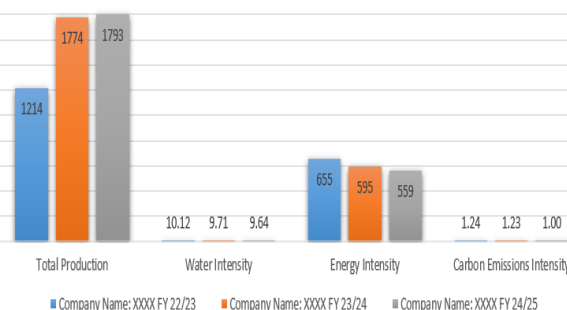


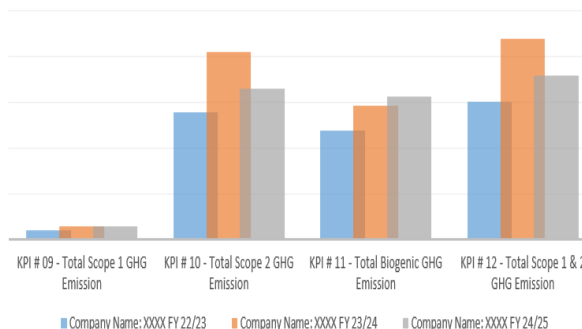
HOW TO CALCULATE GHG & ENERGY CONSUMPTION

1	Broad Details of the Facility				
1	Name of the Company	XXXX			
II	Details of KPIs				
Sl. #	Name of the Environmental KPI of ESG	Reporting Unit	Company Name: XXXX		
			FY 22/23	FY 23/24	FY 24/25
1	KPI # 01 - Quantity of Industrial Water In	in KL	12287	17223	17281
2	KPI # 02 - Quantity of Industrial Hazardous	in MT			
3	KPI # 03 - Quantity of Industrial Bio-Media	in MT			
4	KPI # 04 - Quantity of Industrial Renewab	in TJ	10.49	12.89	13.70
5	KPI # 05 - Quantity of Industrial Non-Ren	in TJ	1.45	1.93	1.88
6	KPI # 06 - Quantity of Grid Energy Consum	in TJ	7.07	10.37	8.35
7	KPI # 07 - Total Quantity of Energy Used	in TJ	19.00	25.20	23.93
8	KPI # 08 - Percentage of Renewable Energ	in %	55%	51%	57%
9	KPI # 09 - Total Scope 1 GHG Emission	in MT of CO ₂ eqv.	108.59	145.16	140.95
10	KPI # 10 - Total Scope 2 GHG Emission	in MT of CO ₂ eqv.	1394.20	2045.17	1647.08
11	KPI # 11 - Total Biogenic GHG Emission	in MT of CO ₂ eqv.	1194.96	1469.15	1561.53
12	KPI # 12 - Total Scope 1 & 2 GHG Emissio	in MT of CO ₂ eqv.	1502.80	2190.33	1788.02
Analysis					
13	Total Production	Mn Production	1214	1774	1793
14	Water Intensity	KL/Mn Production	10.12	9.71	9.64
15	Energy Intensity	MTOE/Mn Production	655	595	559
16	Carbon Emissions Intensity	MT of CO ₂ eqv/Mn Production	1.24	1.23	1.00
17	Hazardous Waste- Reuse	in MT			
18	Hazardous Waste- Recycling	in MT			
19	Non-hazardous Waste- Reuse	in MT			
20	Non-hazardous Waste- Recycling	in MT			

KPI Analysis FOR FY 22-23, 23-24, 24-25



GHG KPI FOR FY 22-23, 23-24, 24-25



Prepared by:

ECOVERIX SOLUTIONS PRIVATE LIMITED.

