



# HINDUSTAN UNILEVER LIMITED, AMLI, SILVASSA.

CII NATIONAL AWARD FOR EXCELLENCE IN ENERGY MANAGEMENT 2021



Comfort



CLINIC PLUS+





**HINDUSTAN UNILEVER LIMITED, AMLI, SILVASSA.**

**Vinti Arora – Factory Engineering Manager**



# PRESENTATION OVERVIEW

**Overview of  
HUL & Aml  
Site**

**Impact of  
Covid-19**

**SEC & Energy  
Benchmarking**

**Energy Saving  
Projects**

**Water Saving  
projects**

**Initiative  
towards  
Energy Saving**

# About the Organization

- India's **largest FMCG** company with 80+ years heritage
- Turnover: INR 45,487 Cr [2020-21]
- **Market leader** with **100+ brands** spanning 20 distinct categories – **14 brands** in India's **100 Most Trusted Brands** [2017]
- Everyday **9 out of 10 households** use our products
- **Vision:** Make sustainable living commonplace – ***The Unilever Sustainable Living Plan***
  - ✓ **De-couple our growth from our environmental footprint**, while increasing our positive social impact
  - ✓ **450 billion+** litres of water conservation potential created
  - ✓ **47%↓** in carbon footprint vs 2008 baseline



# HUL-AMLI Site Passport

## General

- Categories : BPC, HC, Tea (Only own HUL site catering to all 3)
- 68K Square meter Plot (18 acres),
- € 43.3 million GBV and € 29.8 million NBV
- € 204 million Turnover
- Tons: 100K (2018) ,114 KT (2019), Billion Units: 6.6

## Manpower

- ~30 White Collar Employees (5 Female Employees)
- 535 Blue Collar (13 Female Employees with a day care facility)

## Manufacturing

- BPC : 5 Mixers, 27 Sachet Machines
- HC: 6 Mixers, 4 Bottle lines,1 Mespak big Pouch line, 3 Sachet Lines
- Tea: 1 Natural Care blending line, 15 Carton machines, 2 Sachet lines, 2 Tea Bag machines, 1 Pouch Machine

## Supply Chain

- 154 SKUs & 770 RM,PM
- ~ 110 Vehicles/day for material movements

## Site Evolution



**Over past 22 years Amlis has absorbed 5 other HUL factories/2Ps inside**



**2018 : WCM Bronze Certification**

# AmlI Site Product Portfolio

**BPC : Shampoo, Conditioner ( Fill level – 3ml to 14 ml)**



Clinic Plus (2)



Lux (1)



Sunsilk (3)



Dove LCS (3)



Dove PCS (2)



Dove Shampoo + Conditioner  
Twin Pack (3)

**HC : HHC Liquid ( Fill level – 250ml – 1800 ml)**



Vim Dish Wash  
Bottle (2)



Domex FC (2)



Phenolic (1)



Domex Toilet Expert (8)

**HC : Laundry Liquids (Fill level – 18ml – 2000ml)**



Comfort Sachet  
(3)



Surf Excel Liquid (9)



Rin Ala (2)



Comfort Fab-Con  
(11)

**Refreshments :Packed Tea (28gm to 1 kg) & Tea bags (10s, 25s, 100s)**



Taj Mahal Tea (4)



Red Label (4)



Lipton Tea Bag (15)



Red Label  
NC (2)



Lipton  
GLB (1)



Surf Excel  
Pouch [6]



Comfort  
Pouch [2]

# Impact of Covid-19

## Annual Production Performance

- Production has reduced by less than 5%. Our site took all pro-active steps to get the employees tested every week to avoid the spread.

## Specific Energy Consumption

SEC reduced by 6% in 2020 vs 2019

- Several projects were undertaken in 2020 for Energy & Water saving in line with Unilever's Sustainable Living Plan
- Our biggest project 'Heat Pump' was commissioned in 2020
- Plant Capacity increased by 5% in 2020 with commissioning of a new Dove Shampoo Bottle Line

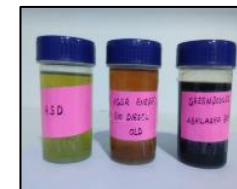
## Projects Commissioned in 2020



Heat Pump to heat process water installed & commissioned in Sep-2020



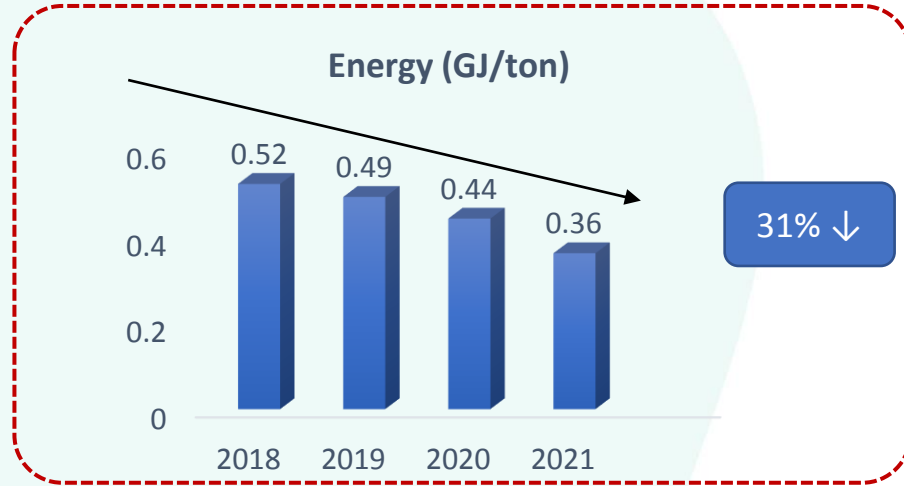
Soap Extract Bio Diesel from Fair & Lovely Soap. Second generation Bio Fuel



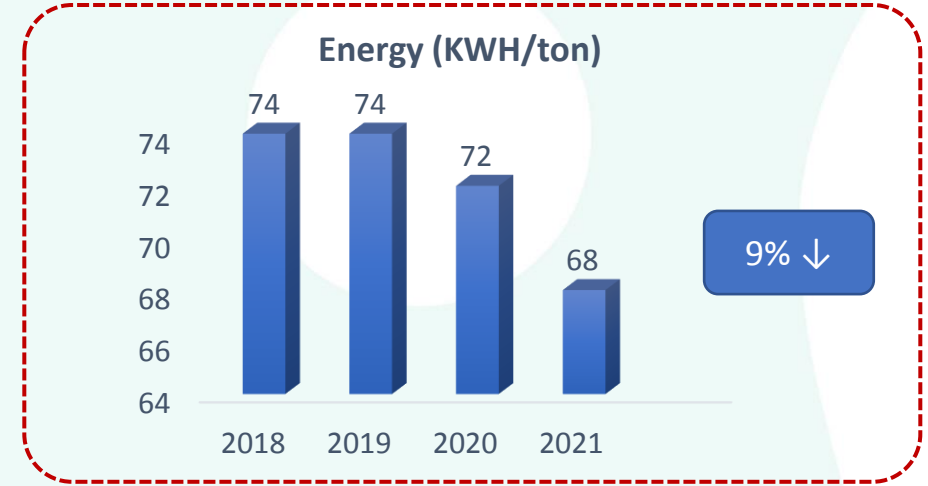
New Dove Bottle Line installed & commissioned

