Sustainable Energy Transition Solutions towards Net Zero

Thermax Limited

12 June 2025

Conserving Resources, Preserving the Future.

Conserving Resources, Preserving the Future.

Net Zero, a purpose

Win with Urgency

- Decarbonization is no longer a future goal — it is a present priority.

Water the Seeds

- It’s a mindset shift towards regeneration, responsibility, and resilience.

Do more, with less

- Lets maximize Recycle and Reuse

Continue to improve "Total System Quality

- From a single utility to a sustainable partner

Be loved by our customers

- Love our Planet, even small actions can create a big impact.

Solutions

Power

Heating

Cooling

Water Treatment

Chemical

Utilities

Raw Material

Desired Product

Waste

Hazardous Waste Treatment

Wastewater Treatment

Air Pollution Control

Waste to Energy Generation

Accelerating Decarbonisation

THERMAX

Sustainable Energy & Environment Solutions

(Capex / O&M)

Green Utility Solutions under Build-Own-Operate

From investment to lifecycle responsibility

Sustainable Solutions by Thermax

Clean Air

Clean Water

Clean Energy

Sustainable Solutions by Thermax

Clean Energy

- Process Heating
- Steam Engineering
- Cooling & Heating

Process heating solutions from Thermax

55+ years of understanding of heating needs of the process industries

Constant innovation to suit industry demands

Unmatched range of heating solutions

Consultative approach to offer energy-efficient and sustainable solutions

Steam Boilers

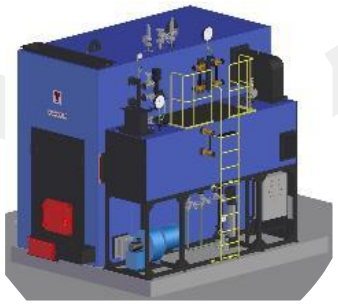
Capacity: 50 kg/hr to 50 TPH

Thermic Fluid Heaters

Capacity: 0.1 Mn kCal/hr to 20 Mn kCal/hr, 280^{O}C to 350^{O}C

Hot Water Generators

Capacity: 0.5 Mn kCal/hr to 20 Mn kCal/hr



Hot Air Generators

Capacity: 7 lakh kCal/hr to 15 lakh kCal/hr, up to 140^{O}C

Process Heat Solutions that efficiently utilise all kinds of energy source

Electricity

Power with green power to achieve zero global emissions

Conventional fuels

All kinds of conventional solid, liquid and gaseous fuels

Biomass

Carbon neutrality of biomass helps reducing carbon footprint of your processes

Hydrogen

Be it a process derivative or derived from electrolysers, Hydrogen helps reach your sustainability goals

Biomass-based Heating Technologies

- 55+ years of understanding heating needs of the process industries
- 30+ years of biomass-based solutions expertise
- Technologies to combust 100+ biomass fuels
- Persistent research and innovation to meet ever-changing market demands
- Thermax Biomass Centre of Excellence's commitment towards technology leadership


Rice Straw


Mustard Stalk


Coffee Husk


Bamboo


Empty Fruit Bunch


Briquettes


Pellets

100+ more

Challenges of Biomass Combustion

- Lower bulk density and lower calorific value
- Higher moisture level
- Fouling and slagging characteristics of biomass ash
- Seasonal variation in biomass fuel

Common biomasses and their classifications

Fibrous and low-density biomass


Rice Straw


Mustard Straw


Jaggary Bagasse

Shredded Biomass


Mustard Stalk


Cotton Stalk


Rice Husk

Nutshell Biomass


Cashew Shell


Palm Kernel Shell


Groundnut Shell

Fine or Dust Biomass


Mustard Husk


Saw Dust


Coffee Husk

Woody Biomass


Wood Chips


Bamboo

Bunch Biomass


Empty Fruit Bunch


Corn Cobs

Processed Biomass


Briquettes

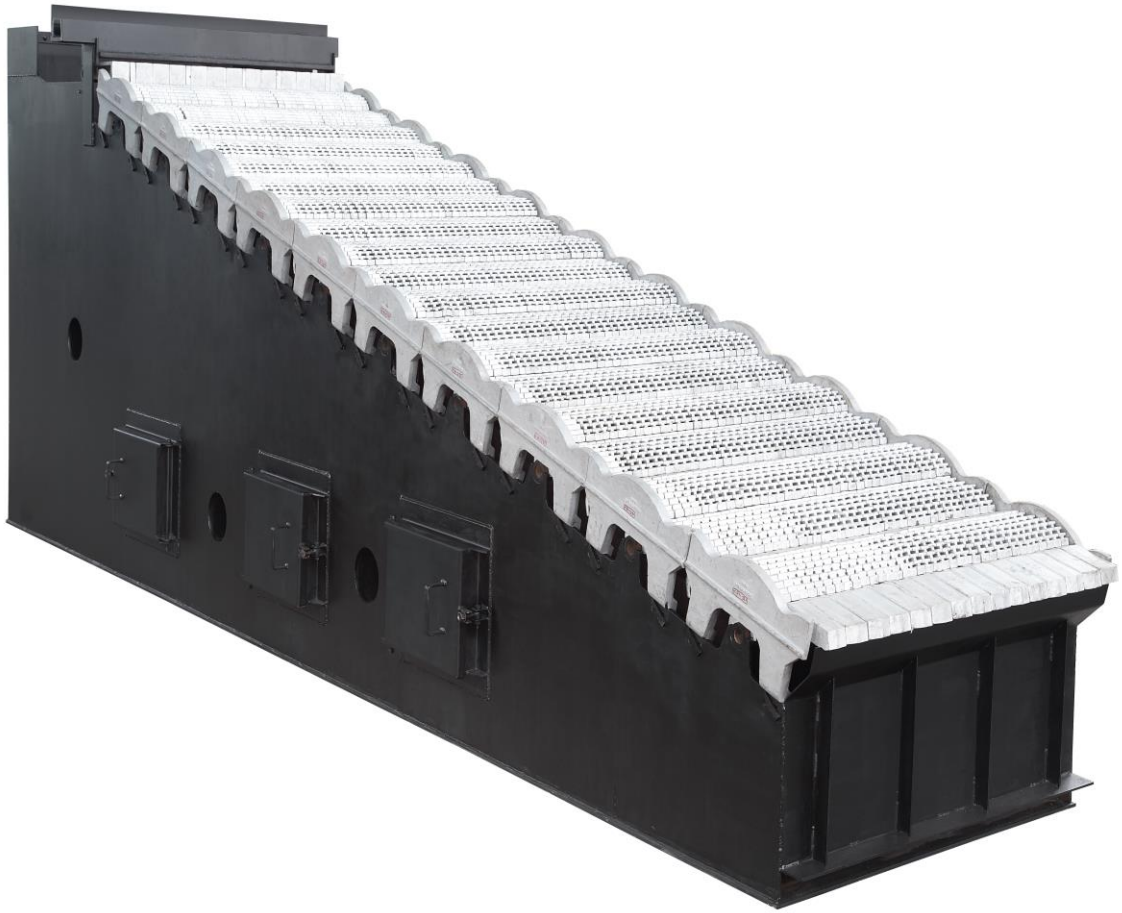

Pellets

DOC / Process by-product


Groundnut DOC


Spent Coffee

Reciprocating Grate Technology for Biomass Fuels



Features of Reciprocating Grate Technology

Reciprocating Motion

- Reciprocating action of the alternate grate pushes fuel into different combustion zones causing toppling and intermixing of the fuel to achieve effective combustion, even for bulky and high moisture fuels

