

A Presentation by



CH Four Energy Solutions
Pune



About CH Four

CH Four Energy under the able guidance and mentoring of our experts is dedicated to work for the GREEN environment worldwide. We offer you our expertise in the field of Waste Management (liquid or solid waste).

Since its inception in the year 2008 in Pune, CH Four has become one of the leading companies in providing Waste Management Solution to the private industries.

Our goal is not just to treat waste but to treat the waste in the most energy efficient and profitable way.



- ◉ Since inception in the year 2008 CH Four has become one of the leading company providing Waste Management Solution.

- ◉ In this short span of time CH Four has made its mark and worked with many of the reputed Business houses of India like
 - Tata Group
 - NTPC
 - Aditya Birla Group,
 - Vedanta Group,
 - Hindustan Unilever Limited
 - Ranbaxy Laboratories
 - Lavasa Corporation
 - Zameel Steels
 - WILO Pumps and many more.....

About CH Four's BUSINESS VERTICALS



- WtE Projects : Biogas Plant
- Sewage Treatment Plants : STP
- Effluent Treatment Plants : ETP
- Waste Water Treatment Plant - WWTP
- Environmental Consultancy and Services



SEWAGE TREATMENT PLANTS : STP

- Sewage water is often drained directly into nearby water body like rivers, lakes.
- Installing the Sewage Treatment Plant can save our natural water source from getting polluted
- And at the same time the treated water can be utilized for gardening/horticulture and flushing purposes, which in turn shall reduce the burden on fresh water consumption

CASE STUDY NTPC: SIPAT

- ◉ Spread in the area of 900 acres
- ◉ Having power generating capacity of 3600 MW
- ◉ We have studied and found out the power plants like this have toilet blocks that generates waste as low as 3 kl to 100 kl per day
- ◉ Connecting all the toilet blocks involves too much capital cost and sometimes due to critical topography is not even possible.
- ◉ Since most of these plants were centralized eventually many pockets were left with untreated sewage.

TECHNOLOGY OF OUR STP



CASE STUDY NTPC: SIPAT

- ◉ Since last few years because of more awareness and stringent norms from the pollution control board, people have been seeking the solutions.
- ◉ Having studied we found out that connecting any 2 toilet blocks having distance around 1 km would from cost Rs. 10 to 12 lacs
- ◉ In comparison a 3 kld plant would cost around Rs. 7 to 8 lacs
- ◉ Also more efficient utilization of treated water

3 KLD PLANT



10 KLD PLANT



75 KLD PLANT



FEATURES

- ◉ Area Required: A 75 KLD package plant required footprint area as low as **24 m²** only (conventional plant required 40 to 60 m²)
- ◉ Power Consumption : Approx. **85 units/day**
- ◉ Total Consumables cost: Approx. **100 Rs/day**
- ◉ Operation Cost: 1 operator can handle 2 plants in 1 km radius so operation cost for 1 plant turns out to be :
Rs. 7000/month or Rs. 230/day

