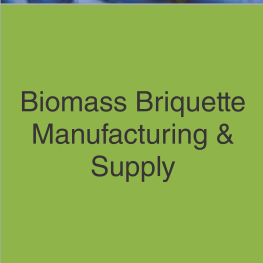
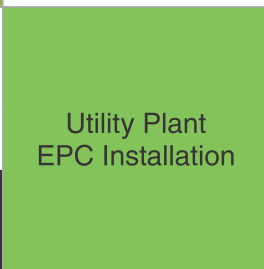


Comprehensive  
O&M



Biomass Briquette  
Manufacturing &  
Supply



Utility Plant  
EPC Installation

# Outsourced solutions in **GREEN** utilities



Capital  
Investment



Statutory  
Approval



Technology  
Selection

- STEAM
- HEAT
- CHILLED WATER
- TREATED WATER
- POWER



Successfully operating the very first fully automatic packaged biomass boiler - Team TOESL stands proud

**TOESL also offers outsourced solutions in power generation and water & wastewater treatment**



TOESL offers reliable captive co-generation solutions on Build-Own-Operate basis to a spectrum of industrial sectors, blending its biomass fuel supply chain with best-in-class performance standards.



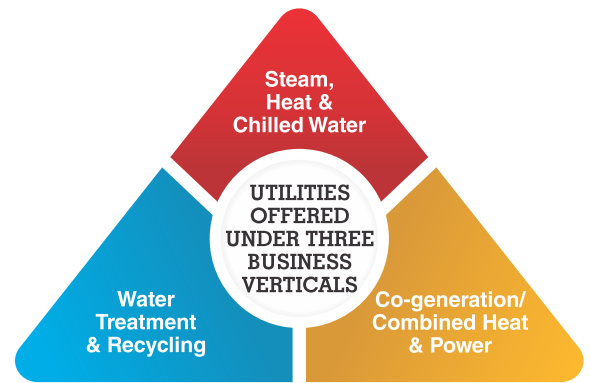
TOESL provides innovative, end-to-end solutions, on Build-Own-Operate basis, in water and waste water treatment/ recycling in standardised and customised options.



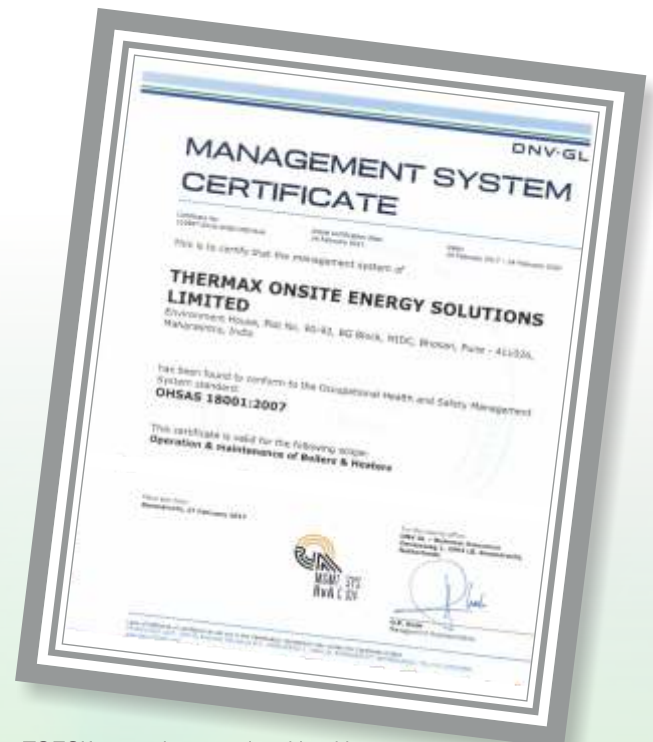
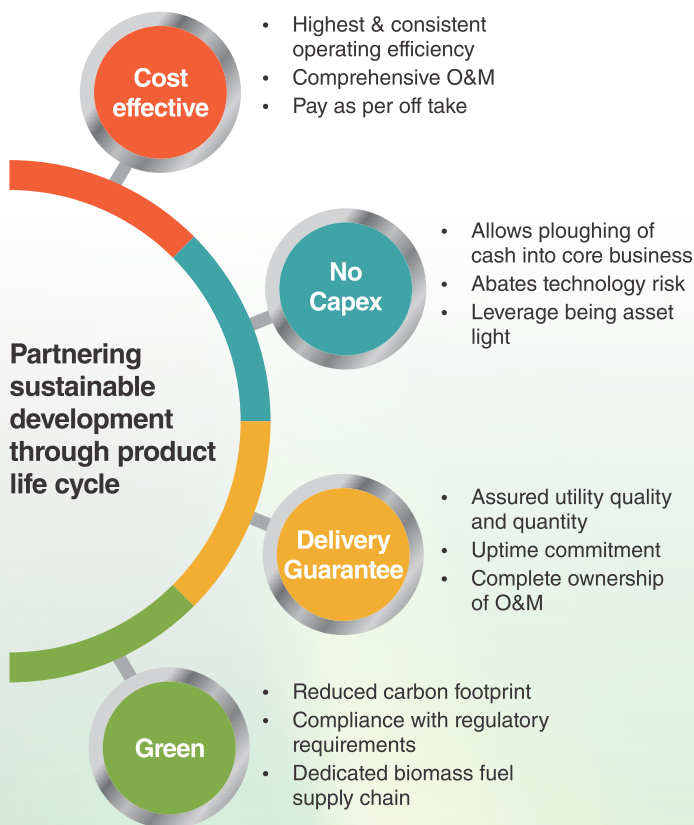
# TOESL: outsourced solutions in green utilities

Thermax Onsite Energy Solutions Ltd. (TOESL), a wholly owned subsidiary of Thermax Limited, offers sustainable solutions in supply of utilities through the outsourcing route. Under this unique business model, customers are relieved from the burden of owning and running the utilities, thus enabling them to focus more on their core manufacturing processes.