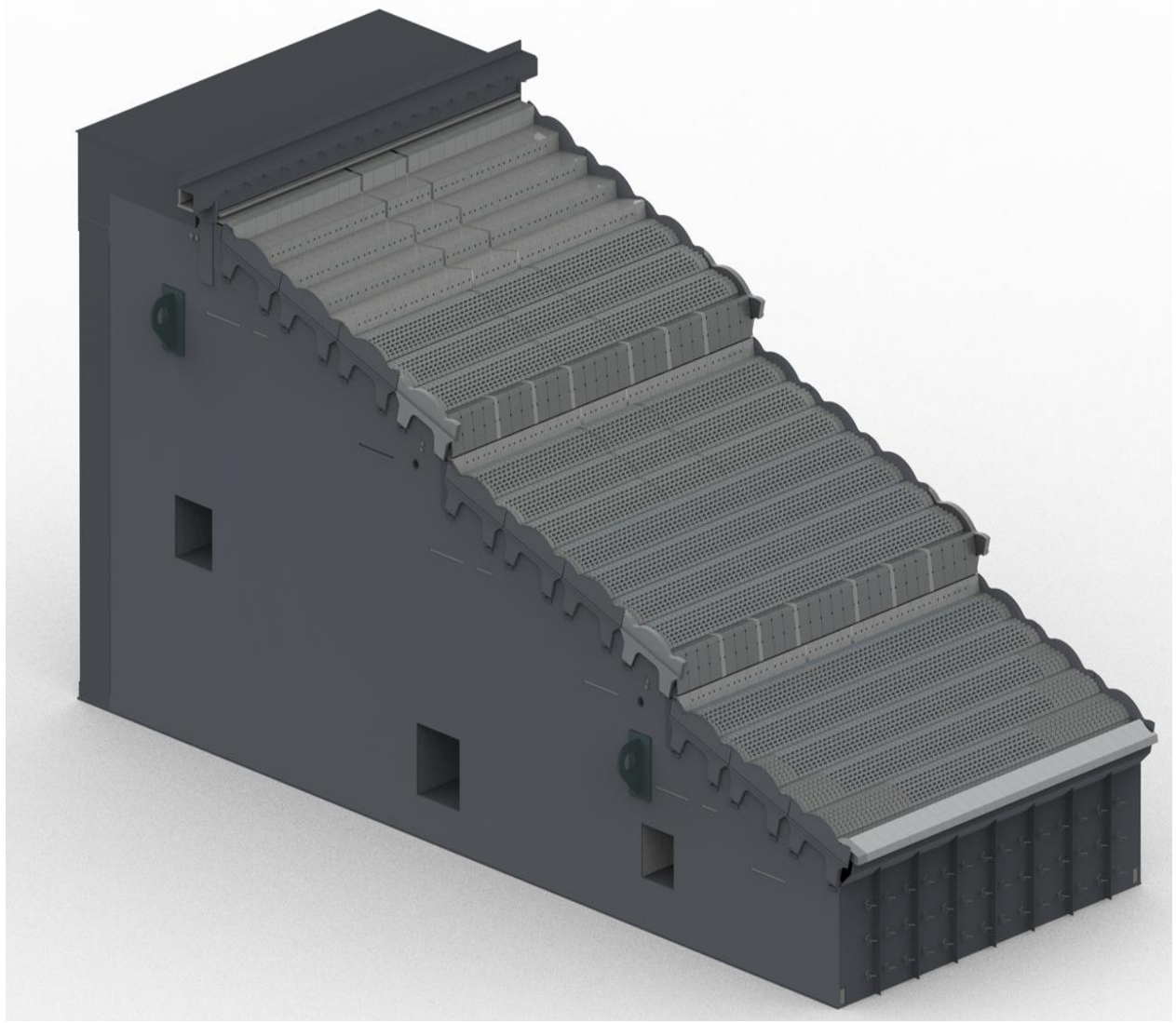
Multiple Trolley

- Multiple trolleys controlled by independent hydraulic cylinders operate at different speeds to meet the time requirement of different combustion stages
- Multiple trolleys provided with different air connections to ensure independent zone-wise air distribution

Multiple grate bar geometry

- Multiple grate bar geometries, namely block, full nozzle, half nozzle, and side plates for width and length-wise air control within the same trolley
- Avoids tongue effect

Introducing Universal Bio Grate



Universal Bio-Grate Technology

THERMAX

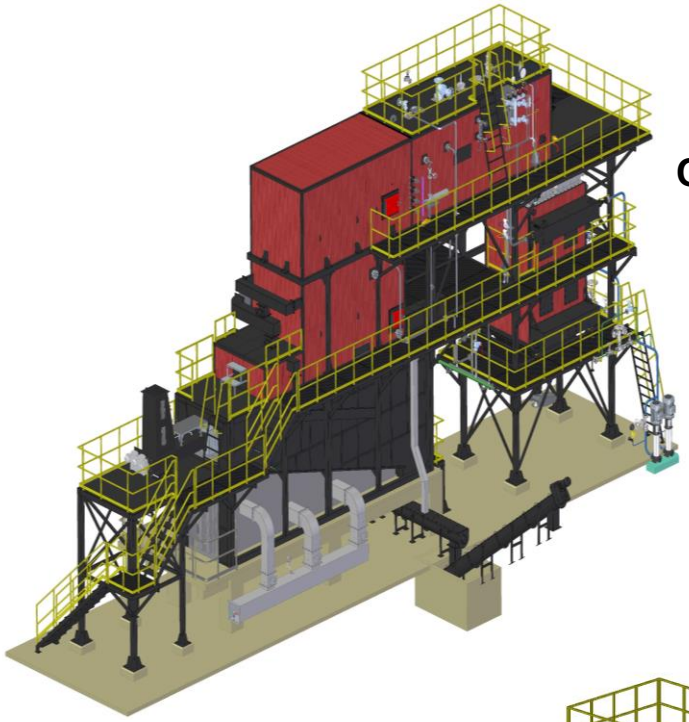
Enhancing 3Ts of Combustion

- Sharp step between trolley promotes intermixing of the fuel due to tumbling action
- Proper stage-wise residence time for complete combustion
- Tumbling of fuel for exposing unburnt portion to proper ignition temperature

