



Confederation of Indian Industry



# Implementing Green Manufacturing through GreenCo Rating System

## Industrial Waste Management Association – 16<sup>th</sup> AGM

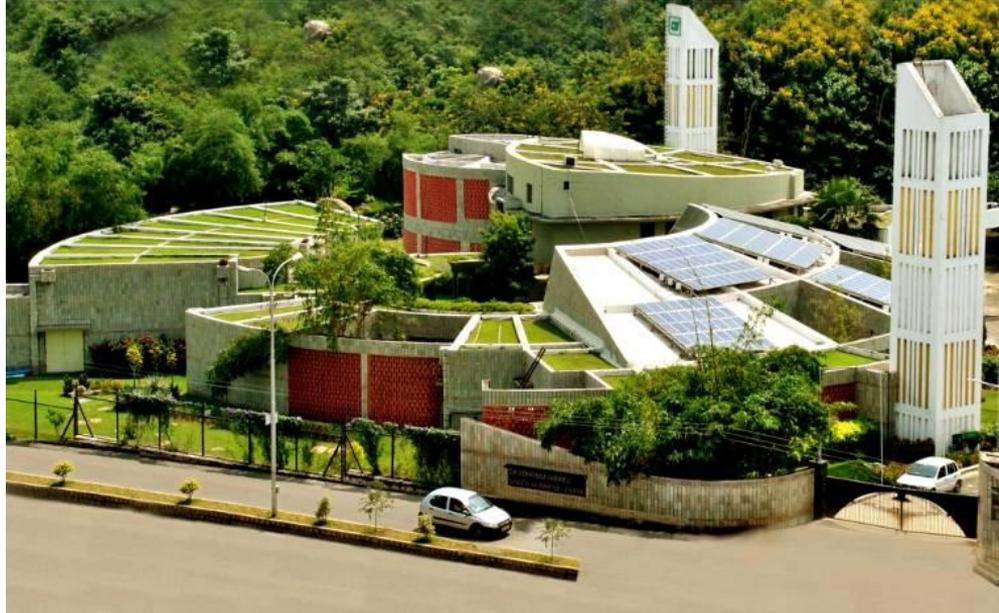
**15 September, 2018: Chennai**



How **Green** is your  
company?

# CII – Sohrabji Godrej Green Business Centre, Hyderabad

Unique activity of  
CII supported by the  
Government of  
Andhra Pradesh,  
USAID and Pirojsha  
Godrej Foundation



“Centre of Excellence”  
Energy, Environment,  
Green Buildings,  
Renewable energy,  
Water & Climate  
change activities in  
India



