



WASTE WATER TREATMENT





WASTE WATER TREATMENT

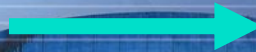
WASTE WATER
PLANT





WASTE WATER TREATMENT

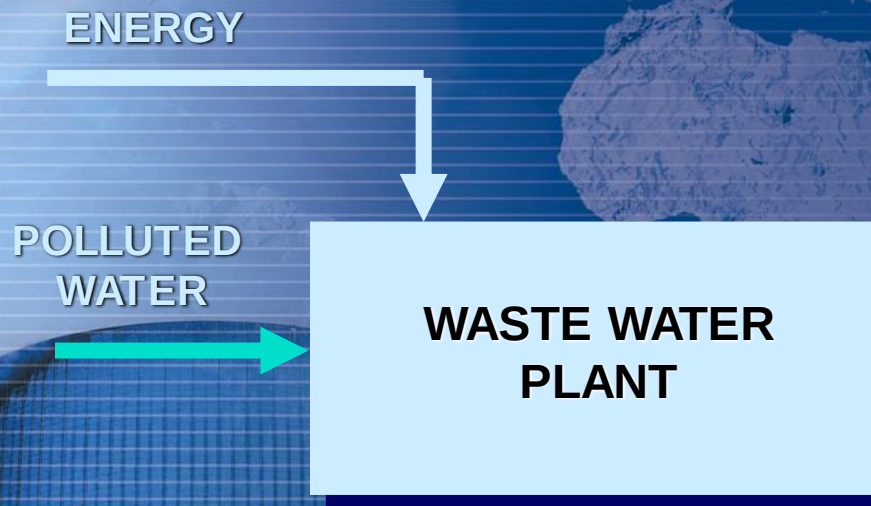
POLLUTED
WATER



WASTE WATER
PLANT

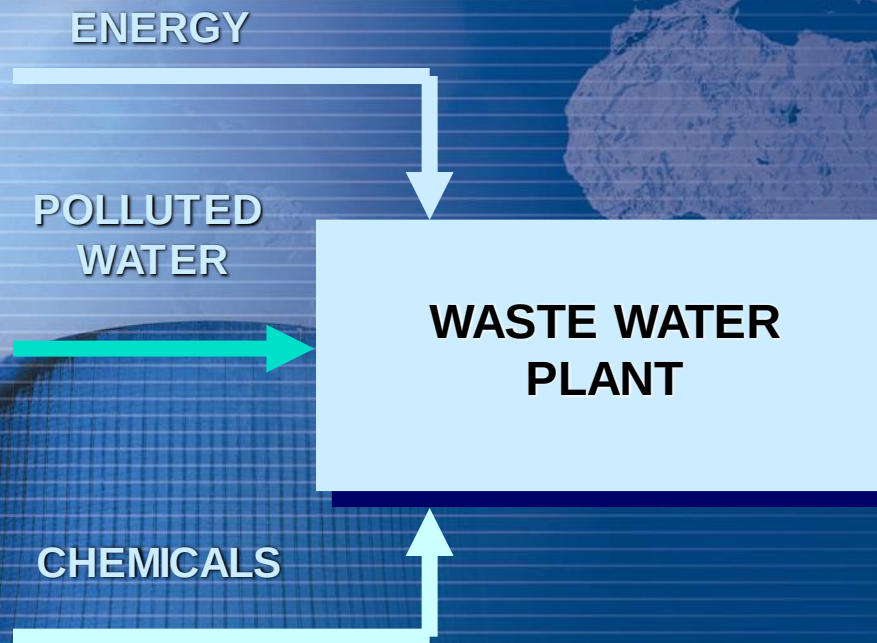


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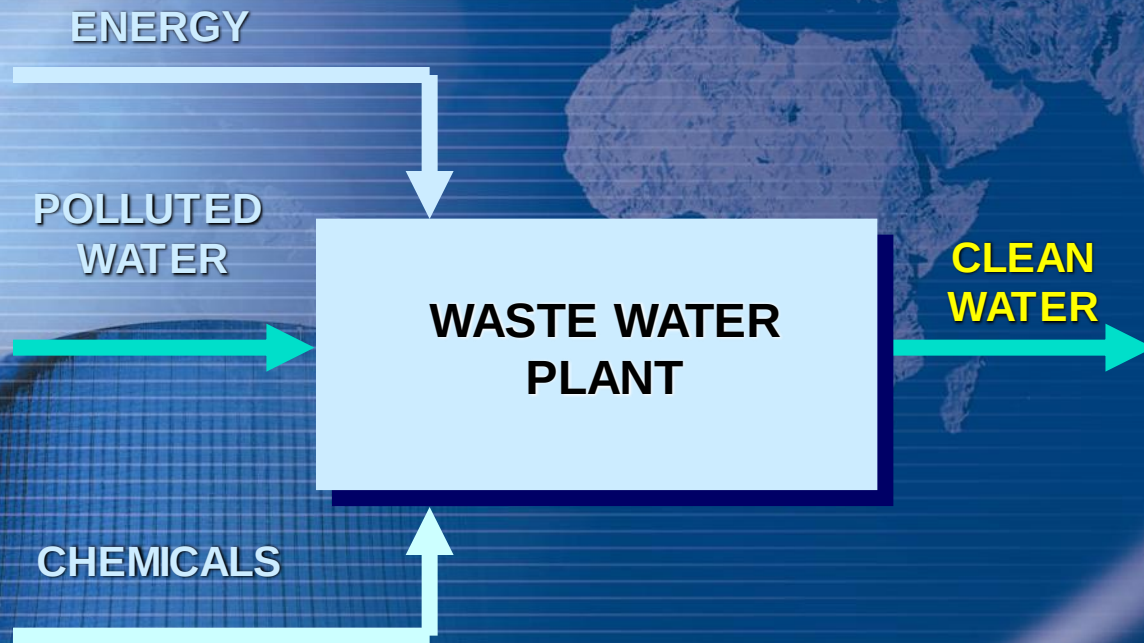