Optimal Use of block grate bar

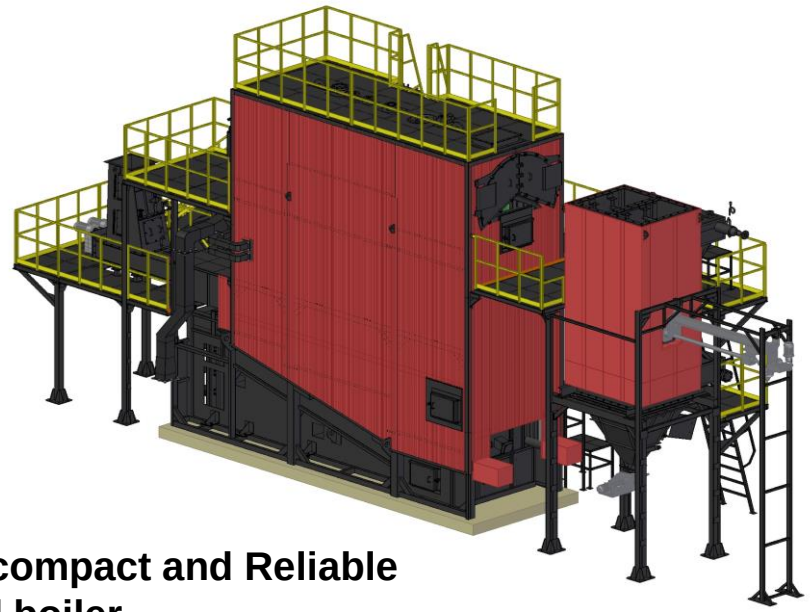
- Initial section that is made of a sharp block grate bar maximizes force for effective pushing of tall fuel layer to reduce accumulation. Other sections of the grate is made of full nozzle grate to accelerate combustion.

An advanced combustion technology suitable for all biomass fuels, even for the fibrous and low bulk density fuels like Rice straw



CPRG – Biomass-fired hybrid boiler

HTRG – Biomass-fired Thermal oil heater



UPRG – Ultracompact and Reliable Biomass-fired boiler

Case Study – Sustainable Steam for the Textile Industry

Rice Straw – A sustainable and widely available fuel

Open-field stubble burning in North India harms air and soil quality. Seeking a cleaner alternative, a textile major partnered with Thermax to adopt rice straw combustion using Universal Bio Grate technology.

Challenges of rice straw combustion

- Low bulk density and inconsistent calorific value
- High ash content leading to potential tube fouling
- Large volume needs robust grate and handling
- Particulate matter emissions in conventional combustion setups

Introduction to the case

Thermax partnered with a textile major to cut emissions and address stubble burning in Northern India.

Location: Punjab

Thermax's Solution

Boiler Model: GreenPac Boiler 6 TPH

Technology: GreenPac based on Universal BioGrate combustion system with Danblast online soot cleaning.

Designed for efficient combustion of rice straw

Handles diverse and challenging biomass fuels

Optimised pressure part and fuel bed design for enhanced reliability

Benefits

Operational Impact

~35% lower fuel cost vs. Indonesian coal

Fuel flexibility: rice straw, bagasse, cane trash, mustard stalk

Online soot-blowing reduces downtime

Efficient at part loads, less ash carryover

Environmental Impact

CO_2e reduction: up to 19,283 TPA

Eliminates stubble burning, improves air quality

Electric Process Heating Solutions

Zero Emission

- No Air Pollution
- No hazardous ash

Best in class performance

- Efficiency of 99%
- Dryness fraction of 98%
- Consistent efficiency at part load

Higher Uptime

- Higher reliability
- Ease of maintenance
- Highest MTBF

No moving parts

- Silent operation
- Low maintenance

Simplified layout and Compact

- No fuel storage and handling
- No ash handling
- No PCE & HRU

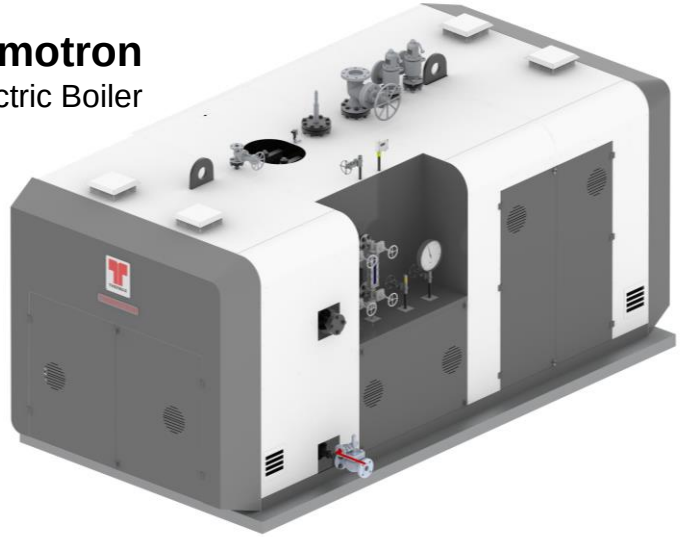
Packaged and Modularised

- Ease of transportation & installation
- Portable
- Plug & Play

Quick Steam generation

- Lower start-up time
- Better response to fluctuating load conditions

Thermotron
IBR Electric Boiler



Effitron
Non-IBR Electric Boiler

Zero Emissions

No air pollution

- Zero local emission
- Reduced carbon footprint
- PCB liaison is not required
- No need of PCE*

No ash generation

- No solid waste generation
- Ash handling system is not required

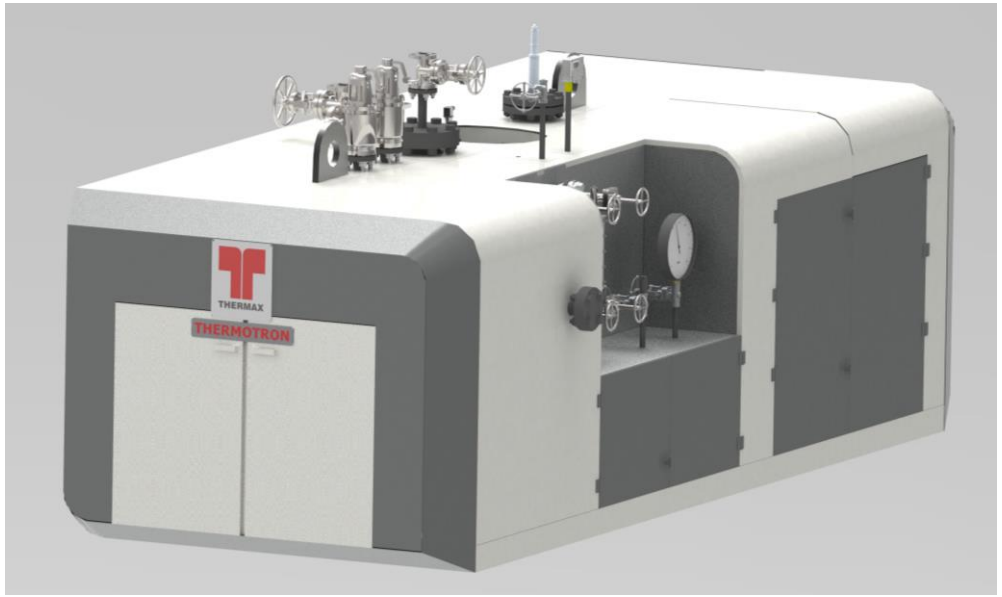
Possibility to achieve **zero global emissions** in a process heating boiler by utilising renewable sources of electricity, like wind and power.