1 ENVIRONMENTAL KPI FOR ESG

I	Broad Details of the Facility	
1	Name of the Company	XXXX

II	Details of KPIs				
Sl. #	Name of the Environmental KPI for ESG	Reporting Unit	Company Name: XXXX		
			FY 22/23	FY 23/24	FY 24/25
1	KPI # 01 - Quantity of Industrial Water Intake	in KL	12287	17223	17281
2	KPI # 02 - Quantity of Industrial Hazardous Waste Disposed Off	in MT			
3	KPI # 03 - Quantity of Industrial Bio-Medical Waste (BMW) Disposed Off	in MT			
4	KPI # 04 - Quantity of Industrial Renewable Energy Generated	in TJ	10.49	12.89	13.70
5	KPI # 05 - Quantity of Industrial Non-Renewable Energy Generated	in TJ	1.45	1.93	1.88
6	KPI # 06 - Quantity of Grid Energy Consumed	in TJ	7.07	10.37	8.35
7	KPI # 07 - Total Quantity of Energy Used	in TJ	19.00	25.20	23.93
8	KPI # 08 - Percentage of Renewable Energy over Total Energy	in %	55%	51%	57%
9	KPI # 09 - Total Scope 1 GHG Emission	in MT of CO ₂ eqv.	108.59	145.16	140.95
10	KPI # 10 - Total Scope 2 GHG Emission	in MT of CO ₂ eqv.	1394.20	2045.17	1647.08
11	KPI # 11 - Total Biogenic GHG Emission	in MT of CO ₂ eqv.	1194.96	1469.15	1561.53
12	KPI # 12 - Total Scope 1 & 2 GHG Emission	in MT of CO ₂ eqv.	1502.80	2190.33	1788.02
Analysis					
13	Total Production	Mn Production	1214	1774	1793
14	Water Intensity	KL/Mn Production	10.12	9.71	9.64
15	Energy Intensity	MTOE/Mn Production	655	595	559
16	Carbon Emissions Intensity	MT of CO ₂ eqv/Mn Production	1.24	1.23	1.00
17	Hazardous Waste- Reuse	in MT			
18	Hazardous Waste- Recycling	in MT			
19	Non-hazardous Waste- Reuse	in MT			
20	Non-hazardous Waste- Recycling	in MT			

2 GHG & ENERGY CALCULATION

Calculation of Energy & GHG Emission

A	Broad Details of the Company				
1	Name of the Company:	XXXX			
2	Company Address:	XXXX			

B	Details of KPIs				
Sl. #	Month	Reporting Unit	Company Name: XXXX		
			FY 22/23	FY 23/24	FY 24/25
4	KPI # 04 - Quantity of Renewable Energy Generated				
4.01	Groundnut Pellet	in Kgs.	626186	769868	818278
		CV in (Kcal/Kg)	4000	4000	4000
		Conversion (Kcal to TJ) Multiply by	4.1868E-09	4.1868E-09	4.1868E-09
		Source	6	6	6
		Annex, if any	6	6	6
		in TJ	10.487	12.893	13.704
4.02	Briquette	in Kgs.	0.00	0.00	0.00
		CV in (Kcal/Kg)	3600	3600	3600
		Conversion (Kcal to TJ) Multiply by	4.1868E-09	4.1868E-09	4.1868E-09
		Source	5	5	5
		Annex, if any	5	5	5
		in TJ	0.000	0.000	0.000
4.03	Total Renewable Energy	in TJ	10.487	12.893	13.704
5	KPI # 05 - Quantity of Non-Renewable Energy Generated				
5.01	HSD	in Litres	40220	53762	52202
		Density (Kg/Ltr)	0.830	0.830	0.830
		in Kgs.	33382.600	44622.460	43327.660
		Net CV in (Kcal/Kg)	10350	10350	10350
		Conversion (Kcal to TJ) Multiply by	4.1868E-09	4.1868E-09	4.1868E-09
		Source	1	1	1
		Annex, if any	1	1	1
		in TJ	1.447	1.934	1.878
5.02	LDO	in Litres	0.000	0.000	0.000