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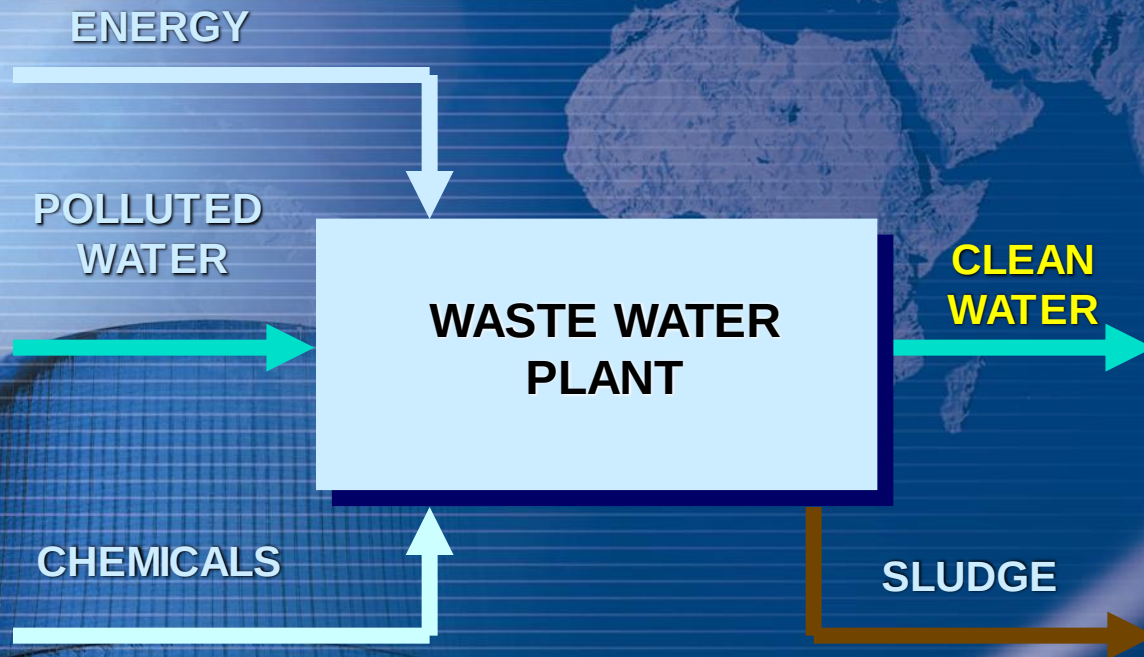




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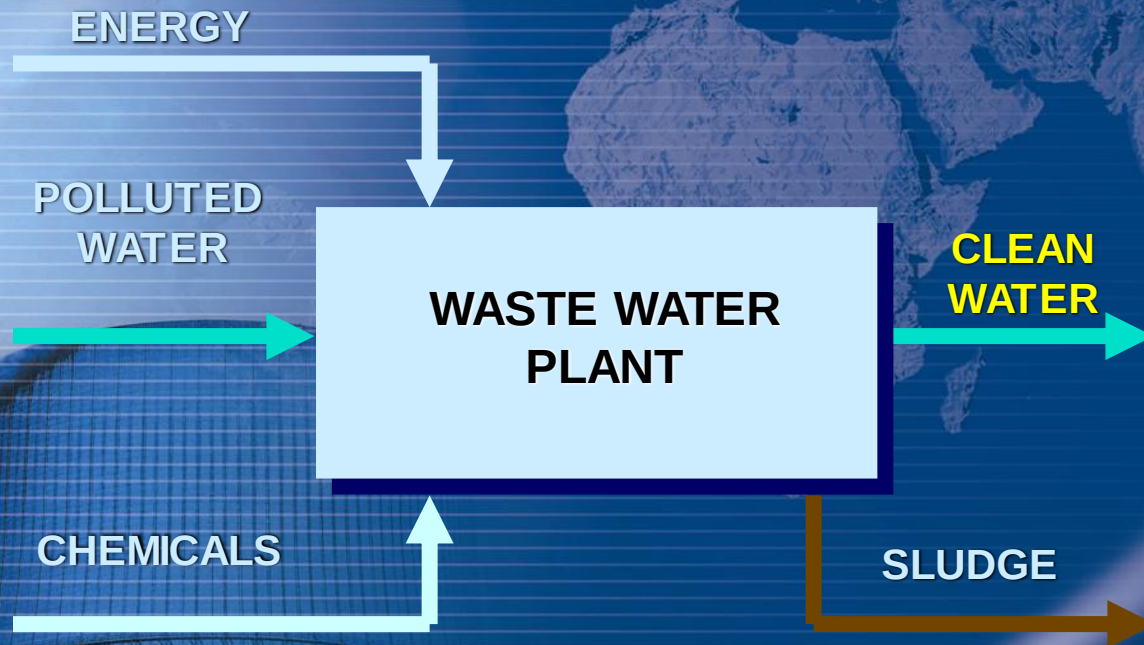
WASTE WATER TREATMENT