Case Study

Thermotron – Electric Boiler

Industry: Petrochemical

Location: Bangalore, Karnataka



Case:

- One of the world's leading petrochemical company has their product testing facility in Bangalore. They required high-quality steam to test the product sample before dispatching it to the market.
- Owing to their commitment to Sustainability, constrained space for boiler installation and the lab being within the city limits, they were looking for electrically operated boilers. They approached Thermax due to their long association with our organization.
- To their above requirements, Thermax offered a newly developed Electric Boiler, Thermotron, which is first of its kind in India.

Result:

- Thermax's First Electric boiler to be supplied in India
- Offering BoP supply solution and high specifications for highly demanding petrochemical industry

Features of Thermotron

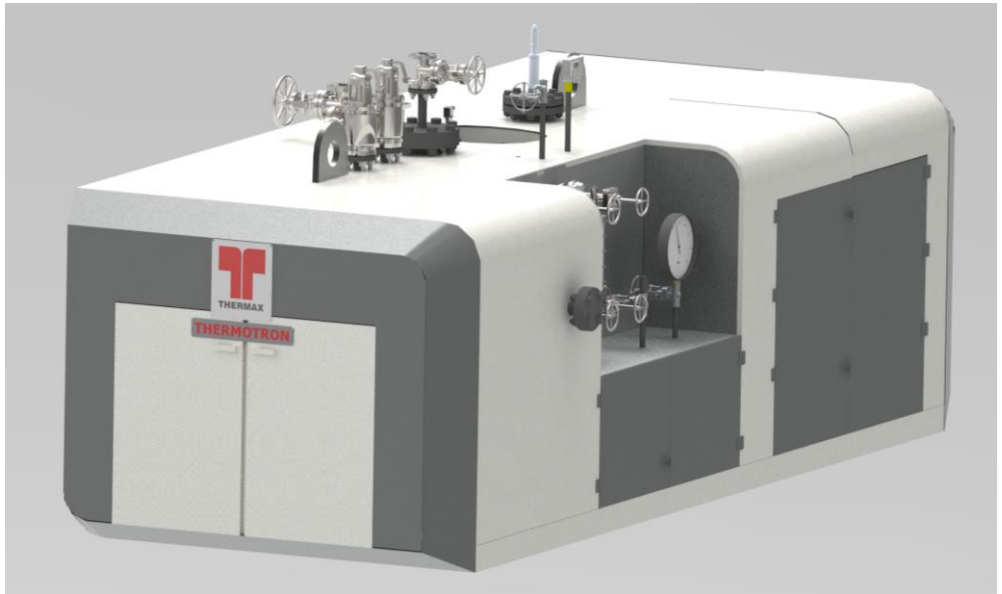
- Capacities range 200 to 6000 kg/hr
- Best in class **Efficiency** of upto **99% at rated and part loads**
- Very High Turndown ratio of 1:10 and highest uptime
- Net Zero emissions when integrated with Green power sources
- Modular construction, Plug and Play
- IIoT Enabled by default

Case Study

Thermotron – Electric Boiler

Industry: FMCG

Location: Nepal



Case:

- One of the world's largest consumer goods companies, known for their multiple brands, is focused on sustainable growth. They required high-quality steam for their process requirement.
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Service-Centric Philosophy

- Comprehensive and tailored service solutions
- Quick and assured Support
- Vast network of service professionals
- Global presence
- Genuine services and spares
- Guaranteed customer satisfaction
- Asset agnostic support
- Thermax expertise

THERMAX SERVE
ALWAYS BY YOUR SIDE

- **Spares**
- **Value Added Services**
- **Retrofit & Revamp**
- **EDGE™ Live**

Optimizing Steam Systems for Efficiency

Maximizing Energy Recovery & Minimizing Waste

Steam is a vital energy carrier in many industries, but its inefficient use can lead to significant energy losses and environmental impact. Our solutions ensure optimal steam quality and efficient condensate recovery.

RealSteam :

- **Ensures correct steam quality**: Prevents heat transfer losses and equipment damage from wet steam.
- **Monitors key parameters**: Provides accurate readings for dryness fraction, crucial for performance calculations and problem detection.
- **Impact**: Reduces fuel consumption by ensuring efficient heat transfer and preventing steam-related issues.

CPCRS (Compact Pressurised Condensate Recovery System):

- **Efficient Condensate Recovery**: Recovers valuable hot condensate (100+ Deg.c) and returns it to the boiler feed system.
- **Compact Design & High Reliability**: Operates without cavitation issues, even with high-temperature condensate.
- **Impact**: Leads to substantial fuel savings, reduced boiler blowdown, and improved overall thermal efficiency.

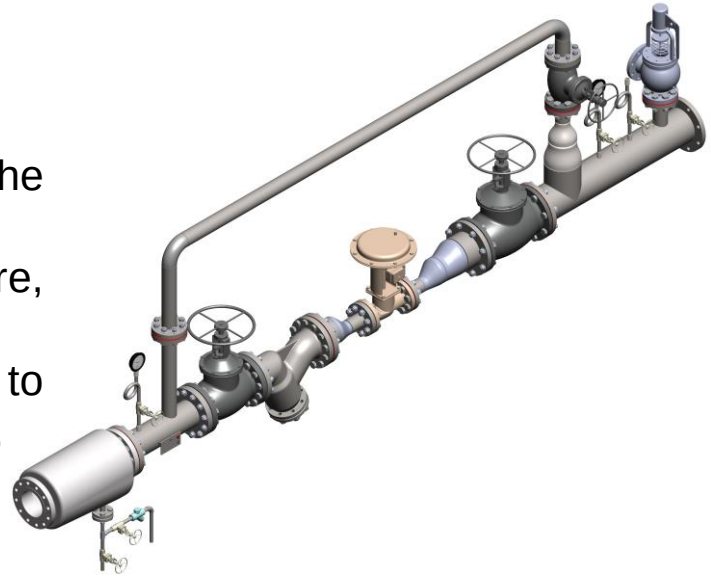
Advanced Steam Management & Heating Solutions

Precise Pressure Control and On-Demand Hot Water for Enhanced Performance

Optimizing steam distribution and hot water generation are key to energy conservation and process efficiency. Our systems deliver precise control and maximum heat recovery:

Pressure Reducing Station (PRS):

- **Optimizes Steam Pressure**: Reduces high-pressure steam to the desired lower pressure for specific process applications.
- **Ensures Stable Supply:** Maintains consistent outlet pressure, improving process stability and heat transfer efficiency.
- **Impact**: Enhances energy efficiency by tailoring steam properties to exact requirements, reducing waste, and prolonging equipment life.



InstaHeat (Instantaneous Hot Water Generator):

- **Instant Hot Water**: Generates hot water on demand using steam as an indirect heating medium.
- **Precise Temperature Control**: PID-based system ensures accurate temperature, regardless of load fluctuations.
- **Impact**: Reduces warm-up times, minimizes energy waste, and optimizes hot water availability for process needs..