# Specific Energy Consumption

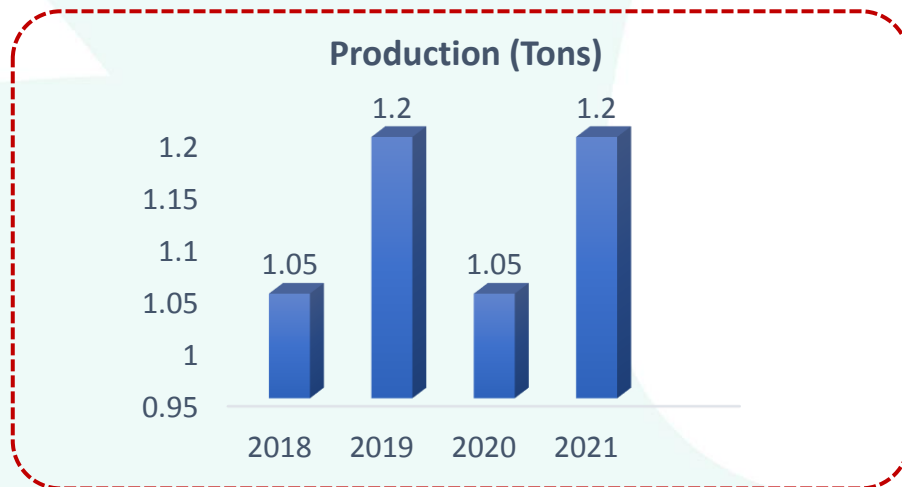
## Energy Trend



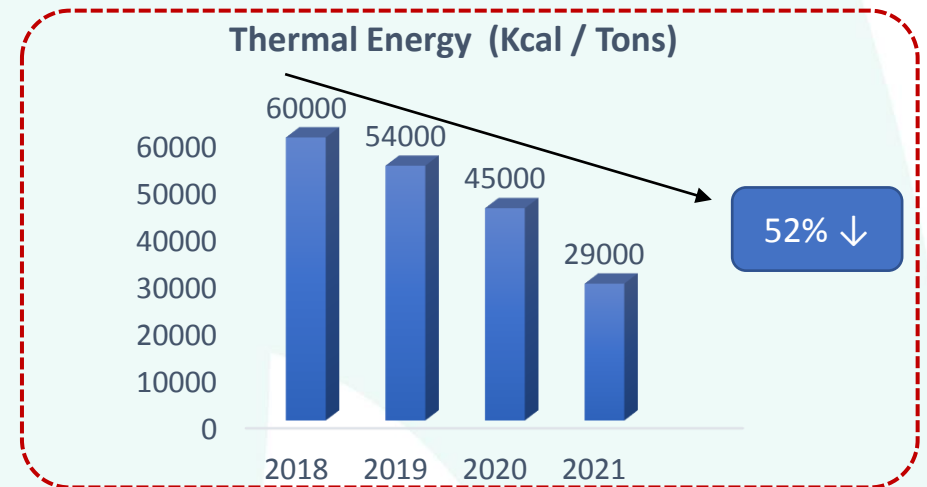
## Electrical Energy Trend



## Production Trend



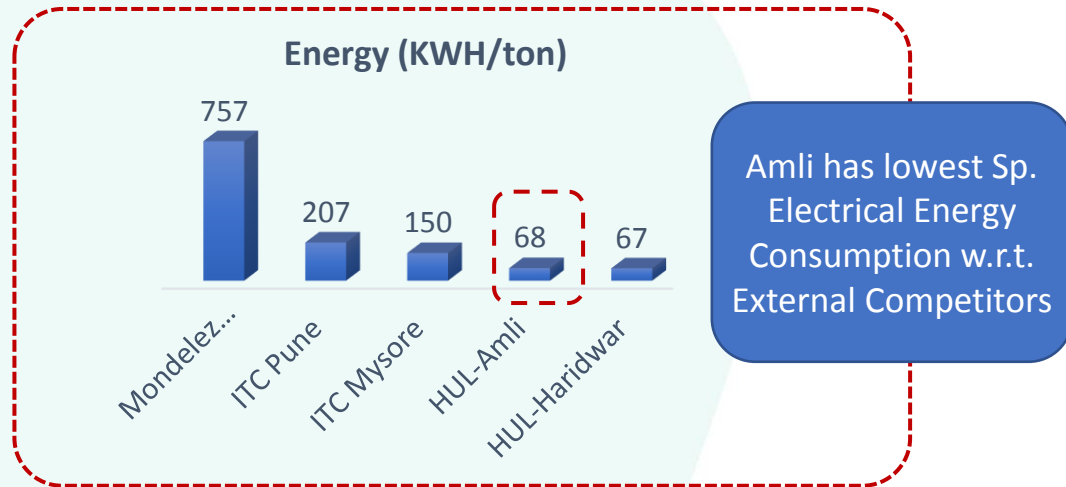
## Thermal Energy Trend



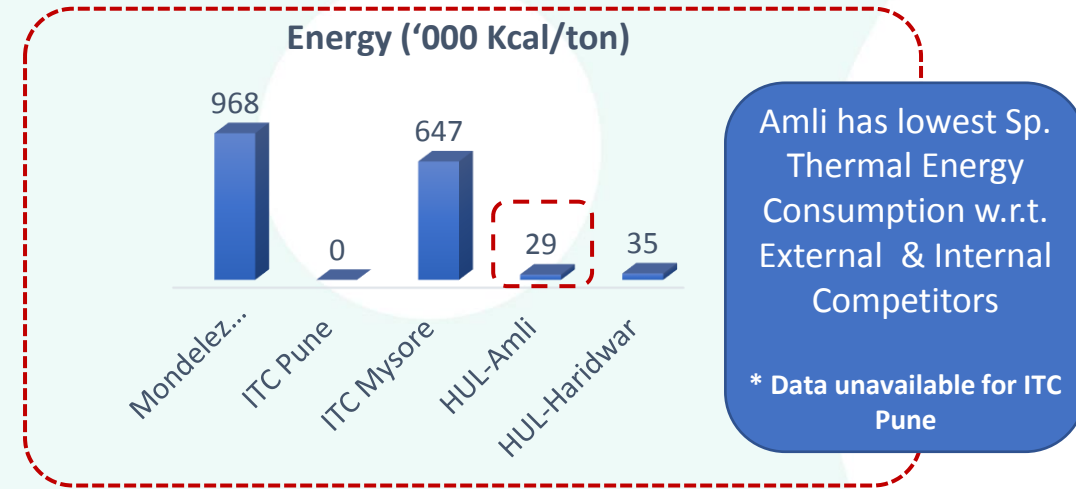


# Energy Benchmarking

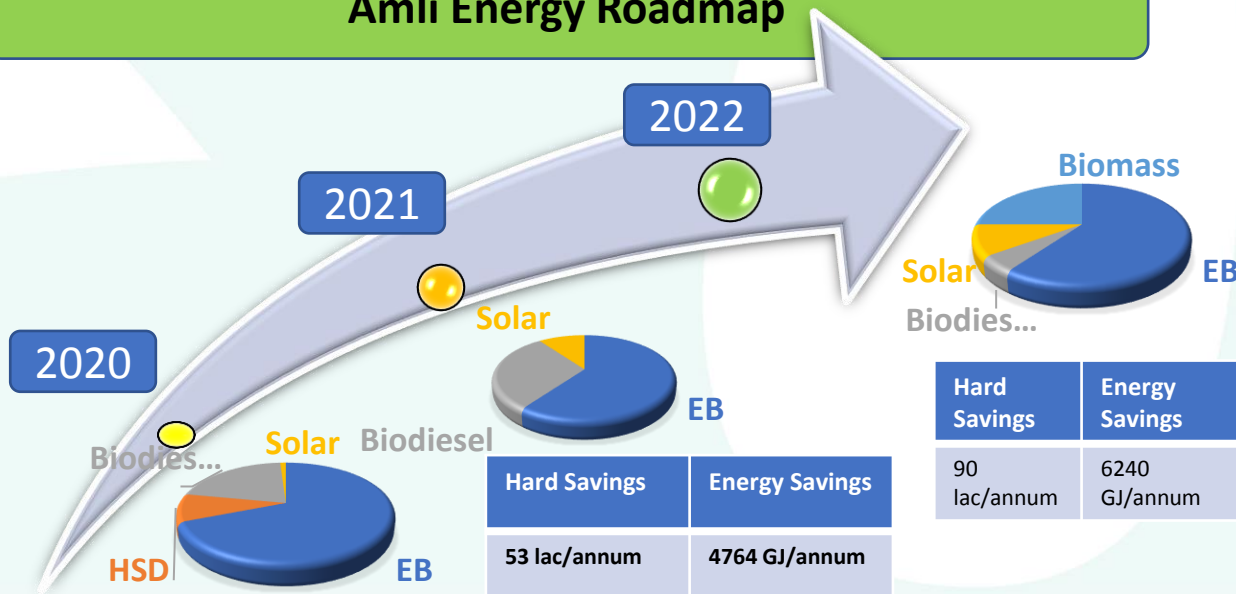
## Electrical Energy Benchmarking



## Thermal Energy Benchmarking



## AmlI Energy Roadmap



## Major Encon Projects Planned in 2021-2022

Project	Target Completion
750 KWp On-Site Solar Plant	April-2022
Chiller plant synchronization	Feb-2022
Biofuel Use in DG Sets	Mar-2022
Vacuum Sludge Drying System	Mar-2022
Transformer relocation to reduce transmission losses	Dec-2021
Harmonics Study to reduce losses	Feb-2022

# History of Energy Saving Projects

Year	No. of Energy Saving Projects	Investment (million INR)	Electrical Savings (KWH)	Thermal Saving (Kcal)	Cost Savings (million INR)	Impact on SEC (% reduction from previous year)
2018-19	2	0.8	700000	0	3.3	5.8%
2019-20	1	4	0	9000	1.4	10.2%
2020-21	2	52	0	16000	14	18.2%

