 10,820 T CO2











Additional Exercises – GHG Accounting

MSME Training Series #02:

Tracking your emissions - Corporate GHG
Accounting and Reporting
03 November 2020

Exercise #1 Calculating Indirect Emissions from Electricity Use

Cost-lo is a discount retail clothing chain. Cost-lo records its annual electricity purchases in megawatt-hours (MWh) and for the last year, its average monthly electricity consumption was 150 MWh. Calculate CO2 emissions from electricity use for Cost-lo.

Assume the following emission factors for electricity: 0.83 t CO2/ MWh





Answer Key

Step 1: Calculate total emissions from electricity use using annual consumption and emission factor

CO2 emissions (metric tons CO2) = Electricity consumed (MWh) * emission factor (t CO2/MWH)

= 150 MWh/ month * 12 * 0.83 t CO2/MWH

= 1494 tCO2 / year





Exercise #2 Calculating Direct Emissions from Stationary Combustion

F&M is a manufacturing facility with two 10 MW generating units, one burning natural gas and one coal-fired unit. F&M also has DG set on-site and diesel operated forklifts.

Last year, the company consumed 20,000,000 standard cubic meter (m^3) of natural gas and 40,000 metric tons of coal in the generating units. F&M also began the year with 41900 litres of diesel in storage and ended the year with 6000 litres in storage,; it combusted the rest of the diesel and no diesel was purchased during the year. Calculate the company's total emissions of carbon dioxide (CO_2)

Assume the following emission factors

Natural gas : $1.9141 \text{ kg CO}_2/\text{ m}^3$

Coal : 2274.69 kg CO₂/ metric tonnes

Diesel : $2.6533 \text{ kg CO}_2/\text{ litre}$







Answer Key

Step 1: Calculate annual diesel use by taking into account purchase, sale and inventory stock

Annual Diesel Consumption (litres) = Diesel Stock at Start of Year (litres) — Diesel Stock at End of Year (litres)

<u>Step 2:</u> Calculate CO2 emissions for each fuel using respective emission factor. Add to obtain total CO2 emissions for F&M.

Fuel A CO2 Emissions (metric tons) = Fuel Consumed (metric unit) \times Emission Factor (kg CO2/metric unit) \div 1,000 (kg/metric ton)





Answers

```
Fuel A CO<sub>2</sub> Emissions = Fuel Consumed × Emission Factor ÷ 1,000
 (metric tons) (metric unit) (kg CO<sub>2</sub>/metric unit) (kg/metric ton)
Natural Gas CO<sub>2</sub> Emissions = 20,000,000 \times 1.9141 \div 1000 = 38,282 metric tons
 (metric tons) (cubic meter) (kg CO<sub>2</sub>/cubic meter) (kg/metric ton)
Coal CO<sub>2</sub> Emissions = 40,000 \times 2274.69 \div 1000 = 90987.6 metric tons
 (metric tons) (metric tons) (kg CO_2/metric ton) (kg/metric ton)
Diesel CO<sub>2</sub> Emissions = 35900 \times 2.6533 \div 1,000 = 95.25 metric tons
 (metric tons) (litre) (kg CO_2/litre) (kg/metric ton)
Total CO_2 Emissions = 38,282 + 90987.6 + 95.25 = 129,364.85 metric tons
 (metric tons) (metric tons) (metric tons)
```

Exercise#3. Calculating avoided emissions due to implementation of RE project

 AMB is one of the leading manufacturing company. In its efforts to reduce carbon footprint, plant installed 2MW rooftop solar PV. Last year the plant consumed total 70,000 MWh of electrical energy out of which 26,400 MWh came from Solar PV.

Calculate the following:

- 1) total GHG emission from electricity consumption from the grid
- 2) total emissions avoided by the renewable power generated
- 3) Percentage of emissions avoided from renewable power a

Assume the following emission factors Electricity: 0.83 t CO₂/ MWh







Answer Key

- Total electricity consumption = 70000 MWh
- Electricity from Solar panel = 26400 MWh
- Electricity from grid = 70000 26400 = 43600 MWh
- 1) Total GHG emissions from the grid = 43600 MWh X 0.83 tCO2/MWh = 36188
- 2) Total GHG emissions avoided because of solar panel = 26400 X 0.83= 21912
- 3) Percentage of emissions avoided from RE power = Avoided emission/ total emissions

$$= 21912 / (21912 + 36188)$$





QUESTIONS & ANWERS



PRACTICAL INSIGHTS: AN MSME'S JOURNEY ON GHG ACCOUNTING

Shirish Khutale, Chairman & M.D., Khutale Engineering Pvt. Ltd.



GHG-Carbon Footprint Study - JOURNEY TOWARDS GREEN ORGANIZATION





Location: C 2/7, C 2/7 Part & Part 1, MIDC Area, Near Maharashtra Scooters Ltd., Satara-415004, Maharashtra, INDIA Contact:

Tel: 02162 246633 / 246033 Email: khutale.enggpl@gmail.com Web: www.sme.in/khutaleengg



INTRODUCTION

Garden Green Outside & Hospital Clean Inside...!

















- Manufacturers Of Sheet Metal Pressed, Tubular Fabricated Components and Assemblies For White Goods, Furniture, Auto And Other Engineering Industries with Conveyorized Powder Coating, ROHS Zinc Plating, Inspection – Testing, ETP and allied facilities.
- An ISO 9001:2015 QMS & ISO 14001:2015 EMS certified company.
- Business Excellence Manufacturing Organization.
- CRISIL rated SE1B company.
- CII GreenCo Platinum Rated Company.