WASTE WATER TREATMENT



WASTE WATER TREATMENT



OBJECTIVE



RESPECT OF THE DISCHARGE LIMITS

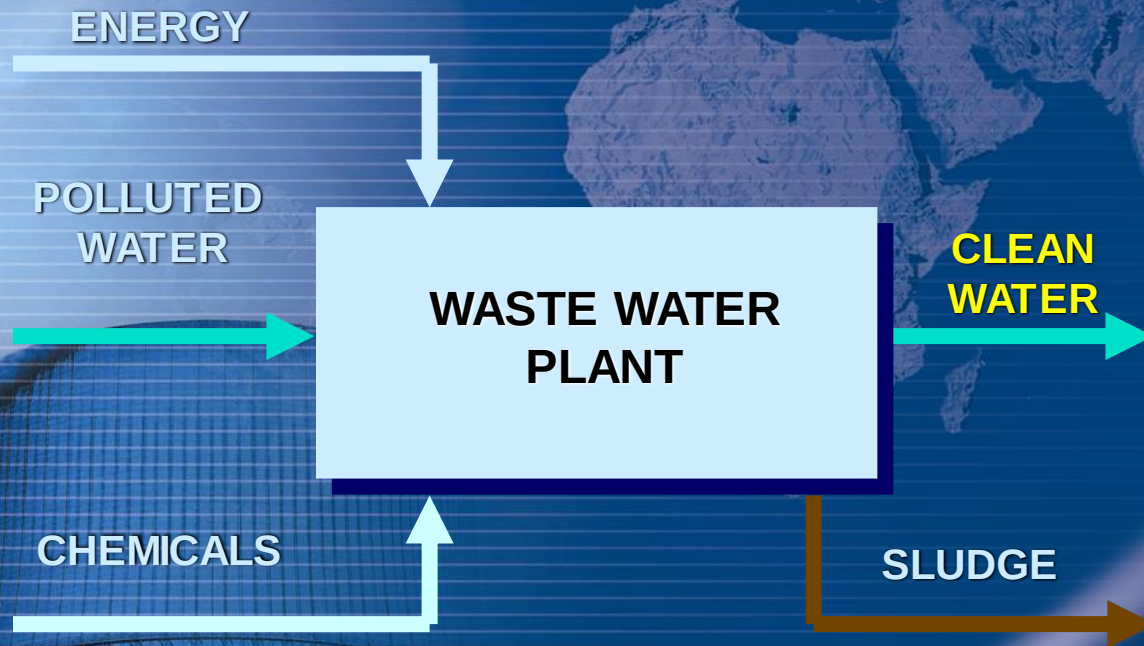


WASTE WATER TREATMENT

AT THE BEGINNING OF THE NINENTIES THE SITUATION IS CHANGED:

- ✓ More stringent law about the environment
- ✓ More competitiveness
- ✓ Water cost increase

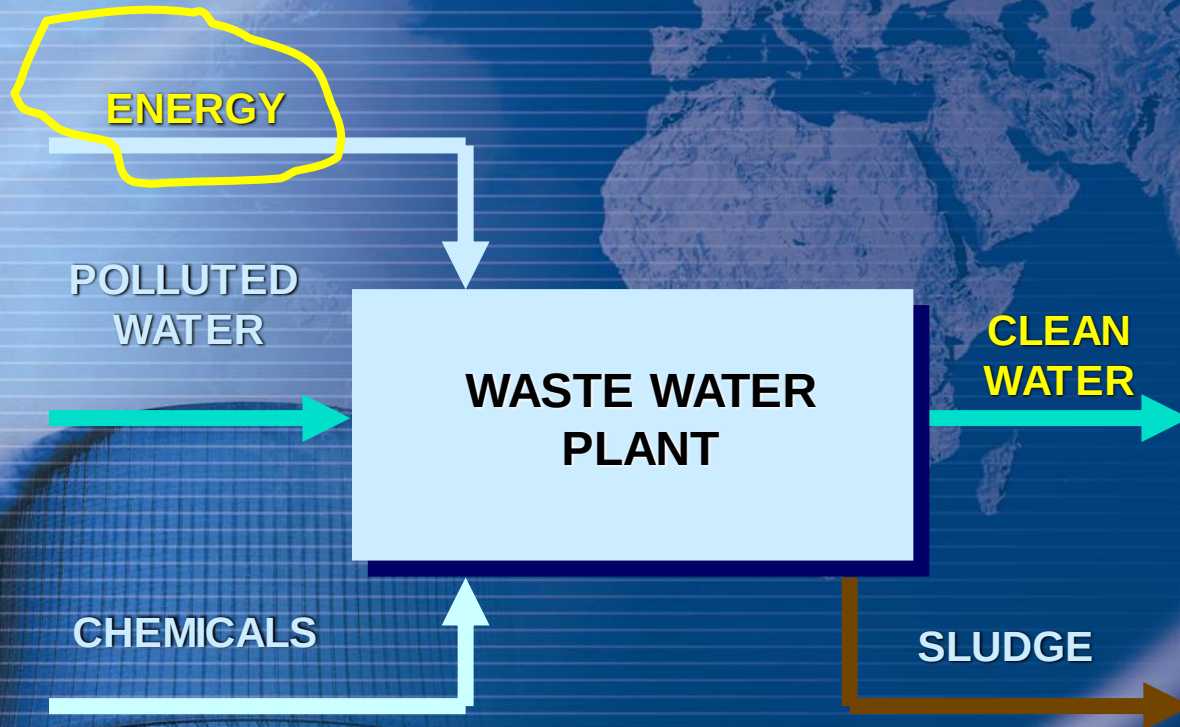
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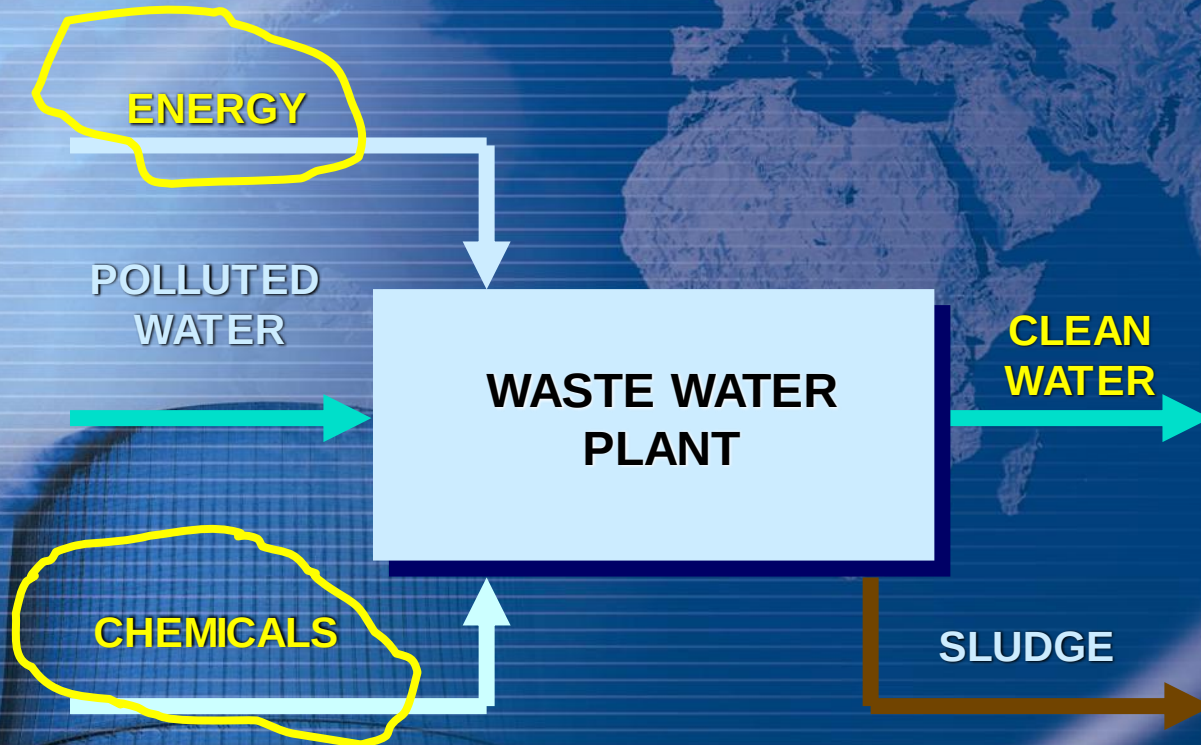
WASTE WATER TREATMENT