# History of Energy Saving Projects



1<sup>st</sup> &  
Largest in  
HUL

Solar Thermal Panels



Solar PV Panels



1<sup>st</sup> time  
in HUL

Heat Pump

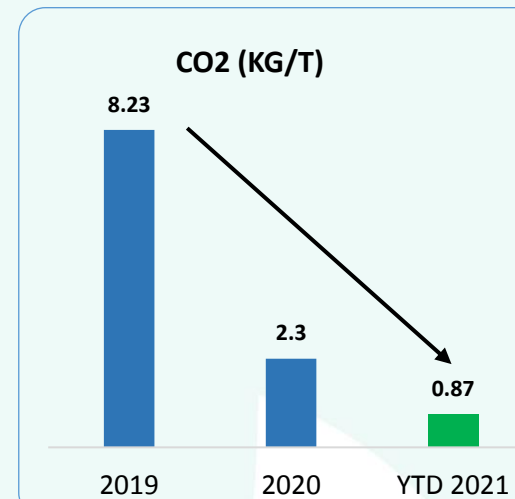


1<sup>st</sup> time  
in HUL

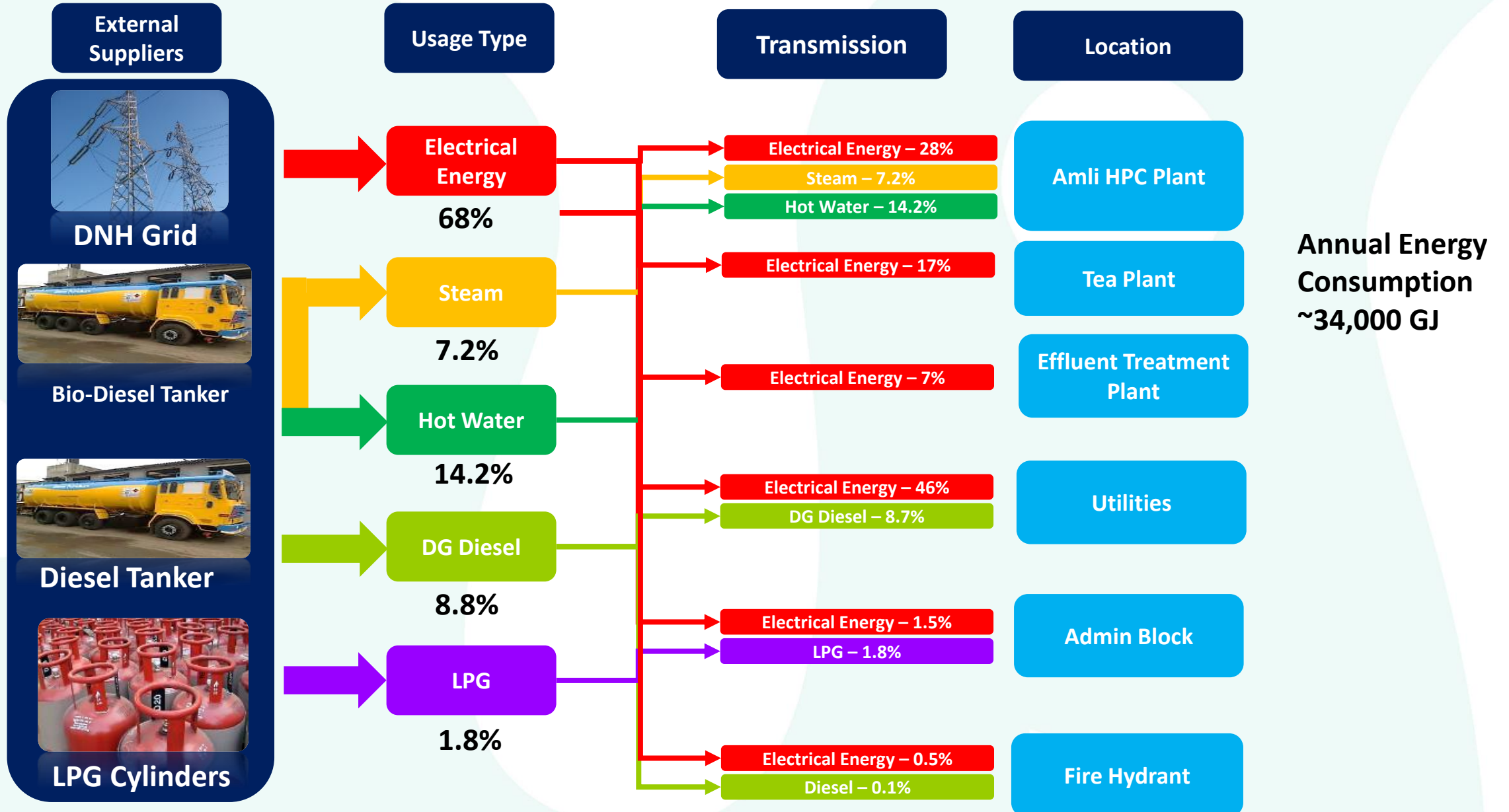
Bio-diesel



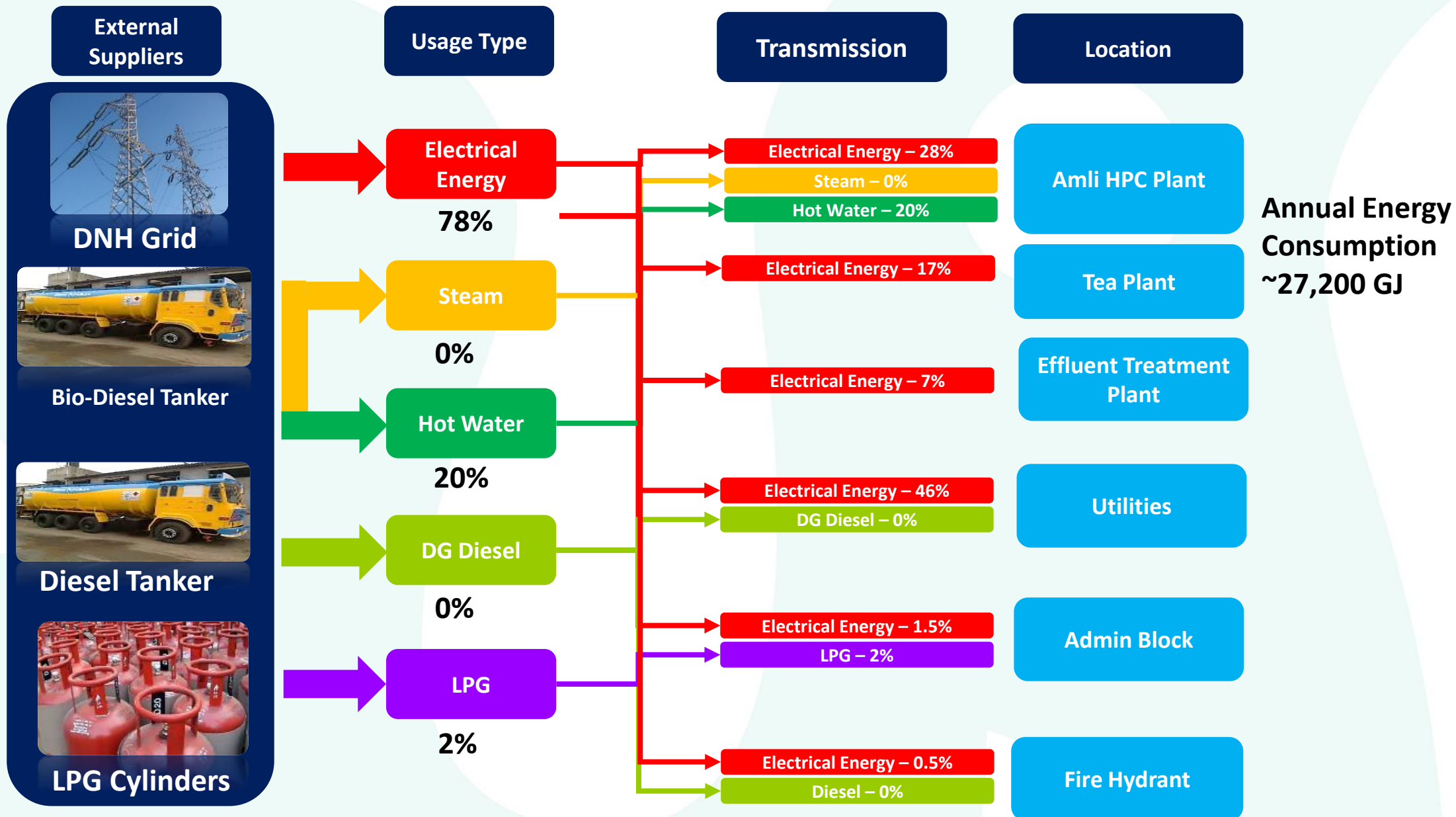
HVLS Fan



# Aqli Energy Mapping – As Is – Where we are!



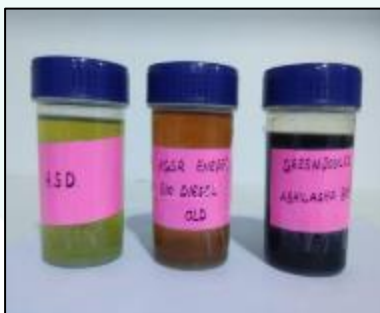
# Aqli Energy Mapping – To Be – Our Vision



# Innovative Project Implemented – Biofuel Extraction from Fair & Lovely Soap Waste

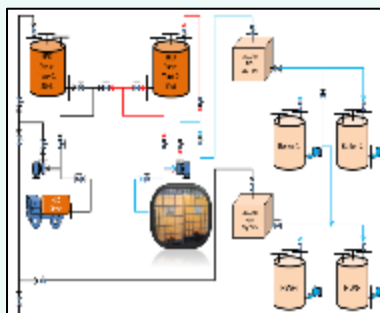


Soap Extract Bio Diesel from FAL Soap.  
Working with start Up Green Joules.  
Second generation Bio Fuel

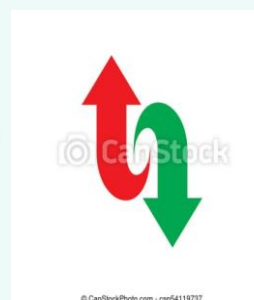


Fuel fired in HWG and RX06 Boiler  
Being used regularly.

42 lacs savings realised



Density (Kg/lit) at 15°C – 0.823  
Flash Point (°C) – 55  
C.V(K.CAL/Kg) – 10619  
Priced at Rs./Lit - 58

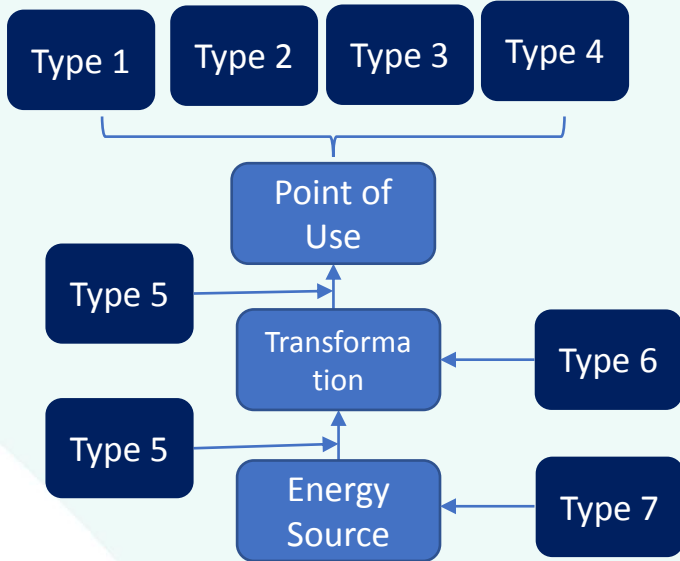


Collaborative effort of Factory Utility Team & Central Technology Team to realize this

**Easily replicable** as **no additional investment** is required. Boilers & HWGs are using this fuel since last 8 months!

# Project Identification – Energy/Cost Deployment – How Energy Management Model Works

## Understanding 7 types of energy losses



- Type 1: Useless Consumption
- Type 2: Over Consumption
- Type 3: Non-optimization
- Type 4: Non-recovery of residual energy
- Type 5: Transmission Loss
- Type 6: Transformation Loss
- Type 7: Renewable energy source loss

### Energy CD

A Matrix		Energy CD																	
Category	#	Loss	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5
Electricity	1	Electricity Type-1 (Useless Consumption)	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5
Electricity	2	Electricity Type-2 (Over Consumption)	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5