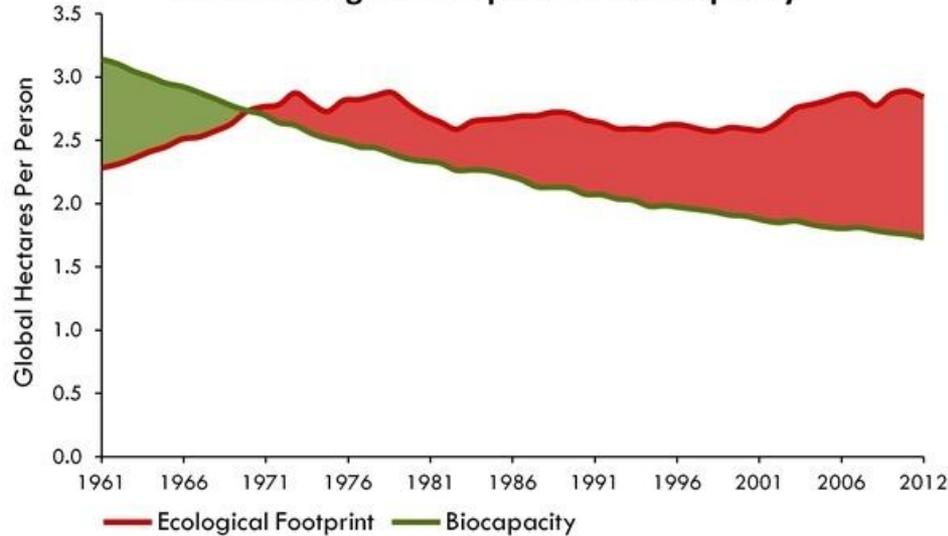


# BACKGROUND



# GLOBAL ECOLOGICAL FOOTPRINT & EARTH OVERSHOOT DAY

World Ecological Footprint and Biocapacity

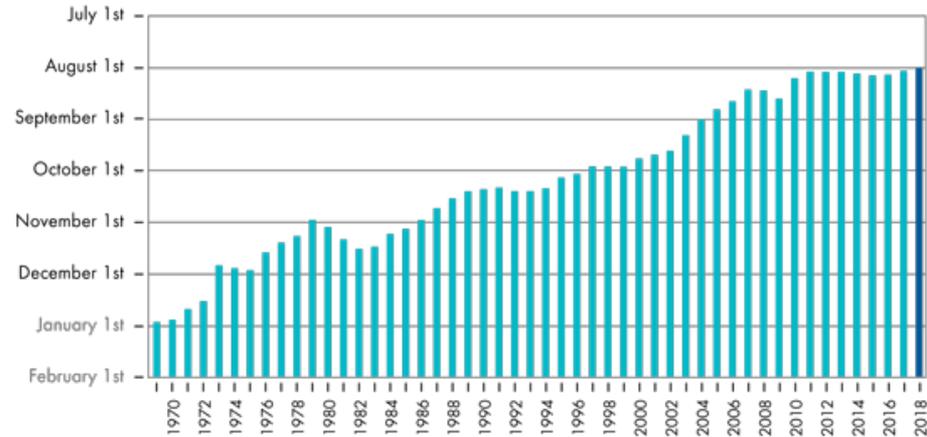


1 Earth

Earth Overshoot Day  
1969-2018



1.7 Earths



Source: Global Footprint Network National Footprint Accounts 2018



# UN - SUSTAINABLE DEVELOPMENT GOALS



# INDIA'S BIG STEP TOWARDS MANUFACTURING

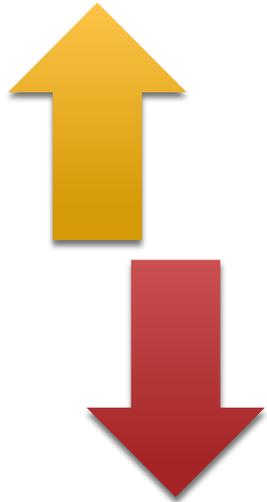
- ❖ **For India to achieve a Developed Country status**
  - ✦ **Need to maintain high GDP growth rates**
  - ✦ **Key - Growth of manufacturing sector**
- ❖ **Make in India – Aim**
  - ✦ **Increase share of manufacturing in the country's GDP from 16% to 25% by 2022 (stated in the National Manufacturing Policy)**
  - ✦ **India to be a global manufacturing hub**
  - ✦ **Create 100 million jobs by 2022**



# SOLUTION TO THE FLIPSIDE OF HIGHER GROWTH RATE

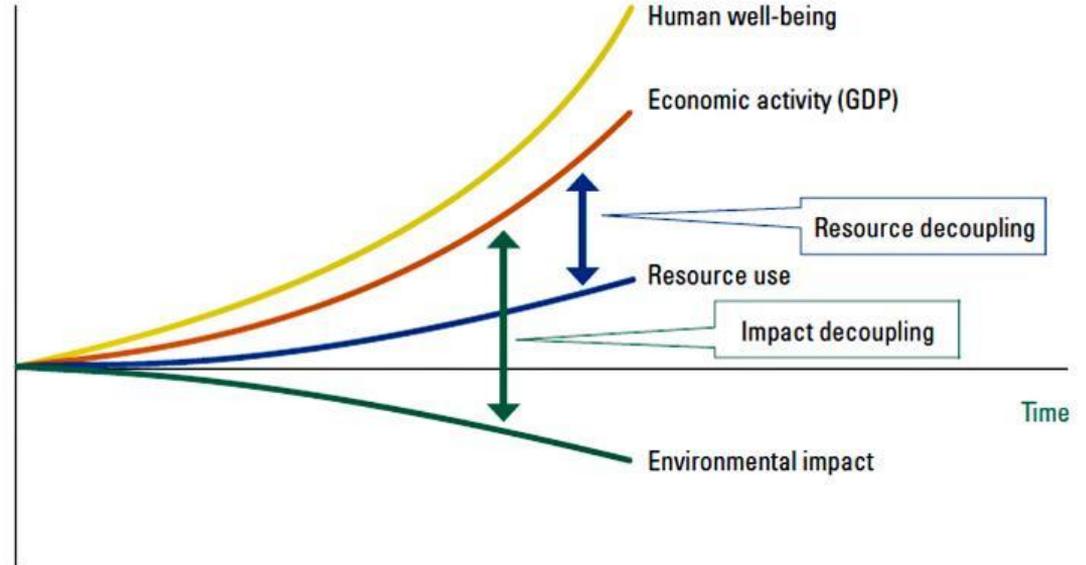
- **Flipside of higher growth rates**
  - ✦ **Increased use of natural resources**
    - » **Energy, Water, Material etc.**
  - ✦ **Increased emissions and discharges**
- **Solution**
  - ✦ **Focus on ecologically sustainable business growth**
    - » **Green Manufacturing**

