

# NALCO WATER CEMENT INDUSTRY CAPABILITIES

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[08 – 08 – 2025]

**ECOLAB®**





# AGENDA

## PURPOSE

- Introduce Nalco/ NL
- Sharing about our capability and customer needs

## PROCESS

- Presentation
- Discussion

## PAYOFF

- Customer understand about Nalco Heavy Division
- Nalco can understand how to support the customer

Global Leader in Water Treatment  
through advance technology, service & expertise

## A TAILOR-MADE APPROACH



### CHEMICAL SERVICES

Water & Process  
Treatment  
Chemistry  
  
Associated Testing  
& Monitoring  
Services



### WATER TECHNOLOGIES

Equipment Solutions  
  
Design &  
Engineering  
  
Installation &  
Deployment

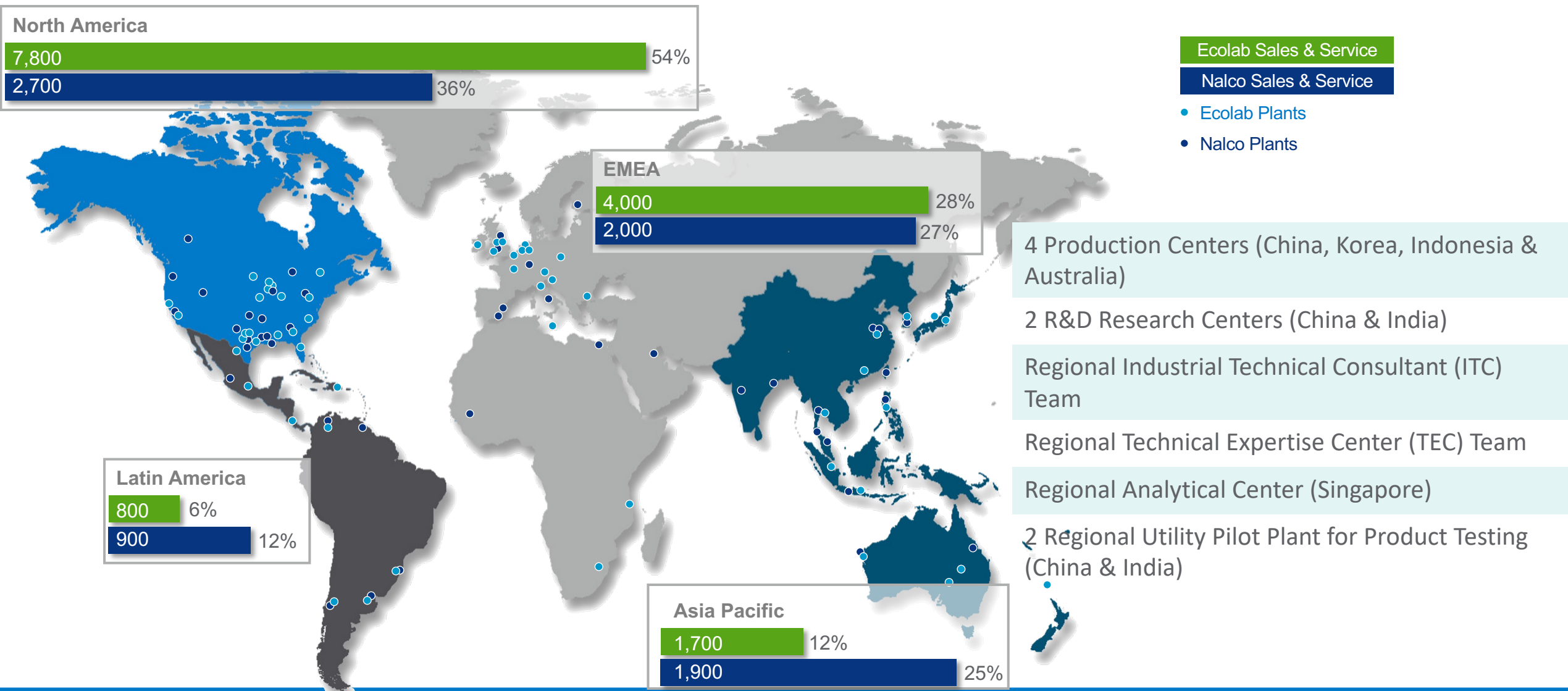


### MANAGED OPERATIONS

Operations &  
Maintenance Services  
  
Project Management  
  
Industry Expertise  
  
Training &  
Certification

Supported by Nalco Water's  
**Service, Knowledge & Digital Platform**

# REGIONAL SUPPORT STRUCTURE





# Global and growing

Nearly **3 million** customer locations