CHIMEC



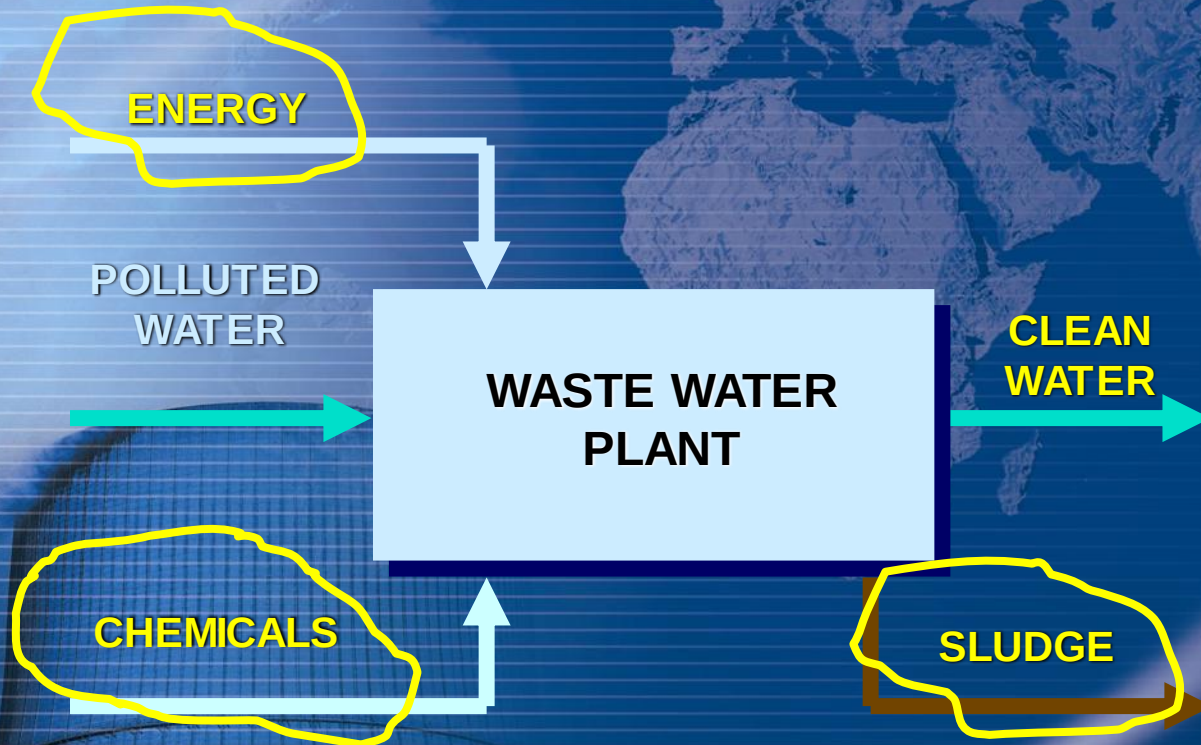


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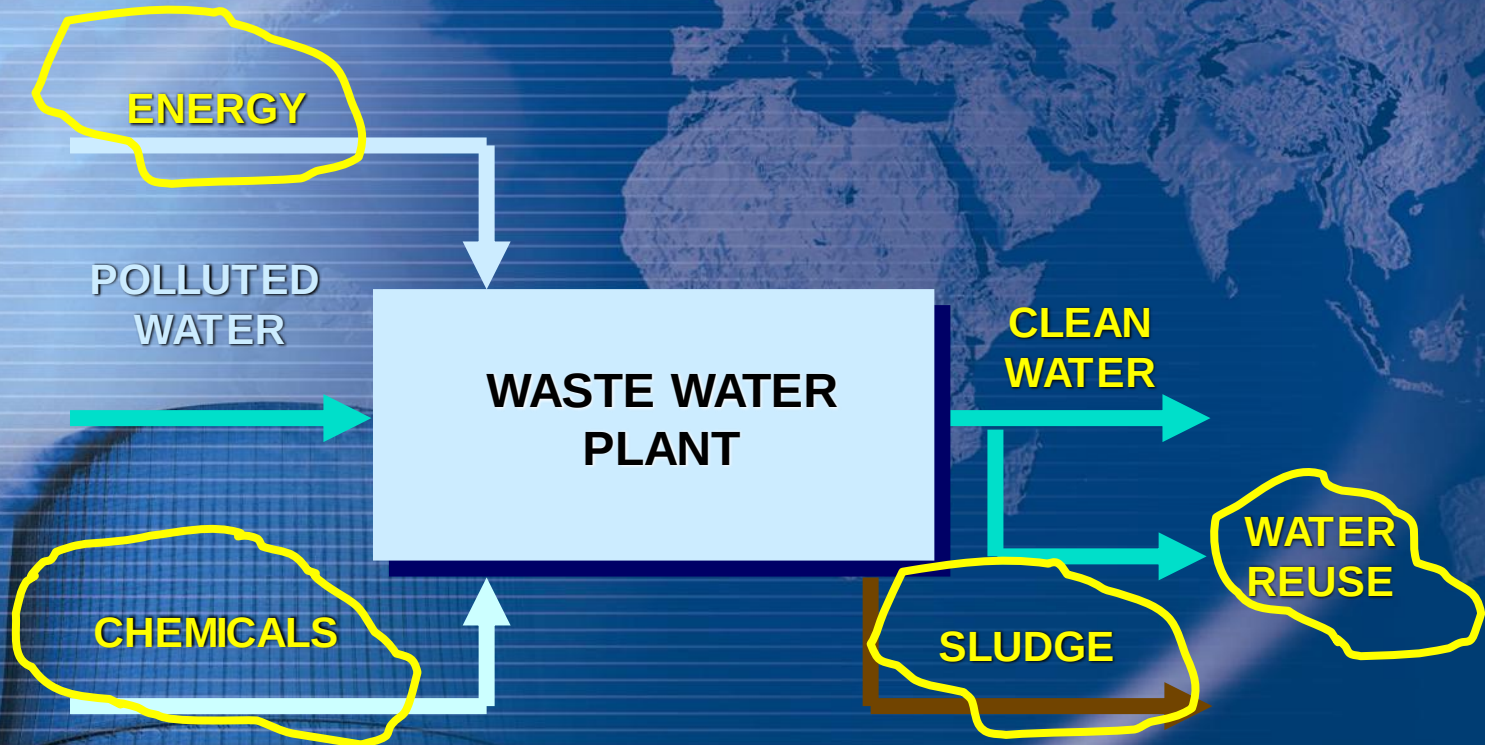




