THERMAX

Energy Transition in Chemicals

Turning Heat and Cooling into Green Assets

Thermax at a Glance

5,225 Employees*, Globally

Installations in
90+ Countries

Sales and Service Presence in
30+ Countries

Rs. 9,323 crore
(USD ~1 Bn)
Revenue

14 Manufacturing Locations
(10 in India, 4 International)

Cooling

Applications

Application Area	Scope for Decarbonisation	Product
Waste Heat Recovery for Cooling	Leverage process heat to generate chilled water, reducing electricity consumption and lowering carbon footprint	Absorption Chillers
Distillation Overhead Condensation	Supply chilled water for vapor condensation, enabling low-pressure operations and enhancing overall productivity.	
Solvent Recovery Systems, Saponification, Polymerization	Cool solvent vapors for efficient recovery, while utilizing low-pressure vapor as a heat source.	
Low-Grade Heat Recovery	Upgrade waste heat for process reuse, achieving high-grade heat with a reduced carbon footprint.	Heat Pumps
Steam Replacement-Feed water Heating (≤120°C Heating)	Reduce steam dependency through efficient heating, lowering boiler load and enabling savings in preheating.	
Drying Applications	Enables use of waste heat or renewable thermal sources, reducing reliance on fossil fuels.	
Reactor Cooling Water Systems	Enhances energy recovery potential, lowering water consumption and overall carbon footprint of chemical processes.	Closed Loop Cooling Tower/Adiabatic
Compressor Intercooling / Aftercooling	Improves compressor efficiency, reducing energy & water consumption and associated emissions.	
Heat Exchanger , Equipment Cooling	Ensures optimal equipment performance, reducing unplanned shutdowns and energy-intensive restarts.	

Multi Energy To Multi Utility Partner-Absorption Chillers

THERMAX

LIVE ENERGY

STEAM: 0 bar(g) - 25 bar(g)

Hot Water: 60°C - 250°C

THERMIC FLUID: 150°C - 350°C

DIRECT FUEL FIRING : PROPANE / BIOGAS LPG/ Natural Gas / Diesel

RECOVERED WASTE HEAT

FLUE GASES: From Engines / Turbines / Furnaces

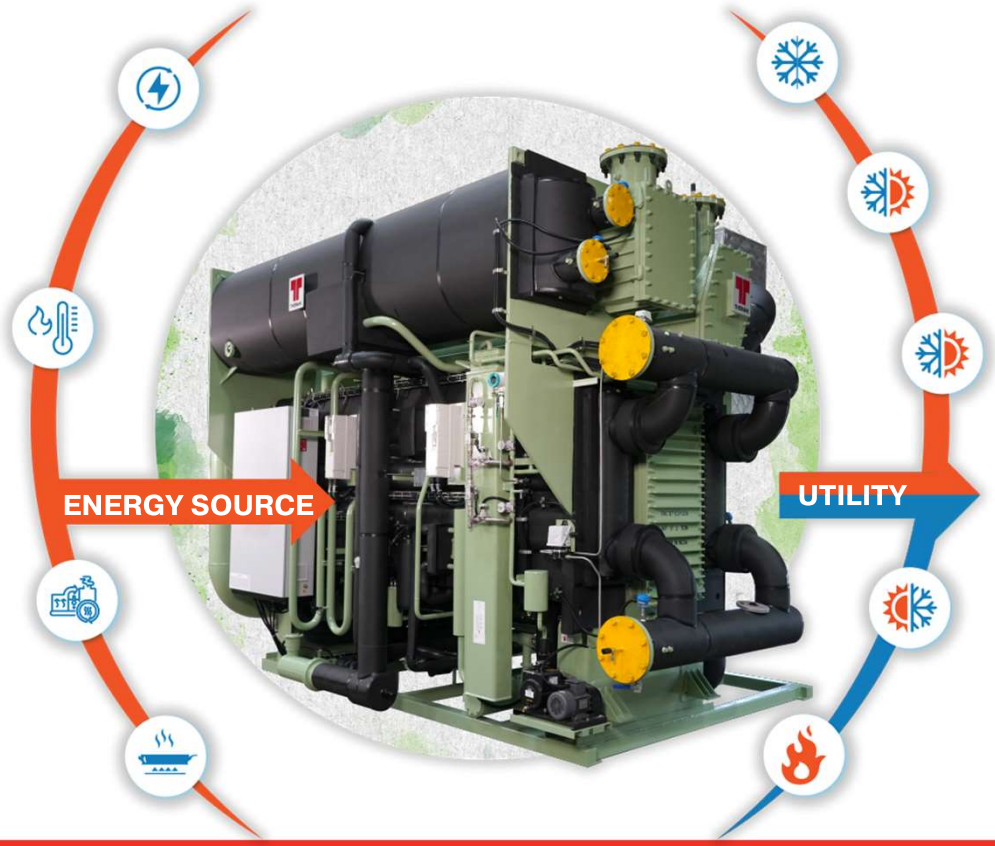
HOT WATER: From Engine / Heat Recovery Unit / Compressor 60°C-220°C