Hence treatment cost turns out to be **Rs.13.5/kld**

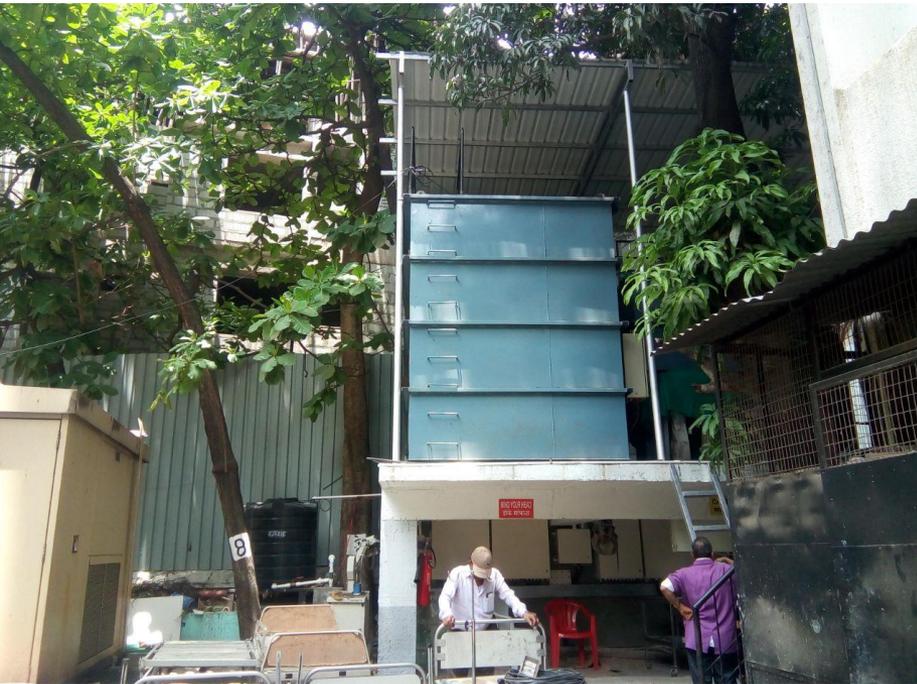
TREATED WATER QUALITY

<i>Parameters</i>	<i>Inlet</i>	<i>Outlet</i>
<i>SS</i>	400 mg/lit	< 50 mg/lit
<i>BOD</i>	300 mg/lit	< 20 mg/lit

PACKAGED SYSTEMS IN HOSPITAL

- ◉ As we all know that know as per the new guidelines from PCB, it is mandatory to have STP/ETP for Hospitals above 30 beds capacity
- ◉ The problem with most of the existing hospitals is that they are space constraint
- ◉ These plants are well suited to them as well
- ◉ As it requires very less civil work
- ◉ And generates noise as low as 60 db

HOSPITAL STP/ETP



HOSPITAL STP/ETP



Conclusion:

The Portable & Package Treatment Plants

- Can be ideally developed to cater capacity from 1 m³/day to 150 m³/day
- These plants are compact in size
- Minimum Civil work required
- Easy to relocate

ORGANIC

WASTE MANAGEMENT

Key FACTS

- MSW generation per capita in India ranges from approximately 0.17 kg per person per day to approximately 0.62 kg per person per day.

MSW composition in India



Source: National Solid Waste Association of India (NSWAI)

- Based on above data, an average Indian household generates 0.5 kg/day of biodegradable waste



Real Challenge

SEGREGATION



Waste after seareaction



MSW in any Residential Complex

1) SOURCE of MSW:

Hotels/Restaurants
Residential Quarters
Offices

2) APPROACH

Segregation at source by providing separate dustbins for wet waste and dry waste



Collection



Treatment



why **BIOGAS** Plant

- 1) Disposal as well as Recovery of energy in the form of Biogas
 - It can be used for Cooking Purpose in Industrial Canteen
 - It can be used for electricity Generation