		Density (Kg/Ltr)	0.910	0.910	0.910
		in Kgs.	0.000	0.000	0.000
		Net CV in (Kcal/Kg)	10200	10200	10200
		Conversion (Kcal to TJ) Multiply by	4.1868E-09	4.1868E-09	4.1868E-09
		Source	2	2	2
		Annex, if any	2	2	2
		in TJ	0.00000	0.00000	0.00000
5.03	Total Non-Renewable Energy	in TJ	1.447	1.934	1.878
6	KPI # 05 - Quantity of Grid Energy Consumed				
6.01	Total Grid Energy Units Consumed	in KWh	1963664	2880524	2319830
		Conversion (kWh to TJ) Multiply by	3.60E-06	3.60E-06	3.60E-06
		Source	7	7	7
		Annex, if any	7	7	7
		Total Energy in TJ	7.069	10.370	8.351
7	KPI # 07 - Quantity of Energy Consumed (Renewable+Non-Renewable)	Total Energy in TJ	19.003	25.197	23.933
8	KPI # 08 - Quantity of Scope 1 GHG Emission				
8.01	GHG Emission due to consumption of Groundnut Pellet	Energy Generated in mmBtu	9939.626	12220.327	12988.757
		Conversion to MT of CO2 eqv./mmBtu	0.1202216	0.1202216	0.1202216
		Source	-	-	-
		Annex, if any	-	-	-
		in MT of CO2 eqv.	1194.958	1469.147	1561.529
8.02	GHG Emission due to consumption of Briquette	Energy Generated in mmBtu	0.000	0.000	0.000
		Conversion to MT of CO2 eqv./mmBtu	0.1202216	0.1202216	0.1202216
		Source			
		Annex, if any			
		in MT of CO2 eqv.	0.000	0.000	0.000
8.03	Scope 1 GHG Emission due to consumption of HSD	Fuel consumed in liters	40220.000	53762.000	52202.000
		Conversion to MT of CO2 eqv./Ltr	0.0027	0.0027	0.0027
		Source			
		Annex, if any			
		in MT of CO2 eqv.	108.594	145.157	140.945

8.04	Scope 1 GHG Emission due to consumption of LDO	Energy Generated in TJ	0.000	0.000	0.000
		Conversion to MT of CO2 eqv./TJ	0.00275	0.00275	0.00275
		Source			
		Annex, if any			
		in MT of CO2 eqv.	0.000	0.000	0.000
8.05	Total of Scope 1 GHG Emission	in MT of CO2 eqv.	108.594	145.157	140.945
9	KPI # 09 - Quantity of Scope 2 GHG Emission				
9.01	Scope 2 GHG Emission on account of consumption of grid electricity	Energy Consumed in MWh	1963.664	2880.524	2319.830
		Conversion to (MT of CO2 eqv./MWh) Multiply by	0.71	0.71	0.71
		Source			
		Annex, if any			
		in MT of CO2 eqv.	1394.201	2045.172	1647.079
10	Total of Scope 1 and 2 GHG Emission	in MT of CO2 eqv.	1502.795	2190.329	1788.025
11	Total Biogenic Emissions	in MT of CO2 eqv.	1194.96	1469.15	1561.53

3 CALCULATION METHODOLOGY FOR INDUSTRIAL RENEWABLE ENERGY GENERATED (TJ)

This methodology outlines the steps for calculating industrial renewable energy generation in terajoules (TJ) from different renewable energy sources such as solar, wind, hydro, biomass, and geothermal.

1. Data Collection

Before starting the calculations, collect the following data:

- Energy generation data (from power meters, production logs, or energy reports).
- Type of renewable energy source (solar, wind, hydro, etc.).
- Unit of measurement (megawatt-hours (MWh), gigajoules (GJ), or kilowatt-hours (kWh)).

2. Conversion Factors

To convert energy data into terajoules (TJ), use the following conversion factors:

Energy Unit	Conversion to TJ
1 kWh	0.0000036 TJ
1 MWh	0.0036 TJ
1 GJ	0.001 TJ
1 PJ	1,000 TJ

3. Calculation Steps

Step 1: Identify the Energy Generated

Obtain the total energy generated from the industrial renewable sources over a given period (usually annual production).

