



Greenhouse Gas (GHG)

Mars Sportswear Ltd.

Plot # 15-16, Sector-1, Karnaphuli Export Processing Zone (KEPZ), North Patenga,
Chittagong, Bangladesh.



Report Prepared by: Green Tech Solutions



Date of Submission: January 24, 2017

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1.0 Overview

The GHG inventory estimates the GHG emission as CO₂ emitted by Mars Sportswear Ltd. From its utility sector. This factory is ready-made garment manufacturing industries situated Plot # 15-16, Sector-1, Kamaphuli Export Processing Zone (KEPZ), North Patenga, Chittagong, Bangladesh. This inventory is prepared as per the request of factory management as the factory is interested to qualify its annual CO₂ emission which will help them to incorporate carbon cost in decision making as well as to identify cost saving opportunities.

2.0 Scope & Boundaries

The annual GHZ emission is estimated in following scopes:

- **Scope 1:** The Direct emission from Stationary combustion sources are considered here.

Stationary combustion sources are given below:

Name of Unit	Types of Fuel Used
<input type="checkbox"/> Generator	Diesel
<input type="checkbox"/> Electricity	Purchased Electricity



- **Scope 2:** Indirect Emission from purchased electricity.
- **Scope 3:** Corporate Value Chain (if any)

Organizational Boundary: Total CO₂ emission is considered for the utility sector of Mars Sportswear Ltd. As the factory identifies that utility is the main and major source of their GHG Emission. In this inventory Scope 2 is not considered as no data has been obtained from the supply chain of the factory.

In this inventory 2 Greenhouse gases emission are considered and these are CO₂, CH₄, and N₂O. The Total GHG emission is considered for total electricity used by the factory in last one year. Fuel properties data (Net Calorific Value, Density) are unavailable at the factory, so some assumptions are done to estimate fuel properties.

3.0 Reporting Period

The annual GHZ Inventory is prepared for the year of January 2016 to December 2016, by collecting data. The data were collected on January 21, 2017.

4.0 Methodology

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The GHG inventory has prepared in accordance with "2006 IPCC Guidelines for National Greenhouse Gas Inventories for Stationary Combustion (Volume 2, Energy, Chapter 2)". The emission of Greenhouse gases is calculated by applying Tier 1 approach following IPCC 2006 guidelines.

5.0 Data Management

Serial No:	Month	Diesel Consumption (m ³)	Electricity Consumption (KWH)
1	January, 2016	0.092	61740
2	February, 2016	0.339	63492
3	March, 2016	0.283	67680
4	April, 2016	0.178	88392
5	May, 2016	0.258	54924
6	June, 2016	0.107	69696
7	July, 2016	0.070	71100
8	August, 2016	0.180	80304
9	September, 2016	0.135	77412
10	October, 2016	0.113	71412
11	November, 2016	0.107	81936
12	December, 2016	0.108	72912
Total Energy Consumption (January 2016 to December 2016)		1.97	8,61,000.00

6.0

Energy Consumption Data of January 2016 to December 2016.

Direct Emission:



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• In Case of Diesel:

CO₂ Emission	<p>For Diesel Consumption of 1.97 m³/year CO₂ Emission is = 5.290 ton/year</p> <p style="text-align: right;">[Reference 1,2 & 5]</p> <p><i>(Note: Natural Gas density is estimated to be 0.714 kg/m³, NCV Of NG as per IPCC 2006 V2, table 1.2 is 48 Tj / Gg which is equivalent to 48 MJ/kg)</i></p>
CH₄ Emission	<p>CH₄ Emission is 0.2134692 Kg CH₄ / year Now CH₄ Emission is Equivalent to Carbon-dioxide (CO₂e) using GWP 21 is =0.0002134692 ton CO₂/year.</p> <p style="text-align: right;">[Reference 1 & 3]</p>
N₂O Emission	<p>N₂O Emission is 0.04269384 Kg N₂O / Year</p> <p>Now N₂O Emission in Equivalent Carbon-dioxide (using CO₂ e) using GWP 310 is e = 0.00004269384 ton CO₂/year.</p> <p style="text-align: right;">[Reference 1 & 3]</p>
Total CO₂ e Emission	5.290 ton CO₂ / year

Indirect Emission:

From Electricity Consumption

Total CO₂e Emission = (8,61,000.00 KWH/year) x (495.175 ton CO₂ /KWH)
= 0.495175 ton CO₂ / MWH Per year