OUR CUSTOMERS









gow interio

















JOURNEY OF ORGANIZATION

KEPL Certified as ISO 1400:2004 EMS

2010

Best

Delivery

Performan

ce Award

From GAD



-Suppliers **Excellence** Award & CSR from GID

2015

-GHG Study





KEPL Certified as ISO 9001:2000 QMS



-Pune White Goods Lean Manufacturing Cluster

-Associated with GAD

2003

--KE becomes KEPL

200





-District Industries Award By Gov. Maharashtra



-Platinum Award from GID

CII GreenCo **Platinum** Rating **Special Achievem** ent Award for Green from GID

2016

Initiatives CII Star Icon Sustained Performan



- 1. Gender Equality award 2. Green
- Crusader award
- ce award 3 Outstanding contribution to Society award





Championshi p Award at 11th CII Competitiven ess & Cluster Summit 2018

Established

KHUTALE ENGINEERING Associated with GAD K

1989

2002 Associated with **GPD** 1996

1995 Established^l

District Industries Award by Gov. Maharashtra to SEPC

SYNERGY ENGINEERS & POWDER COATERS

First Championship Awards for Green manufacturing & Energy & Cost at CII 9th National Cluster Summit 2016 @ New Delhi at the hands of Mr. Wolfgang Leidig GIZ











We Thank Our Partners of Progress



Confederation of Indian Industry

CII Sohrabji Godrej Green Business Centre ,Hyderabad. CII Centre of Excellence for Competitiveness, Chandigadh, Pune, Mumbai, Gurgaon.







Lean, Green & ZED- Excellence Journey.....A Journey which never ends...!!!

- Pune White Goods Lean Manufacturing Cluster 2010
 (Initiated by Godrej Appliances & MCCIA, Pune.)
- CII Godrej Interio Vendor Basic Cluster-IV 2012
- ISO 9001:2015 QMS -2003 . ISO14001:2015 EMS -2013 .
- CII Godrej Interio Advance Manufacturing Excellence Cluster 2014
- Carbon Footprint Study by CII-Sohrabji Godrej Green Business center with support of UNIDO" 2015
- CII GreenCo Platinum Rating 2016 (Initiated by Godrej Appliance.)
- CII Godrej Interio ZED-Zero Defect Quality Cluster 2019







How Green is your company ???? GreenCo journey started.....

In the pursuit of going Green 'Khutale Engineering & Synergy Engineers & Powder Coaters' with the motivation of Godrej Appliances, Godrej Interio & Confederation of Indian Industries, have taken several initiatives and this has resulted in substantial tangible & intangible benefits.

therefore sincerely wish to share our journey of Green with all of you.



Corporate Social Responsibility
Carbon Neutral -Green Manufacturing
To Raise the Awareness of Energy Efficiency
GHG Monitoring & its Measurement

"You must be the change you want to see in the world."



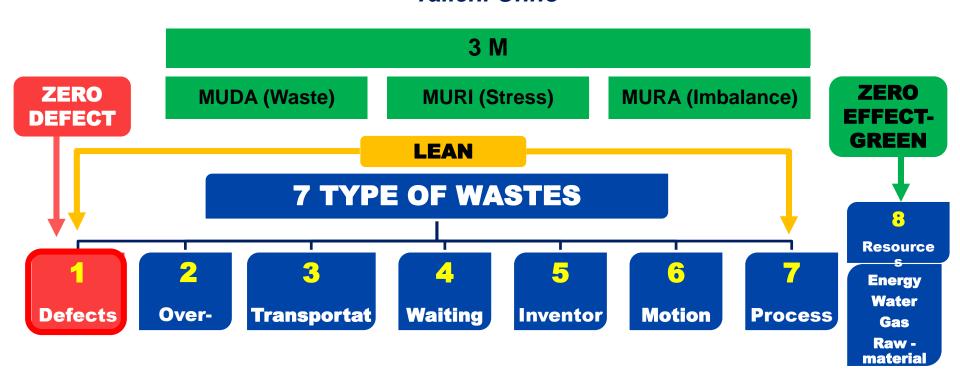
"Everyone must be their own scavenger"

- Mahatma Gandhi



"All we are doing is looking at the time line, from the moment customer gives us an order to the point when we collect the cash. Also, we are reducing the time line by reducing non-value adding wastes."

Taiichi Ohno





Best Practices Before GreenCo.....

- ETP was in Place. Rain Water Harvesting. Drip irrigation. Sprinklers.
- Transparent roof Sheets. Roof Ventilators.
- Usage of CFLs/LEDs . Timers. APFC Panel. Usage of optimum HP of Elect Motors.
- Usage of Chrome free PT chemicals. RoHS Compliance. Member of Common Hazardous Waste Treatment,
- Storage & Disposal Facility (CHWTSDF)
- Recording of Electricity, Water, LPG & RM consumption & Scrap generation religiously since inception.
- Garden surrounding the factory. Efforts to create & maintain Biodiversity
- CSR activities...Swatchhata ,Shramadan, Awareness
- ROHS Chemical & Processes
- ISO 14001-2004 EMS, Hand holding Trainings

Performance Parameters

The Green Company Rating System advocates a performance based approach.

- Energy Efficiency
- Water Conservation
- Renewable Energy
- Green House Gas Emission
- Waste Management
- Material Conservation –Recycling & Recyclability
- Green Supply Chain
- Other Areas (Ventilation, Surroundings, Site location, Innovation & Product Stewardship)



GREEN VISION

Environment Friendly Products, Processes & Operations

RoHS Compliant products & processes, GHG emission reduction, Green Supply Chain & CSR **Energy Conservation**

5% reduction in Energy consumption YoY 100% Green Power by 2020.

Water Conservation

5% reduction in Water consumption YoY

Material Conservation

Waste Reduction

0.5% improvement in RM yield YoY

Zero Waste to Land

Green Policy

Green Policy KE KHUTALE Engineering Pvt. Ltd.

is committed to Environment and conserve Natural Resources. The guiding principle of our Green Policy is,

5 R - Reduce, Reuse, Recycle, Renew and Respect.

We are committed to continually improve the Green performance in our Activities , Products and Services.

We will strive to:

- Conserve Natural resources such as Energy, Water, RM by optimization of their usage.
 Ensure the use of energy efficient Processes . Products & Technologies to benefit
- all our stakeholders.