**16** global technology centers

**110+** manufacturing facilities

**10,000+** patents

**47,000** associates globally

**25,000**  
sales and service  
associates

**1,200+**  
RD&E scientists and  
technical specialists



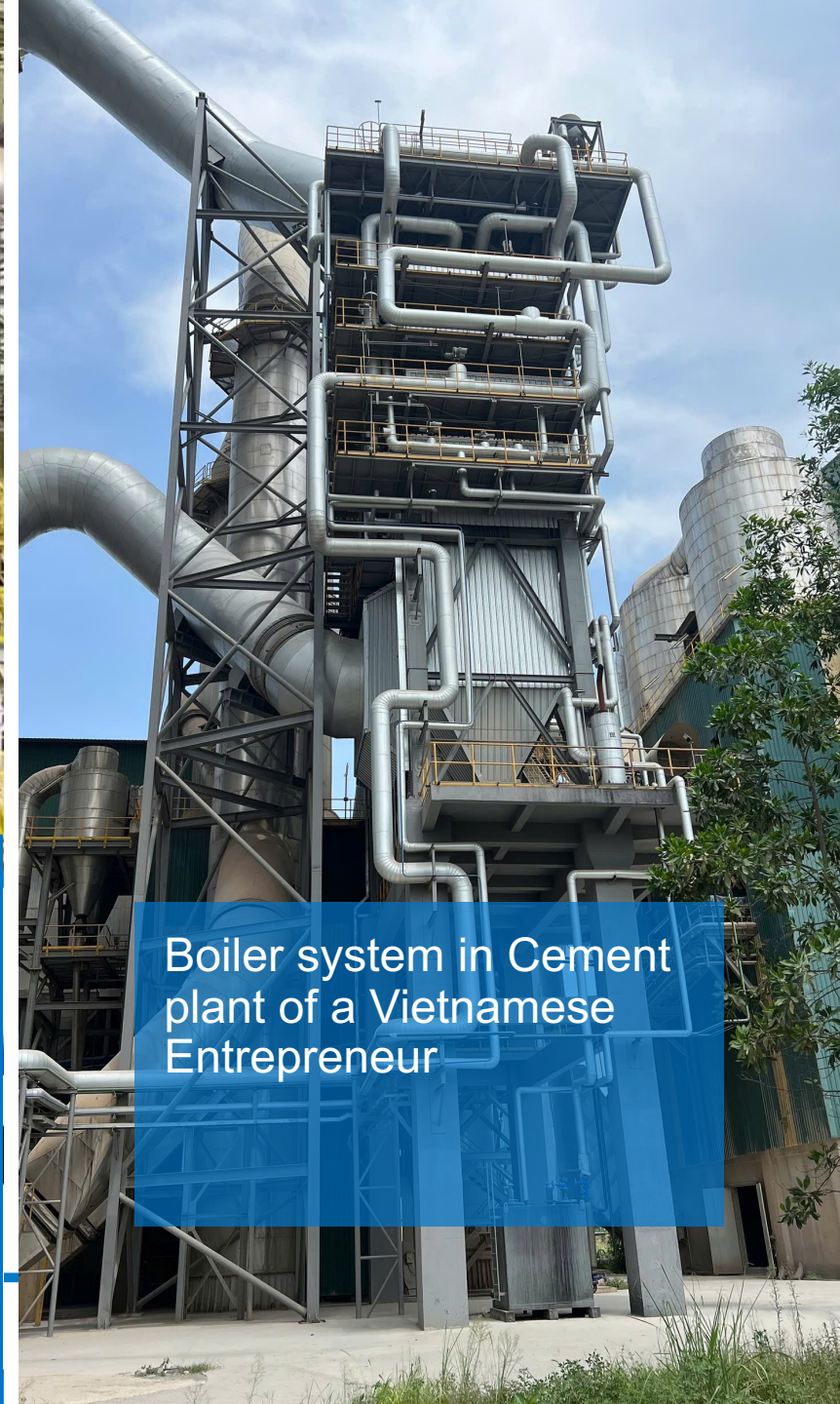




Boiler system in Cement Plant  
of SCG



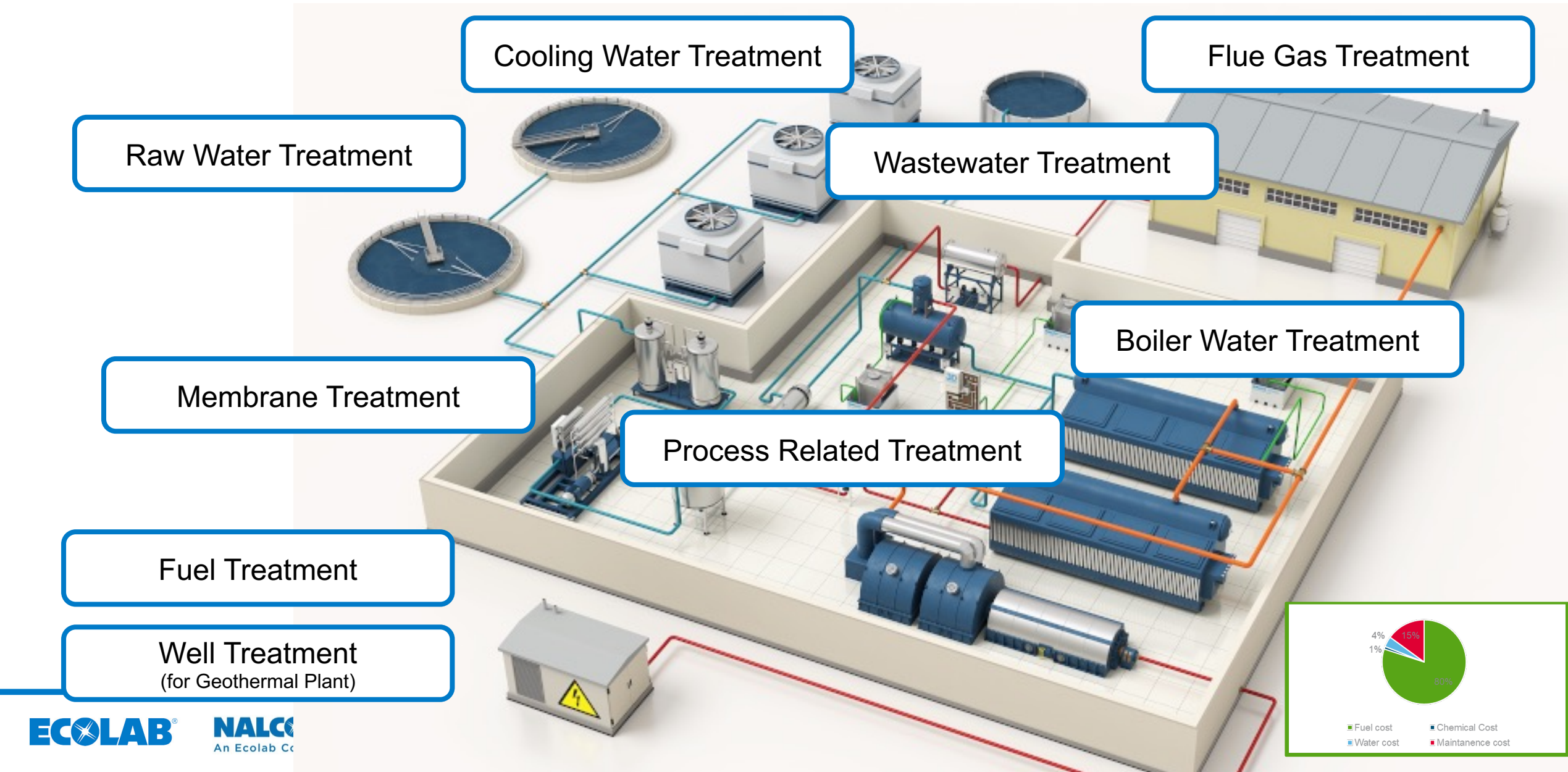
**Waste heat recovery  
power plants have  
become a trend for  
sustainable development  
and help Vietnamese  
businesses save 3.500  
billions vnd**



Boiler system in Cement  
plant of a Vietnamese  
Entrepreneur



# ADVANCE CHEMISTRY APPLICATION



# WHY WATER QUALITY CONTROL IS CRUCIAL FOR POWER PLANT



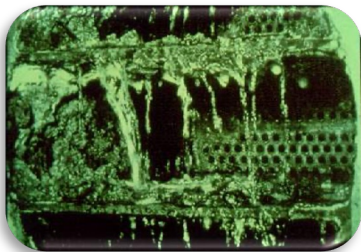
Silica Deposit



Boiler tube failiure



Scale & bio fouling

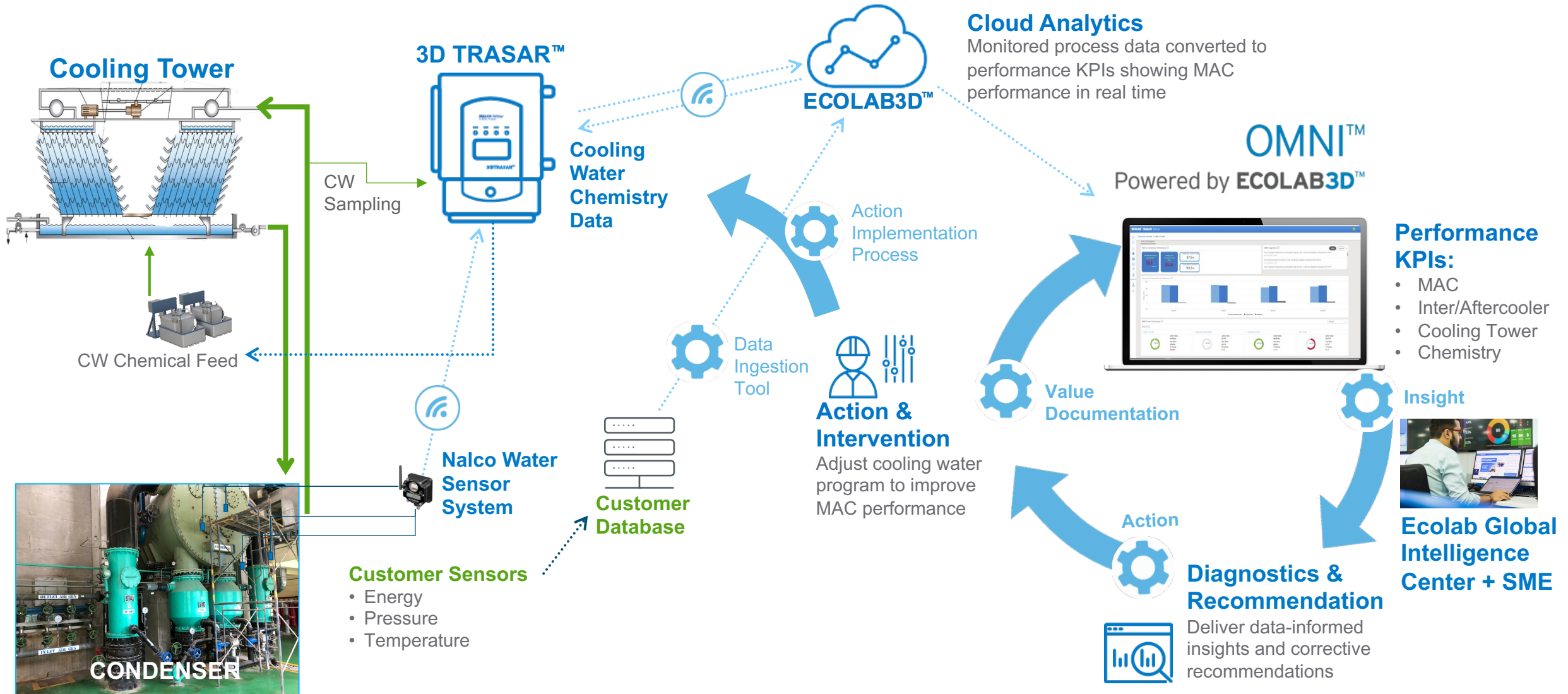


RO Membrane failiure



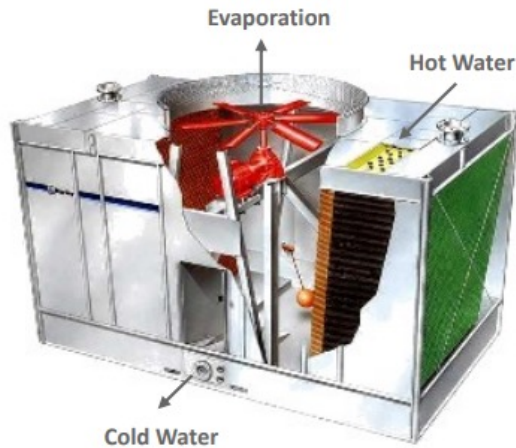


# NALCO CHEMICAL & DIGITAL- ONSITE SERVICE



# WATER SERVICE OFFERING FOR CW

Cooling water treatment is provided for comfort and process cooling across most market segments