TOESL invests and manages all the utility equipment, including biomass fuel supply and solid waste management, thus ensuring uninterrupted supply of utilities. The customer only pays for the metered quantity of utility consumed.



## An unmatched value proposition



TOESL's sound occupational health and safety management systems and practices are borne out by its OHSAS 18001:1999 certification

## Outsource utility supplies to us, focus on your core manufacturing

Since 2009, several companies have gained from outsourcing their energy requirements to TOESL. As a reliable partner with proven expertise in energy and environment solutions, TOESL partners customers through the entire product life cycle. So, whether it is converting an existing plant to green fuel, or meeting the energy needs for a new plant without the hassles of managing utility equipment, TOESL offers solutions that slash energy costs and reduce carbon foot print.

Industries served by TOESL include, among others, paint & chemical, food, textile and dairy. Today, TOESL-managed utilities for steam and heat supply can be seen in Tamilnadu, Maharashtra, Haryana, Uttar Pradesh and Karnataka.



Paint & Chemical



Pharma



Food



Textile



Customised battery operated briquette loader in operation at a TOESL site



TOESL's dedicated firewood chipping facility



# Key drivers in efficient biomass boiler operation

## ■ Biomass fuel supply chain management

Fuel being the most critical input, as a strategic backward integration initiative, TOESL has invested in establishing captive biomass briquetting units on a pan-India basis. Under this initiative, biomass briquetting plants have been installed in the states of Karnataka and Maharashtra having a production capacity in excess of 4000 tons per month.

Many more such plants are on the anvil to ensure uninterrupted supply of consistent & high quality biomass fuel at a competitive price through the life cycle of boiler system for TOESL customers.

Under the biomass fuel supply chain management, as a process following steps are followed:

- Mapping locally available biomass fuels and suppliers during conceptualization of project
- Development of dedicated fuel suppliers to ensure sustainable supply of best quality biomass fuels
- Boiler designed to operate on multiple biomass fuels in view of seasonal availability
- Long term contracts with biomass fuel suppliers



Briquetting unit - Karnataka



Briquetting unit - Maharashtra



Chipping unit - Maharashtra

## AGRO-WASTE TO BIOMASS BRIQUETTE



## ■ Operation & Maintenance

TOESL provides best practices encompassing the following:

- Comprehensive O&M with spares management
- Deploying experienced & trained manpower
- Lab at every site for daily testing of fuel and water
- High-end, PLC based automated controls
- Adequate redundancy, thus maximising uptime
- Periodic safety training and audits
- Routine regulatory compliance (IBR)
- Online and remote performance monitoring
- Robust MIS practices

## ■ Ash management practices

TOESL's solid waste management practices include:

- Ash disposal as per statutory norms
- Productive utilisation of waste ash for use as fertilizers, road construction, land filling etc.





State-of-the-art, reciprocating grate, biomass combustor technology from Lambion, Germany, in operation at a TOESL managed boiler site





## Biomass boiler and combustor system

### Features

- State-of-the-art, modular, high efficiency hybrid water and smoke tube units
- Unique water wall membrane furnace design, best suited for biomass fuels
- Automated fuel and ash handling system with redundancy of critical equipment
- Moving floor system - for efficient storage and handling of voluminous biomass
- Multi-fuel option - to ensure sustained operation for variety fuels
- High end, air cooled, reciprocating grate technology from Lambion, Germany
- Fully automated, PLC based control system with SCADA
- Zone-wise combustion with air control mechanism to ensure best efficiency at varying operating loads
- High turndown with optimum operating efficiency
- Specially designed, high chrome grate casting links to ensure high availability
- Zone-specific metallurgy and varying profiles of combustor grate link construction for reliability and long life

### Select reference installations

- 3 TPH briquette fired boiler - Bawal, Haryana
- 1.5 Mn kcal/hr husk/ saw dust fired hot oil heater - Kanpur, Uttar Pradesh
- 8 TPH briquette fired boiler - Hosur, Tamilnadu
- 3 Mn kcal/hr briquette fired hot oil heater - Hosur, Tamilnadu
- 1.5 Mn kcal/hr briquette fired hot oil heater - Lote, Maharashtra
- 14 TPH briquette fired boiler - Ranjangaon, Maharashtra
- 15 TPH (2 nos.) wood chip fired boiler - Ambasamudram, Tamilnadu
- 10 TPH briquette fired boiler - Bengaluru, Karnataka
- 8 TPH husk fired boiler - Munger, Bihar
- 2 TPH wood chip fired boiler & 300 TR (2 nos.) high efficiency vapour absorption chiller system - Pune, Maharashtra
- 6 TPH (2 nos.) briquette fired boiler -Kurkumbh, Maharashtra
- 8 TPH briquette fired boiler - Dahej (SEZ), Gujarat
- 4.5 Mn kcal/hr + 3 TPH thermic fluid steam generator husk fired heater - Singur, Kolkata
- 16 TPH briquette fired boiler - Pune, Maharashtra

We facilitate customers in focusing on their core business



## EPC installations under various stages of construction at TOESL sites



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