Electricity	3	Electricity Type-3 (Loss due to non-optimized)	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5
Electricity	4	Electricity Type-4 (Loss due to non-use of Recoverable Resources)	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5
Electricity	5	Electricity Type-5 (Transmission Loss)	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5

B Matrix		Energy CD																	
Category	#	Loss	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5
Electricity	1	Electricity Type-1 (Useless Consumption)	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5
Electricity	2	Electricity Type-2 (Over Consumption)	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5
Electricity	3	Electricity Type-3 (Loss due to non-optimized)	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5
Electricity	4	Electricity Type-4 (Loss due to non-use of Recoverable Resources)	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5
Electricity	5	Electricity Type-5 (Transmission Loss)	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5

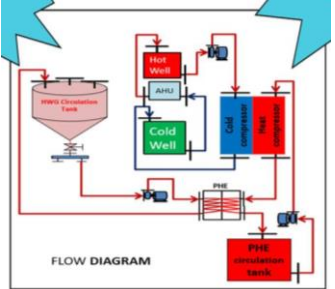



C Matrix		Energy CD																	
Category	#	Loss	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5
Electricity	1	Electricity Type-1 (Useless Consumption)	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5
Electricity	2	Electricity Type-2 (Over Consumption)	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5
Electricity	3	Electricity Type-3 (Loss due to non-optimized)	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5
Electricity	4	Electricity Type-4 (Loss due to non-use of Recoverable Resources)	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5
Electricity	5	Electricity Type-5 (Transmission Loss)	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5

Each identified loss is translated in a cost value.