- Scale Control
- Corrosion Control
- Microbial Fouling Control

3D TRASAR™  
Technology



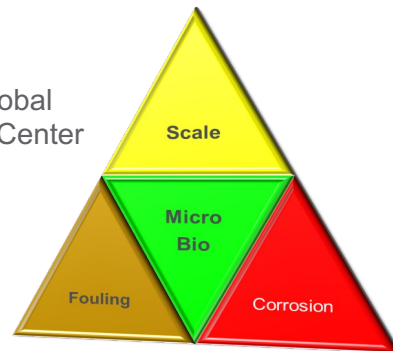
Cooling Water  
Chemistry



Technical  
Expertise

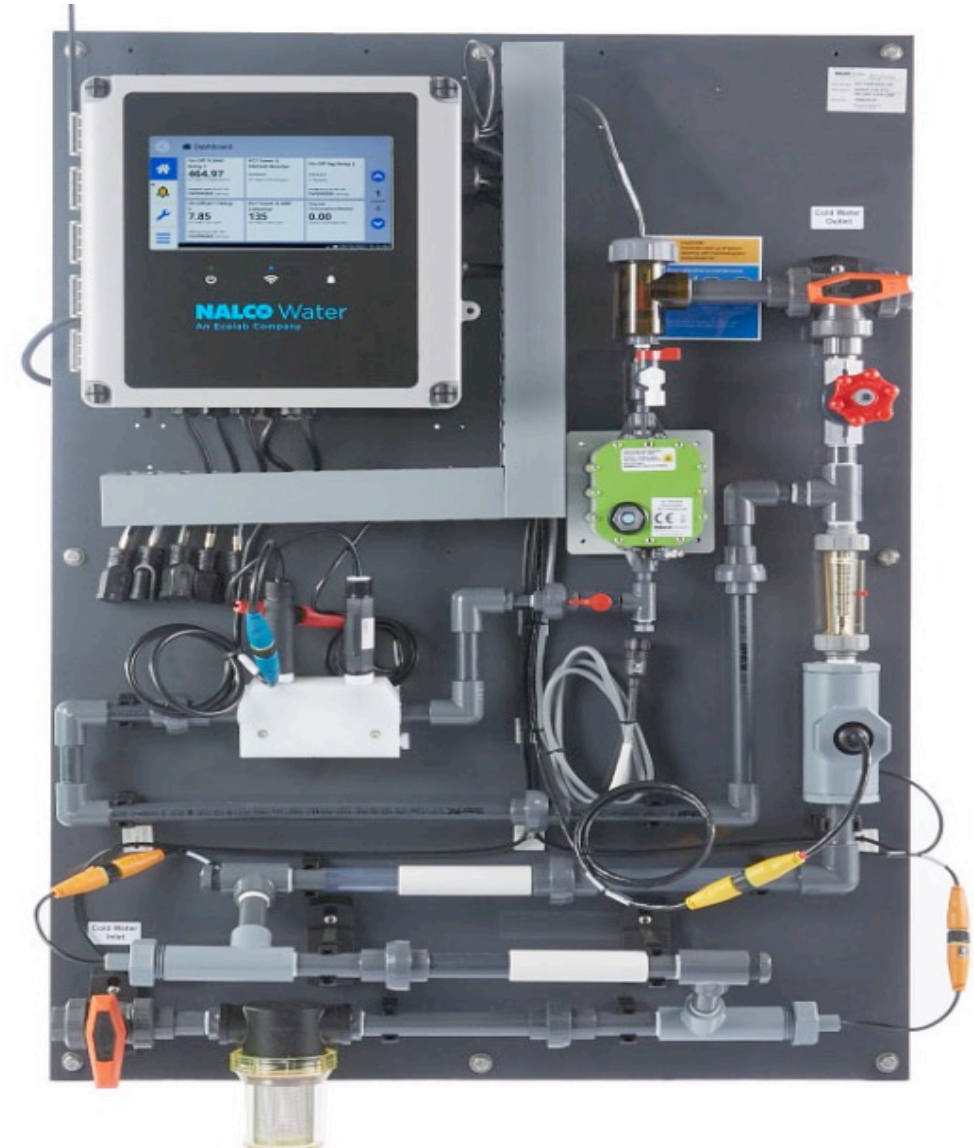
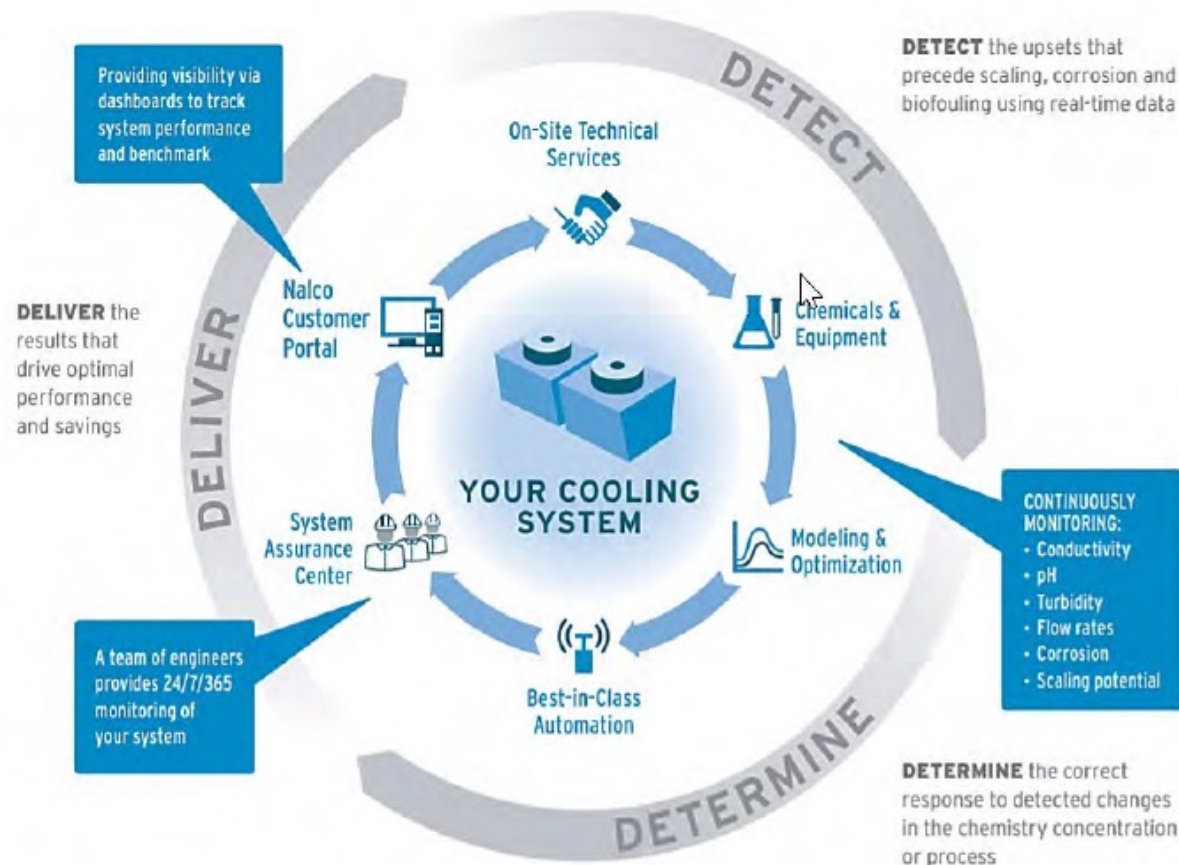


Ecolab Global  
Intelligence Center





# 3D TRASAR TECHNOLOGY FOR COOLING WATER



# WATER SERVICE OFFERING FOR BOILER

Boiler water treatment is offered for heating and process steam production in all major market segments: low, medium and high pressure systems



- Pre-treatment (oxygen scavengers)
- Internal Treatment (scale & corrosion control)
- Condensate Treatment (corrosion control)

3D TRASAR™  
Technology



Cooling Water  
Chemistry



Technical  
Expertise

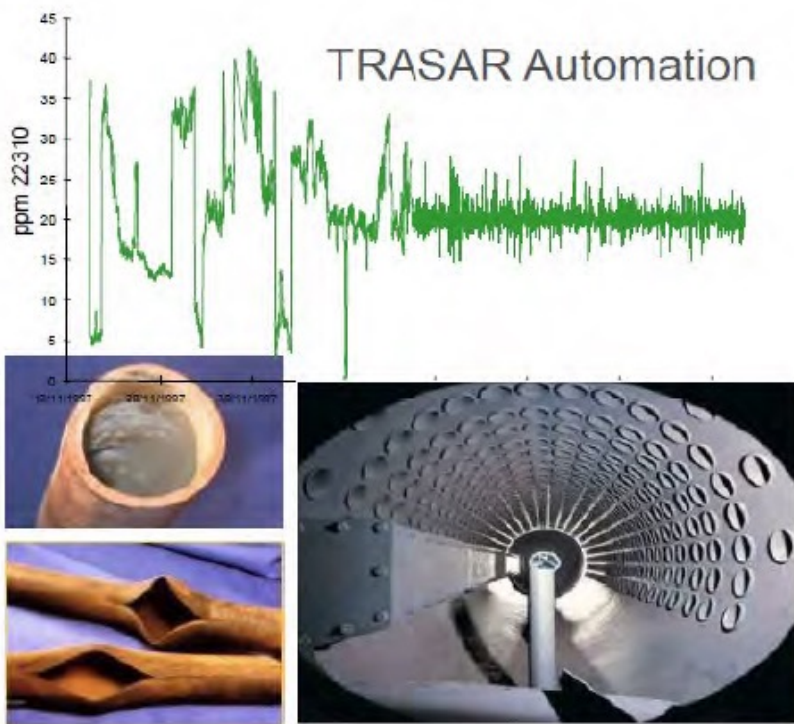


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# 3DT TRASAR BOILER TECHNOLOGY



