

**WELCOME**

**TO**

**PRESENTATION ON**

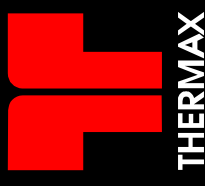
**EMERGING**

**TECHNOLOGIES IN WASTE**

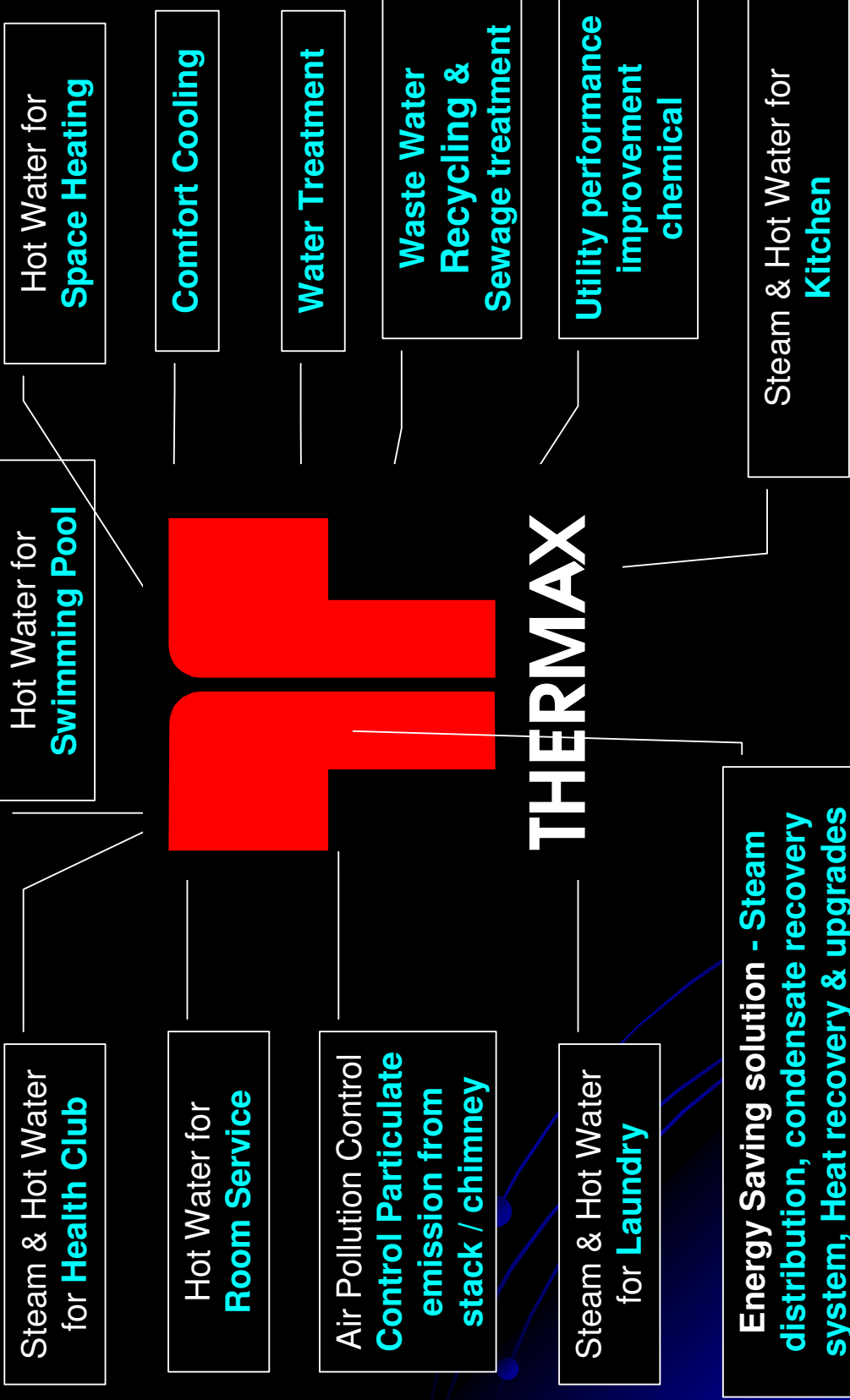
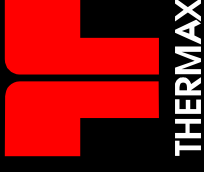
**WATER TREATMENT**

