# REPORT
# ON
# SUSTAINABLE DEVELOPMENT ACTIVITIES
# FOR THE YEAR 2013-14

AT

## M/s. BHARAT DYNAMICS LIMITED
**Kanchanbagh, Hyderabad-500058**

**SERVICE ORDER REF: SCO No 81400065 dt. 23-06-2014.**

By


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## ACKNOWLEDGEMENT

M/s. Centre of Plant Engineering Services, Secunderabad, places on record its sincere thanks to BDL Management for entrusting the work of Report Preparation of "Sustainable Development Activities" carried out at BDL for the year 2013-2014.

Continuation of Sustainable Development Activities including study of Carbon Emission by BDL has to be appreciated of its progressive management practices.

We are thankful to the keen interest and support at BDL, Kanchanbagh and all the concerned executives.

( Er. K.V.S. GUPTA)
Director – COPES

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# CONTENTS



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# SUSTAINABLE DEVELOPMENT

*"Sustainable Development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs"*

*The concept of sustainable development can be interpreted in many different ways, but at its core is an approach to development that looks to balance different, and often competing, needs against an awareness of the environmental, social and economic limitations we face as a society.*

*Often, development is driven by one particular need, without fully considering the wider or future impacts. Living within our environmental limits is one of the central principles of sustainable development. One implication of not doing so is climate change.*

*But the focus of sustainable development is far broader than just the environment. It's also about ensuring a strong, healthy and just society. This means meeting the diverse needs of all people in existing and future communities, promoting personal well being, social cohesion and inclusion, and creating equal opportunity.*

**Some of the more common examples of sustainable development practices are:**

***Solar and wind energy*** *: Energy from these resources is limitless, meaning we have the ability to eliminate dependence on non-renewable power sources by harnessing power from renewable resources.*

***Sustainable construction*** *: Homes, offices and other structures that incorporate recycled and renewable resources will be more energy efficient and stand the test of time.*

***Crop rotation*** *: Many farmers and gardeners are using this method as a chemical free way to reduce diseases in the soil and increase growth potential of their crops.*

***Water fixtures*** *: Water conservation is critical to sustainable development, and more products are available that use less water in the home, such as showers, toilets, dishwashers and laundry system.*

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# Sustainable Development Activities Taken Up By B D L

Sustainable development has become the national priority to channelize the development process in an environment friendly way with the optimum utilization of available natural resources. In its relentless pursuit of implementing sustainable development practices BDL has unleashed various programme to conserve energy thus reducing GHG emission.

I. As a part of this : (a) voltage optimization at substation to maintain the set value of 220 V irrespective of the incoming voltage, which results in energy savings up to 10-15% while maintaining the same illumination level.

(b) The energy efficient lamps which contain little mercury and have long life were installed by replacing the existing 400 Watts high bay MVHP with 250 Watt high bay MVHP.

(c) More energy efficient BEE star rated fans – 330 No's of were installed by replacing the existing ceiling and pedestal fans.

(d) Installed occupancy sensor systems with group controlling. With this sensor whenever no occupancy detected, part of lighting shall be switched off.

(e) Energy in efficient condenser & pumps were replaced with new energy efficient ones, along with fouled / damaged condenser.

(f) The water softening system installed for the cooling and make up water circuit for A/C systems has enhanced heat transfer, thus the efficiency of the A/c plants improved.

II Rain harvesting pit of 50,000 litres capacity was dug to increase the ground water table

III. M/s. BDL also engaged an external agency to study the carbon emission at Kanchanbagh unit, in order to take steps to reduce Green House Gases.

As the environmental sustainability is one of the millennium development goals, for which our nation is committed to, in compliance to the national commitment, BDL is taking the measures like energy conservation, tree plantations and rain water harvesting on continuous basis with perceptible improvement in the ground water table, and striving for reduction in the carbon emission levels by adopting energy systems in terms of solar street lights etc.

As the implementation of sustainable development program is a continuous activity to attain the environmental sustainability, BDL may adopt sustainability as a way of life.

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# Energy Audit & Conservation

***INTRODUCTION***

Energy Conservation is the need of the hour to save fossil fuels and also to protect the environment. Govt of India under BEE (Bureau of Energy Efficiency) has formulated rules, regulation and guide lines for creating awareness, and also offers incentives to encourage industries, large consumer's etc. for implementation.

***METHODOLOGY***

M/s. BDL engaged an external expert agency to study their entire plant w.r.t. energy usage and submit an audit report where they can save / conserve energy to reduce their energy bills so that their specific energy cost to production value shall come down. Apart from saving in energy consumption, will also result in reduction of equivalent $CO_2$ emission to improve the global environment.

This year (2013-14) BDL has implemented the balance recommendations of energy audit. The summary is given in the following table as findings:

By implementing these energy Conservation recommendations, M/s. BDL Kanchanbagh was able to save about up to 4.10 Lakhs of electrical units annually an equivalent of $CO_2$ emissions savings up to 410 tones per annum.