## 1. Scale Control

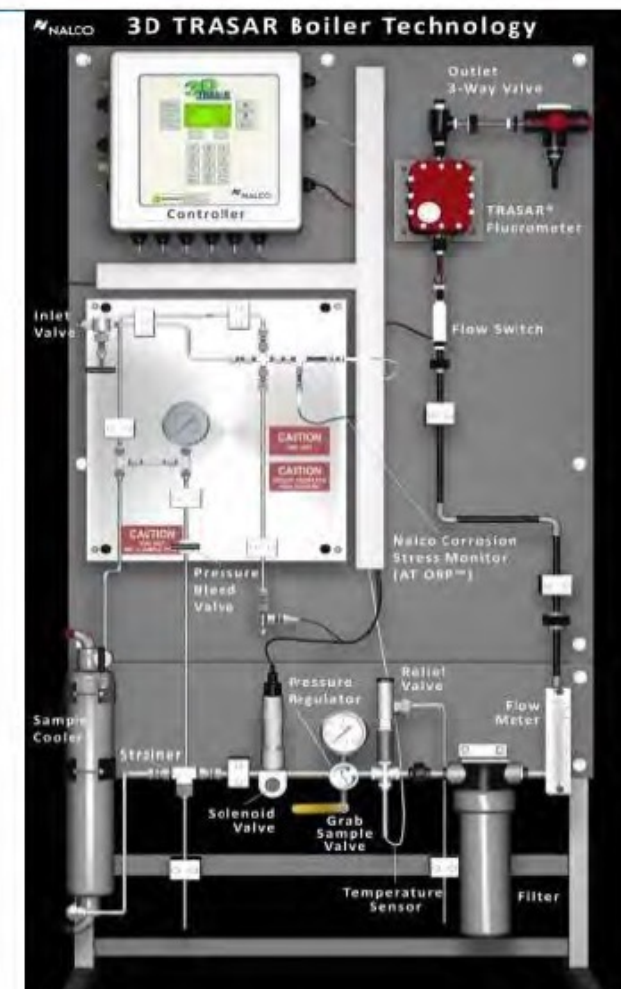
TRASAR based internal treatment application