**BY**

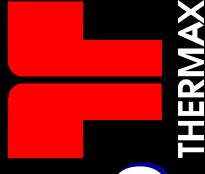
**THERMAX LTD**



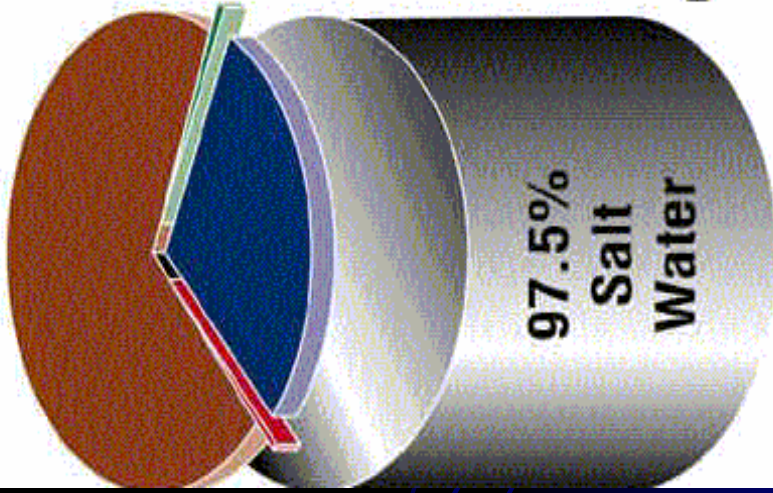
# Thermax Solutions



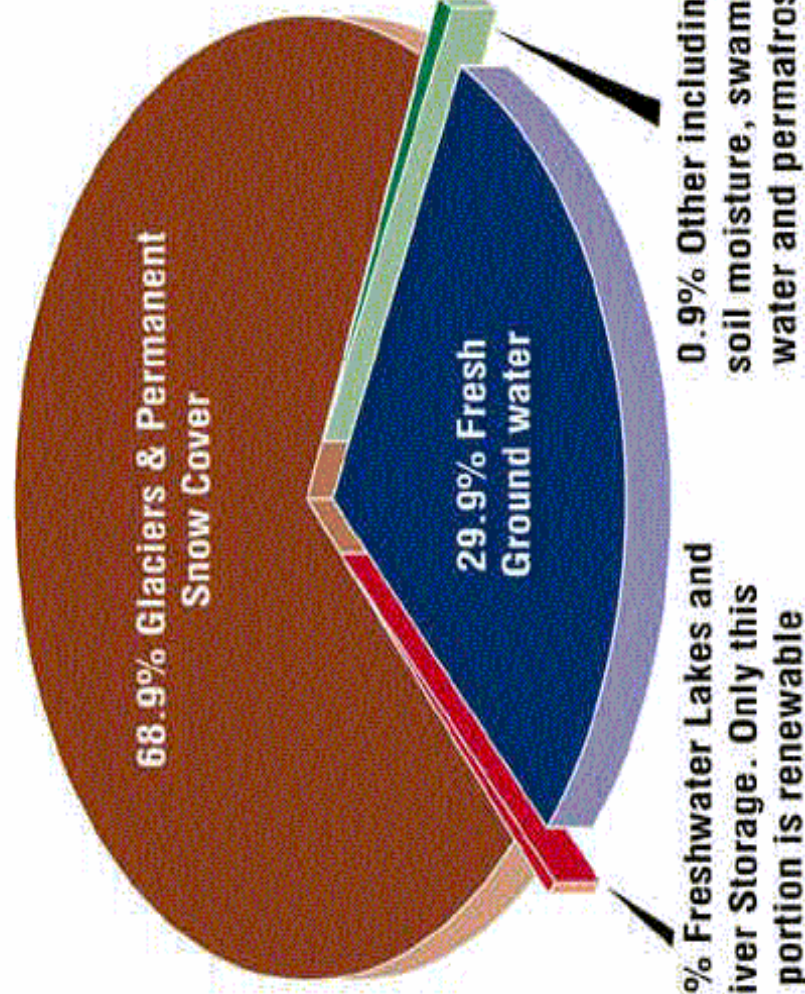
# Salt and Freshwater Relationship



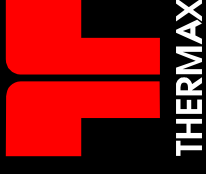
TOTAL GLOBAL (Water)



2.5% OF TOTAL GLOBAL (Freshwater)



# Distribution of Water Source on Earth

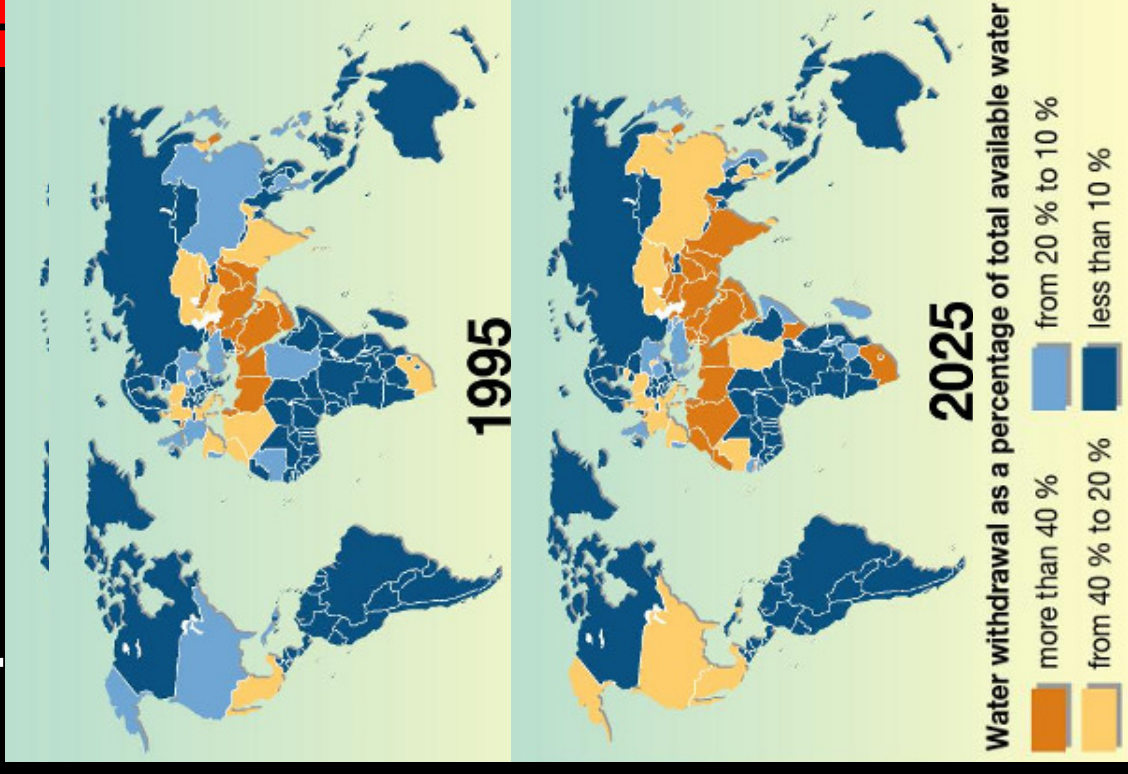


WATER SOURCE	PERCENT OF TOTAL WATER
OCEANS	97.24%
ICECAPS, GLACIERS	2.14%
GROUNDWATER	0.61%
FRESHWATER LAKES	0.009%
INLAND SEAS	0.008%
SOIL MOISTURE	0.005%
ATMOSPHERE	0.001%
RIVERS	0.0001%
TOTAL WATER VOLUME	100%