639 Cost value of the loss in each cell.



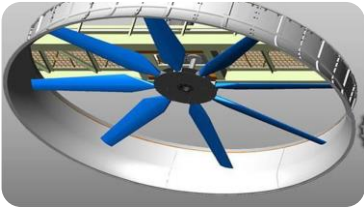



# Major Energy Conservation Projects

Project Name	Project Description	Cost Benefit	Uniqueness	Horizontal Replication
<p>1 Heat Pump</p>	 <p>Using Heat pump to heat water thus eliminating diesel use in Hot water generators</p>	<p>INR 100 lakhs/annum</p>	<p><b>First time in HUL.</b> Scale, hygienic design, integration to existing process</p>	<p>Easily replicable in areas with <b>low kwh rates &amp; sizable hot water needs</b></p>
<p>2 EC Motors for HVAC Systems</p>	 <p>Replacing Induction Motor by Electronically Commutated motor</p>	<p>INR 30 lakhs/annum</p>	<p><b>Simple yet innovative solution to</b> minimize I2R losses</p>	<p>Easily replicable as retrofitting in existing AHUs is both <b>cost effective</b> as well as <b>quick execution</b></p>
<p>3 Auto-Tube Cleaning System in Chillers</p>	 <p>In-Situ cleaning of chiller condenser tubes to increase COP of Chillers</p>	<p>INR 12 lakhs/annum</p>	<p>Auto-cleaning with no shutdown required. This is also a <b>first timer in HUL, piloted at Amli</b></p>	<p>Easily replicable as <b>standard package</b> available from <b>different vendors</b></p>
<p>4 Solar Water Heating System</p>	 <p>Using solar energy to produce hot water for process needs</p>	<p>INR 40 lakhs/annum</p>	<p>Scale, hygienic design, integration to existing process</p>	<p>Easily replicable in areas with <b>good solar insolation &amp; sizable hot water needs</b></p>



# Major Energy Conservation Projects

Project Name	Project Description	Cost Benefit	Uniqueness	Horizontal Replication
<p>5 <b>Bio-Fuel in Boilers &amp; HWGs</b></p> 	<p>Biofuel replacing HSD in boilers &amp; Hot water generators</p>	<p>INR 70 lakhs/annum</p>	<p><b>First time in HUL</b>, No requirement of any capex</p>	<p>Easily replicable with <b>standard LED lights</b> with <b>sensors &amp; timers</b> as applicable in a area</p>
<p>6 <b>Pump optimization</b></p> 	<p>Optimizing pumps &amp; motors through head and flowrate study</p>	<p>INR 8 lakhs/annum</p>	<p>Simple yet innovative solution</p>	<p>Easily replicable with appropriate sizing study</p>
<p>7 <b>FRP Fans in Cooling Tower</b></p> 	<p>Replacing conventional fans with FRP Fans to minimize energy losses</p>	<p>INR 5 lakhs/annum</p>	<p>Low-cost sustainable solution</p>	<p>Easily replicable in all standard Cooling Towers</p>
<p>8 <b>Eco-Clean Dosing in Cooling Tower</b></p> 	<p>E-Clean dosing in CTs to replace DM make-up water with River Water saving DM plant energy</p>	<p>INR 5 lakhs/annum</p>	<p>Low cost solution to eliminate blowdown in cooling towers</p>	<p>Easily replicable in all standard Cooling Towers</p>

# Major Energy Conservation Projects

Project Name

Project Description

Cost Benefit

Uniqueness

Horizontal  
Replication

9

**Compressor  
Heat  
Recovery  
System**



Using heat recovery system to extract heat from oil cooled compressors

INR 11 lakhs/annum

Utilizing extracted heat to pre-heat process water

Easily replicable as **standard package** available from **different** air compressor **vendors**

10

**Chillers Heat  
Recovery  
System**



Using heat recovery system to extract heat from chiller compressors

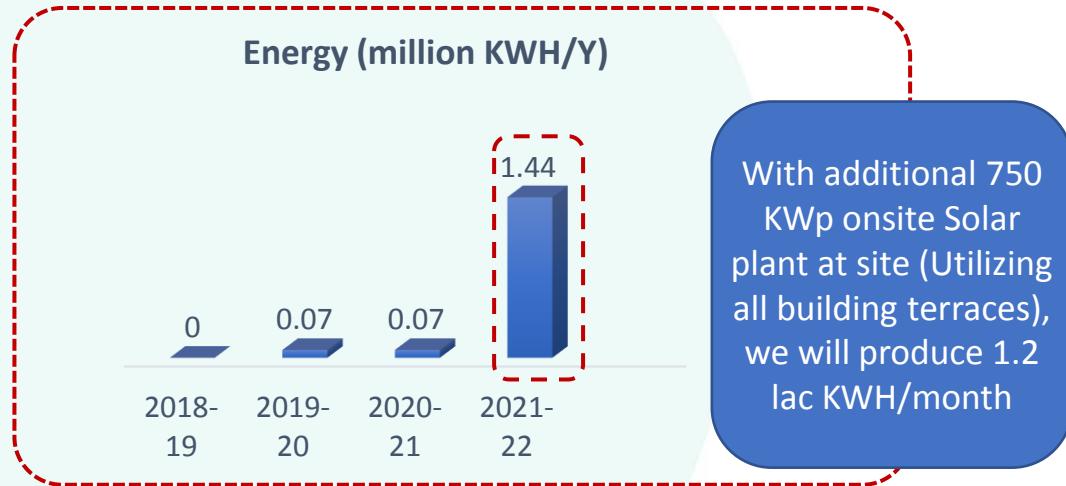
INR 10 lakhs/annum

Utilizing extracted heat to pre-heat process water

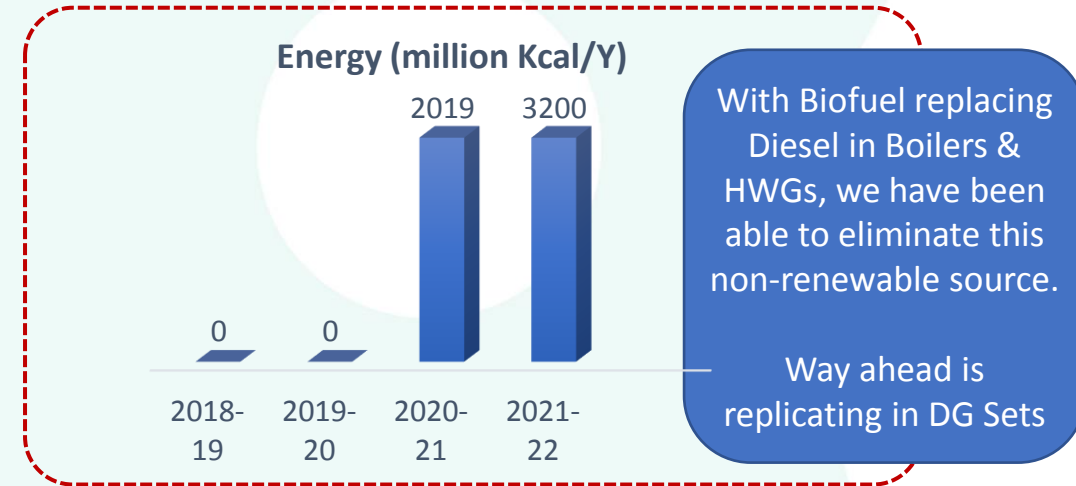
Easily replicable as **standard package** available from **different** compressor **vendors**