## 2. Pre-Boiler Corrosion Protection:

Nalco Corrosion Stress Monitor™ (NCSM) based scavenger feed

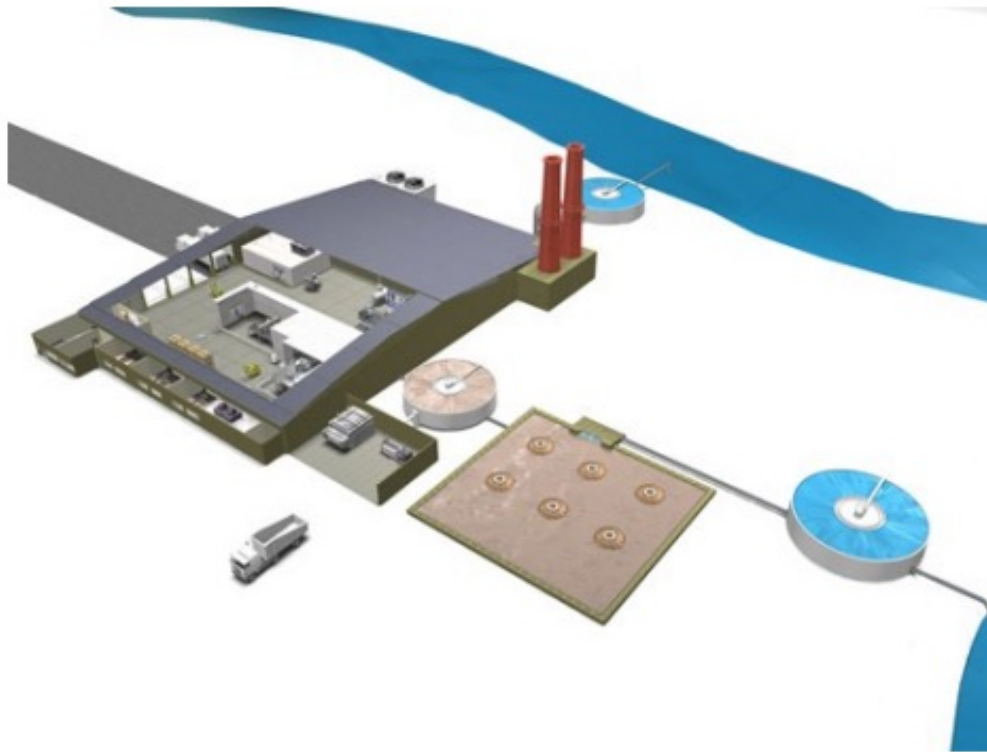
## 3. Energy Savings

Boiler blowdown control with conductivity or TRASAR



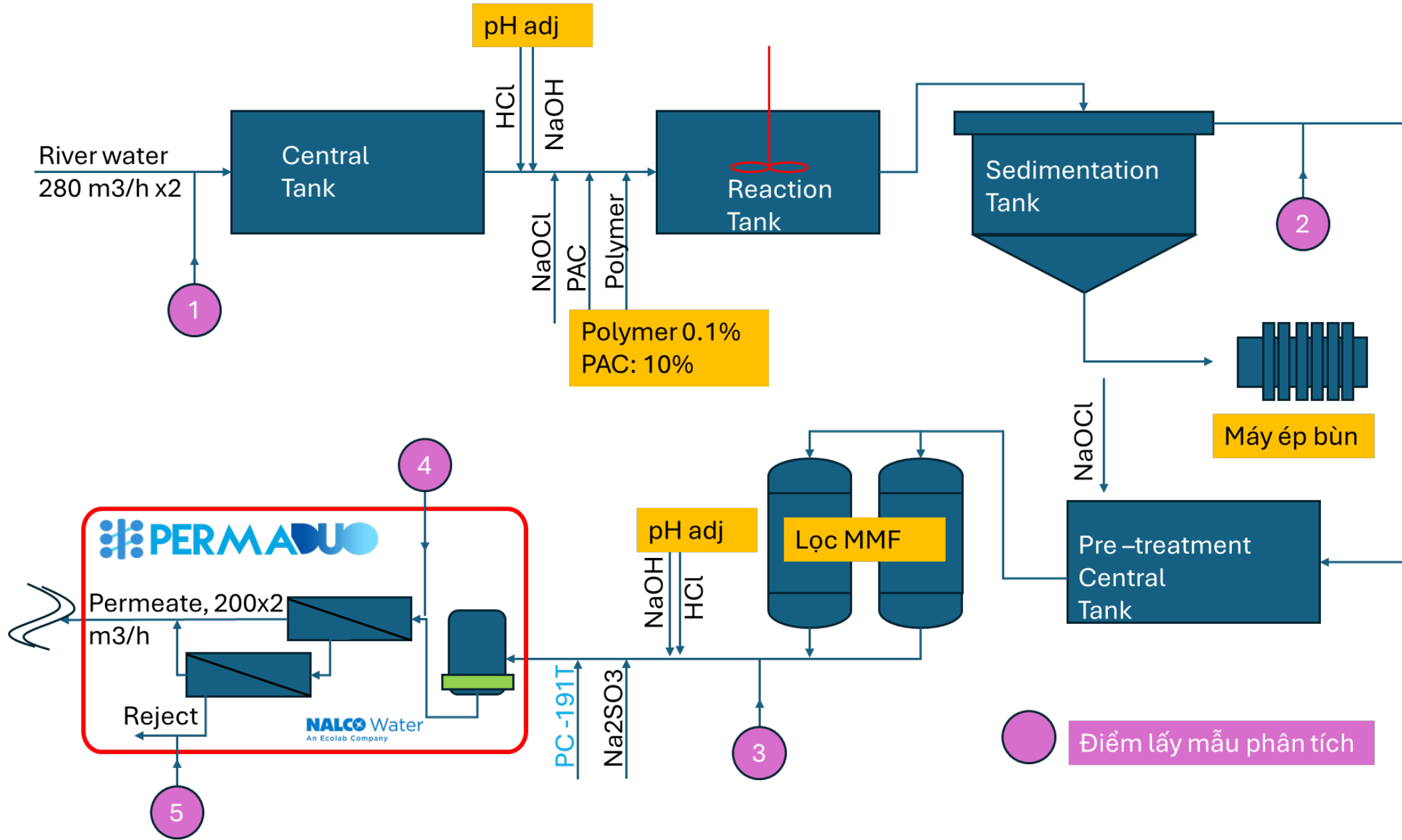
# WATER SERVICE OFFERING FOR PRETREATMENT AND WWT

Wastewater and raw water treatment is offered in all market segments

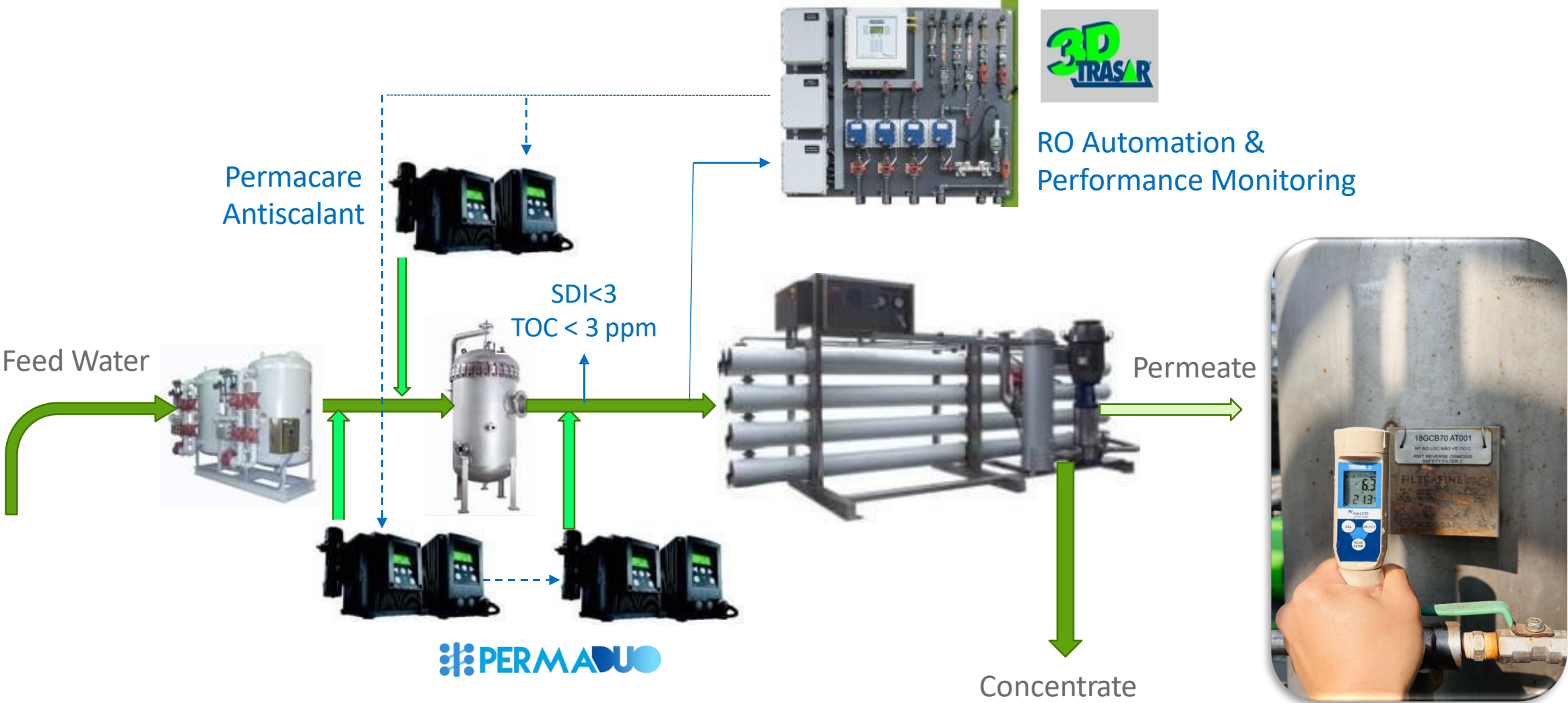


- Flocculants
- Coagulants
- Antifoams
- Soluble heavy metal removal
- Emulsion breakers
- Bioaugmentation
- Odour control





# NALCO WATER RO FOULING CONTROL PACKAGE



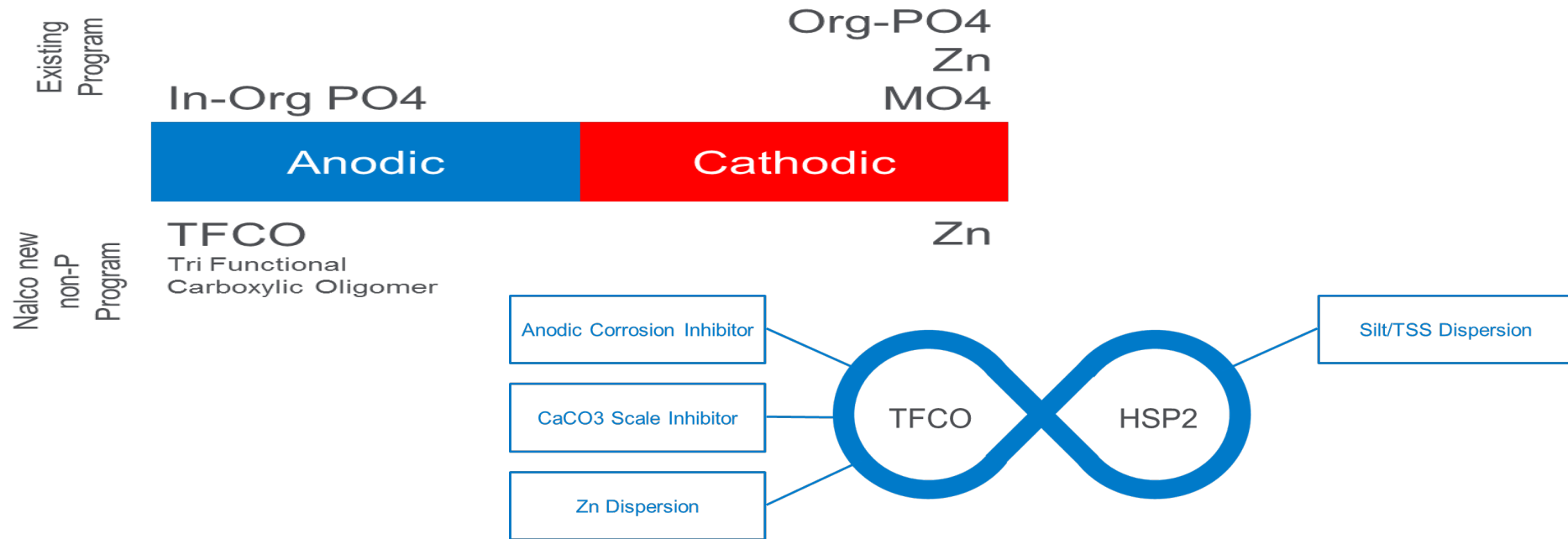


# CHEMICAL PROTECTION MECHANISM



# NON-P PROGRAM FOR CORROSION PROTECTION

- Utilizing TFCO and Zn as corrosion inhibitor



- Tolyltriazole/Benzotriazole blend – Copper alloy corrosion protection in [3DT437](#)
- [Zinc: 3DT125](#)



# HOW CAN SCALE FORMATION BE CONTROLLED?

- **Crystal Modifiers**

- Modifies the Nucleation Site, not allowing the formation of stable microcrystals