(As per BEE, 1 kwh = 1 kg of $CO_2$ emission. The $CO_2$ emission factor for the sub bituminous coal 1.816T-CO2 / T of fuel)

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# FINDINGS

| Sl.No. | Brief Description | Annual KWH savings achieved | Equivalent $CO_2$ Emission Save in Kg |
|---|---|---|---|
| 1 | Voltage optimizations for saving energy in lighting circuits | 108900 | 108900 |
| 2 | Replaced existing 250 watt high bay MVHP with energy efficient 150W MH | 5660 | 5660 |
| 3 | Replaced existing 400 watt high bay MVHP with energy efficient 250W MH | 39846 | 39846 |
| 4 | Replaced the existing inefficient fan with energy efficient fans | 32687 | 32687 |
| 5 | Provided automatic controls for toilets and corridors lighting | 20340 | 20340 |
| 6 | Replacement of existing inefficient condensers along with water pumps in SSIII | 202345 | 202345 |
| 7 | Providing dedicated R.O. system for the cooling and make up water circuit for A/C systems. | --- | --- |
| 8 | Kg's of $CO_2$ gas emission saving | 4,09,778 | 409,778 |

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# RAIN WATER HARVESTING PIT

Water is one of the most important elements on earth. Population growth coupled with industrialization and urbanization has resulted in an increasing demand for water thus leading to water crisis and serious consequences on the environment. Rapid industrialization has led to the industrial effluents and sewage, resulting in water pollution which leads to water crisis in India and all over the world.

## RAIN WATER HARVESTING TO AUGMENT GROUND WATER RESOURCES

Rain water harvesting is the technique of collection and storage of rain water at surface or in sub-surface aquifers, before it is lost as surface run-off. The augmented resource can be harvested in the time of need. Artificial recharge to the ground water is a process by which the ground water reservoir is augmented at rate exceeding that under natural conditions of replenishment.

## METHODOLOGY

BDL constructed a rain water harvesting pit of 5m x 5m x 2m in its premises as a part of its commitment to sustainable development. The capacity of pit is 50,000 liters.

## FINDINGS

The ground water table which used to be 90 feet level during 2001 has dropped down to around 300 feet. Immediate impact of these harvesting structures, there is marked improvement in ground water table which rose to, at around 100 feet presently.

The rain water harvesting structures have directly influenced and improved the water table levels.

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5m X 5m Rain Harvesting Pit behind transport (Corner of EP shop)

## CARBON FOOT PRINT STUDY

### Introduction

Carbon footprint is a synonym for emission of carbon dioxide or other greenhouse gases (GHGs) expressed in carbon dioxide equivalents. This has been used as an environmental indicator to understand and quantify the main emission sources and it constitutes as an effective tool for energy and environment management.

Carbon foot-print is the measure of the global warming impact of any activity causing emission of (Green House gasses) GHGs which are defined in the Kyoto protocol. The carbon foot print is measured in terms of TONNES OF CO2 equivalent.

### METHODOLOGY

BDL wanted to undertake assessment of carbon footprints study on a pilot basis for their Kanchanbagh Unit and entrusted study of the carbon emission to M/s. SIRI ENERGY & CARBON ADVISORY SERVICES (P) Ltd., Hyderabad -500 035.

### APPROACH

The GHG accounting and reporting approach undertaken in this study follows the guidance and principles set out in the "Greenhouse Gas Protocol Corporate Accounting and Reporting Standard" (here after referred to as the GHG Protocol) developed by the Greenhouse Gas Protocol Initiative. This is the most widely used and accepted methodology for conducting corporate carbon footprints.

The GHG Protocol requires emissions to be reported against the three different "scopes" described below:

Scope 1: Direct emissions from sources that are owned or controlled by the company (e.g. emissions from combustion of fuels in boilers, furnaces and turbines)
Scope 2: Indirect emissions associated with the generation of purchased electricity consumed by the company.
Scope 3: All other indirect emissions as a consequences of the activities of the company that occur from sources neither owned nor controlled by the company (e.g. out-sourced distribution).

***(Note: Emissions covered under Scopes 1 and 2 are mandatory for reporting, while Scope 3 emissions can be reported on a voluntary basis and are omitted in the present case.)***

## FINDINGS

**GHG Emissions of Scope – 1**

In the present case the direct emissions are from the following activities at BDL.
a) Emissions from DG set operation for self generation during power cut periods.
b) LPG consumption in Canteen.

Based on the Diesel consumption & LPG by above activities, the carbon foot print from source 1 activities are as follows:

| Sl.No. | Activity | Year 2012-13 | | | |
|---|---|---|---|---|---|
| | | Consumption | Unit | GHG emissions $TCO_2$ / yr | % of GHG emissions |
| 3 | DG sets | 8.2 | KL/year | 22.47 | 36.95% |
| 4 | LPG | 12.84 | MT/Year | 38.33 | 63.05% |
| | Total | 19.9 | | 60.8 | 100% |

It is evident from the above that the LPG used in canteen alone accounts for almost 63% of GHG emissions under scope – 1 and DG sets 37% respectively.

GHG Emissions of Scope – 2

1. Scope 2 emissions are indirect GHG emissions resulting from the generation of electricity , heating and cooling, or steam generated off site but purchased by the entity, and the transmission and distribution (T&D) losses associated with some purchased utilities (e.g., chilled water, steam, and high temperature hot water.

2. In the present case the indirect emissions are from purchased electricity.

| Sl.No. | Activity | Year 2012-13 | | |
|---|---|---|---|---|
| | | Consumption | Unit | GHG emissions $TCO_2$/yr |
| 1 | Purchased Electricity | 7738158 | kWh/year | 7583 |

**The total GHG emissions is 7643 (7583 + 60) $TCO_2$ per year**

It is evident from the above that the Scope – 2 accounts for almost 99% of GHG emissions and scope – 1 only 1 %.

The consultant also suggested the possible areas for carbon foot print reduction.

(1) Plantations.

(2) Implementation of Energy Conservation projects based on Energy Audit.

(3) Use of Solar Streets / Solar Power Generation etc.

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