WASTE WATER TREATMENT



WASTE WATER TREATMENT





WASTE WATER TREATMENT

THE NEW OBJECTIVES OF THE WASTE WATER MANAGEMENT ARE:

- ✓ Environmental impact minimization
- ✓ Cost control
- ✓ Water reuse



WASTE WATER PLANT

Waste
water

homogenization





WASTE WATER PLANT



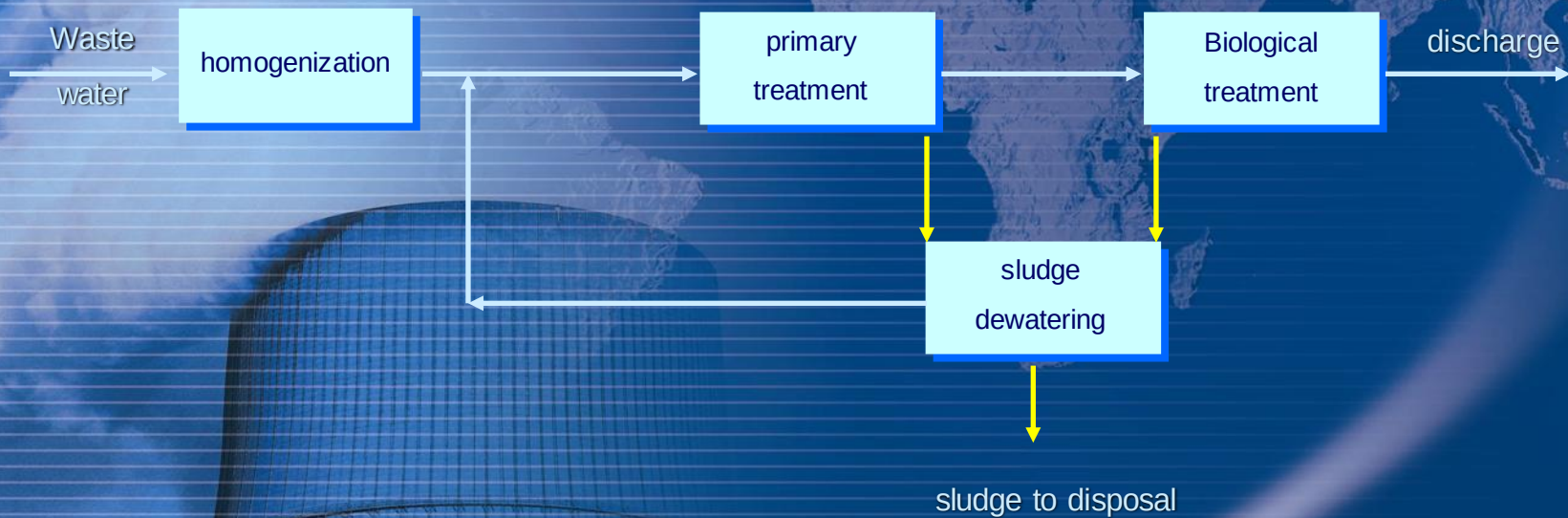


WASTE WATER PLANT