 Adopt measures to prevent pollution by monitoring & controlling Process Water
- Adopt measures to prevent pollution by monitoring & controlling Process Water discharge, Air emission, Waste generation & Zero Landfill.
- Recognize and reward the efforts of our employees in conservation of natural resources.
 Share and enrich our experiences in resource conservation within the company.
- Promote use of Renewable Energy resources and 100% Green Power by 2020.
- · Abide by the legal requirements.

We will continue to ensure that our operations comply with all local ,state and central statutory

Rules Regulations and standards, relating to environment & conservation of natural resources.

This policy is made available to all employees & our stakeholders.

Place: Satara

Shirish P. Khutale

Pledge For Energy Conservation





Methodology for Inventorisation of GHG Emission

Scope 1 : Direct GHG Emissions

- Diesel /Petrol Used in Company Owned Vehicles
- CO2 Used In Welding
- LPG Used in oven
- Top up in AC
- CO2 top up in fire extinguisher
- Kerosene (burning hangers)

Scope 2 : Indirect GHG Emissions

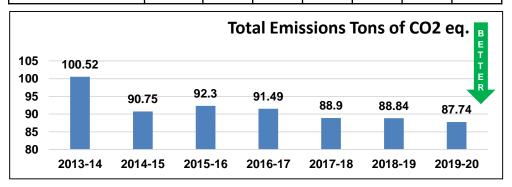
- Total electricity consumed in plant by Grid.
- Green power

Scope 3: Other Indirect GHG Emissions

- Business Travel
- Material Transport
- Employee Transport

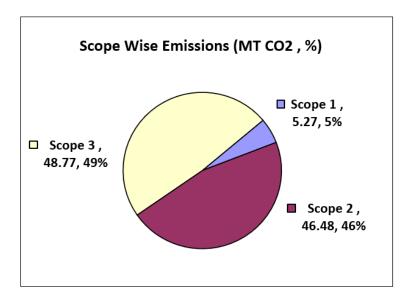
GHG - Inventorisation of Scope 1,2 & 3 KEPL

Scope of Emissions Tons of CO2 eq	2013- 14	2014 -15				l	2019 -20
Scope 1	5.27	4.12	6.17	6.63	8.35	15.2	20.1
Scope 2	46.48	35.7	37.9	37.9	11.1	22.4	28.8
Scope 3	48.77	51	48.2	47	69.5	51.2	38.8
Total	100.5	90.8	92.3	91.5	88.9	88.9	87.7





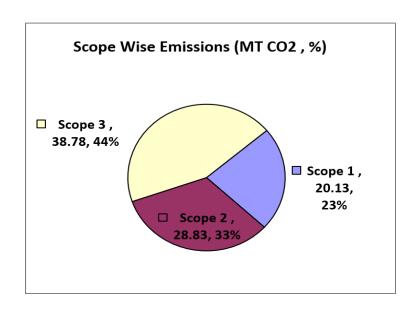
Year 2013-14



Scope of Emissions	Value	Unit	share
Scope 1	5.27	Tons CO2 eq	5.25
Scope 2	46.48	Tons CO2 eq	46.23
Scope 3	48.77	Tons CO2 eq	48.52

Total Emissions	100.52	Tons CO2 eq
Specific Emissions	0.09	Tons CO2 eq/Ton prod.

Year 2019-20



Scope of Emissions	Value	Unit	Percentage share
Scope 1	20.13	Tons CO2 eq	22.94
Scope 2	28.83	Tons CO2 eq	32.86
Scope 3	38.78	Tons CO2 eq	44.20

Total Emissions	87.74	Tons CO2 eq
Specific Emissions	0.05	Tons CO2 eq/Ton prod.



Carbon Neutral Manufacturing Focus Areas

- Energy Management
- Fuel Management
- Renewable Energy Substitution
- Supply Chain Management
- Logistics
- Travel



GHG -List of projects

Sr. No.	Project	Scope	Implementati on Year	Benefit (Rs.)	Investment (Rs.)
1	Installation of Co2-Argon welding machine (Sigma make)	Scope1	2015	76,860	1,44,400
2	Monitoring daily trip (km) of company owned vehicles & introduced Milk Run concept.	Scope1	2015	11,400	
3	Placement of Transparent sheets& Air Ventilator on roof top	Scope 2	2013	45,164	1,13,000
4	Replacement of CFL to LED Lights	Scope 2	2013	7,632	13,333
5	Procurement of cut to size Raw Material	Scope 1 & 3	2016	18,283	Nil
6	Installation of VFD for 4 no. Power press.	Scope 2	2015	36,969	79,870
7	Installation of APFC Panel	Scope 2	2015	PF 0.99	33,500
8	Use of Transvector guns	Scope 2	2015	13,176	5,880
9	Selection of local suppliers for bought out material	Scope 3	2015	55,000	
10	Using full capacity of vehicle for transportation of finished goods	Scope 3	2015	27,000	



GHG Emission Reduction Projects

- After stacking two pallets, we observe & calculate weight of loaded material is underutilized.
- We decide to club Part load of another customer Godrej Interio. Which is on way to Shirwal.
- Vehicle Model:- EICHERS 1050 / Vehicle Size (L-3580X W-1980X H1930)MM
- Vehicle Capacity: 3000 Kgs (3MT) /Utilisation Increased By-8.49%

	BEFORE			AFTER			
Sr.	Customer	Description	No. of Pallet/Wt.	Customer	Description	No. of Pallet/Wt.	
	Caduai	CBP Pallets	2 X 550 Kgs.	Caduai	CBP Pallets	2 X 550 Kgs.	
1	Godrej Appliance Shirwal	EP T/B Strips,	2X 388 Kgs.	Godrej Appliance Shirwal	EP T/B Strips,	2X 388 Kgs.	
	Silliwai	Cab Btm Pc.	1X 818 Kgs.	Silliwai	Cab Btm Pc.	1X 818 Kgs.	
2				Godrej Interio.	Bed Metal Frames /	25X10 Kgs.	
				Shirwal	DRSR Sq. Pipe		
3		Utilised load	2694 Kgs.		Utilised load	2944 Kgs.	