# NEED OF THE HOUR



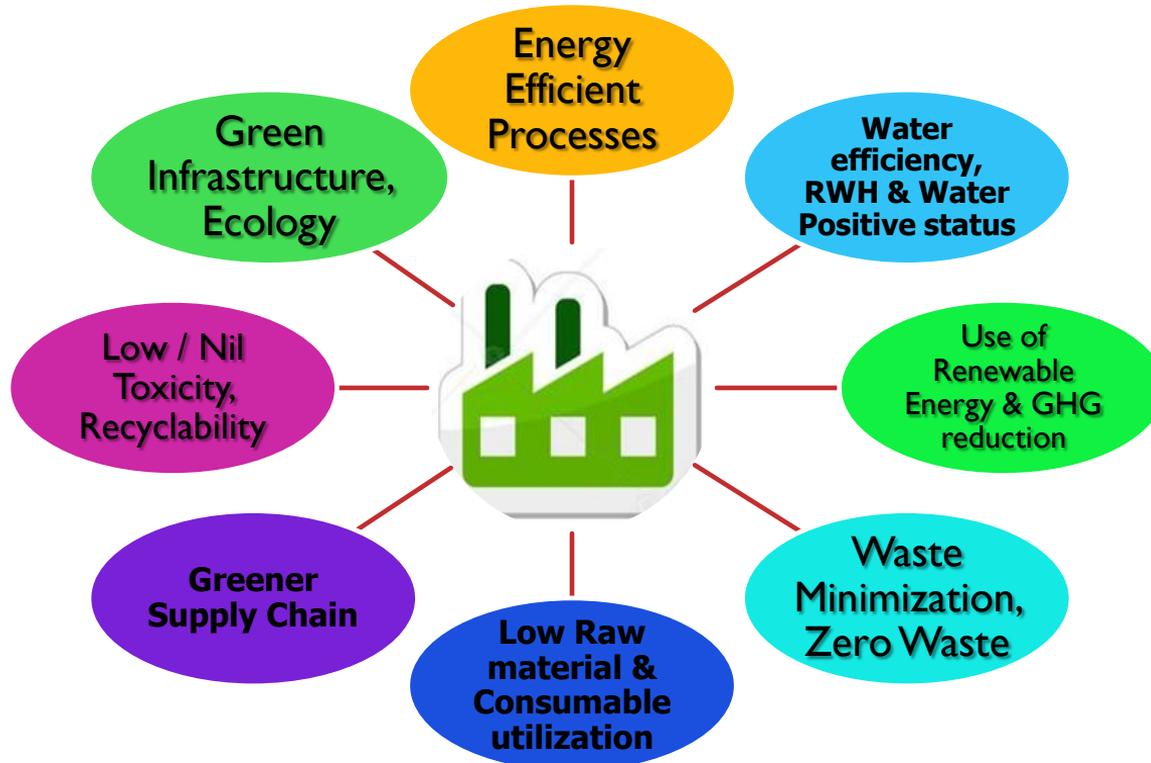
Improve  
Efficiency

Resource  
Intensity



from: [Decoupling Natural Resource Use and Environmental Impacts from Economic Growth](#)  
2011 UNEP International Resource Panel Report

# GREEN MANUFACTURING



# DRIVERS OF GREEN MANUFACTURING

**Efficiency improvement/  
reduced cost of  
ownership**

**Scarcity of resources/  
risk of rising prices**

**Environmental  
Legislation**

**Pressure from society/  
consumers/customers**

**Pressure from  
competitors**

# Development of GreenCo Rating System

**120 industry experts participated in the development**



**Launch of GreenCo Rating in 2011 by  
Mr. Suresh Prabhu**



# CII - GreenCo Rating System

- ❖ **Green Rating to assess Environmental performance of companies**
  - **Facilitate to achieve world class in 'Green'**
- ❖ **First of-its-kind in the world**
- ❖ **Excellent response from Industry – more than 450 + companies are working**
  - **198 Companies are certified**
- ❖ **GoI acknowledged in India's – 'Intended Nationally Determined Contribution' document to UNFCCC**