- **Chelants and Sequestering Agents**

- Formation of soluble ion complexes, preventing precipitation reactions

- **Conditioners and Dispersants**

- Prevents precipitants from depositing

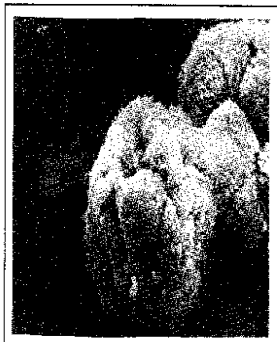
Add Chemical Scale Inhibitors



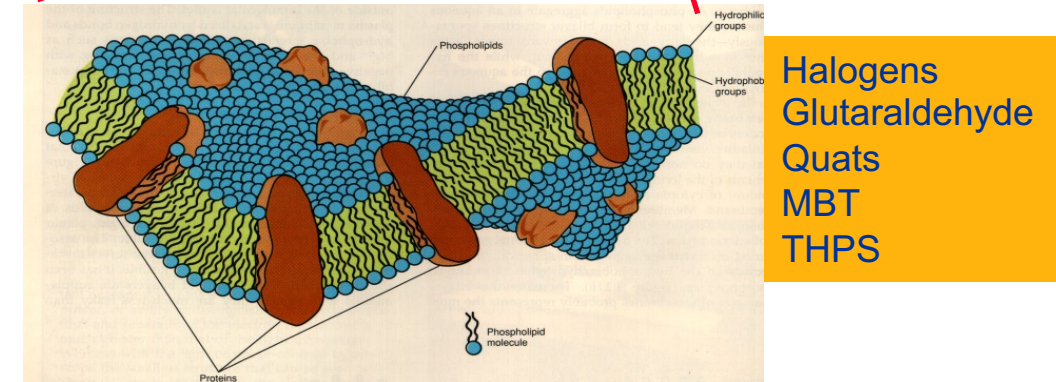
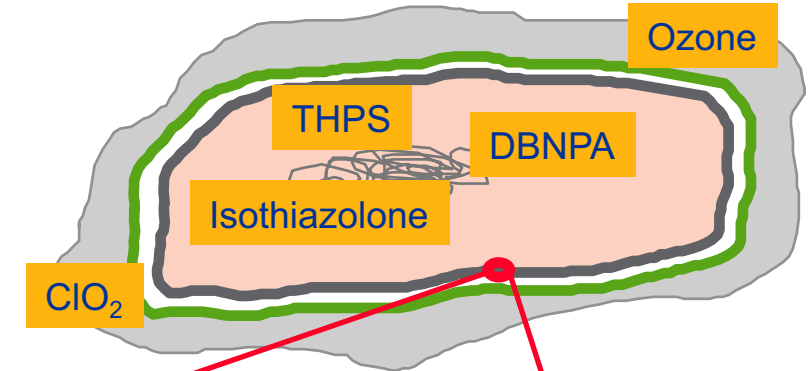
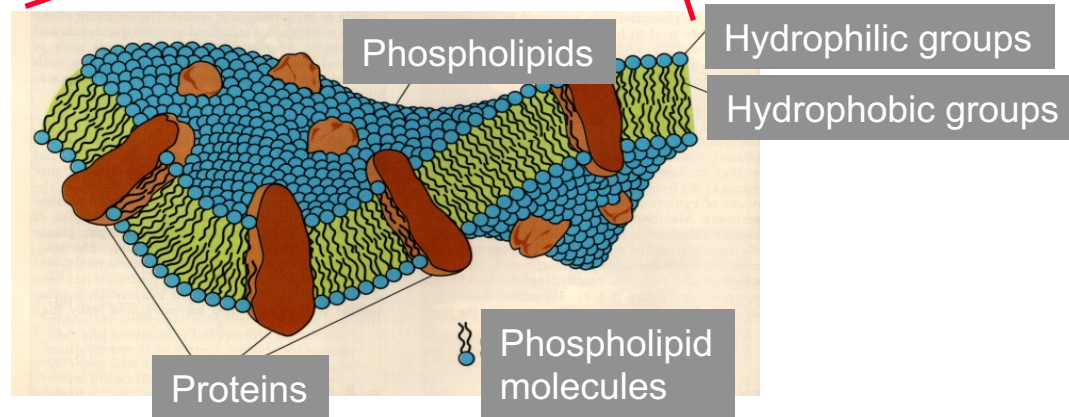
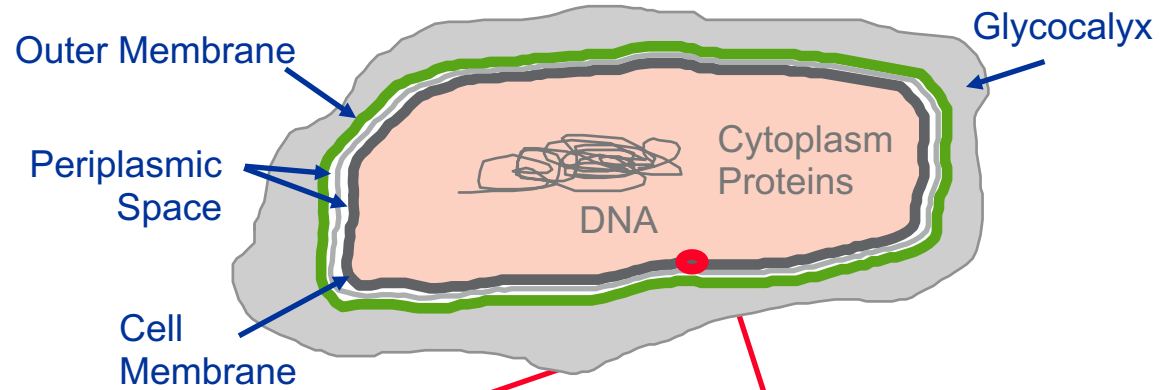
Figure 11A—Untreated  $\text{CaCO}_3$  (calcite 2000x, 4 microns)



Figure 11C—Polyacrylate (2000x, 12-18 microns)



# BIOCIDES PRODUCTS FUNCTIONING





# DUST CONTROL





# Dust – A Concern



Road dust - Haul



Stock yard dust



Reclaiming



Crusher



Rail Wagon



Road dust - Haul



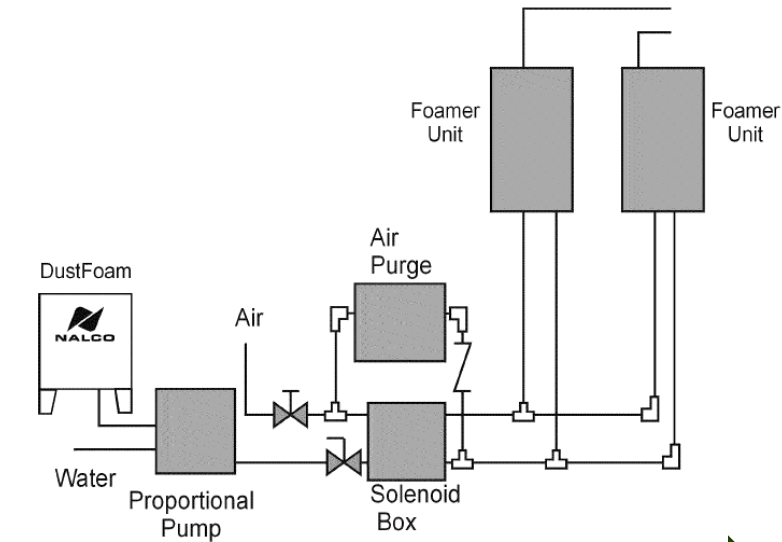
# PARTICULATE MATTER

According to the World Health Organization (WHO).

- ❖ The recommended threshold for **PM 2.5** is **15  $\mu\text{g}/\text{m}^3$** .
- ❖ In **Hanoi**, the average PM2.5 concentration in **2025** has reached **45  $\mu\text{g}/\text{m}^3$** , which is **three times** higher than the WHO guideline.
- ❖ At certain times, the PM2.5 index has been measured at **56  $\mu\text{g}/\text{m}^3$** , nearly **five times** the WHO standard.



# NALCO DUST CONTROL APPLICATION



**DUST FOAM (N-81600)**





# SUSTAINABILITY ENVIRONMENT



# SERVICE COMMITMENT



# SERVICE KỸ THUẬT TẠI SITE





# NALCO SERVICE TEAM VIỆT NAM



Onsite Service Test Kits and Lab to do accurately analysis for all kind of water samples daily/ weekly and monthly for Customers using Nalco solution and services.