ENERGY EFFICIENCY



Best Practices at KEPL Unit

Energy Efficiency

- Various initiatives on reduction in specific energy consumption
- Monitoring of energy consumption at various processes through energy meters and conducting variance analysis
- PQCDSME monitoring and display
- Substantial reduction in specific energy consumption
- Good awareness creation programs for involvement of operators and their families
- Energy efficiency operational practices
- 5S, My Machine, Preventive maintenance



ENERGY CONSERVATION

BEFORE



Reciprocating Air Compressor

AFTE



Energy efficient Screw Compressor Benefits: saving 10.15 Kwh/Day

BEFORE

Angle cutting on cut-off Machine.

AFTE



Die designed to cut in single stroke)

BEFORE



Machine run with out VFD

AFTE



Instillation of VFD's Benefits : saving 0.41 Kwh/Day per machine

Roof Top Solar System Saved 1.72 Kwh/Day



Usage of 67% Renewable Energy from 40 Kw Grid Interactive PV Roof Top Solar System.



Energy Saving Initiatives

BEFORE

AFTER

BEFORE

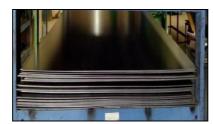
AFTER



5% Energy saving by using CFL



30% Energy saving by using LED Light



Procurement of standard size RM sheet



Procurement of Cut to length RM sheets 35% Energy Saving



High LPG consuming MS trolleys



Low LPG consuming Aluminium trolleys 41% Energy Saving & 33% gas consumption saving



Improper utilization of space in baking oven



Space productivity by trolley modification 25% Energy Saving



30% Energy Saved by instillation of VFD's



APFC panel for better power factor



3% Energy Saved by Air ventilators installation



81% Energy Saved by transparent roofing



MATERIAL CONSERVATION

BEFORE



RM procured in standard size sheets.

AFTE



RM procured in Cut to Size.
Benefit: 1.43 % saved / annum

BEFORE



RM procured in standard size sheets.

AFTE



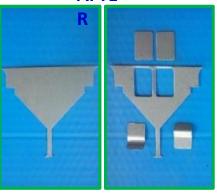
RM procured in Coils form.
Benefit: - 0.22 % saved / Annum

BEFORE



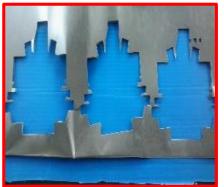
TP/BTM strip with 12% Scrap

AFTE



CTH clips are made out of this scrap
Benefits:-2.79% saved / annum

BEFORE



Standard Punching Layout

AFTE



Strip Punching Layout Modified. Benefits: Reduction in utilization of material by 17.34 %



WATER CONSERVATION

BEFORE AFTE



Convectional water taps.



Push type water tap. Benefit :- 6KL save / day.

BEFORE



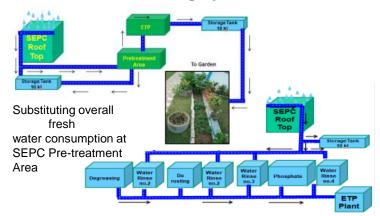
Regular taps



AFTE

Water Saving Aerators Benefit - It reduces water wastage up to 80%

Rain Water Harvesting System



BEFORE

Manual watering in Gardening.

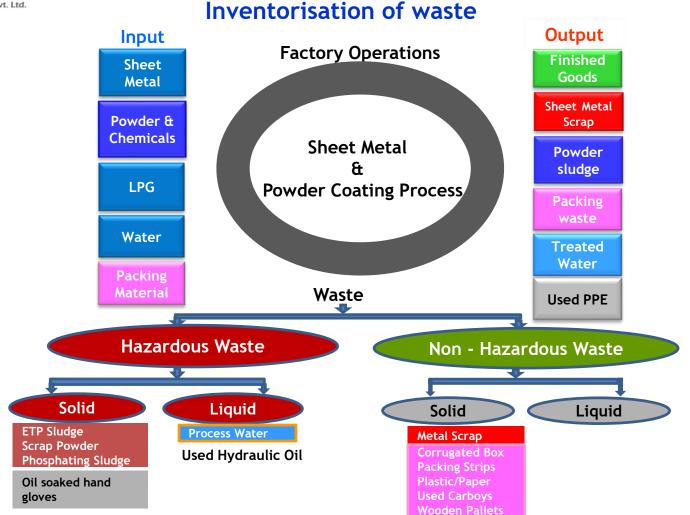
AFTE





Drip Irrigation & Sprinkler system used in gardening Benefit 64 KL saved / Annum







Results

Hazardous Waste Management

Sr.	Type of Waste	Unit	1	Reduction %		
No.	Type of waste	Onit	2013-14	2014-15	2015-16	Reduction 76
1	Phosphate & ETP sludge	Kg/D	1.35	1.08	0.54	60%
2	Scrap Powder	kg/D	0.98	0.77	0.20	80%
3	Oil soaked hand gloves	Kg/ Anum	115.2	89.28	67.2	42%
4	Used Hydraulic Oil	Lit.	0	0	360	100% reclaim

Non - Hazardous Waste Management

Cr. No.	Type of Wests	l lesis	V	Reduction %		
Sr. No.	Type of Waste	Unit	2013-14	2014-15	2015-16	Reduction %
1	Metal scrap	%	8.1	6.71	6.1	25%
2	Corrugated boxes	kg	147	132	127	14%
3	Carboys	Nos.	201	114	94	53%
4	Wooden pallets	kg	457	665	610	8%
5	Polythene bags	kg	45	40	38	16%
6	Cut off wheel	Nos.	124	97	21	17%



GREEN SUPPLY CHAIN

Purchase Guidelines





Implementation of Green Purchase Guidelines

Use of Energy Efficient Products

Oil - injected Rotary Screw Compressors

Hydraulic Press 75 TON Model - SH - 75

Make - Atlas CopCo

Model - GA 15VSD +7 bar pack delivering 15 - 88.6 CFM

- Variable Speed Drive Air Compressor
- · Energy Efficient Electrical Motor.
- · Directly Drive.
- · No transmission loss.
- Noise level 60 db to 63 db
- · Cooler fan operated
- · Air drier & Receiver





- Energy efficient electric motor (Siemens make)
- AC VFD (Drive for power consumption)
- Hydraulic system with counter balance valve system.
- Hand safety guard mounted on front side of machine.