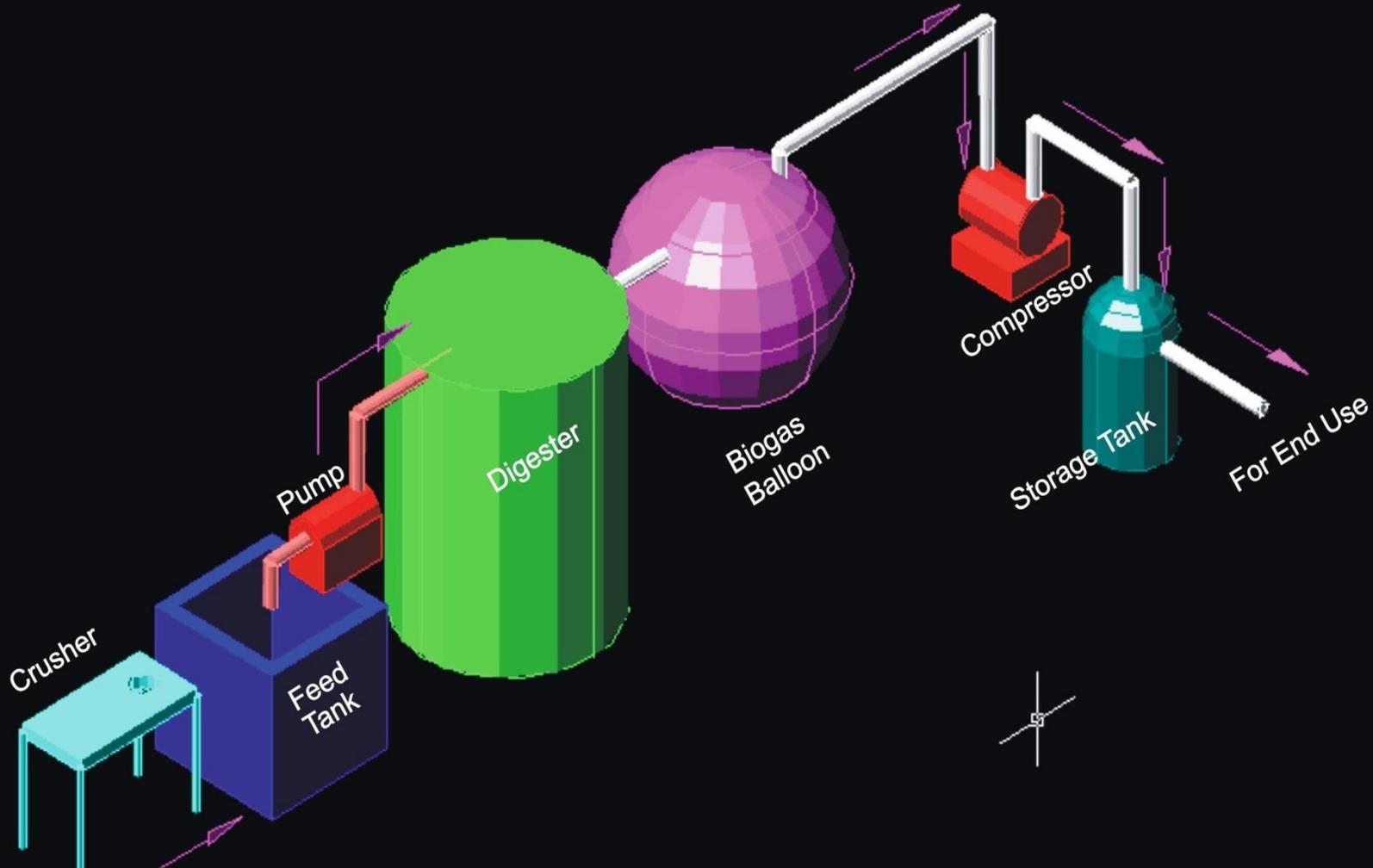
Biogas Plant for Organic Waste Management

- ◉ Biogas can be produced from any type of food waste/kitchen waste/municipal solid waste (organic waste only)
- ◉ It reduces the impact of green house gases and contribute in the cleaner and greener vicinity
- ◉ Reduces the impact of odour generated due to organic waste dumped in the open.
- ◉ Low power consumption.
- ◉ Less noise generation.
- ◉ Smokeless combustion of gas.