Dr Abdul Kalam addressing  
GreenCo Summit 2013



# Intent of GreenCo Rating

## ❖ Unit level

- More Competitive
- Green Image



## ❖ National level

- India should be globally competitive
- Exporter of Green Products and Services

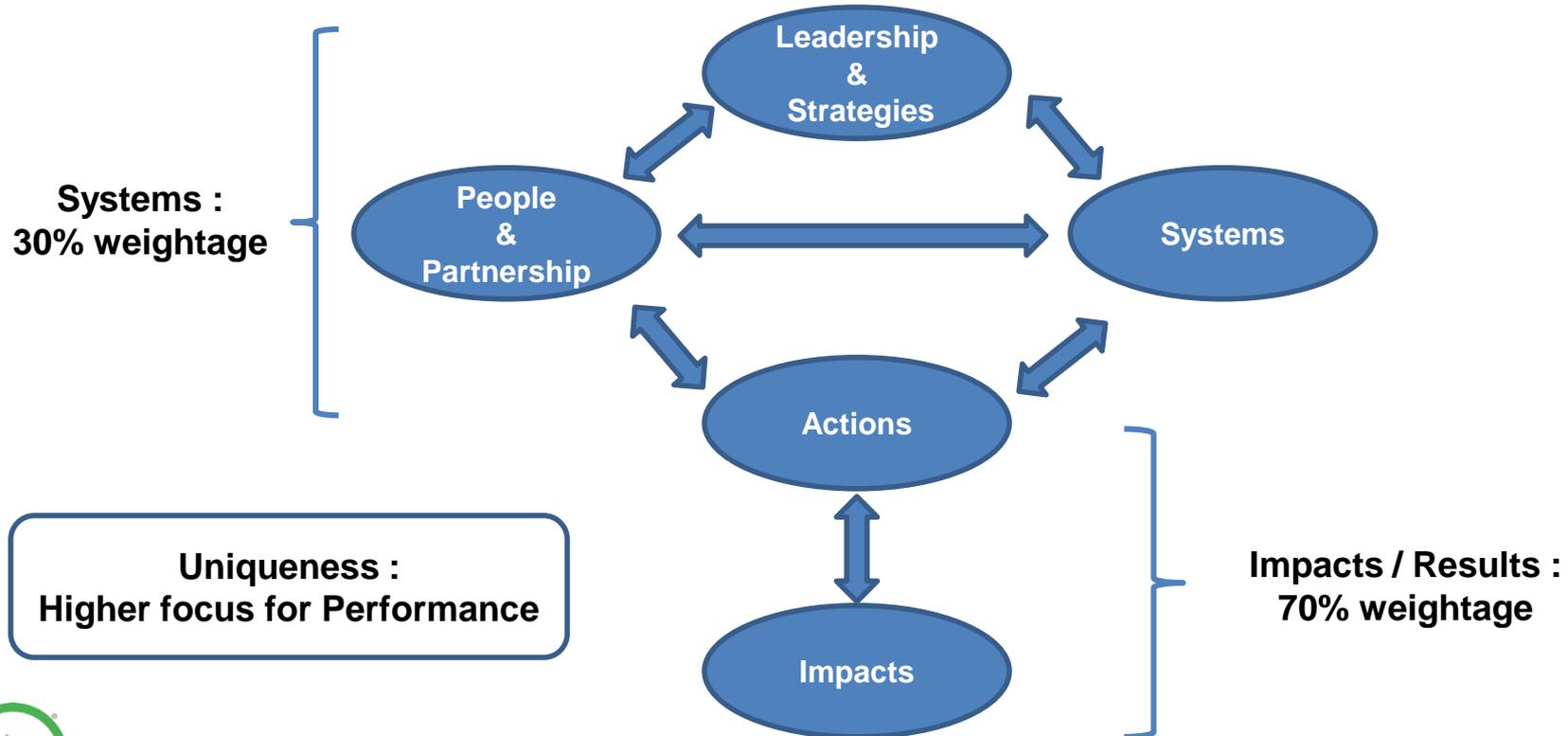
**Add value & Improve performance**

# GreenCo Rating Framework

S.No.	Parameters	Points
1	Energy Efficiency	150
2	Water Conservation	100
3	Renewable Energy	100
4	GHG Emissions	100
5	Waste Management	100
6	Material Conservation, Recycling & Recyclables	100
7	Green Supply Chain	100
8	Product Stewardship & Life Cycle Aspects	125
9	Innovation for Environment	50
10	Green Infrastructure & Ecology	75
	<b>Total</b>	<b>1000</b>



# GreenCo Rating System – Approach



# Levels of GreenCo Rating



## Exemplary Environment performance

- ❖ Resource Conservation
- ❖ Waste management
- ❖ GHG Emission Reduction
- ❖ Supply chain Management
- ❖ Product responsibility
- ❖ Product / Process /Packaging Optimization