Advanced Flow Control for System Integrity

Accurate Monitoring and Leak Prevention

Effective management of steam systems is crucial for energy efficiency, operational reliability, and environmental protection. Our solutions provide precise measurement and prevent costly steam losses:

Steam Flow Meter (A2Zflo-S):

- **Accurate Steam Measurement**: Precisely measures mass flow rates of saturated and superheated steam.
- **Comprehensive Monitoring**: Displays instantaneous and cumulative steam flow, pressure, and temperature.
- **Impact**: Enables continuous monitoring of utility consumption, helps identify steam losses, and optimizes energy costs by providing data for efficiency analysis.

Bellow Seal Valve:

- **Zero Leakage Design**: Features a metallic bellows that creates a hermetic seal, eliminating gland leakage common in conventional valves.
- **Durability & Minimal Maintenance:** Designed to withstand high pressures, temperatures, and corrosive environments, requiring less maintenance.
- **Impact**: Prevents significant energy and medium loss, reduces environmental hazards (fugitive emissions), enhances safety for plant personnel, and lowers maintenance costs by ensuring a tight, permanent seal.

Our Commitment to Sustainable Solutions

Driving Efficiency, Reducing Footprint, and Ensuring Performance

Our comprehensive suite of solutions delivers tangible benefits that contribute to a more sustainable industrial ecosystem:

a) **Significant Fuel & Energy Savings:** By optimizing steam quality, accurately measuring consumption, preventing leaks, and maximizing heat recovery, we help industries drastically reduce their energy footprint.

b) **Reduced Emissions:** Lower energy consumption directly translates to a smaller carbon footprint and contributes to cleaner air.

c) **Enhanced Operational Efficiency:** Precise control of steam pressure and instantaneous hot water generation lead to improved process stability, higher product quality, and reduced downtime.

d) **Resource Conservation:** Maximizing water and heat recovery minimizes fresh water intake, chemical treatment costs, and overall waste.

e) **Increased System Reliability & Longevity:** Protecting equipment from issues like wet steam, pressure fluctuations, and leaks extends asset life and reduces maintenance burdens.

At Thermax, we are dedicated to developing and implementing innovative energy and environment solutions that empower industries to achieve their sustainability goals while ensuring economic viability and operational excellence.

Energy And Water Savings Products

Electrical Heat Pump

Acheive Maximum Operational Savings

Capacity: 0.2MW-3MW per single unit

- Hot Water Output: Up to 120°C
- Energy Savings Up to 80%
- Simultaneous Cooling generation capacity Up to 60%
- COP: 1.8 – 6
- Type:Air,Water,Dual Source

Hybrid Heat Pump

Achieve 40% Cost Savings

Capacity: From 400 KW- 40 MW

- Hot Water Output: Up to 120°C
- Water Savings: Up to 30%
- Direct Fuel/Energy Savings: Up to 40%
- Simultaneous Cooling generation capacity Up to 30% of heating capacity

Closed Loop Cooling Tower

Achieve upto 30% Water Savings

Capacity: From 10 CMH to 400 CMH (In a Single Unit)

- Temperature Range : Inlet 55°C (Max)
- Delta T : 25°C
- Casing : ZAM / AZ 150 / SS 304
- Tubes : SS 304
- Fans : Std Axial Fan & Motor / EC Fans
- Types: Mixed Flow, Counter Flow, Hybrid

Adiabatic Cooling Tower

Achieve upto 95% Water Savings

Capacity: From 100 KW to 1 MW (In a Single Unit)

- Temperature Range : 48°C (Max)
- Delta T : 7 – 8°C (Typical) / 10°C (Max)
- Casing : ZAM / AZ 150 / SS 304
- Tubes : SS 304
- Fans : Std Axial Fan & Motor / EC Fan

Case Study

Electrical Heat Pump

Industry: Automobile
Location :India

Features of Electrical Heat Pump

- Hot Water output up to 120ºC
- Simultaneous cooling generation capacity up to 60%

Case

An automobile major faced a challenge to reduce their operational costs associated with hot water generation which is required for their process heating applications

Thermax commissioned 200kW air sourced electrical heat pump which replaced the diesel fired generators for hot water generators. Thermax Electrical Heat
Pump runs on electricity sourced from the grid and provides hot water for the critical process heating applications

Result

- Saved 1,344 m^3 of water savings per annum
- Steam savings of 3,427 tonnes per annum
- Operational cost savings up to 58 lakhs per annum

Case Study

Hybrid Heat Pump

Industry: Chemicals
Location: India

Case:

A leading chemical company wanted to cut down the operational expenditure associated with hot water generation for process heating applications

Thermax commissioned its 562kW Steam driven Hybrid Heat Pump which replaced the existing conventional system. A part of steam from the conventional system will be given as an input and the heat exchangers which were earlier used to provide hot water will be kept in standby mode. Hot water of temperature 110ºC will be produced and used for the polymerization process

Features of Hybrid Heat Pump

- Hot Water output up to 120ºC
- Water savings up to 30%
- Simultaneous cooling generation capacity up to 30%
- Direct fuel savings up to 40%

Result:

- 3,341 tonnes of steam savings per annum
- 519 tonnes of carbon emission savings per annum
- 2,841 m^3 water savings per annum

Case Study

Closed Loop Cooling Tower

Industry: Information Technology
Location: India

Case:

A leading information technology company was incurring high operational costs due to the formation of scaling in their cooling system

Thermax commissioned its 170CMH closed loop cooling tower which replaced the existing open loop cooling tower. This helped the process water to flow in closed loop eliminating the risk of scale formation reducing overall water and power consumption and improved uptime performance of the equipment

Result:

- Water Savings up to 15%
- Scale free operations

Features of Closed Loop Cooling Tower

- Plug-and-play
- 30% less footprint
- No contamination
- Energy savings
- Types : Mixed Flow, Counterflow, Hybrid

Case Study

Adiabatic Cooling Tower

Industry: Beverage
Location :India

Case

A beverage major faced a challenge to prevent excessive water consumption and high operational costs associated with process cooling

Thermax commissioned 8 Nos of 789kW ADCT works at wet mode during daytime and produces effective cooling by the addition of spray water across cooling pads whereas, night-time, when ambient temperature is low, cooler works as dry mode with zero water consumption.
Furthermore, it prevents water accumulation and scaling issues which guaranteed uninterrupted operation and prolonged the lifespan of the cooling equipment.