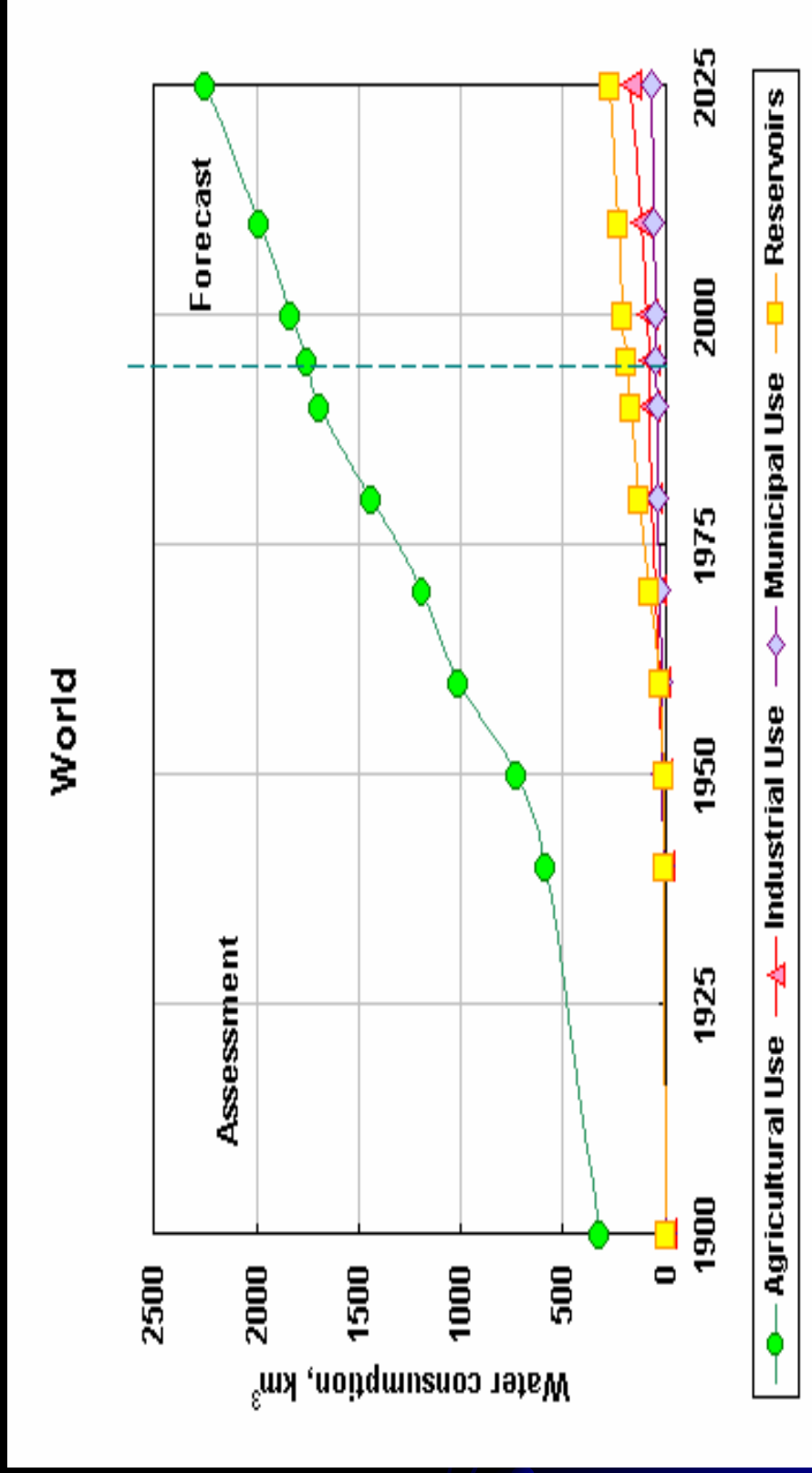
# World Water Report



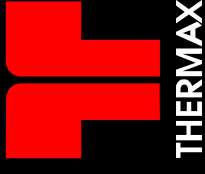
- The water-stress index looks at how much water is available per person and counts people with less than 1,000 m<sup>3</sup> (seven gallons per day) as highly water stressed.
- When looking forward to future years, it is clear that more people are going to be water stressed, **as a consequence of an increasing population.**