Instead of Procuring Catalogue Machine we ask mfgr to customise the machine which suits to our process as well as product

Catalogue machine had 7hp motor and our product needs 5hp motor so that we procured Shearing machine with 5 hp motor.Lean machine



Implementation of Green Purchase Guidelines

Use of Energy Efficient Products

MIG / MAG / FCAW Welding Inverter

3 Phase 415V, Duty Cycle: 60%



- 30 to 40 % electricity saving.
- Compare to transformer base welding m/c
- Fine parameter control & adjustment.
- Spatter & scale free.



- Press Brake EHP 80.25.20
 - Productive Bends
 - •Low Power Consumption
 - Lower Noise Levels
 - Lesser Maintenance
 - Lower oil capacity



Transvector Nozzle Gun

- 70% natural air usage.
- Energy efficient
- Low noise

ERP Implementation



		360	CONTRACT	PERMIT		199	Collinson	_
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- Elimination of stationary
- Accuracy and speed of work
- Daily performance analysis
- Daily stock maintain
- 5. Inventory control significantly
- Excise & VAT report generated automatically hence eliminate written tasks.
- Aid for preparing balance sheet and P&L statement
- Outsourcing material 4/5 A register online & eliminate written tasks
- Easy for sales order tracking & schedule workout



Supply Chain Intensity Reduction

Sr. No.	Category	No. Of Projects	Implementation Year	Benefit
1	Milk run model	2	2015	22 % reduction in transportation. GHG reduction.
2	Localization of suppliers	6	2014	1L km reduction in transportation. GHG reduction.
3	Reduction in packaging material in upstream	4	2014	27 % reduction in packaging material.
4	Transport optimization	1	2015	3900 km reduced in transportation. GHG reduction.
5	Toxicity Reduction	•••	2014	Environment friendly products
6	Awareness creation in supply chain	•••	2016	Trained supplier. Inventory cost reduced. DSA increased.Cost benefit. 141



Reduction in packaging material in upstream

Sr. No.	Project	Before	After	Benefit
1	Use of corrugated scrap for wall nut packing	do i siente.	ASSIA KING BED	Elimination of use of 2 ply corrugated sheet
2	3C packaging		11A 2015	Eliminated use of stretch film
3	components from single side instead of wrapping entire component			Reduction in bubble sheet
4	Reusable PP corrugated boxes & plastic bins			Elimination of corrugated boxes.





Benefits:

- Corrugated Packing is totally eliminated with Usage of Recyclable PP Caps Annual Consumption Rs-10,500/Annum)
- Manpower Saved Rs-120000/Annum, Rejection due to Dent & Damage is totally eliminated,
- Usage of Gum Tape is eliminated (Consumption Rs-2,400/ Annum

in ISO 9001:2015 & 14001:2015 Certified Company

Toxicity Reduction

MEPL Certification for Hazardous Waste





MAHARASHTRA ENVIRO POWER LTD

Common Hazardous Waste Treatment, Storage & Disposal Facility (CHWTSDF)

This is to certify that : M/s. SYNERGY ENGINEERS & POWDER COATERS Address: C - 2/6 & C - 2/6 Part - 1, Old MIDC Area, Satura 415004 is a Valid member of CHWTSDF (As per MOU with MIDC & MPCB), at Plot No.P-56. Ranjangaon MIDC, Taluka - Shirur, Pune - 412 220.

Certificate issued on 28 September 2018 is valid till 27 September 2023

For Maharashtra Enviro Power Ltd.

Membership No.: MEPL/33002894

Asif Hussain Director

RoHS Certificate



Report No. : PN:HL:7490000457 DATE: 13/01/2016 SYNERGY ENGINEERS & POWDER COATERS C.265, C2/6 PART 1, OLD MIDC AREA, NEAR MAHARASHTR, SCOOTER, SATARA-415004 SGS MR SHIRISH KHITTALE THE FOLLOWING SAMPLE(S) WAS/WERE SUBMITTED AND IDENTIFIED BY/ON BEHALF OF THE CUSTOMER SAMPLE DESCRIPTION MOUNTING PLATE FR FATL

Part / Ref. No: WMS9774505 Raw Material: CRCS Grade: D EDD COLOUR TRIVALLENT YELLOW GODREJ APPLIANCES BUYER

SAMPLE RECD ON TESTING PERIOD: 12/01/2016 to 13/01/2016 12/01/2016 TEST(S) REQUESTED RoHS 4E test :IEC 62321 : 2013 / 2015

CONCLUSION: Based on the performed tests on selected part of submitted samples, the results of Lead. Mercury Cadmium, Hexavalent chromium comply with the limits as set by Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

RoHS Directive 2011/65/EU Annex II

Test Item(s):	Unit	Test Method	Results	MOL	Limit
Cadmium(Cd)	mg/kg	With reference to IEC 62321-5:2013 (Determination of Cd by ICP-OES)	n.d.	5	100
Lead (Pb)	mg/kg	With reference to IEC 62321-5:2013 (Determination of Pb by ICP-OES)	n.d.	5	1000
Mercury (Hg)	mg/kg	With reference to IEC 62321-4:2013 (Determination of Hg by ICP-OES)	n.d.	5	1000
Hexavalent Chromium (CrVI) #	µg/cm²	With reference to IEC 62321-7-1:2015 (Determination of CrVI by UV-VIS)	n.d.	0.10	-