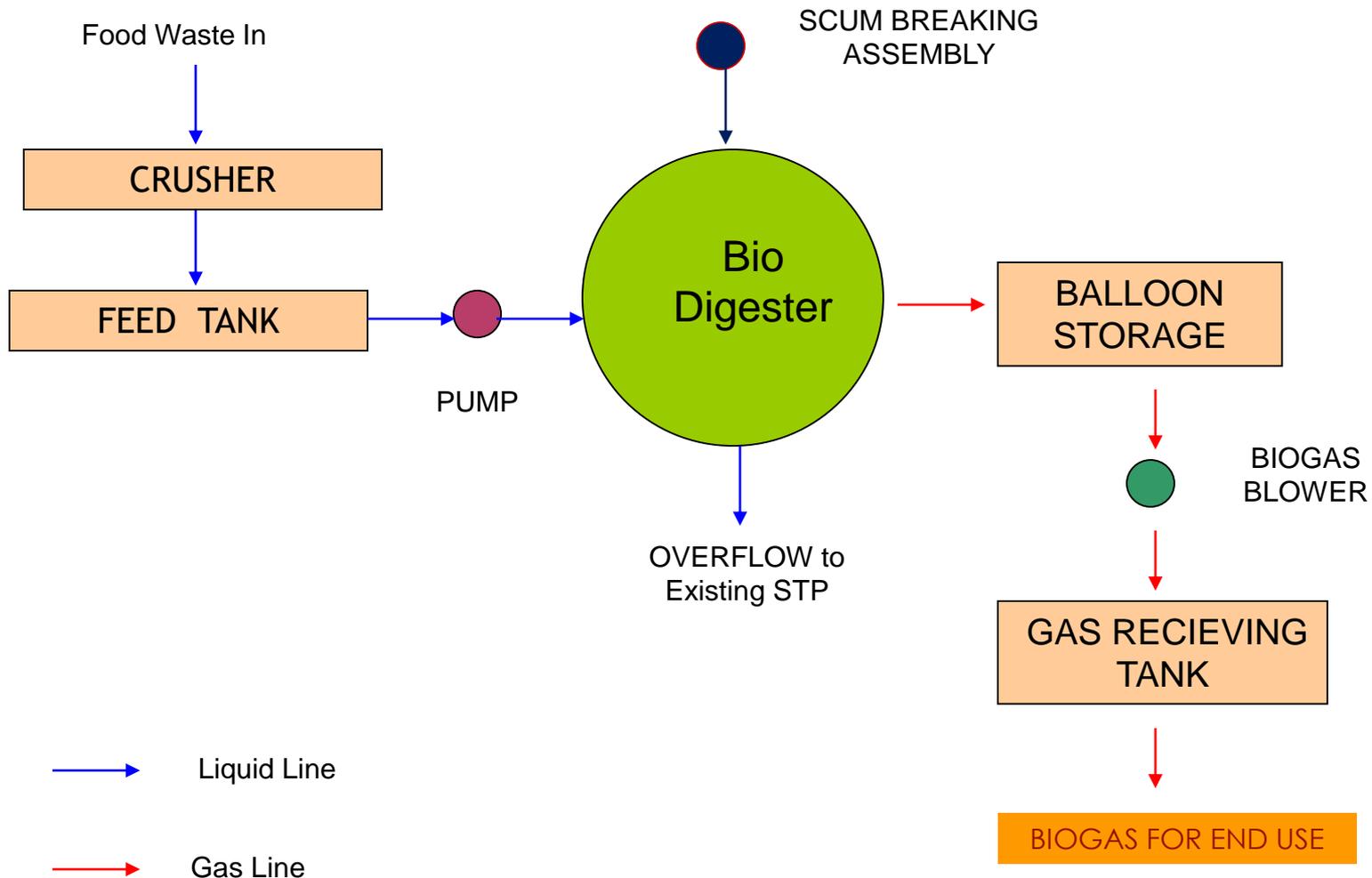


Biogas Plant

A typical flow sheet of our Biogas Plant



PROPOSED SCHEME



PROCESS DESCRIPTION

- Food waste is first crushed with the help of crusher and then collected into the collection tank by gravity from where it is pumped into the Bio-digester.
- The overflow of the Bio-digester is connected to the existing STP. The biogas generated from the Bio-digesters is collected in a specially designed Biogas Balloon
- The stored Biogas can be used for the heating/electricity generation purpose.

PARTS OF THE BIOGAS PLANT

- ◉ **Crusher with Segregation Table:** It is used to crush the food waste.
- ◉ **Feed Tank:** The waste in the form of slurry is collected into this tank.