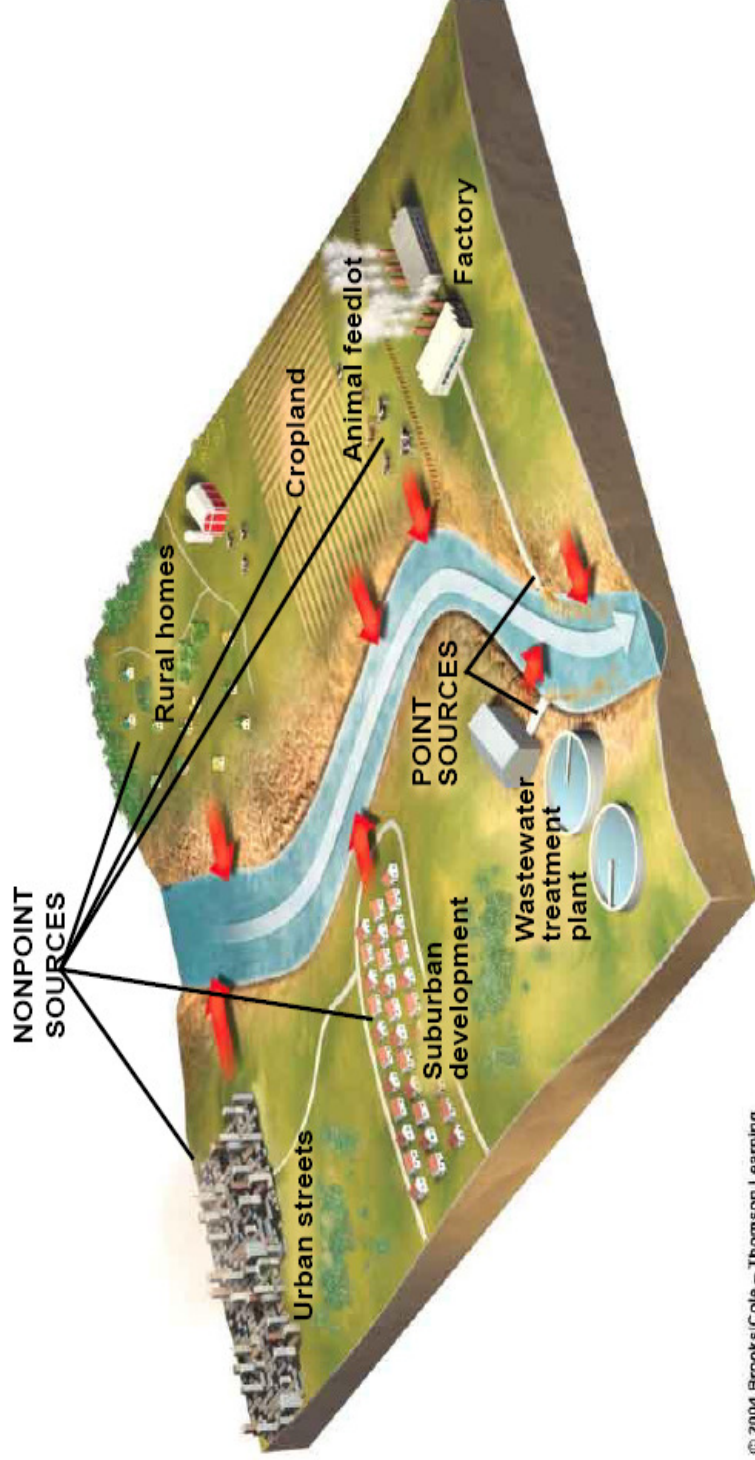
# Water consumption/use

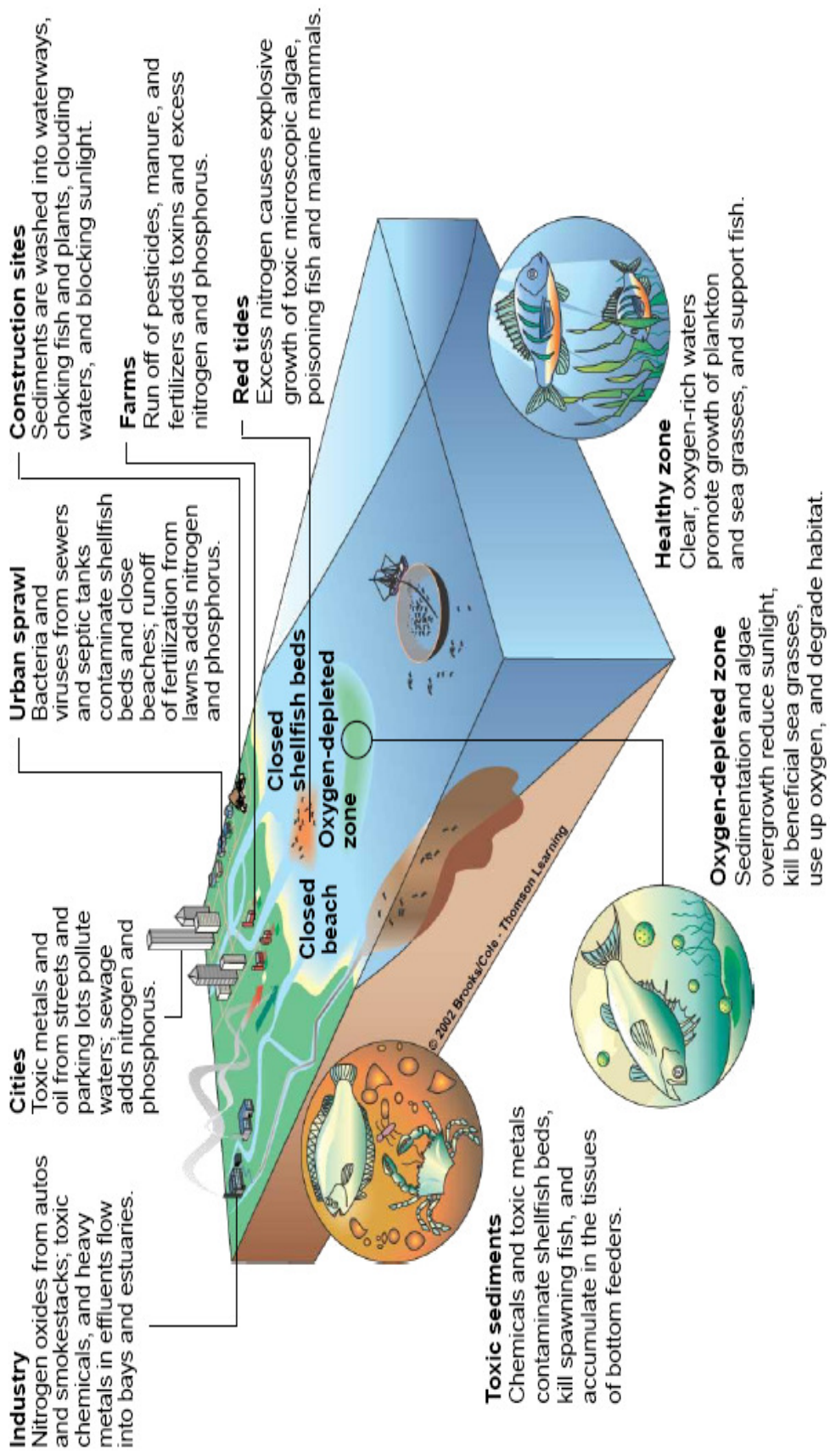


# WATER POLLUTION



## Sources of Water Pollution







To avoid this .....