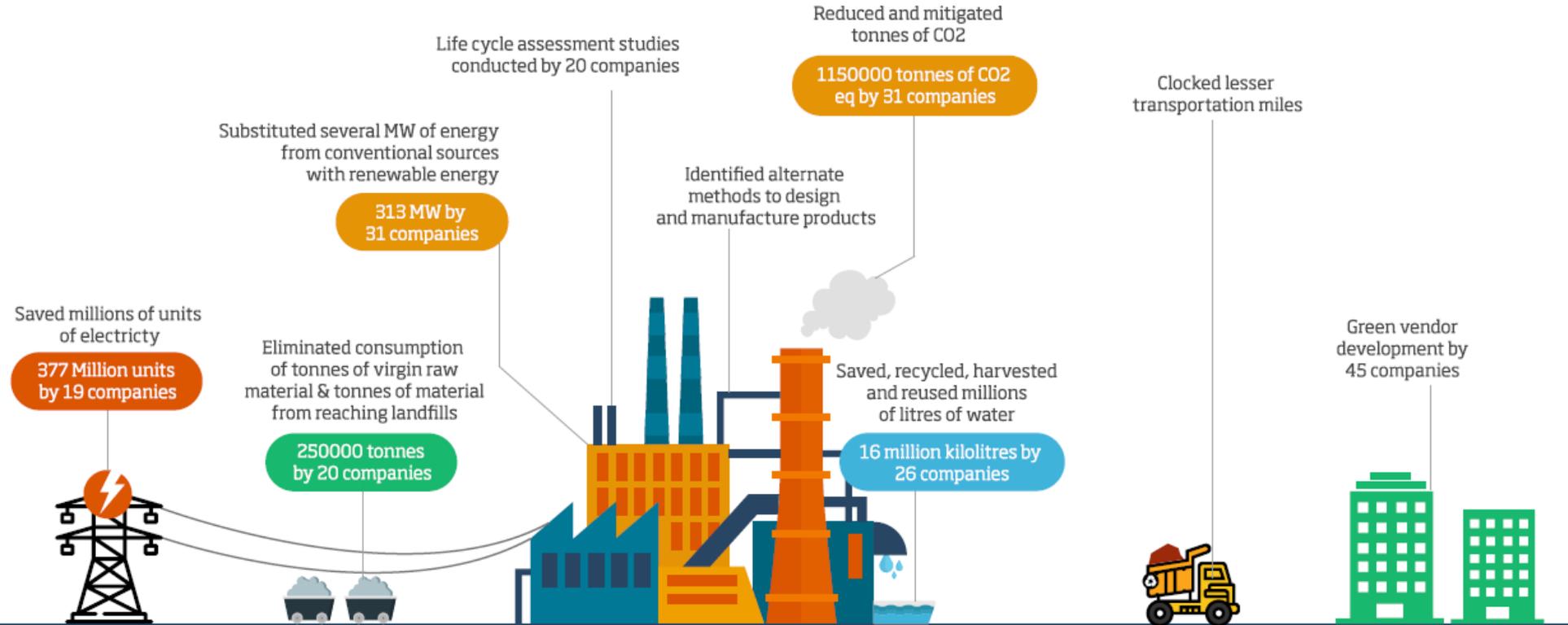
Meeting standards & requirements



# 198 GreenCo Rated Companies & More than 450 Companies working on GreenCo



# Green Makes Business Sense



**First 90 companies reported a recurring cost savings of 1710 Million Rupees**

# GreenCo for SMEs

- ❖ Corporates leading their suppliers / vendors in improving environmental efficiency
- ❖ Later extending to individual clusters



SMEs working on GreenCo Rating

Savings Scorecard by SMEs

In areas of GreenCo	Savings
Energy saved in Lakh kWh	4.8
Water saved in m3	1535
Rain water captured in m3	633
RE added in kW	643
GHG emission reduced tons of Co2 eq	527
Material saved in tons	169
Monetary benefits in Rs Lakhs	194

- 70 Registered SMEs
- 51 Rates SMEs



# INDIAN RAILWAYS SIGNING AN MOU WITH CII

## On Green Industry initiatives



**33 Railway Units are GreenCo Rated out of 50 Units working**



# GREENCO RATING

**GreenCo Rating in India's INDC**  
( Intended Nationally Determined Contributions)  
**Submitted to UNFCCC**



United Nations  
Framework Convention on  
Climate Change

**INDIA'S INTENDED NATIONALLY DETERMINED CONTRIBUTION:**  
WORKING TOWARDS CLIMATE JUSTICE

ॐ द्यौः शान्तिरन्तरिक्षं शान्तिः  
पृथिवी शान्तिरापः शान्तिरोपधम्यः शान्तिः ।

*"Om dyanh sãntir antariksam sãntih p̄thivī sãntih õpak sãntih esadhayah sãntih"*  
-- Yajur Veda 36.17

**India to reduce the CHG emission intensity of its GDP by 33 to 35 percent by 2030 from 2005 level**

6) GreenCo Rating System is first of its kind in the world which assesses companies on their environmental performance across 10 different parameters to help them develop a roadmap to improve further. Page # 19

## ACKNOWLEDGEMENTS

**UNIDO features GreenCo**  
in 50th anniversary publication



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION



**INDIA**  
**GRADING**  
**ON GREEN**

Part of developing countries such as India have the potential to grow their economies rapidly, provided they invest in energy-efficient technologies, adopt sustainable and responsible design, the development of moderately sustainable business growth models.



GREEN  
MANUFACTURING –  
MANAGEMENT  
COMMITMENT

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# GREEN MANUFACTURING

- **Strong commitment from top management for implementation**
  - ✦ **Policies**
  - ✦ **Process of target setting & review mechanism**
  - ✦ **Resource allocation**
- **Involvement of Employees**
  - ✦ **Training & Awareness**
  - ✦ **Suggestion Schemes**
- **Metering & Monitoring**
  - ✦ **Effective monitoring system**



# Tata Motors - GreenCo as a Performance Monitoring Tool



- GreenCo – *"The Environmental Standard"*
- Environmental targets for every unit is based on GreenCo



**Interplant comparisons and target setting**



# Energy Scorecard at Operator Level

Description	Name	Target	Actual
1. Melting Energy KWH/TON			
2. Consumption of Borings %			
3. Holding Energy KWH/TON			
4. Alloy Consumption %			
5. Metal Pigging %			
6. Production Delay %			
7. No. of Molds Poured/SHIFT			

 ENERGY SCORE CARD - SM 1000 (Month- Apr 17)		Parameters	Resp.	Target	Actual
		1	Energy Consumed (Kwh) :-	Ravi	-
2	RM Processed (MT) :-	Prashant	-	13.18	
3	Kwh/ MT :-	75	400	200	
4	Rejection Kgs/MT :-	75	50	443	
5	No. of Mold change (Hrs) :-	75	-	2	
6	Machine Break down (Hrs):-	Ravi	0	1	
7	Mold Break down (Hrs):-	Bipen	0	0	
8	Overall Equipment Efficiency (%):-	Prashant	86	75	

**Annual incentive based on Energy Score Card**

© Confederation of Indian Industry

# Equipment wise Efficiency Improvement

## ❖ Periodic Measurement of Equipment Performance

### ➤ Major Energy Intensive Equipment / Processes

❑ 80 - 20 Rule

### ➤ What are the systems followed ?

### ➤ Compare

❑ Operating efficiency Vs Design Efficiency

❑ Operating efficiency Vs Market efficiency

❑ E.g. kW/CFM, kW/TR, Eff of Pumps,

Effectiveness of CTs and HEx's etc.