- (a) mg/kg = ppm : 0.1wt% = 1000ppm
- (b) n.d.= not detected (c) MDL = Method Detection Limit
- = not regulated
- (e) IEC 62321 series is equivalent to EN 62321 series
- # = a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 µg/cm². The sample coating is considered to contain CrVI
 - b. The sample is negative for CrVI if CrVI is n.d. (concentration less than 0.10 µg/cm²). The coating is considered a non-CrVI based coating

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505 India Inv. Ltm. Consumer Texting Services Laboratory, Gat No. 624/2, Karuli, Chakan, Tal. Khed, Dist. - Pune - 410 501, Mahawatora, India 1: (91-2135) 615 3001: (91-2135) 615 330 Reg. & Corp. Off. SGS House, 4R, A. S. Marg, Vahroli (Wayo), Marrian-403 603 t : + 91 602 6640 8888 t : + 91 602 6640 8808 t : + 91 602 66

All our processes & products are well within RoHS limits



Transport Optimisation













Kms saved / year – 2210 Kms No of trips saved / year – 13 Nos

Tata-Bhushan Steel /Uttam Galva Steels Ltd , Khopoli.

Reductio Presen n in Supplier -Item **Transport Before** Supplie ation (Km/Year) Khopol RMSahibabad Steel (UP) 42560 (170 Sheet (1500 Km) Km) RMSahibabad **Pune** Steel (UP) (130 32880 Coils (1500 Km) Km) In Zink Satara house 1160 **Plating** (4 Km) (0 km) Corrug Shahapur Satara ated 13662 (210 Km) (3 Km) Box Corner Mumbai Satara 2096 fitment (265 km) (3 Km) Pin for Mumbai Satara side 262 (265 km) (3 Km) disc **Pune** Steel Bhiwandi (130 5280 **Tubes** (290 Km) Km)

Vehicle loading capacity increased - For Sheets - from 14 MT to 20 MT

For ERW tubes from 6 MT to 8 MT



Awareness creation in Supply Chain

Green Policy circulation among vendors









Ebenazeer Industries

Gajanan Enterprises

Purushottam Enterprises





Siddhi Enterprises



Efforts to create & maintain Biodiversity

"Garden Green Outside, Hospital Clean inside."

























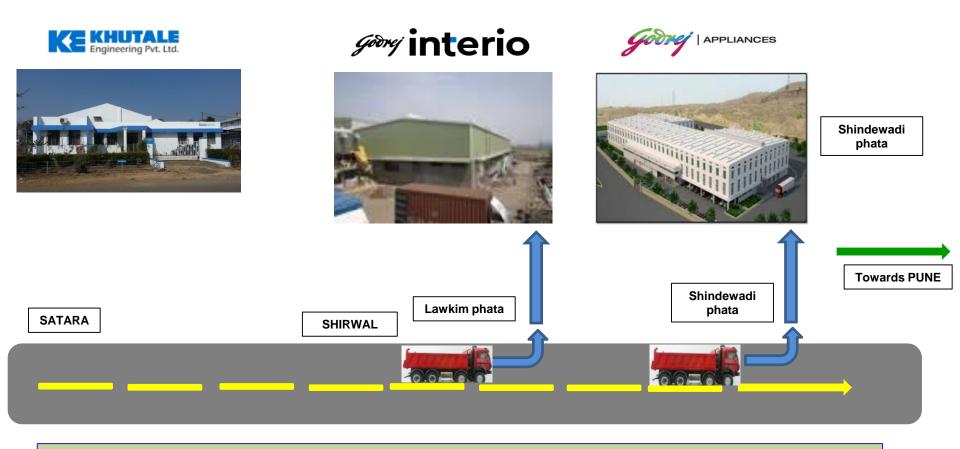


Evolution towards Lean, Green & ZED Organization





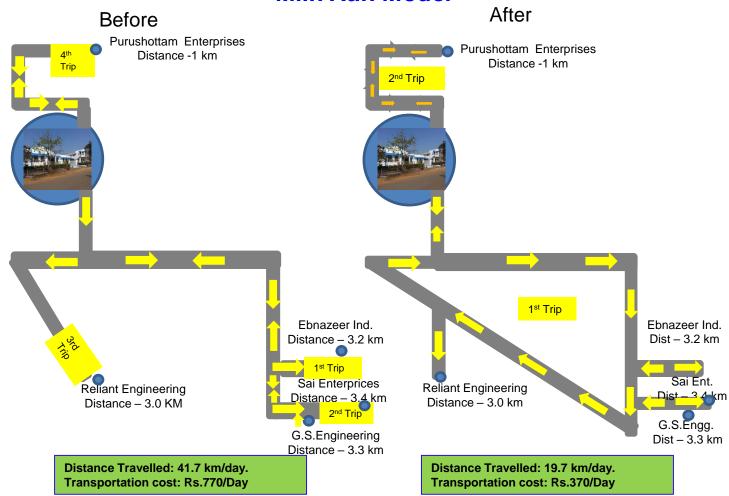
Milk Run Model



Saved 390 kms per month of TATA ACE vehicle by clubbing dispatch in GID & GAD big vehicle.



Milk Run Model





GHG Reduction Projects



Using 1 bike for 2 people & Bicycle usage



Milk Van Concept For **Local Supplier**







Optimum Utilization Of transport Vehicle

Details of loading Method:

- Initially vehicle floor was thin & waviness generated due to pallet point Load. Hence we weld 3MM sheet @ bottom for easy sliding of pallets.
- Un-even unloading Platforms, We provided foldable plate to match level.
- To avoid use of Forklift @ Customer end. We provide Pallet truck (MHE) to reduce GHG Carbon emission @ customer end.
- We convert Plastic Bins to M.S. Pallets & Gunny bags to Poly Bags to cover no. of Varity.