Bio-digester:

- The slurry from the Feed tank is pumped into the Bio digester where the organic degradation takes place that results into the formation of the Biogas.
- Our Bio digester have baffles inside to increase the surface area and hence the efficiency
- It is also equipped with agitator that breaks the scum formed in the bio digester due to the oily content in the food waste



In MS with Epoxy Coating



IN RCC

- ⦿ **Biogas Blower:** It is used to pressurize the Biogas so as to supply the Biogas at the constant pressure at desired place.



- ◎ **Balloon:** The Biogas generated in the Bio digester is collected into the Balloon so as to utilize when required.



- ◎ **Biogas Burner/ Biogas Flaring:** It can be utilized in the kitchen for cooking purpose with the help of special Biogas burners or burn with the help of flare



Biogas Burner



Biogas flare

Some Salient Feature of our Biogas Plant

- ◉ **Area Required:** For 1 TPD approx. 60 to 75 m²
- ◉ **Minimum Wastage Required** to Run the system is 20 %
- ◉ **Minimum Line Pressure of the system:** Biogas itself has very low pressure so for making it suitable for cooking, which need constant flow and flame, it is required to be pressurized with the help of Biogas Blower only when cooking activity is going on in the kitchen, for flaring purpose it can be used directly.
- ◉ **Odour & HSE Issue:** During the feeding process some minute odour would be present that too can be eliminated when shredding mechanism is installed in a closed room, after that since it is a closed loop system no odour at all would be their and we can guaranty for the same, for the reference you can even take direct feedback from our clients.

Biogas is not a Hazardous and also since its density is lighter than air a minor leak shall not pose any threat to the surrounding. Also lot of other safety features has been included like Flame Arrestor, Pressure Relief Valve etc. to protect both the plant and the surrounding from any ill effects.

TYPICAL SAVING CALCULATION FROM 1TPD

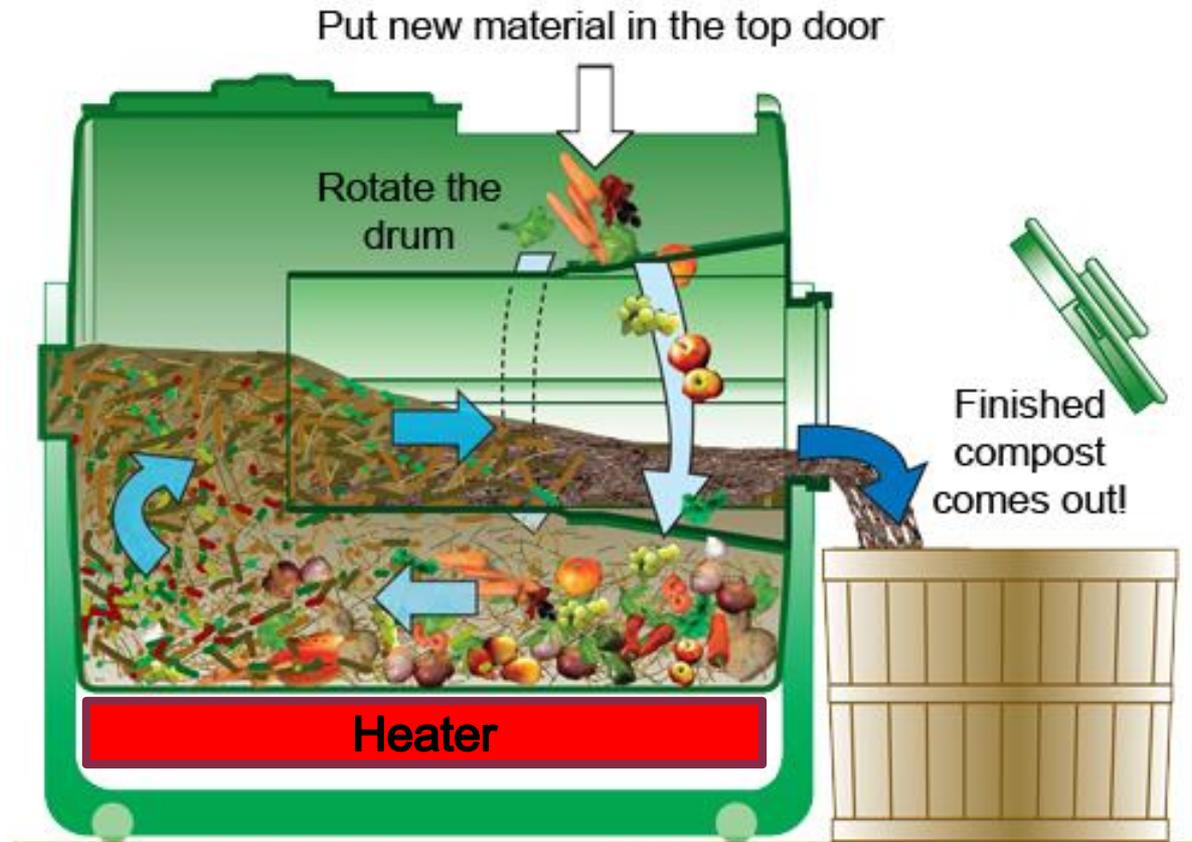
Sr. No	Description	Unit
1)	Biogas Produced per day	90 to 100 m ³ /day
	LPG Equiv	40 kg/day
	LPG Rate Rs/kg	68 Rs/kg
	Income from equiv LPG saving per year(300 days)	Rs. 8,70,400/-
2)	Manure Generation per day	46 kg/day
	Rate of organic manure	5 Rs/kg
	Income from Organic Manure per year (350 days)	Rs. 80,500 /-
3)	Yearly Savings from waste disposal @ Rs. 1.0/kg	Rs. 3,50,000/-
4)	Power Expenditure per year (Considering consumption 22 units/day @ Rs. 8/unit)	Rs. 61,600/-
5)	O &M Cost including consumables per year	Rs. 2,00,000/-
	<u>NET SAVING</u>	<u>Rs. 10,38,900/-</u>