Features of Adiabatic Cooling Tower

- Water Savings up to 95%
- Legionella Free
- Eliminates the risk of scale formation
- Wet and Dry Cooling

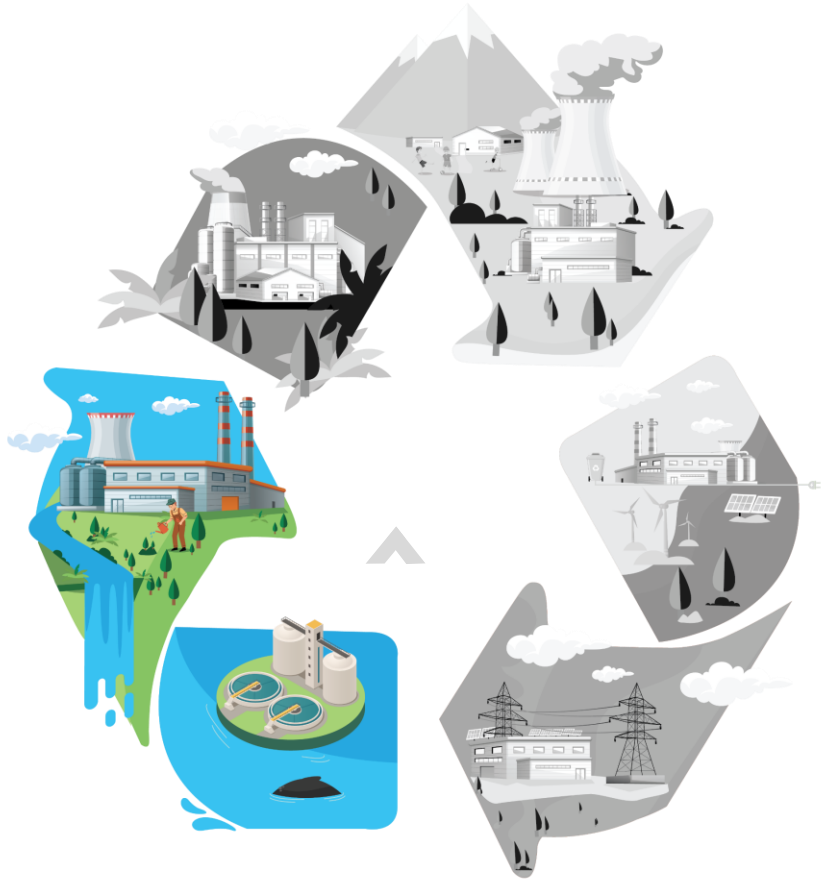
Result

- Water savings up to 70%

Sustainable Solutions by Thermax

Clean Water

Water and Waste Solutions



O&Ms, Plant Improvement & Upgrades, Spare Parts Management

Water Treatment & Effluent Treatment Chemicals

Thermax Build-Own-Operate (BOO) Solutions

THERMAX

Water Treatment Products

Sewage Treatment Products

Effluent Recycle & Zero Liquid Discharge Plants

urthh®

Digitally-enabled Operation and Maintenance for Urban

Water Treatment & Sewage Treatment Plants

Desalination Plants

Thermax One Stop Solution

Business Insights

220
Thousand
m^3/hr
water treated

120
Thousand
m^3/hr
wasterwater recycled

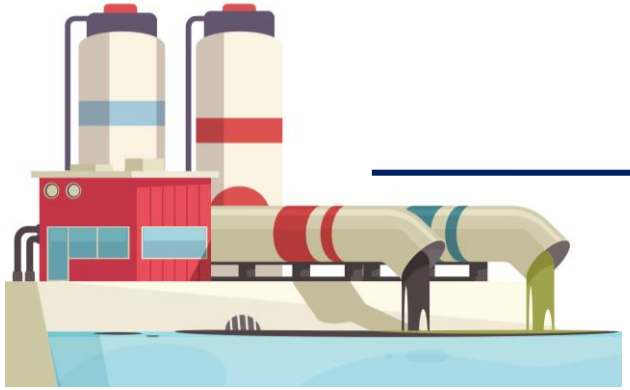
In-house design, detail engineering, procurement, project management, construction & commissioning services

1st

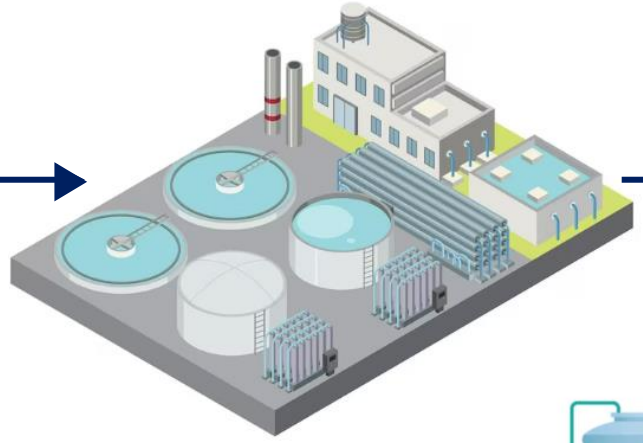
In India to Install
a Large-Scale
Desalination Plant

In India to Install
Effluent Recycle & ZLD Plant

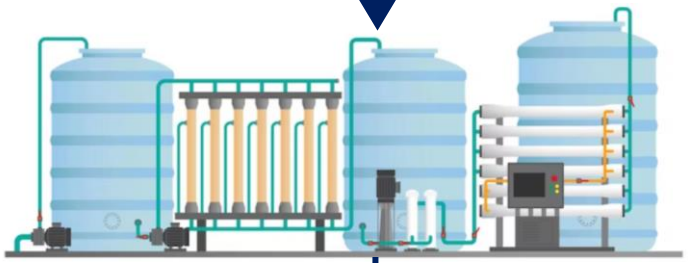
Complete Zero Liquid Discharge System



Industrial Wastewater



Wastewater/effluent treatment plant



Reverse Osmosis (90% Recovery)

10% high TDS RO Reject

Up to 98% Recovery

Re-usable water going back to Industry as process makeup water of RO/Soft Quality Water

Zero liquid discharge unit

Salts for disposal

Resource Recovery **$NaCl$, Na_2SO_4**

Central hazardous waste disposal facility

Thermax’s in-house designed and manufactured sustainable and efficient ZLD solution

Advanced Mechanical Vapour Recompression

Capacity Range

5 KLD - Above
(available for larger capacity, if required)

Thermax's in-house designed and manufactured energy efficient and optimised ZLD solution

Advanced Multi - Effect Evaporator

Capacity Range

5 KLD - Above
(available for larger capacity, if required)

PureCODe™

Advanced media

To effectively treat complex organic constituents, present in wastewater

An advanced media to effectively treat organic compounds present in wastewater, especially COD, colour and odor removal.

It is a novel media having very high surface area and multiple reaction centers, enhancing reaction kinetics and maximizing COD reduction.

PureCODe Pilot Results

		Treatment Result		
Industry	Associated Product	Initial in ppm	Final in ppm	% Reduction
ETP	Pure CODe	10000	3000-5000	50-70
CETP	Pure CODe	100	33	66.7
Paints Industry	Pure CODe	352	86	75.6
Synthetic Rubber (NBR & HSR)	Pure CODe	617	65	89.5
Specialty Chemicals	Pure CODe	47250	10125	78
Textile Industry	Pure CODe	569	162	71.5
Color and effect pigment manufacturer	Pure CODe	1548	307	80
Intermediate and Chemicals	Pure CODe	5562.5	125	97
Personal care product company	Pure CODe	128	0	100
Paper Industry	Pure CODe	10640	2335	78
Steel Industry	Pure CODe	812	445	45.2
Chemical Industry	Pure CODe	75	29	61.3
Cellulose Manufacturing Industry	Pure CODe	150	50	66.7

Sustainable Water Solution for Food Sector

Challenge

- Company’s aim to achieve water positivity
- Ground water requirement of 7 ltr/kg of chip production; increase in wafer production
- High quantity & quality of effluent is generated
- Difficulty in compiling the PCB norms

Solution

- Recycling the process wastewater generated during the process
- Unique combination of biological systems with membrane systems
- Less use of chemicals; utilising the organic sludge for Biogas generation
- Alternate source for Boiler and cooling tower makeup.