Communication to Customers & Supplier of Carbon Emission



Godrej Appliance, Shirval



Godrej Interio, Shirval



Godrej Vending, Pune





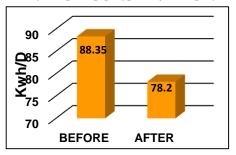


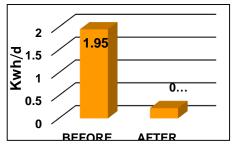
To our Suppliers

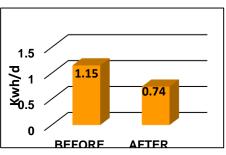


ZERO EFFECT

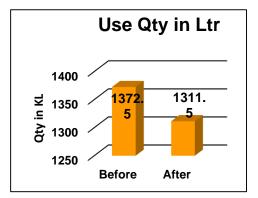
ENERGY CONSERVATION



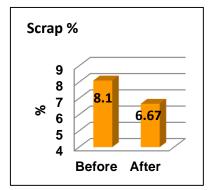


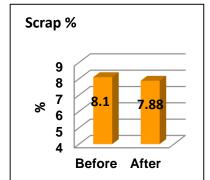


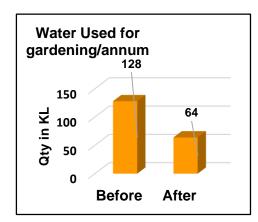
WATER CONSERVATION

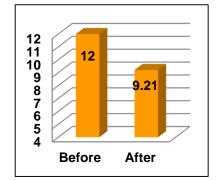


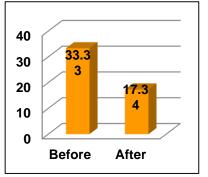
MATERIAL CONSERVATION





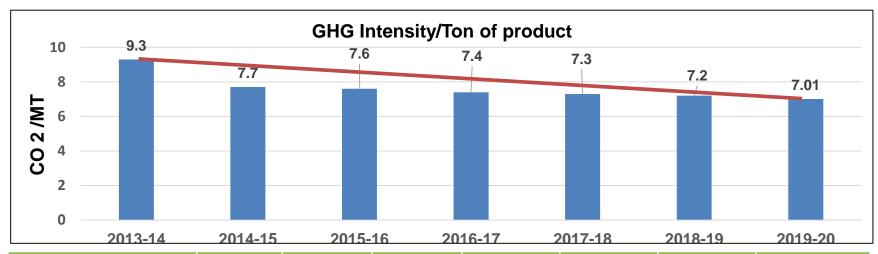








Reduction in GHG Emission Intensity KEPL



	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Total (1,2,3)	100	90.82	92.2	91.49	88.90	88.84	87.74
Production (mt)	1074.73	1172	1199.78	1287.00	1171.45	1523.22	1887.14
GHG Intensity/Ton of product	9.3	7.7	7.6	7.4	7.3	7.2	7.01

24.62 % reduction in GHG Intensity/mt of production from 2013-14 to 2019-



GreenCo Saving / Annum

Electricity conservation	31062	KWH
Renewable energy addition	43800	KWH
Water conservation	353.02	KL of water
Resource conservation	8.31	MT of material
LPG Gas Reduction	108	Kg
Waste Reduction	750	Kgs of waste
GHG emission mitigation	157.265	MT of CO2 eq.
Total investment made	45,21,833	Rs Lakhs
Monetary savings	17,37,610	Rs Lakhs

Intangible Benefits

- More concerned, more responsible towards mother nature, even while achieving higher growth with optimal use of resources and better Emission and Discarge Standards.
- Builds Competitiveness, strengthen Bottom Line, Preferred Vendor Partner status, Green corporate image,
- Enhance Credibility and provide increased ability to raise capital.
- Equip to meet future Environmental Regulations & mitigate future Environmental Risks.
- Anticipate the future instead of reacting to regulatory requirements.
- Export Opportunities.







BUILDING CULTURE – TOTAL EMPLOYEE INVOLVEMENT

WORLD ENVIRONMENT



WORLD WATER DAY



BLOOD DONATION CAMP



NO TOBACCO DAY



GANDHI JAYANTI







WOMEN'S DAY







BUILDING CULTURE - TOTAL EMPLOYEE INVOLVEMENT

ENGINEERS DAY



SAFETY WEEK



ROAD SAFETY WEEK



2ND OCT GANDHI JAYANTI SURROUNDING CLEANLINESS DRIVE







WORLD ENVIRONMENT DAY CELEBRATION



SAFETY DAY -WEEK - OATH









BUILDING CULTURE - TOTAL EMPLOYEE INVOLVEMENT

LABOR DAY



GHG TRAINING & MEDICAL CHECKUP CAMP AWARENESS



BIRTHDAY CELEBRATIONS



PERFORMANCE AWARD







CULTURAL PROGRAMME





RECOGNITIONS AT VARIOUS CONFERENCES / FORUMS / SUMMITS

Year 2015



Green Initiative Award Program at Green Conclave, CII Pune 19th Dec 2015

Year 2017



Excellent Energy Efficient Unit at CII National Energy Summit 2017, Hyderabad

Year 2016



First Championship Award for Green Manufacturing at CII 9th National Cluster Summit 2016

Year 2017



2nd Championship Award at 10th CII Competitiveness & Cluster Summit 2017, Delhi

Year 2016



First Championship Award for Energy & Cost at CII 9th National Cluster Summit 2016

Year 2018



2nd Championship Award at 11th CII Competitiveness & Cluster Summit 2018, Delhi



Year 2016





KEPL received Greenco Platinum Plaque at the hands of Shri Nitin Desai , Member Prime Minister's Council on Climate Change @ CII Greenco Summit 2016, Hyderabad





SMB Star Icon Recognition 2016 for Sustained Performance Excellence received at 24th CII National Quality Summit, Bengaluru

Year 2018



MCCIA-Dr. R.J. Rathi Award for Green Initiative in Industries 2018, Pune

Year 2019





Greenco Star Performer @ CII Greenco Summit 2019, Delhi



Year 2019

KEPL receives first IMTMA-ACE MICROMATIC Productivity Championship Award @ National Productivity Summit 2019, BIEC Bengaluru at the hands of Mr. Sandeep Kumar Maini, Chairman Maini Group.













THANK YOU



CONTACT DETAILS Mr. Shirish Purushottam Khutale.