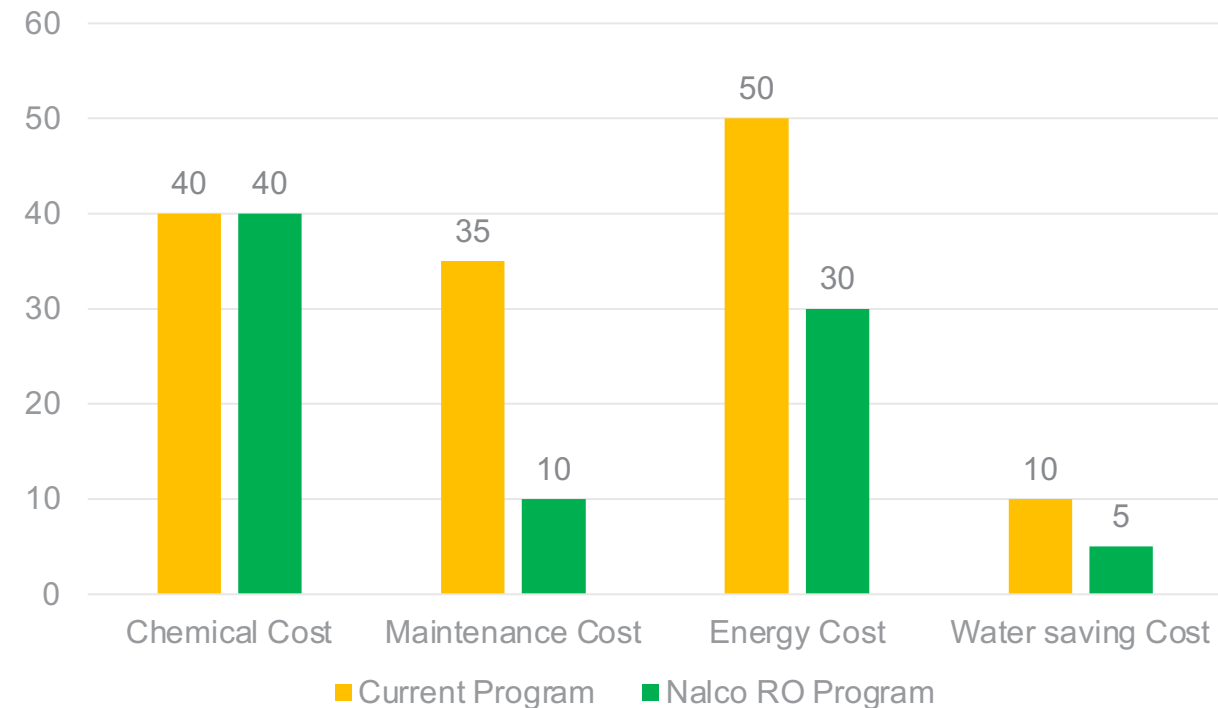
# NALCO TOTAL VALUE DELIVERY

# LIFE SPAN OF RO / CARTRIDGE FILTER CREASING PROJECT

#	Cost of Operation	Current Cost of operation	Nalco Cost of operation	Note
1	Chi phí Hóa chất xử lý (usd/ year)	40\$K	30\$K	20 hour per day x 135 m3/h RO
2	Chi phí bảo trì bảo dưỡng và thay mới & nhân công ( usd/year)	35\$K	10\$K	Estimated based on Performance
3	Chi phí năng lượng ( usd/year)	50\$K	30\$K	Assumed & proved later
4	Chi phí nước sử dụng cho CIP ( usd/ year)	10\$K	5\$K	Estimated based on Performance
5	Tiết kiệm cho Nhà máy	= Trước – Sau Nalco =		



Total cost of operation Comparison



**Tăng tuổi thọ màng lọc > 5 lần**



Tiết kiệm chi phí đã được xác nhận  
**390 triệu vnd/ năm**



**ASSETS**



# WATER SAVING PROJECT FOR WASTE HEAT POWER PLANT

**Saving m3 250,096**



**50 K\$ value**

Identified **Water**  
Savings



**eROI<sup>SM</sup>**  
by Ecolab

EXPONENTIAL  
VALUE



CUSTOMER  
PERFORMANCE GOALS

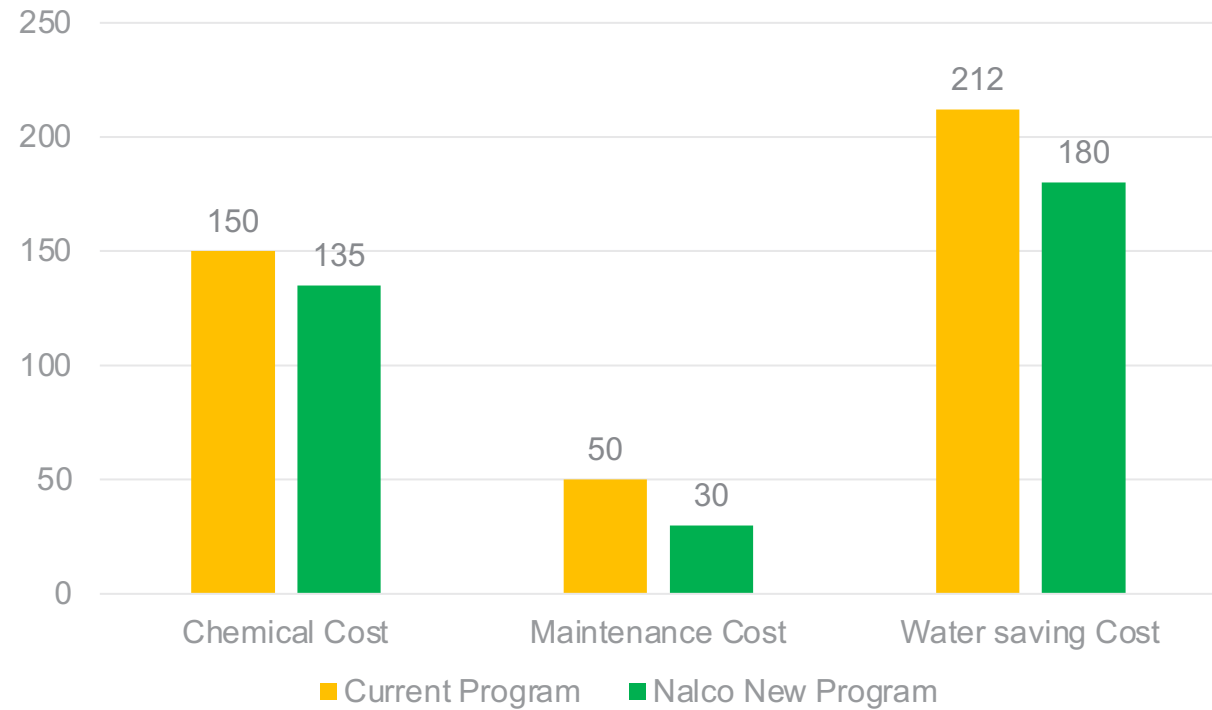
ECOLAB PERSONALIZED  
SERVICES & TECHNOLOGY

SUSTAINABLE  
IMPACT

OPERATIONAL  
EFFICIENCY

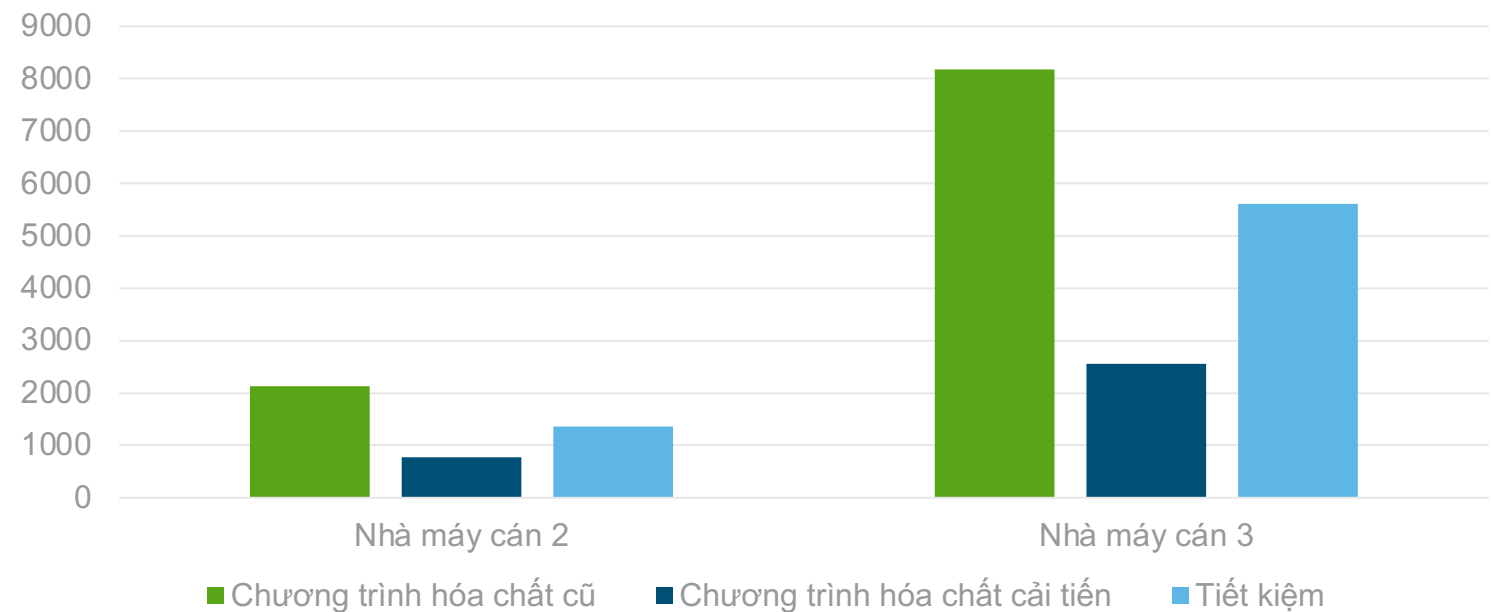
IMPROVED  
PERFORMANCE

## Total cost of operation Comparison



# SUSTAINABILITY ENVIRONMENT

LƯỢNG HÓA CHẤT TỐI ƯU HÓA



**LOW CORROSION**

- Improved corrosion control compared to current non-P MS >30% protection improvement)
- Superior protection in different water matrices
- Extends HX life span



**ENVIRONMENTAL IMPACT**

- Ensures compliance with Total Phosphorus discharge limits
- Brings less load to the Wastewater Treatment Plant