**We MUST** .....

**R**

**educe**

**euse**

**eclaim**

**ecycle**



# **WHY TREAT WATER ?**

**Rapid Growth In Population**

**Limited resources**

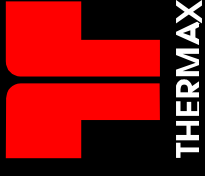
**Rising demand supply gap**

**Rising Cost and lack of surety of tanker water.**

**Quality of bore well water not up to mark and sometimes not available**

**Presence Of Disease Causing Micro-Organisms in waste water.**

**Compulsion from Government**



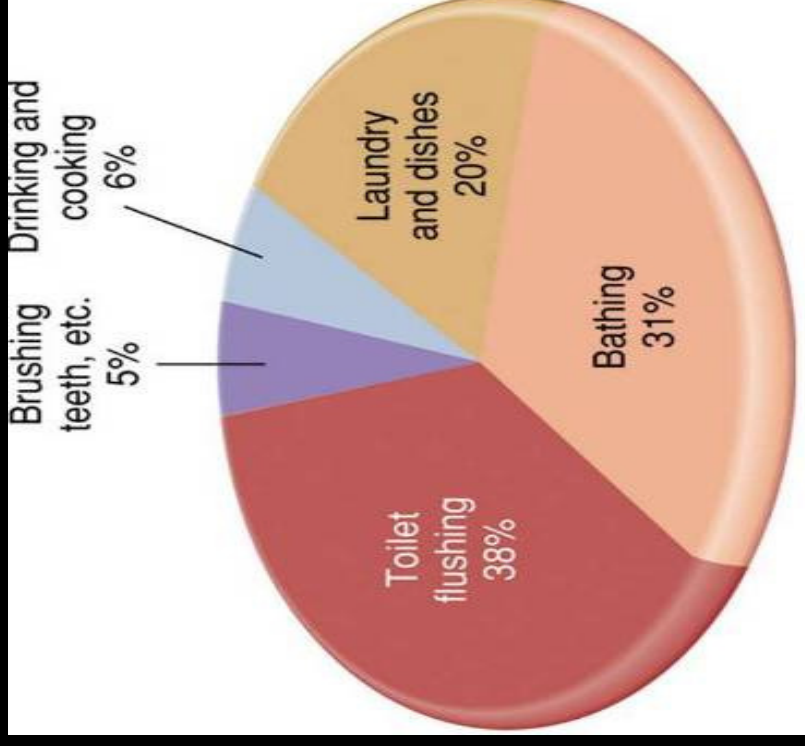
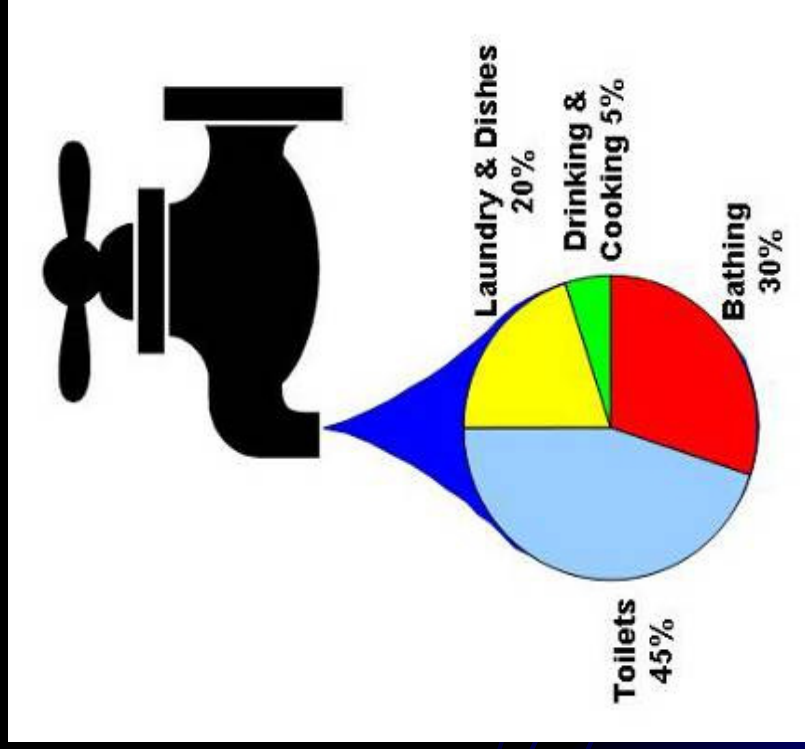
**Compulsion from Government – for recycling waste water in to Gardening Toilet flushing and Cooling tower**

**Discharge of more than 50,000 ltrs of Waste water per day**

**Built up are of more than 2,00,000 Sq Ft**

**Project outlay more than 50 Crore**

# Water usage



*Typical Household Use in the U.S.*

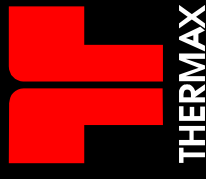
# Water usage

## Human Requirements

- 2 to 3 liters of water for men
- 1 to 2 liters of water for women should be taken in as fluid
- RDI – Reference Daily Intake

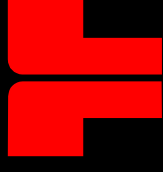


**THERMAX**



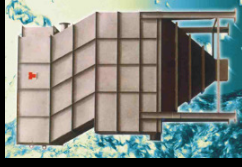
**TAKING CARE OF YOUR ENTIRE  
WATER AND WASTE RELATED  
REQUIREMENTS.....**

# Complete Range of Pre-engineered, Skid Mounted systems for Water & Waste Water Treatment



THERMAX

- Raw Water Clarification systems
- Water Softening systems
- Water Filtration systems
- Demineralization systems
- Potable Drinking Water Units (RO Based)
- Ultra-Pure Water application
- Compact sewage treatment plants & recycle systems
- Waste water color removal system
- Non-hazardous waste incineration systems



✓ Installation base of more than 10,000 units across various industry segments

✓ Options of fully automatic, semi automatic and manual systems available



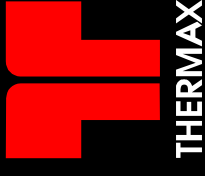
## Water & Waste Solutions



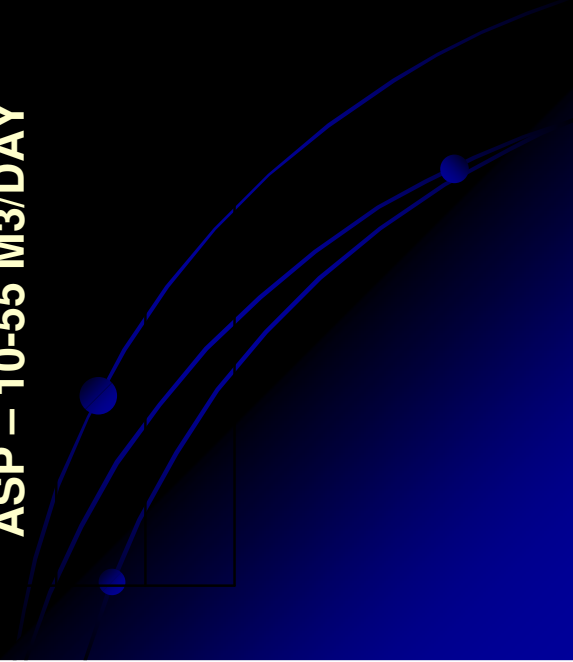
## **OUR PRODUCTS**

- **DM Plants**
- **Reverse Osmosis - RO**
- **Softeners / Filters ( DMF, ACF, UF)**
- **CRS (Color Removal System)**
- **Fluidized Aerobic Bio Reactor - STP**
- **Biofilter – STP**
- **Membrane Bio Reactor – MBR - STP**
- **Standard Incinerator - for Solid waste**