Chairman & Managing Director.

KHUTALE Engineering Pvt. Ltd.

Tel: 02162 246633/246033. Mob: +91 9822032220

email: shirish@khutaleengg.com



INTRODUCTION: GHG MANAGEMENT & TARGET SETTING

Shubhangi Gupta, Consultant, WRI India

GHG MANAGEMENT



- I. PERIODICALLY QUANTIFY & REPORT EMISSIONS
- Choose a base year.
- Report emissions annually with respect to base year.



II. IDENTIFY GHG REDUCTION OPPORTUNITIES

For each GHG source:

- 1. Analyze level/trend of emissions
- 2. Assess organizational influence,
- 3. Translate mitigation options into concrete targets for the short, medium and long-term.



III. SET GHG REDUCTION TARGETS

- Target type- absolute or emissions intensity
- Emissions coverage- scope 1, (scope-2, scope-3)
- Timeframe for achievement
- Nature of the target

II. IDENTIFY GHG REDUCTION OPPORTUNITIES-1

1. Analyze Level/ Trend of Emissions (for each source)



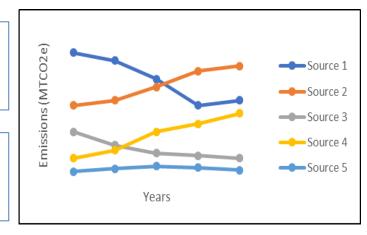
Level Analysis

Share of emission source to total emissions



Trend Analysis

Trajectory of each emission source over time



II. IDENTIFY GHG REDUCTION OPPORTUNITIES-2

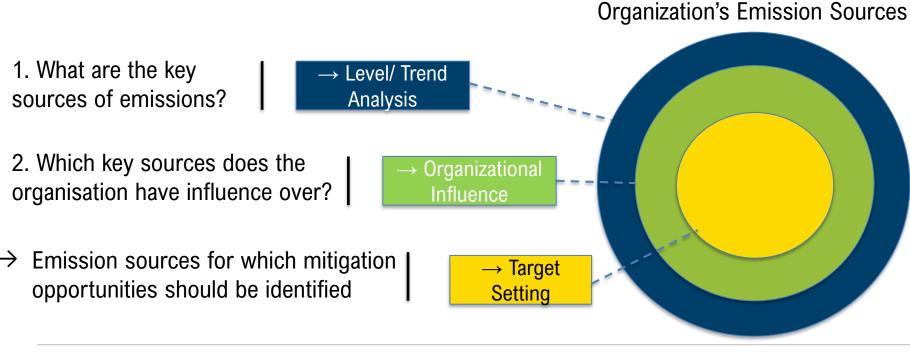
2. Determine your Organizational Influence



Eg: Emissions from electricity (Scope 2) = Emission Factor * Electricity Consumed Reduction potential for company:				
Electricity Consumed (full control) Emission Factor (less control)				
 ✓ Energy audits internal / external. ✓ Use of an energy management system, e.g. ISO 50001 	Switch to clean energy sources through ✓ Power Purchase Agreements, ✓ Self Generation such as Rooftop Solar or ✓ through the purchase of Renewable Energy Certificates			

II. IDENTIFY GHG REDUCTION OPPORTUNITIES-3

3. Identify Mitigation Opportunities

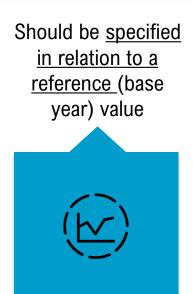


III. SET A GHG REDUCTION TARGET-1

GHG reduction target: A formal commitment to reduce GHG emissions from organizational activity.



Should be
Quantitative ie
specify the desired
amount of GHG
emission reduction





Should be time bound ie should specify when the target is going to be achieved

III. SET GHG REDUCTION TARGETS- 2

Consideration 1: Type of Target

ABSOLUTE EMISSIONS TARGET	EMISSIONS INTENSITY TARGET		
	PHYSICAL INTENSITY TARGET	ECONOMIC INTENSITY TARGET	
PROs: Demonstrates strong ambition and ensures an absolute quantitative reduction in emissions	PROs: Reflects GHG performance and efficiency improvements independent of business growth/ decline		
CONs: Does not allow comparison amongst peers. Do not necessarily track efficiency improvements, as reported reductions can result from declines in production output, rather than improvements in performance.	CONs: Intensity targets do not necessarily lead to reductions in absolute emissions. This is because increases in business output can cause absolute emissions to rise even if efficiency improves on a per unit basis		
Example: Scope 1: 1000 MTCO2e emitted as a result of 2000 Tonnes of production of cement in 2019	Example: Scope 1: 0.5 MTCO2e/ Tonne. This is calculated as 2000 MTCO2e/ 2000 Tonnes of Cement in 2019		

III. SET GHG REDUCTION TARGETS-3

Consideration 2: Identify scope of emission target: Scope 1 & Scope 2

Consideration 3: Identify targets for 3 timeframes



SHORT TERM

Immediate
Opportunities of
emission reduction



MEDIUM TERM

Not feasible at present but should be considered as part of the target



LONG TERM

Roadmap for carbon neutrality in 2050 as per IPCC 1.5 / 2°C scenarios

III. SET GHG REDUCTION TARGETS- 4



Energy Consumption/ Efficiency- scope 1 or 2

Renewable Energy/ Clean Energy





Process Emissions/ Fugitive emissions



Science Based Targets (SBT)

Definition	1.5C Target	2C Target	Why SBT?
Emission reduction targets for companies aligned with the global commitment to limit global warming to 1.5 or 2C, as prescribed by the IPCC	A 50% reduction between 2018 and 2030 = 4.2% annual linear reduction	A 30% reduction between 2018 and 2030 = 2.5% annual linear reduction	 ✓ Reduce regulatory uncertainty ✓ Meet shifting procurement requirements by corporate buyers ✓ Improve cost-efficiency and competitiveness.

QUESTIONS & ANWERS



CLOSING REMARKS

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THANK YOU

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