# Utilization of Renewable Energy Sources

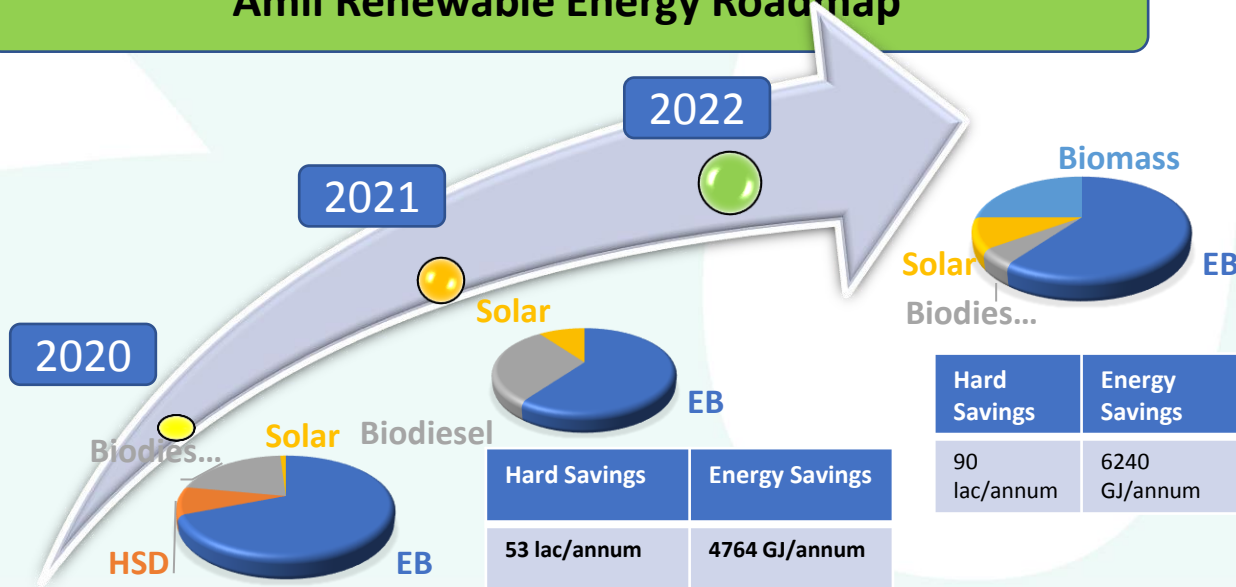
## Replacement of Electrical Energy with Renewable Energy



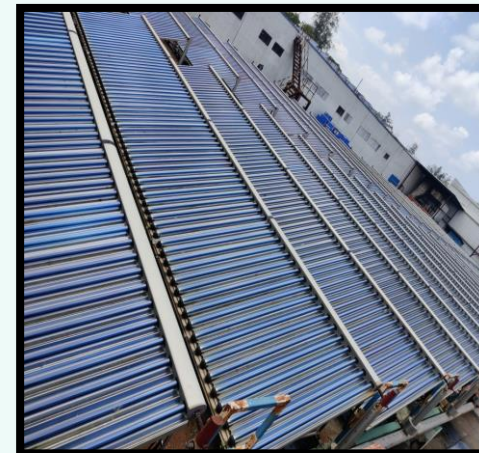
## Replacement of Thermal Energy with Renewable Energy



## Akli Renewable Energy Roadmap



## Major Projects : PV Solar & Solar Water Heaters



# Waste Free Aml- Key Initiatives Planned



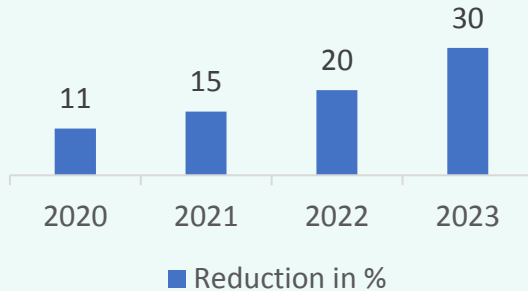
Responsible and competitive growth by ensuring NGTW

## REDUCE

- Reduction of sachet thickness from **18/18/30 to 18/15/30**
- Trial for bilayer sachet of **18/30 & 15/30**



Plastic Reduction

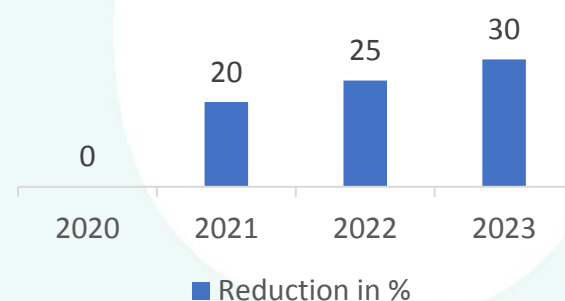


## RECYCLE

- **PCR** inclusion in plastic in **Laundry bottle**
- **MLP** implementation in HC



PCR Inclusion

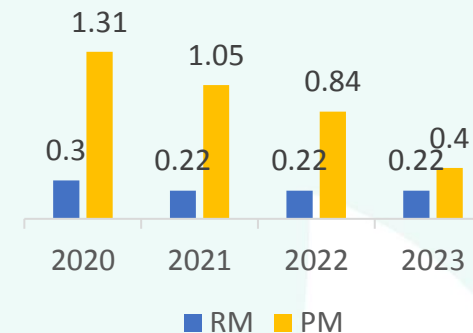


## REFUSE

- Robust process control on manufacturing & packing to control **tech-eff below 0.5%**



RM PM Tech-Eff

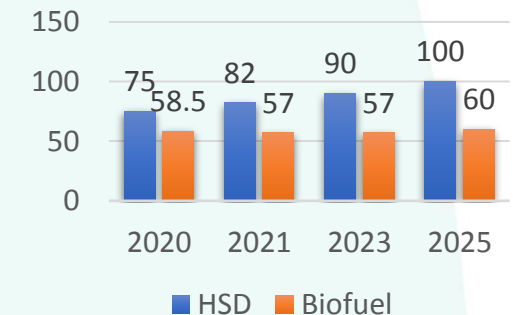


## REPURPOSE

- Use Rejected Sachet (FG) to **extract biofuel with same CV as HSD**



Fuel Cost (INR/l)



# Waste Utilization & Management – The Data!

Year	Type of Waste Generated	Quantity of Waste Generated (MT/year)	Disposal Method
2018-19	Sludge & Filters	0.5	Common Incineration – TSDF
	Spent Resins	0.35	Common Incineration – TSDF
	Used Oil	1.5	Sending to authorized dealer
	Chemical Sludge from ETP	10	Reused-Captive
	Empty barrels/containers	385 drums/year	Sending to authorized dealer
2019-20	Sludge & Filters	0.5	Common Incineration – TSDF
	Spent Resins	0.3	Common Incineration – TSDF
	Used Oil	1.5	Sending to authorized dealer
	Chemical Sludge from ETP	10	Reused-Captive
	Empty barrels/containers	372 drums/year	Sending to authorized dealer
2020-21	Sludge & Filters	0.4	Common Incineration – TSDF
	Spent Resins	0.2	Common Incineration – TSDF
	Used Oil	1	Sending to authorized dealer
	Chemical Sludge from ETP	7	Reused-Captive
	Empty barrels/containers	250 drums/year	Sending to authorized dealer