PROCESS INDUCED WASTE HEAT

VAPOUR: From Chemical Reactor / Polymerization Column / Potato Chips or Noodles Fryer

RENEWABLE HOT WATER

Geothermal / Solar



Chilling only **CHILLER**
-5°C Chilled Water / Brine
1°C Pure Water

Chilling: Primary
Heating: Secondary
SIMULTANEOUS CHILLER HEATER
0°C to 35°C Chilled Water 35°C to 90°C Hot Water

Heating: Primary
Chilling: Secondary
SIMULTANEOUS HEAT PUMP CHILLER
5 °C to 35 °C Chilled Water Up to 95°C Hot Water

Heating: Primary
Chilling: Secondary
CHILLER HEAT PUMP
Up to 90°C Hot Water &
5 °C to 35 °C Chilled Water

Heating only **HEAT PUMP**
Up to 170°C Hot Water

Case Study-Absorption Chiller for a Chemical Major

THERMAX

Challenge

A specialty chemical plant faced high electricity costs due to conventional chillers and had unused waste steam from its processes.

Solution

- To address these issues, the company collaborated with Thermax to implement steam-fired absorption chiller.
- This system was designed to harness waste steam generated within the plant to produce chilled water for process applications, effectively converting unused thermal energy into a productive resource.
- The adoption of absorption technology allowed the plant to drastically reduce its dependence on electrical chillers.

Result: The plant saw a 55% reduction in electricity consumption for cooling, leading to annual energy savings and reduction in carbon emissions by a significant margin

Heat Pumps-Product Basket

Absorption Heat Pump

Energy savings Up to 40%

- Water Savings: 60%
- **Heating Capacity: 0.25MW-40MW**
- **Hot Water Output: Upto 110°C**
- CO2 Reduction: Upto 90%
- Steam Pressure: 2-10 bar
- COP: 1.7 -1.8

Electrical Heat Pump

Achieve Maximum Operational Savings

- **Heating Capacity: 0.2MW-3MW per single unit**
- **Hot Water Output: Upto 120°C**
- Energy Savings up to 80%
- Simultaneous Cooling generation capacity Upto 60%
- COP: 1.8 – 6
- Types: Air Source and Water Source

Hybrid Heat Pump

Achieve 40% cost savings

- **Heating Capacity: 0.4MW and above**
- **Hot Water Output: Upto 120°C**
- Water Savings: Upto 30%
- Direct Fuels Savings: Upto 40%
- Simultaneous Cooling generation capacity Upto 30%

Case Study-Hybrid Heat Pump for a Chemical Major

THERMAX

Challenge

To reduce higher water, steam consumption and substantial carbon emissions

Solution

- Thermax's hybrid heat pump generates hot water (110°C) while simultaneously producing cooling, reducing the need for energy-intensive steam generation.
- The system replaces traditional steam-based heating with more efficient heat pump operation, saving steam and energy.
- Plate Heat Exchangers (PHEs) are now on standby, and the heat pump runs continuously, optimizing energy use

Result:
Reduction in operational costs by 52 lakhs per annum with reduced carbon footprint of 519 tonnes per annum

Highlight

Steam Saving – 3,341 Tonnes per annum

Water Savings – 2,841 m3/annum

Hybrid Closed Loop Cooling Tower

Salient Features

- Can be operated for higher temperature difference (Δ T)
- Zero contamination due to closed loop
- Capacity: 20 m3/h onwards
- Up to 40 % water savings compared to Open Loop Cooling Tower
- Up to 60 % Lower power consumption than Adiabatic Cooling towers
- Low Maintenance Costs
- Lesser environmental impact due to the reduction of water loss.

Types : Mixed Flow, Counter Flow, Hybrid

Case Study-Closed Loop Cooling Tower for a Chemical Major

THERMAX

Challenge

A chemical plant faced significant challenges with its traditional open-loop cooling system, including high water consumption, scale and corrosion issues, and increasing maintenance costs