# SHREE ASHTAVINAYAK GLASS PRIVATE LIMITED



- **Reduction in SEC by 30%**
- **225 kW Rooftop solar PV to generate 3,28,500 kwh/year**
- **Installation of biogas plant to generate 912 kg/year. Sewage slurry is directed to biogas.**
- **Installation of 20 biogas plant in nearby Village to generate 10950 kg / year**
- **Reuse of ETP sludge for brick manufacturing**
- **Greenhouse made of PET bottles to grow vegetables**
- **Material & Packing material reduction**





***These cost reduction measures contribute to profits amounting to ₹ 68 lakh year at SAG***



Create decorative/ innovative products from waste



Recycling wooden scrap for making Exports consignment

© Confederation of Indian Industry



Use of flucoolant for grinding

# KHUTALE ENGINEERING PRIVATE LIMITED, SATARA



- **Water Positive Unit through rain water harvesting system**
- **Reduction in SEC by 33%**
- **91% RE substitution through rooftop solar PV**
- **Inventorisation of Scope 1, Scope 2 & Scope 3 emissions**
- **Reduction in scrap powder generation by 80%**
- **Excellent synchronization of various processes**
- **Efforts to reduce material consumption**



# WATER CONSUMPTION

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# WATER CONSERVATION – WITHIN THE FENCE

## Reduce

- Map all water consuming sources and set targets
- Use of low flow fixtures, water efficient gardening

## Reuse

- Treat the waste water generated
- Reuse of treated water in the process

## Recharge

- Capture rain water harvesting to capture 100% of the potential
- Recharge rainwater to borewell or use it for application



Should be seen at par with Energy Efficiency



Industry should not be  
perceived as  
**competing**  
with society  
for  
WATER

# RENEWABLE ENERGY AND GHG EMISSION

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# EMERGING INNOVATIVE BUSINESS MODELS IN RE

- **3rd Party Purchase of Renewable Energy**
  - ✦ **No investment**
  - ✦ **Long term contract**
  - ✦ **Tariff – Less than electricity board in some cases**
  - ✦ **Green Power with reduced energy cost**



# USE OF RENEWABLE ENERGY



**Captive Solar PV Plant & Solar Roof Tops**



**Wind power captive & Procurement**



**Bio Mass gasification for thermal energy**



**CP Solar Thermal energy**



**Solar Wind Hybrid**



**Solar light Pipe**



ZERO WASTE AND  
RESOURCE  
CONSERVATION

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**REDUCE**  
**REUSE**  
**RECYCLE**