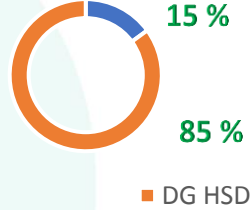
# GHG Emissions

## Key Project to reduce Carbon Emissions

### CURRENT SCENARIO

Production (Tons)	96788
CO <sub>2</sub> Emissions (Tons of CO <sub>2</sub> )	273
Emissions (Kg/Ton)	2.82

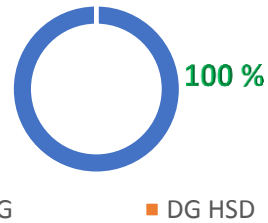
Current CO<sub>2</sub> Emissions (Tons of CO<sub>2</sub>)



**Using Biodiesel in DG to reduce CO<sub>2</sub> emissions from HSD to zero**

Annualized CO<sub>2</sub> savings of 268 tons

Proposed CO<sub>2</sub> Emissions (Tons of CO<sub>2</sub>)



### PROPOSED SCENARIO

Production (Tons)	120,000
CO <sub>2</sub> Emissions (Tons of CO <sub>2</sub> )	4.8
Emissions (Kg/Ton)	0.04



Oct-2021 50-50 blend

Nov-2021 75-25 blend

Dec-21 100% Biofuel

Capex

0

Savings

20 lac/ann.

## Emissions Trend

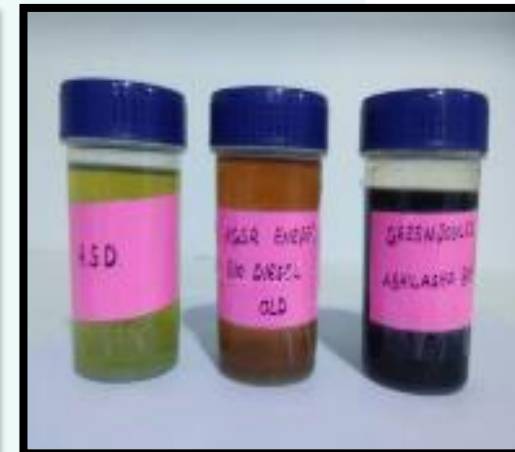
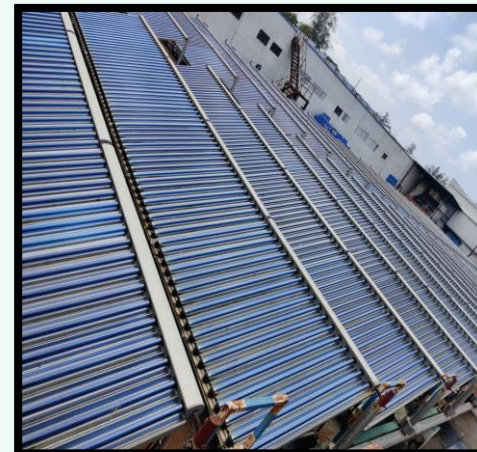
Carbon Emissions (Kg CO<sub>2</sub>/ton)



With Biofuel replacing Diesel in Boilers & HWGs, we have been able to drastically reduce carbon emissions.

Way ahead is replicating in DG Sets

## Major Projects : PV Solar & Biofuel Expansion



# Green Supply Chain Management : Organization's Branding

## Unilever Sustainable Living Plan (USLP)

### IMPROVING HEALTH AND WELL-BEING FOR MORE THAN 1 BILLION

By 2020 we will help more than a billion people take action to improve their health and well-being.

- Health & hygiene >
- Improving nutrition >



We are taking action on the UN Sustainable Development Goals

### REDUCING ENVIRONMENTAL IMPACT BY HALF

By 2030 our goal is to halve the environmental footprint of the making and use of our products as we grow our business.\*

- Greenhouse gases >
- Water use >
- Waste & packaging >
- Sustainable sourcing >



We are taking action on the UN Sustainable Development Goals

### ENHANCING LIVELIHOODS FOR MILLIONS

By 2020 we will enhance the livelihoods of millions of people as we grow our business.

- Fairness in the workplace >
- Opportunities for women >
- Inclusive business >



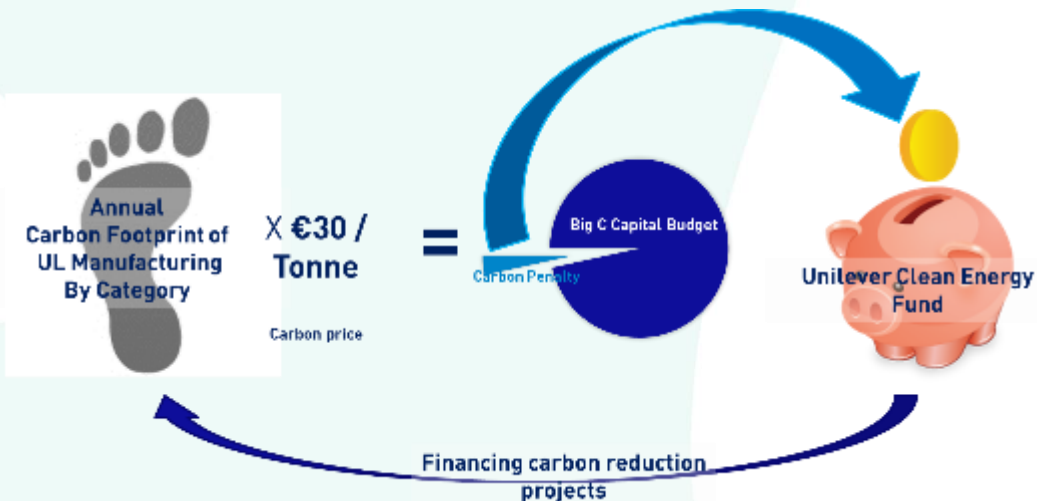
We are taking action on the UN Sustainable Development Goals

# Green Supply Chain Management : Budget & Policy

## Budget Allocation

- Through financial justification (Internal Rate of Return >33% over 3 years)
- Unilever Clean Energy Fund

## Unilever Clean Energy Fund



~ 5-10% of Turnover invested in sustainability projects

## Our Policy

Policy displayed in local language at various locations

Policy approved by central committee

Regular communication of the policy to ensure good level of awareness among employees

## EMS – Environment Management System Pyramid





# Energy Monitoring – Advanced Analytics Use

## Need

- ✓ Risk of misreporting energy consumption due to manual intervention
- ✓ Man hours consumed annually in keeping track
- ✓ Limited coverage of feeders

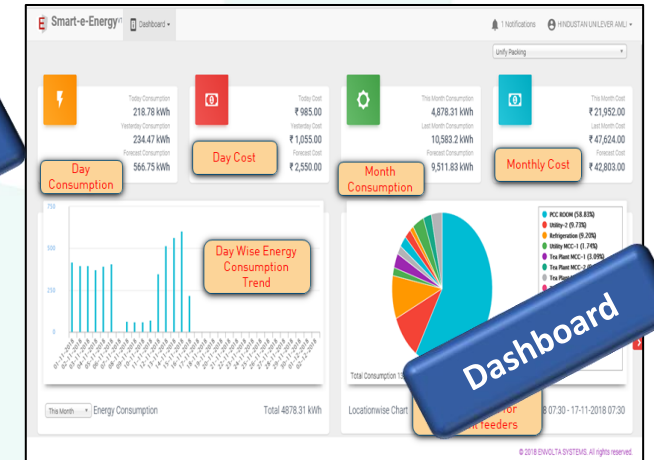
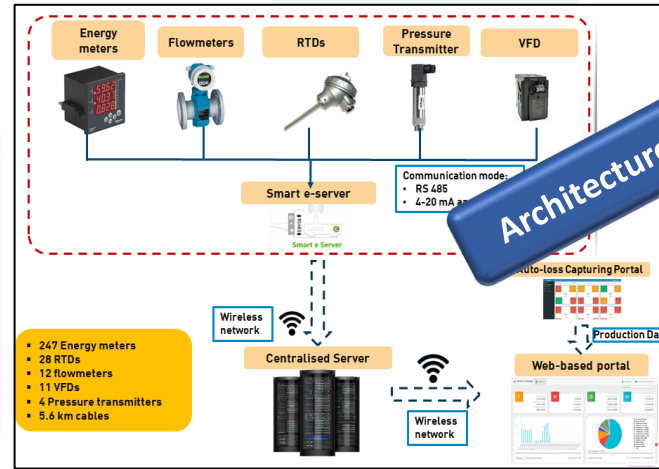
## System Description