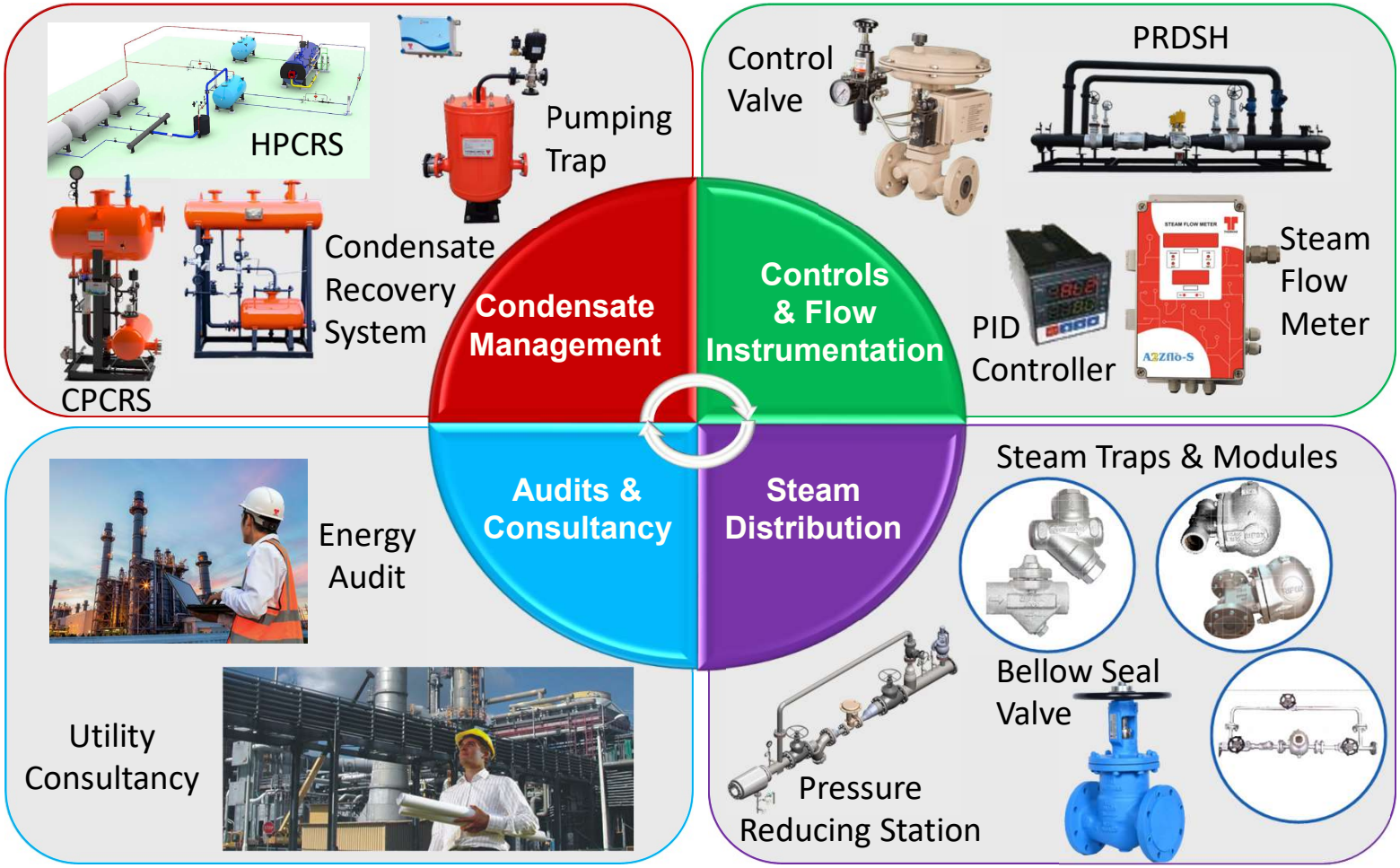
Solution

With environmental regulations tightening on water usage and waste discharge, the plant decided to implement a closed-loop cooling tower system. This solution reduced direct exposure to environmental factors, minimized water loss, and utilized corrosion-resistant materials along with anti-scaling technologies to enhance system durability.

Result: The plant reduced water usage by 30%, along with maintenance costs, improved efficiency, lower operational costs and ensuring regulatory compliance

Steam Engineering Solutions

Steam-Product Basket



Why Thermax Steam Products?

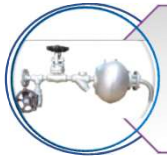
How our products, solutions and services benefit our end users ?

- **Improving**
  - Product quality
  - Production output
  - Efficiency
  - Plant monitoring
  - Profitability
- **Meeting**
  - Statutory rules/regulations
  - Industry standards
  - H&S requirements
- **Reducing**
  - Energy use and costs
  - Water use and costs
  - CO2 emissions
  - Waste
  - Production times
  - Maintenance downtime

Product Install base

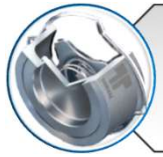
(till Mar 2024)

Steam Traps
(104,000 nos)

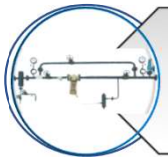


Steam Trap Module
(20650 nos)

Bellow Seal Valves
(46250 nos)



Disc Check Valve
(13100 nos)



Pressure Reducing Station (PRS)
(7100 nos)

Condensate Pump
(5250 nos)

Flow Meters
(1670 nos)

Control Valves
(7950 nos)

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Thank You!