[Reference 4]

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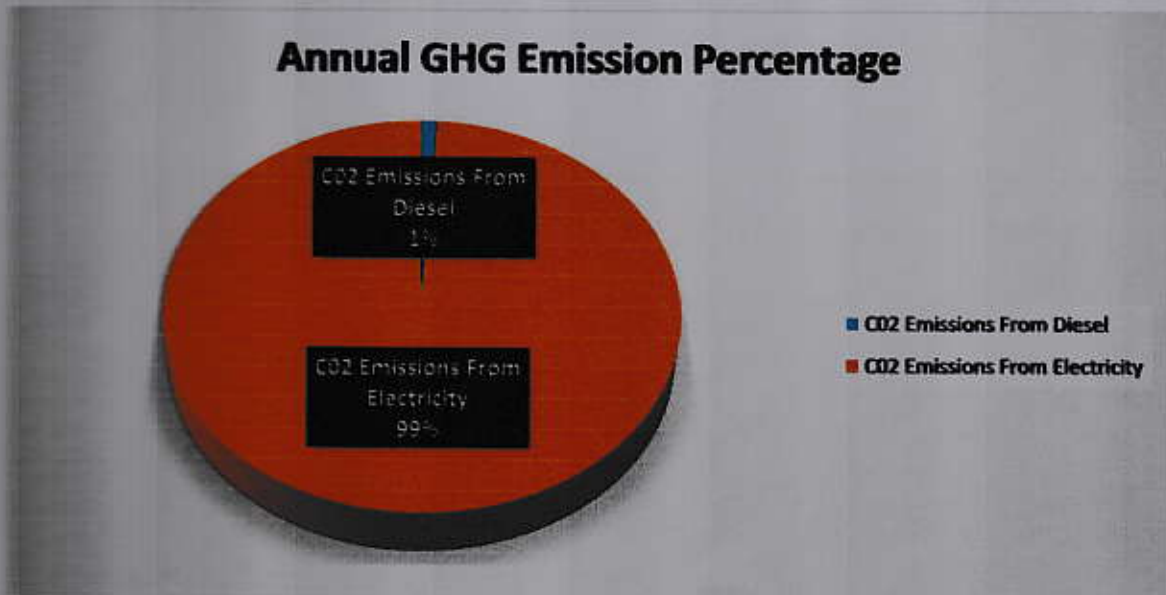


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TOTAL GHG EMISSION = CO₂e from Diesel + CO₂ emission from Electricity consumption
= (5.290+ 495.175) ton CO₂ / year.

=500.456 ton CO₂ / Year

Graphical Representation of results:



Comment:

From the GHG Inventory it has been observed that about 99 % CO₂e is emitted by indirect emission (Purchased Electricity) and CO₂e emission from indirect emission 1% from Diesel is negligible.

It is also found that the emission of CH₄ & N₂O is negligible comparing with CO₂ emission.



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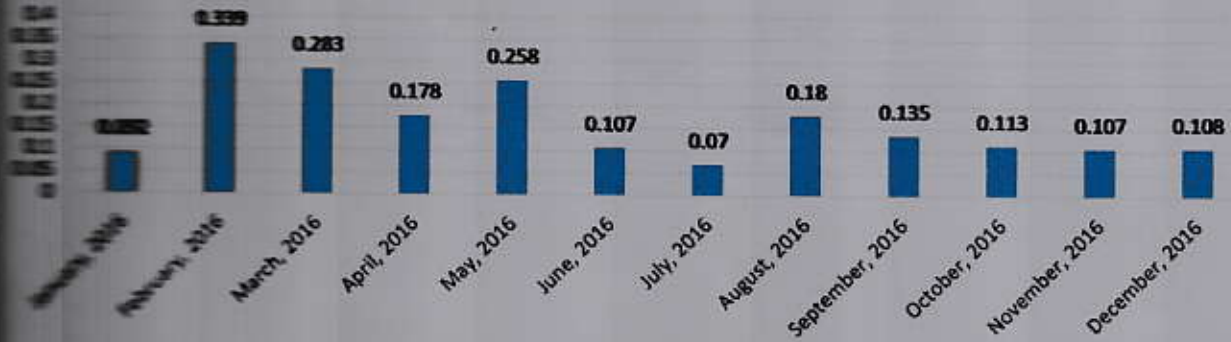
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Monthly Diesel Consumption in m3



Monthly Electricity Consumption (kWh)



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