Step 2: Convert Energy Units to TJ

Depending on the unit of energy data available, use the relevant conversion:

- **If energy is in MWh:**

$$\text{Energy (TJ)} = \text{Energy (MWh)} \times 0.0036$$

- **If energy is in GJ:**

$$\text{Energy (TJ)} = \text{Energy (GJ)} \div 1000$$

- **If energy is in kWh:**

$$\text{Energy (TJ)} = \text{Energy (kWh)} \times 0.0000036$$

4. Example Calculations

Example 1: Solar Power Plant

A solar power plant generates 600,000 MWh annually.

$$\text{Energy (TJ)} = 600,000 \times 0.0036 = 2,160 \text{ TJ}$$

Example 2: Biomass Energy Plant

A biomass plant produces 3,000,000 GJ annually.

$$\text{Energy (TJ)} = 3,000,000 \div 1000 = 3,000 \text{ TJ}$$

Example 3: Industrial Wind Farm

A wind farm generates 1,200,000 MWh per year.

$$\text{Energy (TJ)} = 1,200,000 \times 0.0036 = 4,320 \text{ TJ}$$

5. Summing Up Multiple Energy Sources

If an industry uses multiple renewable energy sources, sum up the TJ values from each source:

$$\text{Total Renewable Energy (TJ)} = \text{Solar TJ} + \text{Wind TJ} + \text{Biomass TJ} + \text{Hydro TJ} + \text{Geothermal TJ}$$

Example:

- Solar = 2,160 TJ
- Wind = 4,320 TJ
- Biomass = 3,000 TJ
- Total Renewable Energy = 2,160 + 4,320 + 3,000 = 9,480 TJ

4 CALCULATION METHODOLOGY FOR INDUSTRIAL NON-RENEWABLE ENERGY GENERATED (TJ)

Calculation Methodology for Industrial Non-Renewable Energy Generated (in Terajoules - TJ)

Non-renewable energy sources include **coal, natural gas, oil, and nuclear power**. In industries, these sources are used for electricity generation, heating, and production processes. The energy generated is usually calculated in **Terajoules (TJ)**, where:

$$1 \text{ TJ} = 10^{12} \text{ Joules}$$

Step-by-Step Calculation Methodology

Step 1: Identify the Non-Renewable Energy Source

Industries use different non-renewable fuels such as:

- **Coal** (measured in tonnes)
- **Natural Gas** (measured in cubic meters or MMBtu)
- **Crude Oil/Diesel** (measured in liters or barrels)
- **Nuclear Fuel** (measured in kilograms of uranium)

Each fuel type has a specific **energy content** (also called calorific value), which is used to convert the fuel quantity into **energy generated (TJ)**.

Step 2: Collect the Fuel Consumption Data

Obtain the actual fuel consumption for the industrial facility over a given period (**monthly, yearly**).

Example:

- **Coal consumption = 1,000 tonnes per year**

- **Natural gas consumption = 500,000 cubic meters per year**
- **Diesel consumption = 50,000 liters per year**

Step 3: Use Energy Conversion Factors

Multiply the amount of fuel consumed by its calorific value (energy content per unit).

Standard values are:

Fuel Type	Energy Content
Coal	24 GJ/tonne
Natural Gas	38 MJ/m ³ (or 38 GJ/1000m ³)
Diesel	43 GJ/1000 liters
Crude Oil	42 GJ/Barrel

Conversion to TJ:

1 GJ=0.001 TJ

Note: Ecoverix is introducing a **ready-to-use**
GHG Calculation Excel Sheet—a simple,
accurate, and efficient tool to help you:

Thanks!

Mr. Sonu Naval Jha (BEE Certified Energy Auditor)

Mr. Avneesh Pandey (Six Sigma Master Black Belt)

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