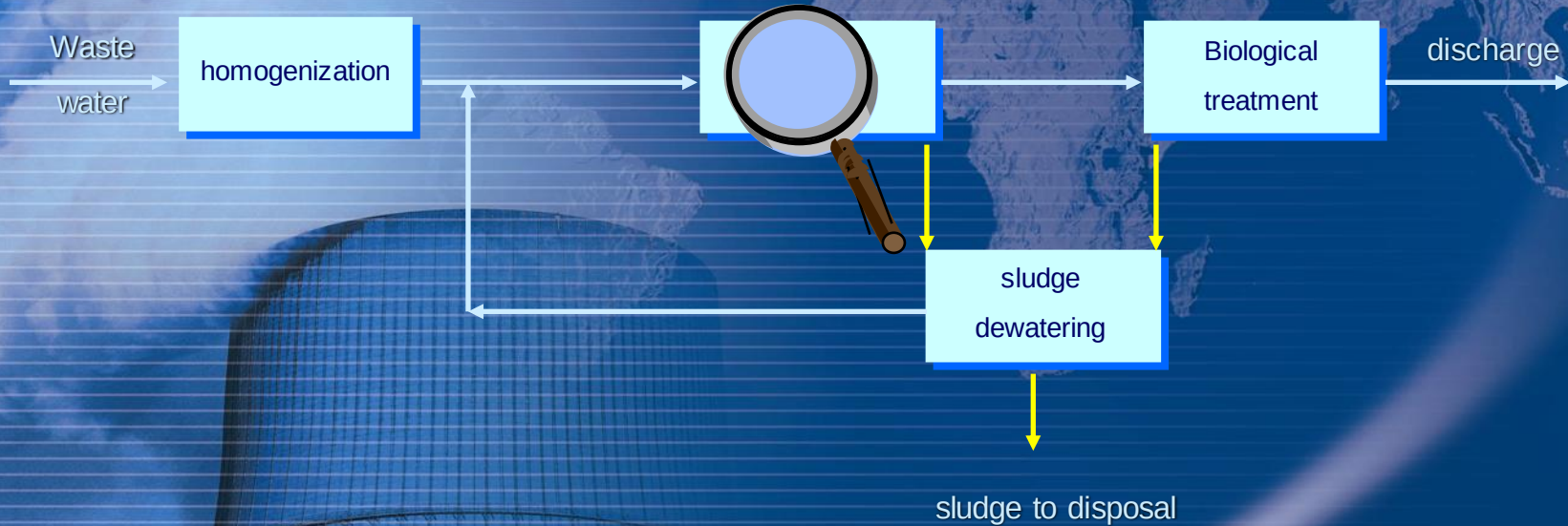




WASTE WATER PLANT



WASTE WATER PLANT



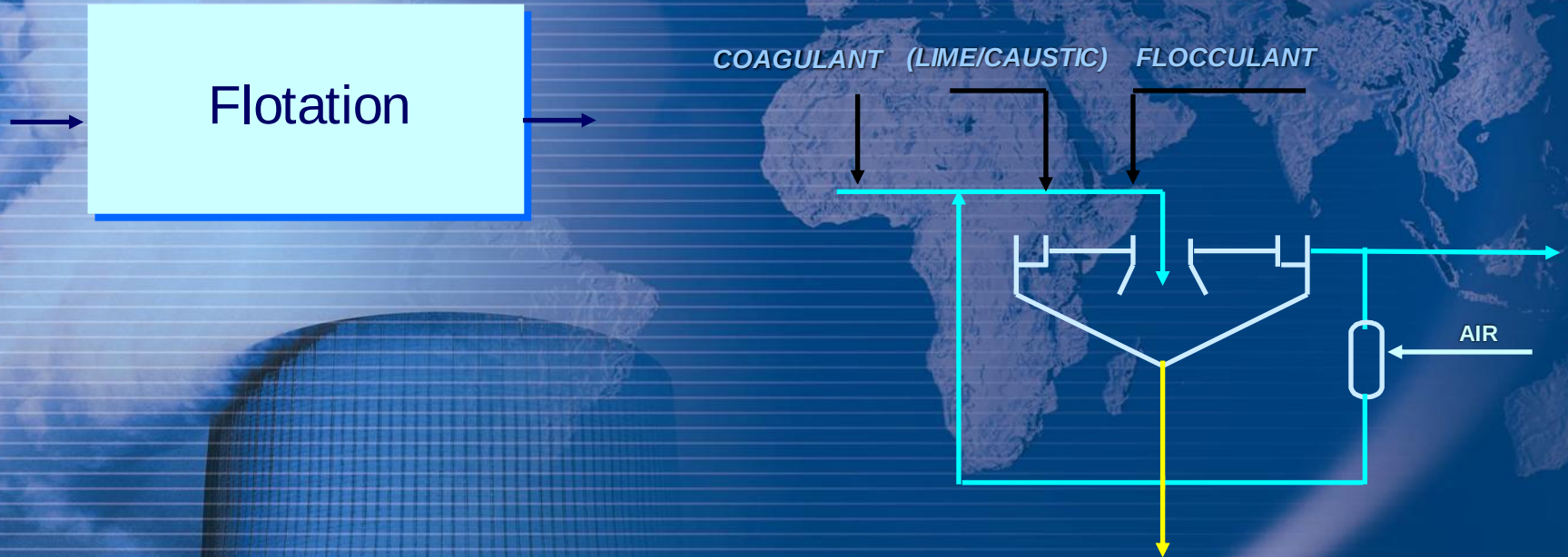
WASTE WATER PLANT

primary
treatment

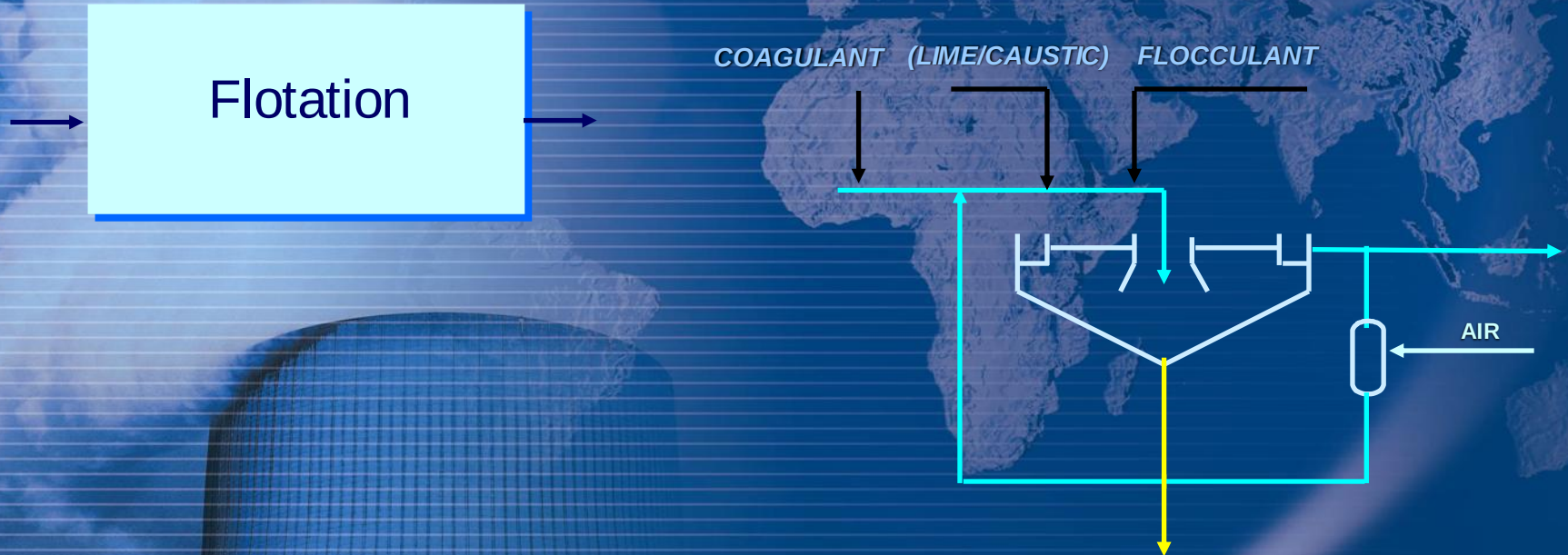
- Primary clarification

- Flotation

WASTE WATER PLANT



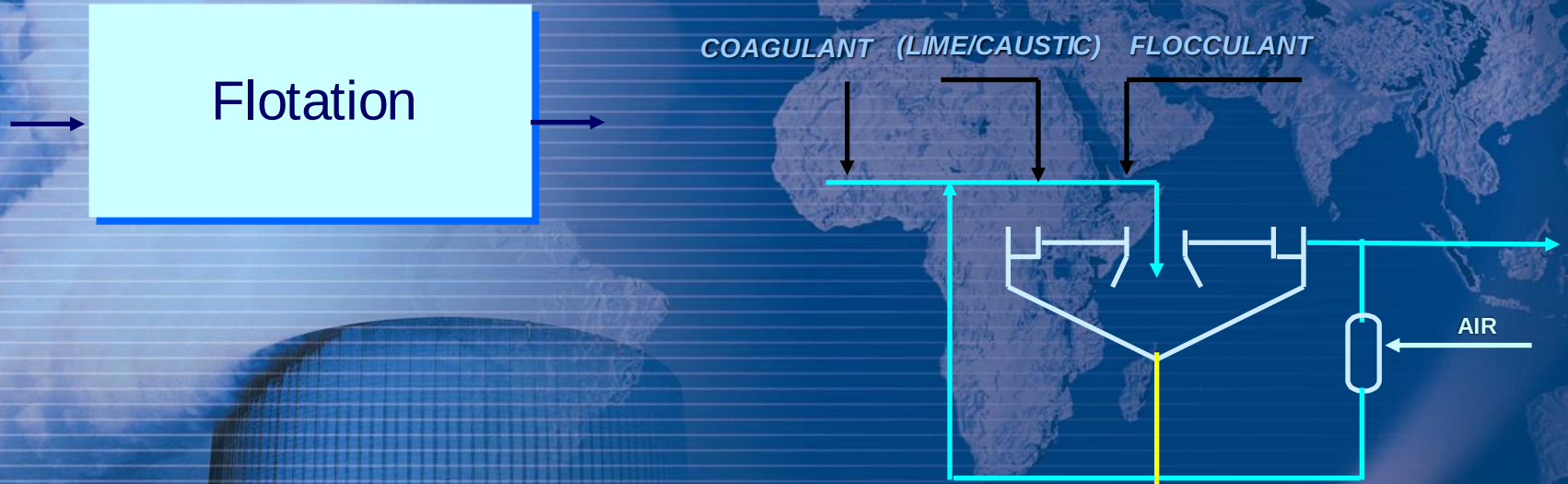
WASTE WATER PLANT



Objectives

- ❑ Insoluble pollutants removal