**LESS WATER & COST**

- Reduced MU water usage with higher Cycles of Concentration
- Reduced acid usage, higher pH
- Reduced Bleach usage with better biological control
- Reduction in TCO



**RUN LENGTH**

- Improved efficiency of Heat Exchangers
- Tolerant to pH/Ca swings
- Less phosphate scaling
- Less downtime
- Higher production



# COMPLETING THE CIRCLE WITH DIGITAL



## Remote Assist

Remote troubleshooting at any point of day / time

**NALCO Water** An Ecolab Company

**E-DATA SERVICE REPORT**

Water Flow Intelligence  
Powered by ECOLAB30™

Company: [Redacted] Attention: [Redacted] Date: 31-May-2021  
Location: [Redacted] Nalco copy to: [Redacted]  
Address: [Redacted]

**Table of Contents**

1. Condenser Cooling Tower (CDW)
2. Chilled Water (CHW)
3. Chemical Inventory Record
4. Condenser Approach Temperature

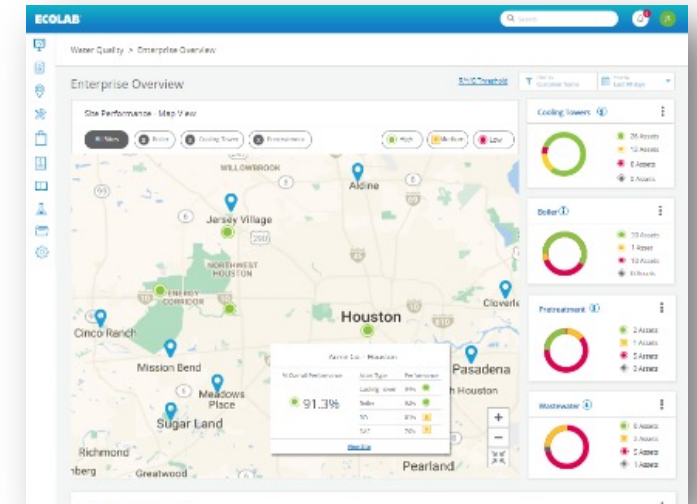
**Condenser Cooling Tower (CDW)**

Monthly Analysis 5/25/2021 9:56:00 AM

Sample Point	pH	Calcium (ppm as CaCO <sub>3</sub> )	M Alkalinity @ STP	Total Orthophosphat (ppm)	Free Chlorine (ppm as Cl <sub>2</sub> )	Total Aerobic Bacteria (CFU/mL)	Cycles based on Ca (calculated)	Conductivity @ STP (µS/cm)
Condenser Cooling Tower (CT)	8.00 7 - 8.5	174.00 50 - 300	74.00 300 Max	4.00 4 - 8	0.03 0.5 Max	1000.00 100000 Max	5.80	701.00 600 - 1000
Make-up Water (MU)	8.20 6.7 - 7.5	30.00 30 Max						103.80 100 Max

## Service report

Site conditions and observations documented in digital reports



## Dashboard

Providing asset level performance visibility

# TRAINING

## Basic Training / Workshops

- Fundamentals of water
- Water safety
- Reverse Osmosis 101
- Safe Chemical Handling
- Personal Hygiene
- Basic Principles of C&S
- Cooling water treatment
- Boiler water treatment
- Pasteurizer treatment
- Product application: CIP, Foam System, Bottle Washing, Lubrication
- 3DTrasar and Nalco Oxidant Analyzer

## E-Learning / Brewery Technical Visit

### Nalco Water University

- Unique, high-tech e-learning
- Develop customers expertise
- Minimize water usage and optimize total cost of operations

### Brewery Technical Visit (BTV)

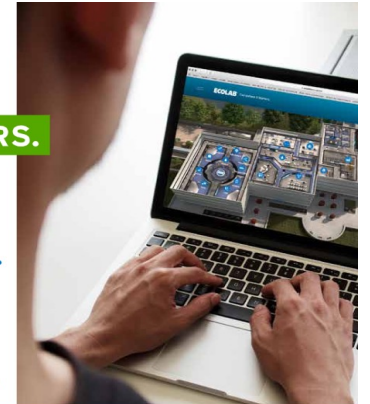
- Open discussion
- Technical/ operational/ knowhow sharing/ challenges/ trends in the industry
- Consultative approach

## Customer Experience Centre

### VIRTUAL TOURS.

### REAL BUSINESS INSIGHTS, SOLUTIONS & OPPORTUNITIES.

Connect with us face to face via video conference and visit our Eagan RD&E facility and Naperville Water University. Discover the science behind Ecolab's products and services.



Easy navigation through the facilities.



Pop-up content for a custom learning experience.

- ✓ Meet with Ecolab sales, marketing and R&D experts to discuss real-time business solutions
- ✓ Ideal for groups of 10 (up to 20 if needed)
- ✓ Access to online asset library to review key document during and after the tour
- ✓ After guided tour, explore virtual platform anytime on your own

ECOLAB



# NAMLONG JSC: DISTRIBUTOR OF NALCO IN VIETNAM



## LIST OF CHEMICALS SUPPLY TO CEMENT FACTORY :

- Chất chống cáu cặn cho nồi hơi (boiler water);
- Hóa chất chống cáu cặn, diệt vi sinh, rong rêu, chống ăn mòn cho hệ thống nước làm mát (cooling tower water)
- Hóa chất chống đóng cặn cho hệ thống RO và khử khoáng (RO system);
- Hóa chất dập bụi cho nhà máy xi măng (dust-control)
- Hóa chất cho hệ thống xử lý nước thải (waste watertreatment).
- Hóa chất công nghiệp cơ bản (industrial chemicals)

Nam Long is the official distributor for NALCO products in Vietnam. NALCO products are widely used in many cement factories around the world, especially for factory with power generation unit utilizing the residual heat source.

# FACILITY OF NAMLONG JSC



04 CHEMICAL STORAGE  
TANKS WITH CAPACITY >  
12.000 TÂN,



CHEMICAL LIQUID IMPORT PORT  
VESSEL > 5.000 DTW.



CHEMICAL  
WAREHOUSE



**CÔNG TY CP XNK VÀ CÔNG NGHIỆP NAM LONG**  
**ADD.: CẢNG GÒ DẦU, ĐỒNG NAI, VIỆT NAM**



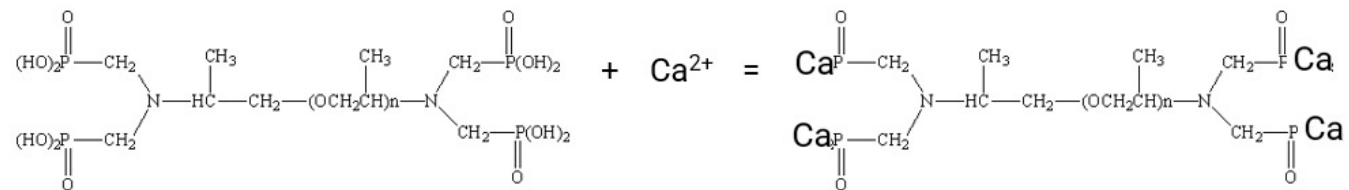


**ECOLAB®** | **NALCO** Water

# CƠ CHẾ PHẢN ỨNG

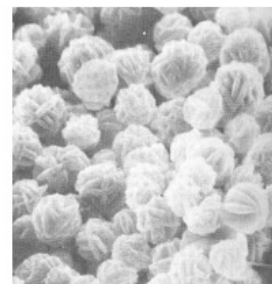
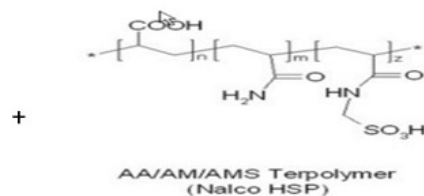
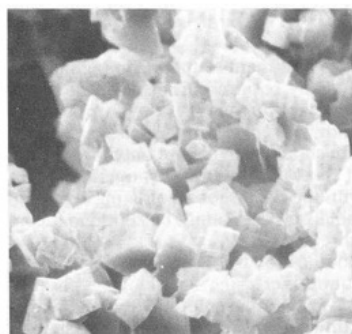
## 1. Cơ chế phản ứng của PAPEMP:

Polyamino Polyether Methylene Phosphonic Acid (PAPEMP)



## 2. Cơ chế phân tán tinh thể cấu của HSP:

(High Stress Polymer) – Sẽ tạo ra cá tính thể vô định hình, ngăn chặn sự hình thành của các cá tính thể định hình, gây cấu cứng.





# DUST SUPPRESSION APPROACH

- Water Spray vs other chemical approach

	Water Spray	Water + Surfactant	Residual Treatment	Foam Based Program
Cost of installation	Low	Low	Low	High
Cost of operation	Low	Medium	High	High
Water volume	High	High	Medium	Low
BTU Penalty	High	High	Low	Low
Persistence	Low	Low	High	High