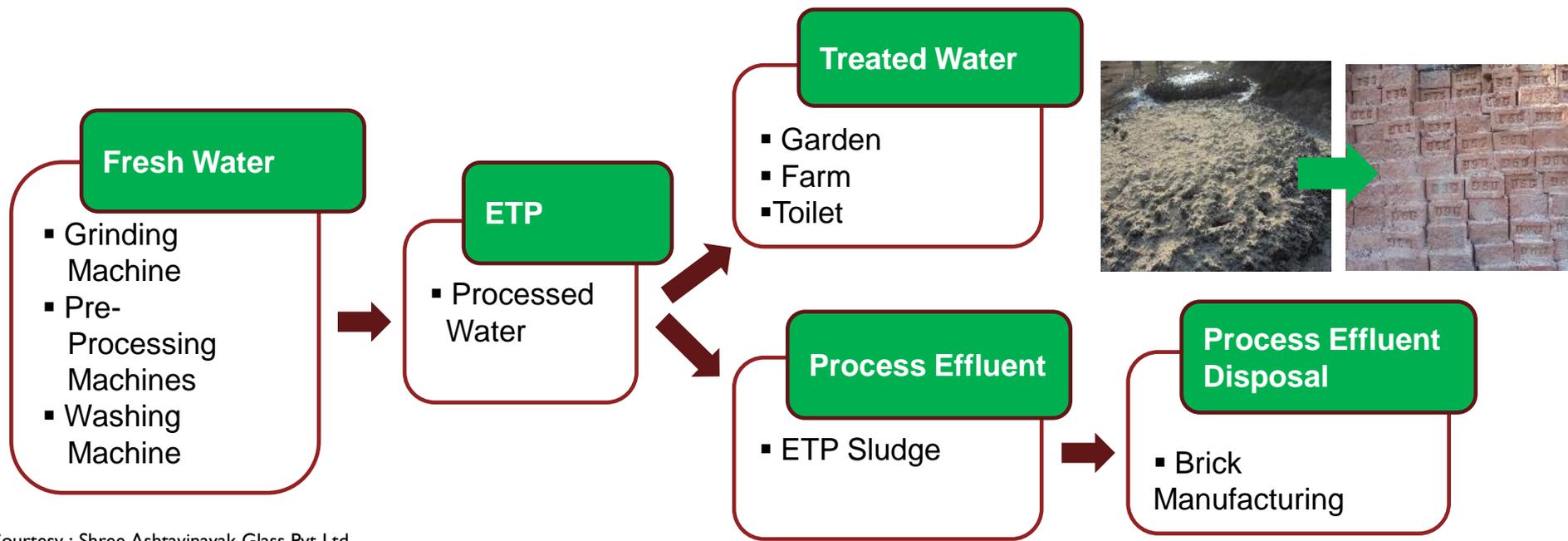
# WASTE MANAGEMENT & CONTROL AREA



Courtesy : Amber Enterprises  
Pvt Ltd., Ranjangaon

Journey from “Scrap Yard” to Waste Management & Control Area.

# SYSTEMATIC APPROACH TOWARDS ZERO WASTE TO LANDFILL



Courtesy : Shree Ashtavinayak Glass Pvt Ltd



# GREEN SUPPLY CHAIN

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# GREENING THE SUPPLY CHAIN

- **Why ?**

- **Good opportunity**
- **Improve operational efficiency & reduce costs**
- **Reduce environment impacts**



# GREENING SUPPLY CHAIN



Green Purchase Guidelines, TCO/LCC for capital goods purchase



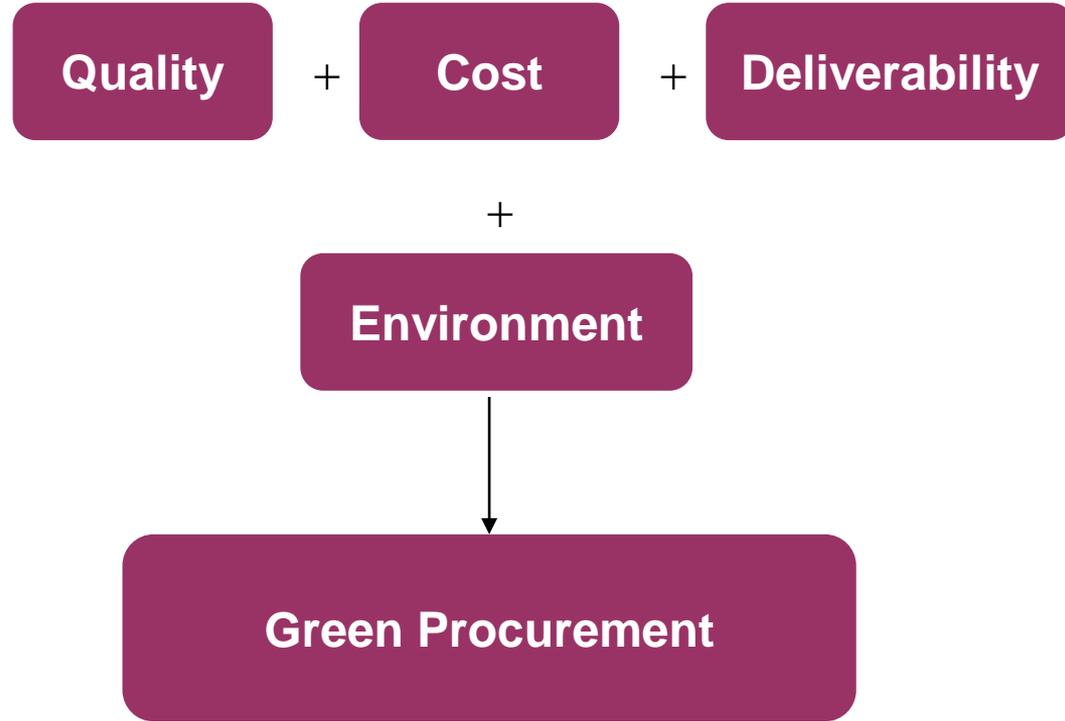
Transport optimization through milk run model, localization of suppliers



Environment as one of the key criteria in supplier selection

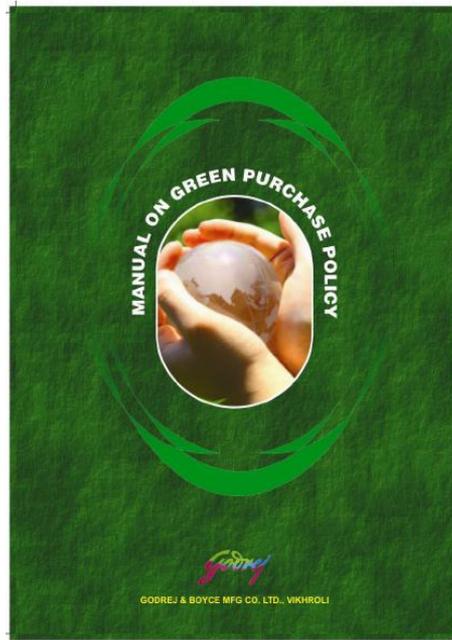
# Green Procurement

- ❖ Vendor selection
- ❖ Sustainable sourcing of raw materials
- ❖ LCC for procurement
  - Capital goods, maintenance consumables, packing materials, others