WASTE WATER PLANT



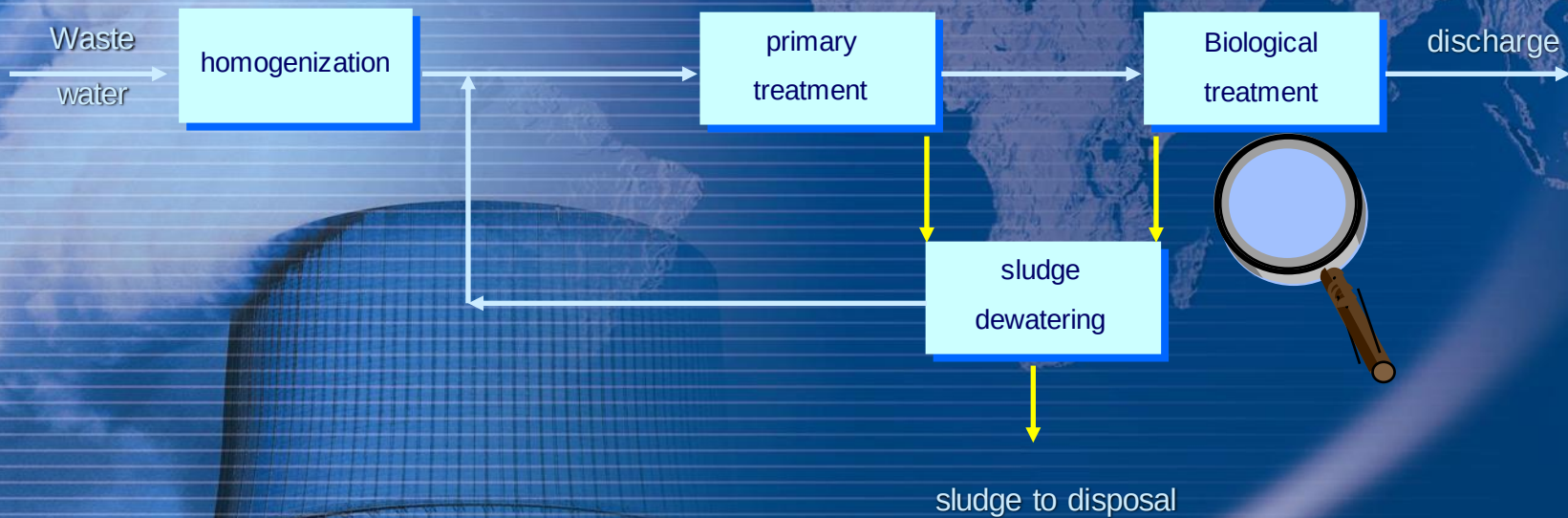
Objectives

- ❑ Insoluble pollutants removal

Costs

- ❑ Chemicals
- ❑ Sludge production

WASTE WATER PLANT



WASTE WATER PLANT



WASTE WATER PLANT



Objectives

- ❑ Organic compounds removal

WASTE WATER PLANT



Objectives

- ❑ Organic compounds removal

Costs

- ❑ Energy
- ❑ Sludge production