## THERMAX OFFERINGS IN THE STP



- FLUIDIZED BED AEROBIC BIO REACTOR – FAB – 10 – 150 MLD
- FAB + ULTRAFILTRATION – 100 – 500 M3/DAY
- MBR – 100 – 5 MLD WITH GE / NORIT / PENTAIR / MITSUBISHI MEMBRANES
- HYBRID BIOFILTER – COMBINATION OF ATTACHED GROWTH AND ASP – 10-55 M3/DAY



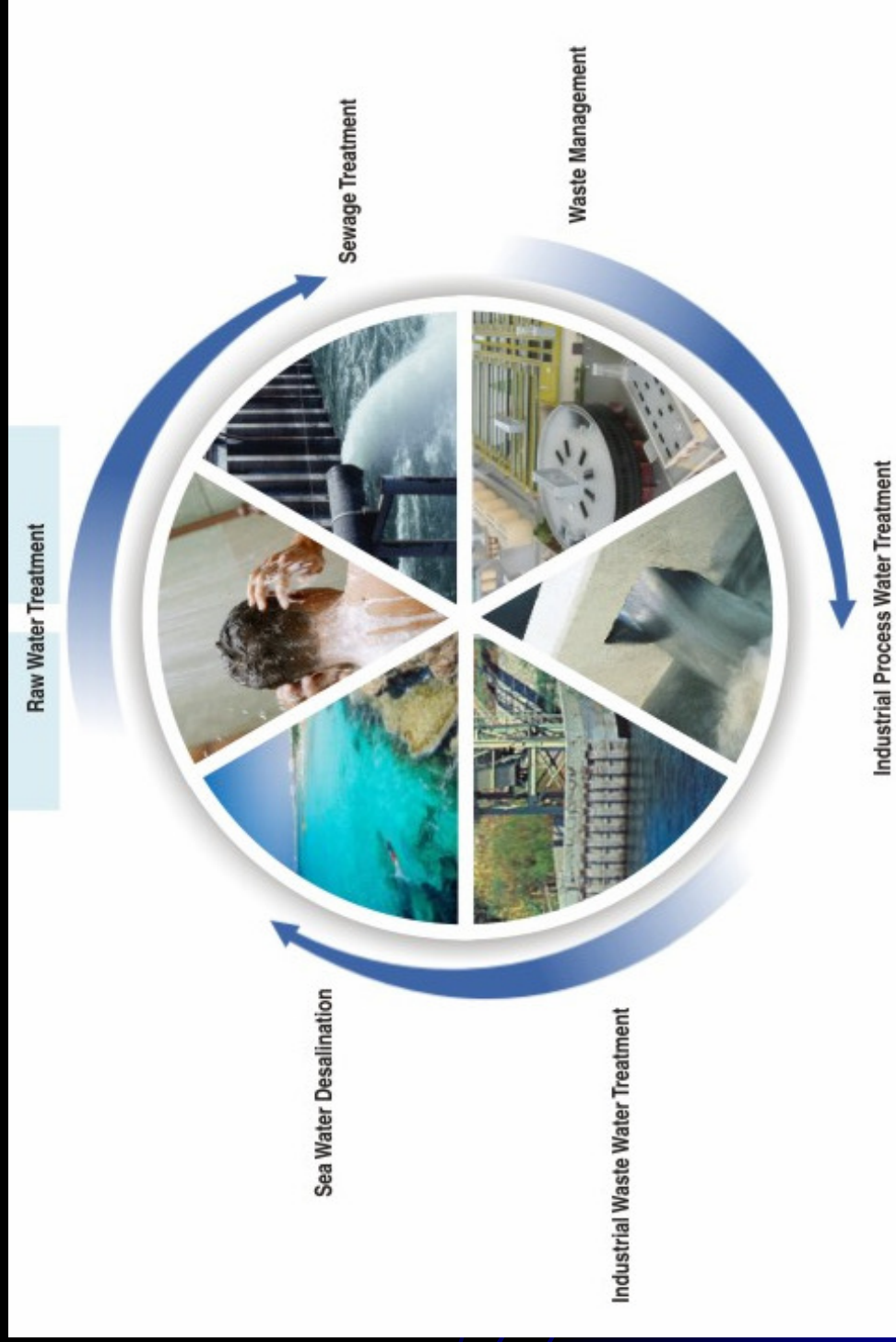
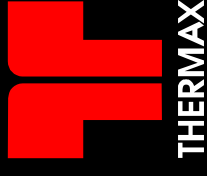
# **APPLICATIONS**

- **Process water treatment**
- **Boiler feed water treatment**
- **Drinking Water treatment**
- **Cooling Towers – Treatment and make up**
- **Sullage and Sewage Treatment with recycling**
- **Solid waste management**
- **Bio medical waste incineration and disinfection**