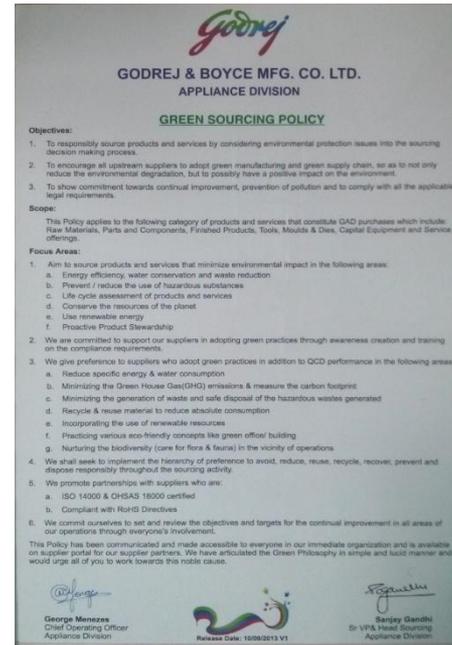


# Green Sourcing Policy

## Corporate Green Procurement Policy



## Divisional Green Sourcing Policy



# Criteria for Critical Vendors

Critical Vendor Selection Criteria					
S.No	Parameter	Performance			
1	Environmental performance	Good	1	Large scope for improvement	5
2	Quantity	Low	1	High	5
3	Alternative	Have alternative	1	No alternative	5
4	Distance	Long distance	1	Nearby	5

The screenshot shows an Excel spreadsheet with the following columns: S.No, Vendor, Environmental performance, Quantity/Alternative, Distance, Score, Selection, and One performance good. The 'Environmental performance' column is highlighted in green for vendors 1, 2, 3, 4, 5, and 6, indicating good performance.

The below Vendors with good environmental performance

1	Roquette Riddhi Siddhi pvt ltd
2	BASF India Ltd
3	Buckmann Laboratories
4	Nalco Water India Limited
5	SNF(India) Pvt. Limited
6	Apcotex India Limited



# Supplier Engagement

ROADMAP FOR GODREJ SUPPLIER CLUSTER																DELIVERABLES				
SMED Cellular manufacturing Multi-tasking								PRODUCTIVITY IMPROVEMENT						Reduction in c/o time Reduction in throughput Improvement in labour productivity						
CTQ mapping Concept of 100% inspection Quality Alert boards 7 QC tools + QC story CP/ CPk studies Poka Yoke Calibration SOP creation				QUALITY						Reduction in rework ( inprocess) Zero defects at customer end Measure cost of Poor Quality										
Mapping and monitoring efficiency of - Energy Water Waste				GREEN			Reduction in Energy consumption Reduction in Water consumption Reduction in all type of Waste													
Step 0 to 2			MY MACHINE				Breakdown reduction trend													
1S / 2S Red Tag campaign Fixed point photography Jogging track Safety			5 S			1S score worksheet Zero red tag items Before / after photos Boundary walls clear Department Safety Score (DSS), Frequency / Severity rate, No. of accident free days														
Time in Months :			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15			
Reduction Targets for Suppliers						Short				Medium				Long						
Energy, Water, Waste						5%				5%				3%						



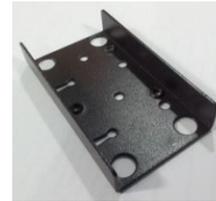
# Life Cycle Assessment by Godrej Locks

## ❖ LCA Study for Safe deposit Lock

- ❑ Electricity & Material major contributor to Environmental impacts
- ❑ Hot spot identified
  - Base Plate, Cover Plate, Bolt
- ❑ Converting from Brass to Steel
  - Environment impact reduction
  - Cost reduction 10%



Base Plate Sub assembly



Cover Plate



Bolt

# GREENCO RATING – AN EXCELLENT TOOL FOR GREENING INDUSTRY

**One single comprehensive tool to manage and excel in green performance**

**Identify priority areas**

**Significant enhancement in resource conservation and cost saving**

**Comparison of facilities**

**Prepares to meet future environmental regulations & mitigate future environmental risks**

**Aligns company towards the National Goal**

**An enhanced Green Image**

TODAY **'GOING GREEN'** IS NOT A CHOICE. IT IS  
NECESSITY FOR COMPETITIVENESS AND GLOBAL EXCELLENCE



**GreenCo Rating is an excellent framework catalyzing and  
promoting Green Industry growth in India**

# Way forward

- ❖ **Invite to be part of the GreenCo Movement & Register for the Rating**
- ❖ **Excellent Opportunity to become World Class Green Manufacturing unit Status**





For Further details; kindly contact:  
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Principal Counsellor  
CII – Godrej GBC

**THANK YOU!**

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[www.Greenco.in](http://www.Greenco.in)