Result

- 1st in the world novel solution and application
- Making the facility net water positive; 3.5 lacs litres of fresh water saved per day
- 95-99% water in-house recycled
- Fresh water requirement of 7 ltr/kg dropped down to zero, with condensate recovery
- Water availability for a production increased to 5 times
- Zero water requirement for boiler & cooling tower applications
- Biogas production for boiler feed; Minimising sludge generation by 60%
- 100% removal of toxic compound like Acrylamide, Bromide & Colour
- Treated water meets IS10500 / WHO drinking water standard

Clean Water

Thermax TSA Process Equipment's Pvt Ltd

Distribution System Water Treatment System

CIP System Sterile Vessels

Sustainable Solutions by Thermax

Clean Air

Air pollution control

Gas Purification and Clean Air Solutions

Renewable Energy

Thermax Ne0 : Gas Enrichment Solutions

- Biogas Purification and Upgradation (Biogas to Bio CNG)
- Hydrogen Purification System

Solar , Semiconductor

Process Exhaust System for solar and semiconductor manufacturing process

Waste to Energy

Flue Gas Cleaning System (FGCS)

- Municipal Solid Waste (MSW) Fired Power Plants
- Non-Recyclable Solid Waste (NRSW) based Power Plant
- Bio Medical Waste Incinerators in Hospitals
- Hazardous Waste Incinerators

Success Story

Thermax Ne0 pioneer's biogas purification technologies in India

Inhouse VPSA technology delivering as committed

Performance delivered

Purity **>96%**

Recovery **>97%**

1st Bio-CNG plant on PSA technology in India

Performance delivered

Purity **>96%**

Recovery **>99%**

Success Story

Flue Gas Cleaning System (FGCS) for Waste to Energy Plant

- **System Supplied :** FGCS for 2 X 600 TPD

  Municipal Solid Waste (MSW) Fire Boiler off gases
- **Flue gas at the inlet of FGCS :** 1,50,000 Nm3/hr
- **Temperature :** 210 Deg.C

Performance Report

Parameters	Inlet Parameters	Outlet Emissions
HCl	1000	20
So_x	800	50
HF	10	4
Total dioxins & furans	10 ngTEQ/Nm^3	0.1 ngTEQ/Nm^3
Hg and its compounds	0.07	0.02

Accelerating Decarbonisation

THERMAX

Sustainable Energy & Environment Solutions

(Capex / O&M)

Green Utility Solutions under Build-Own-Operate

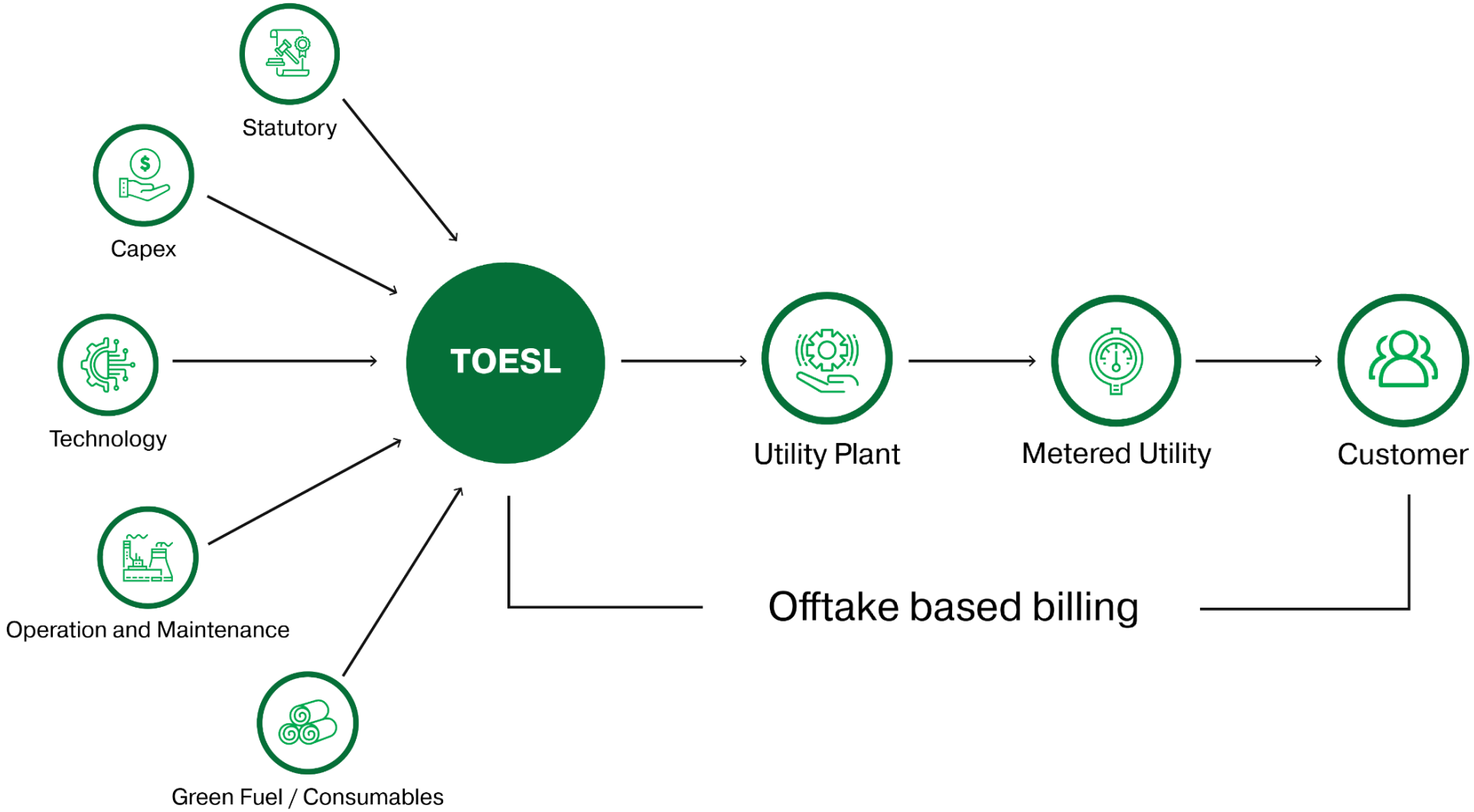
From investment to lifecycle responsibility

Thermax Onsite Energy Solutions Limited (TOESL)

(Build-Own-Operate Solutions)

Green Utility Solutions under Build-Own-Operate

Thermax Onsite Energy Solutions Limited (TOESL) – championing sustainable solutions in industries



Utility Delivery Solutions

- **Steam & Heat** (Boiler & Heater)
- **Chilled Water** (Cooling & Heating)
- **Treated Water** (Water & Wastewater Treatment)
- **Co-generation** (Power)
- **Multi utility** (Above + Comp. Air, CT, Elec Chiller, DG, etc.)
- **BioCNG, Gasification**

From investment to lifecycle responsibility

15+ Years	**25+ Accounts**	**45+ Installations**
Of experience in utility solutions	Partnered globally	In India, Sri Lanka and Indonesia
3000+ Tons/Day	**> 1.3 M Tons**	**> 140 M Litres**
Biomass supply chain in India	Reduction in CO_2e for clients	Of water treated till date
110+ Utility Assets	**Global Presence**	**Diverse Workforce**
Owned & managed across sites	South Asia, South-East Asia	> 650* employees

Multiple Sectors Addressed

Pharma | Food | Chemicals | Tyre | Paint | Textile | Packaging | Confectionery | Tobacco | Metal…….