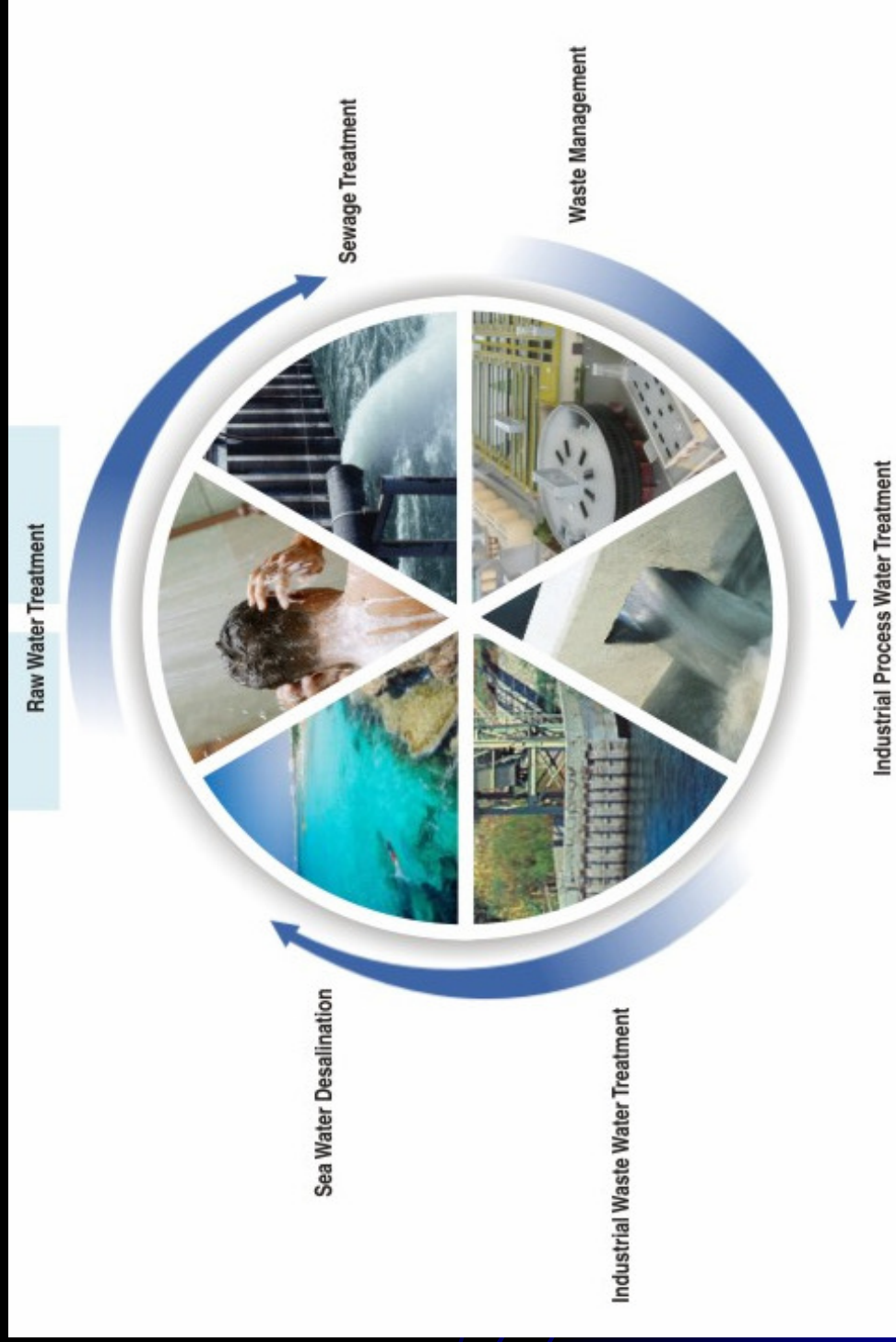
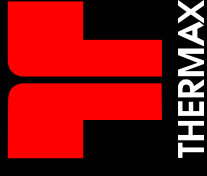
## Value Added Services

- Annual Maintenance Contracts
- Operation & Maintenance Contracts
- Spare Parts Management
- Plant Audits / Resin & Membrane analysis
- Life Cycle Analysis
- Plant automation
- Augmentation / Revamp / Retrofit
- Training
- Made to Order Service Programs
- Cooling water treatment
- Boiler water treatment

# WATER CYCLE



# WATER CYCLE



# Water Treatment Solutions



- **Raw Water Clarification / Pretreatment Plants**
  - Clariflocculators
  - Tube Settlers
  - High Rate Solids Contact Clarifier
- **Water Softening & Filtration**
  - Base Exchangers
  - Activated Carbon Filters
  - Dual Media & Pressure Sand Filters
- **Membrane Separation Systems**
  - Reverse Osmosis (RO)
  - Seawater Desalination (SWRO)
  - Brackish water RO
- **Deminerlization Plants & Condensate Polishing Systems**
  - Weak & Strong Acid Cation Exchangers
  - Weak & Strong Base Anion Exchangers
  - Co-Current & Counter-Current Configurations
  - Balance of plant (Acid / Alk Handling , Neutralization facilities)
  - Ultrapure Application (De-Ionization)

**Water & Waste Solutions**

# Waste Water Treatment & Recycle Systems



- **Industrial Effluent Treatment**
  - **Oil-Water Separation**
    - Tilted Plate Separators
    - Dissolved Air Floatation
  - **Physico-Chemical Treatment**
  - **Treatment of tough to degrade effluents**
    - MBR (Membrane Bio Reactor)
  - **Biological Treatment**
    - Activated Sludge Process
    - Moving Bed Bio-Reactor (Fluidized Aerobic Bio-Reactor)
    - Anaerobic Filters
    - UASB (Up-flow Anaerobic Sludge Blanket)
- **Sewage Treatment**
  - Moving Bed Bio-Reactor (Fluidized Aerobic Bio-Reactor)
  - Sequential Batch Reactor (SBR)
  - Membrane Bio Reactor (MBR)
- **Membrane based Recycle Systems: UF/NF/RO**