ORGANIC WASTE COMPOSTING

- Composting is a way to treat solid waste so that microorganisms break down the organic material, helping along the natural process of decay until it can be safely handled, stored and applied to the environment.



PROCESS WORKFLOW



Rotary type waste composter

PROCESS DESCRIPTION

- ◉ Organic materials used for compost should include a 1:1 mixture of brown organic (carbon) material (dead leaves, twigs, manure) and green organic (nitrogen) material (lawn clippings, fruit rinds, etc.)
- ◉ To supply oxygen, you will need to turn the compost pile so that materials at the edges are brought to the center of the pile.
- ◉ Turning the pile is important for speed composting and for controlling odor.
- ◉ The pile can be either heated externally or be allowed natural heating by 2-3 weeks.

TYPES AND ITS COMPARISON

Sr.no.	Parameter	OWC	Rotary	Automatic
1				

SOME OF OUR HAPPY CLIENTS

(A) FOOD WASTE BASED BIOGAS PLANT

CLIENT
FEED

: NTPC
: BILASPUR



(B) Food Waste based Biogas Plant

Client : City Corporation, Pune
Feed : Food Waste



(C) FOOD WASTE BASED BIOGAS PLANT

CLIENT
FEED

: ULTRATECH CEMENT, GULBARGA
: FOOD WASTE



(D) FOOD WASTE BASED BIOGAS PLANT

CLIENT
FEED

: TATA MOTORS, JAMSHEDPUR
: FOOD WASTE



OUR VALUABLE CLIENTS

Finolex
Cables Limited



KIRLOSKAR BROTHERS LIMITED



Enriching Lives



Mahindra



KONECRANES
Lifting Businesses™



Since the beginning, we have exploited the fact that
“Necessity of energy & the waste generated are directly
proportional”.

And to fulfil our vision of a **GREEN-WORLD** we wish
for your support today & in future.



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