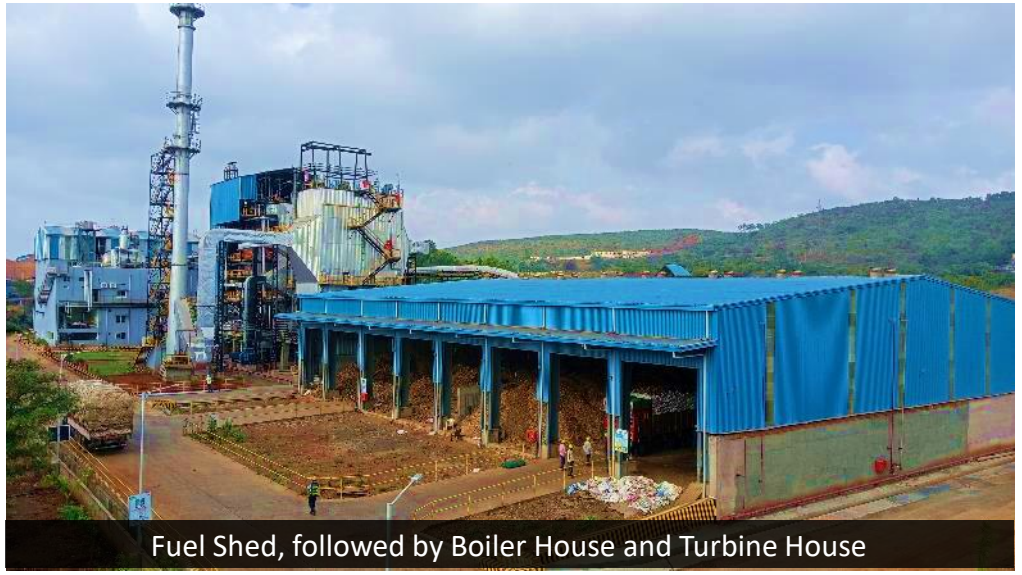
* Includes employees with third party contracts

Values Delivered

- 100% Green Solutions
- Asset Light
- Cost Effective
- Guaranteed Performance & Uptime

TOESL relieves its clients from the responsibility of utility management, enabling them **to focus more on their core manufacturing processes and partner with them to achieve ESG targets.**

Biomass based Cogen under Build-Own-Operate



Fuel Shed, followed by Boiler House and Turbine House

Condensate Polishing Unit

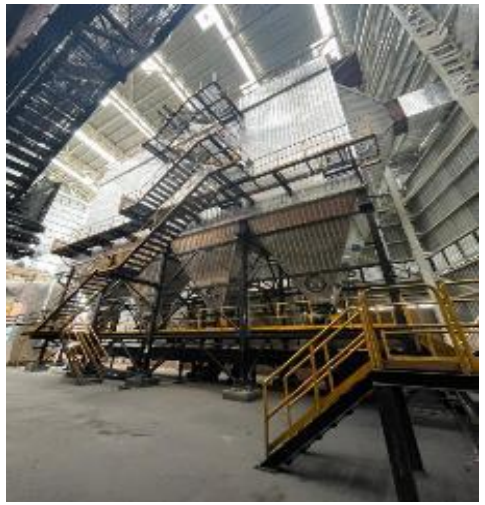
PROJECT:

- **Industry:** Aluminium
- **Location:** Belagavi, Karnataka.
- **Solution: Water tube design Bi-drum Boiler** with Thermax reciprocating grate
- **Project Capacity:** 33 TPH MCR / 67 kg/cm^2(g) / 450 ± 5 °C | 4 MW Power
- **Fuel:** Agro-waste Biomass Briquettes + Loose Biomass

BENEFITS:

- Reliable steam & power supply from 100% agro-waste biomass based cogen plant for producing **green alumina**.
- Guaranteed supply of 200 TPD quality biomass for round the year operation.
- Annual cost savings: **~INR 40 Crores** (against FO).
- Est. **CO2e reduction: ~48,000 tons/year** against FO.
  (Equivalent to 1 lakh barrels of oil consumed)
- 100% safety and uptime delivered as per commitments.
- Capital investment for the utility plant by TOESL

Green Steam Supply to Vaccine Manufacturer, Bengaluru



PROJECT:

- **Location:** Bengaluru, Karnataka.
- **Solution: Hybrid boiler with reciprocating grate** installed by TOESL in a limited space of 966 m^2 with a **'G+1' layout** (ground floor fuel storage, first floor boiler plant)
- **Boiler Capacity (F&A 100°C):** 30 TPH MCR / 17.5 kg/cm^2 (g)

BENEFITS:

- Reliable steam supply from 100% agro-waste biomass fired boiler in compromised space.
- Guaranteed supply of quality biomass for round the year operation.
- Est. **CO2e reduction**: **~30,000 tons/year** against gas.
  (Equivalent to ~72,000 barrels of oil consumed)
- 100% HSE compliance and uptime delivered as per commitments.

PARTNERSHIP WITH LEADING VACCINE MANUFACTURER

- Received constant customer **appreciation for execution** of large capacity biomass fired boiler plant on 'G+1' layout, enabling Biocon towards **energy transition and cost savings.**

Green Steam Supply to Nestle, Sri Lanka


Boiler House

PROJECT:

- **Industry:** Food
- **Location:** Kurunegala, Sri Lanka.
- **Solution: Hybrid (smoke tube & water tube) design Boiler** with Thermax reciprocating grate
- **Boiler Capacity (F&A 100°C):** 20 TPH / 21 kg/cm^2 (g)
- **Fuel:** Wood Chips

BENEFITS:

- Reliable steam supply from 100% sustainable biomass fired boiler.
- Guaranteed supply of 140 TPD quality biomass for round the year operation.
- Annual cost savings: **~INR 10.7 Crores** (against FO).
- Est. reduction in CO2 e: **~15,000 Tons/yr** against gas (Equivalent to **~35,000** barrels of oil consumed)
- **100%** safety delivered as per commitments.
- **>99%** plant uptime after stabilization
- Capital investment for the utility plant by TOESL

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“Profit is not only a set of figures, but of values.”

Rohinton D. Aga
Chairman, Thermax
(1935 - 1996)

Boundlessly bridging the gap between energy availability and sustainability

Thank You

Conserving Resources, Preserving the Future.

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