**Water & Waste Solutions**



# **THERMAX** IN SEWAGE & SULLAGE TREATMENT



**MORE THAN 25 YEARS IN THE FIELD OF WASTE WATER  
TREATMENT FIELD  
CAPACITY RANGE 10 M<sup>3</sup>/DAY TO 200 MLD**

**FLUIDIZED AEROBIC BIO REACTOR BASED SYSTEMS**



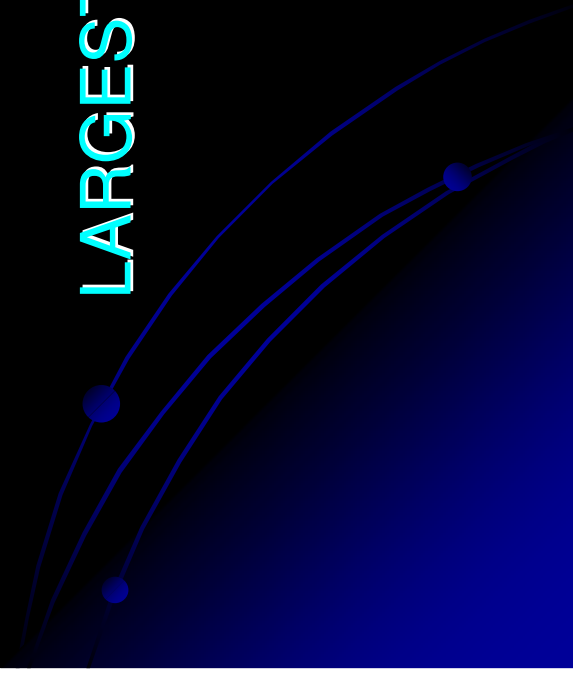
**THERMAX** IN SEWAGE & SULLAGE TREATMENT



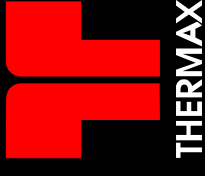
**MORE THAN 700 REFERENCE INSTALLATIONS**

**LOWEST CAPACITY – 10 M<sup>3</sup>/DAY**

**LARGEST CAPACITY – 175 MLD**



**THERMAX** IN SEWAGE TREATMENT PLANTS ( STP)



**TECHNOLOGIES BEING OFFERED**

**F A B**

**S B R**

**M B R**

**ULTRAFILTRATION**

**HYBRID BIO FILTER**

**ROTARY FAB**

# Urbanization – Existing offerings



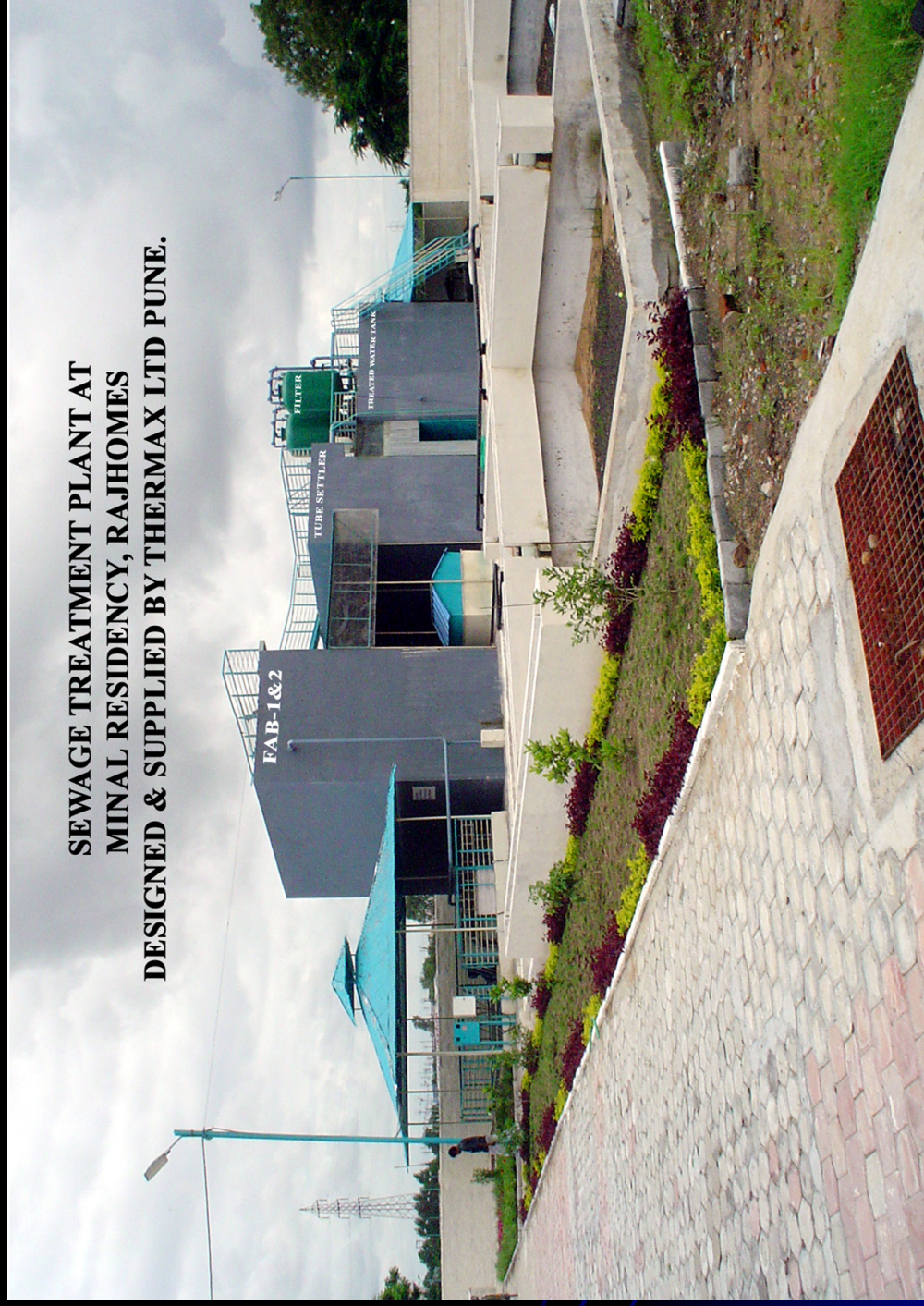
FAB



# **THERMAX** IN SEWAGE TREATMENT PLANTS ( STP)



**SEWAGE TREATMENT PLANT AT  
MINAL RESIDENCY, RAJHOMES  
DESIGNED & SUPPLIED BY THERMAX LTD PUNE.**



# THERMAX IN SEWAGE TREATMENT PLANTS ( STP)



THERMAX

## MBR INSTALLATION AT IISC BANGALORE