- ✓ Wireless system for monitoring energy via energy meters
- ✓ Live status of machines on web portal – current, power factor, load

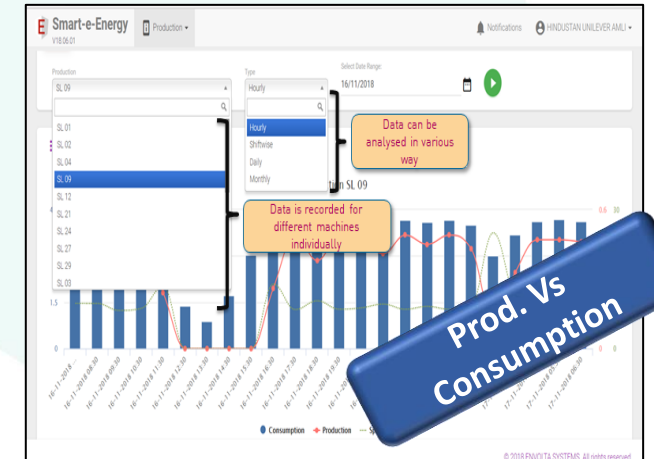
## Benefits

- ✓ Live energy consumption monitoring
- ✓ Minimal inaccuracy
- ✓ Timely action possible with dynamic data availability and monitoring

2021	2022	2023
<ul style="list-style-type: none"> <li>100% Feeders covered of the entire plant</li> <li>Type-1,2,3 loss for PC sachet machines</li> </ul>	Expansion of type-1,2,3 loss capturing to HC machines	Expansion of Type – 1,2,3 Losses to TEA plant Cover Full Factory under EMS



## Production Vs Consumption Trend



# Team Work, Employee Involvement & Monitoring

## Energy Management Systems and Performance

1

- Daily monitoring of Grid Energy Consumption

2

- Shift wise online energy monitoring by smart-e-energy system

3

- Daily power factor monitoring of factory load.

4

- Daily monitoring of DG , Air Compressor, performance

5

- Real time monitoring of factory maximum demand

6

- Real time monitoring of high energy consumption loads

## Kaizens Implemented by our Workmen

- - Reduction in fuel consumption in boilers by fuel spray rate optimization
- - Installation of VFDs to cut off loads at non-critical hours
- - Reduction in pasteurization time of water to reduce consumption of fuel
- - Replacement of conventional motors (IE2) with IE5 energy efficient motors
- - Installation of Auto cut off valves

# Implementation of ISO 5001/Green Co/IGBC



## The Environment Policy

Hindustan Unilever Limited & Unilever Industries Private Limited are committed to meeting the needs of customers and consumers in an environmentally sound manner, through continuous improvement in environmental performance in all our activities. Management at all levels, jointly with employees, is responsible and will be held accountable for Company's environmental performance.

Accordingly, the site's aims are to:

- Ensure safety of its products and operations for the environment by using standards of environmental safety, which are scientifically sustainable and commonly acceptable with particular emphasis on Research & Development activity.
- Develop, introduce and maintain environmental management systems across the site to meet the company standards as well as statutory requirements for environment. Verify compliance with these standards through auditing.
- Assess environmental impact of all its activities and set annual improvement objectives and targets and review these to ensure that these are being met at the individual department & level.
- Reduce Waste, conserve Water & Energy and explore opportunities for reuse and recycle.
- Involve all employees in the implementation of this Policy and provide appropriate training. Provide for dissemination of information to employees on environmental objectives and performance through sustainable communication networks.
- Encourage suppliers to develop and employ environmentally superior processes and ingredients and co-operate with other members of the supply chain to improve overall environmental performance.
- Work in partnership with external bodies and Government agencies to promote environmental care, increase understanding of environmental issues and disseminate good practice.
- Ensure that a formal and systematic risk assessment exercise is undertaken during the process/ product development stage with specific reference to environmental impact & sustainability.
- Transfer technology to the pilot plant and main production through a properly documented process specification which will clearly define environmental impact and risks associated with processes, products, raw material and finished product handling, transport and storage.
- Ensure that treatment techniques are developed for any wastes generated as a result of the new product/process and is incorporated into the process specifications.



Ensure safety of product and environment

Complying to all legal standards, EMS

Assess environmental impact, aim for continual improvement

Implement 5R

Involve all employees

Encourage suppliers and co-packers

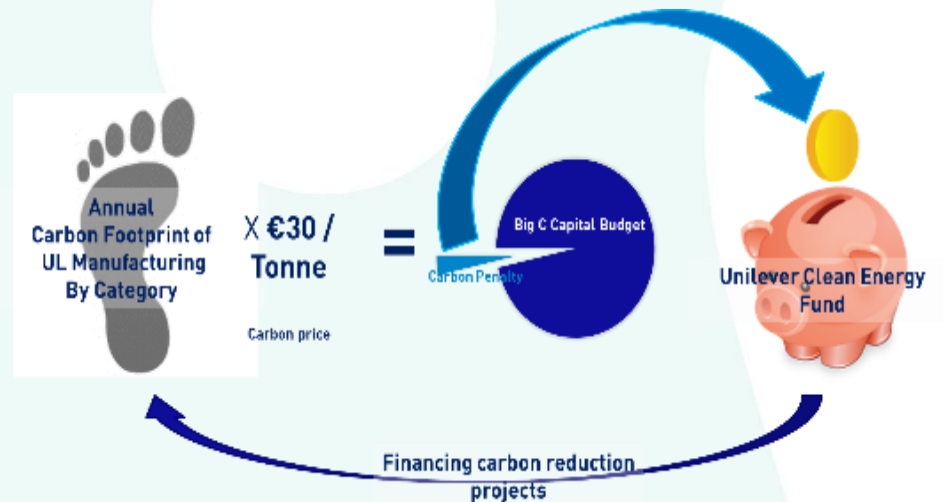
Disseminate good practices to government

Ensure systematic risk assessment for env impacts

Documentation for process handling

Treatment techniques for wastes from new products

## Unilever Clean Energy Fund



~ 5-10% of Turnover invested in sustainability projects

# Learning from CII Energy Awards

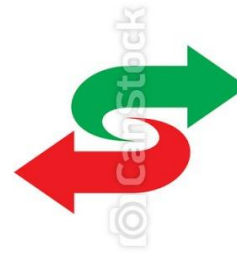
## EC Motors for HVAC Systems

Idea of replacing conventional motors in our AHUs with **Electronically commutated motors** was adopted from one of the best practices presented in CII Energy Awards



**Three Phase induction motor with blower**

**HP Consumption : 157 HP  
Power consumption per day=1611KWH**



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**Electronically Commutated motor with blower**

**HP Consumption : 55 HP  
Power Consumption per day=814KWH**

# Awards & Recognitions

## FICCI - 2018

1<sup>st</sup> prize in Quality Systems Excellence Awards



## CII - 2018

1<sup>st</sup> prize – Energy Efficient Organization

1<sup>st</sup> prize – Best Use of Renewable Energy

1<sup>st</sup> Prize – Best Energy Efficient Case Study





THANK YOU