- ❑ Chemicals

WASTE WATER PLANT

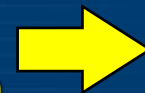


Objectives

- ❑ Organic compounds removal

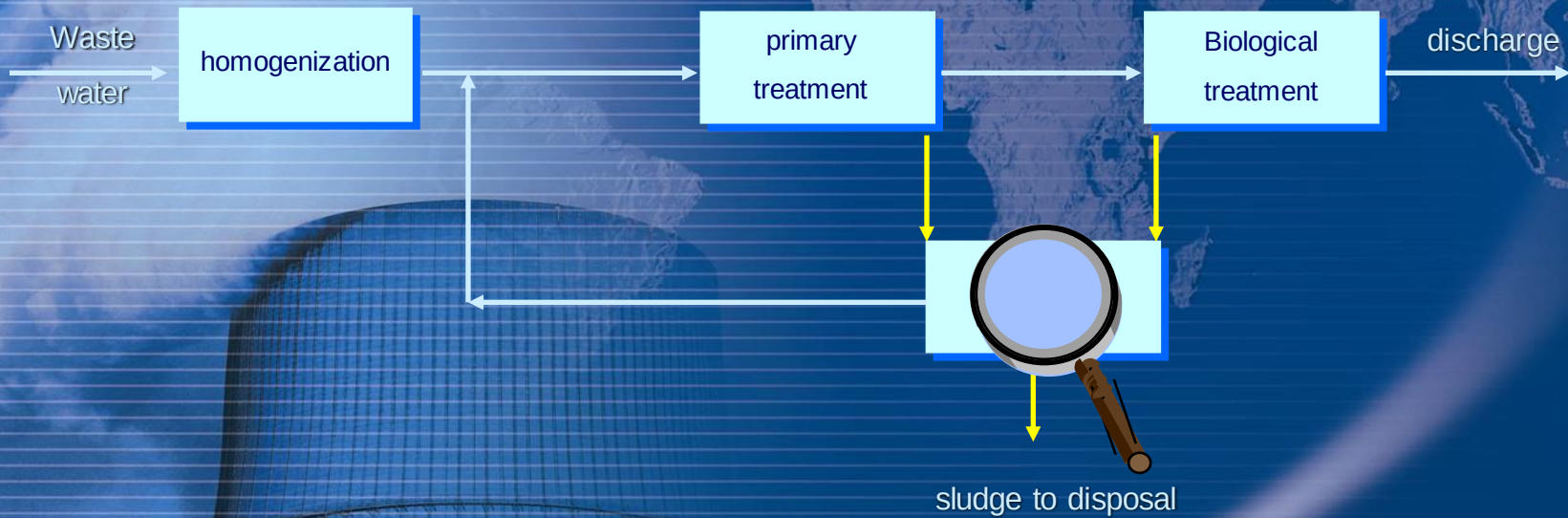
Costs

- ❑ Energy
- ❑ Sludge production
- ❑ Chemicals



Inlet water quality

WASTE WATER PLANT

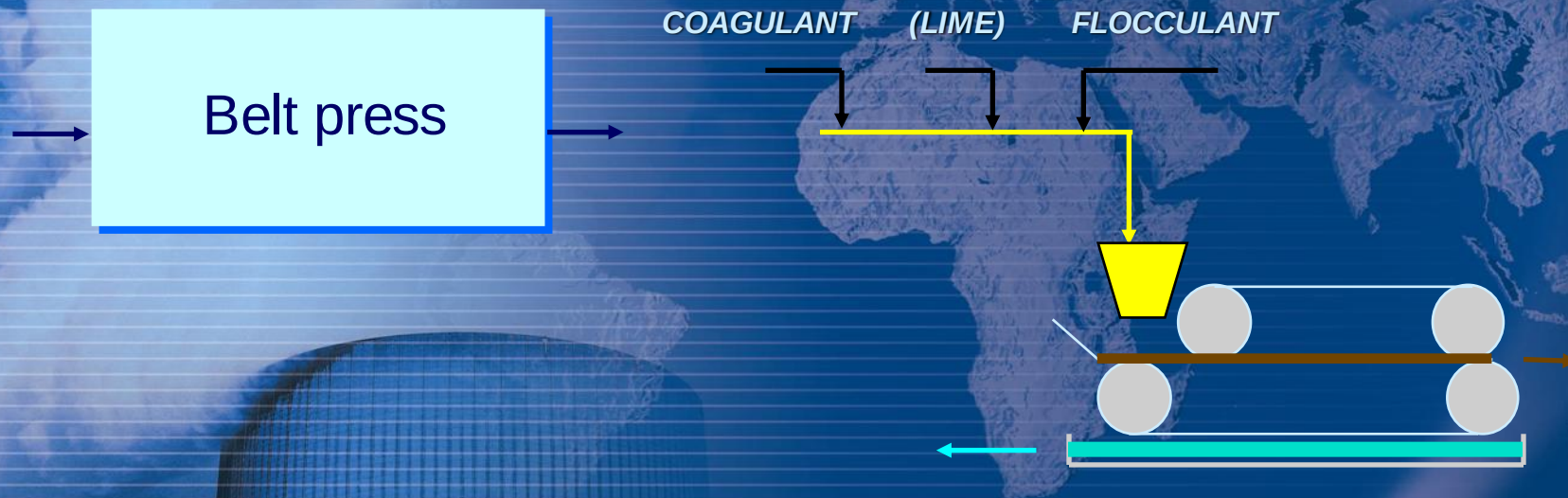


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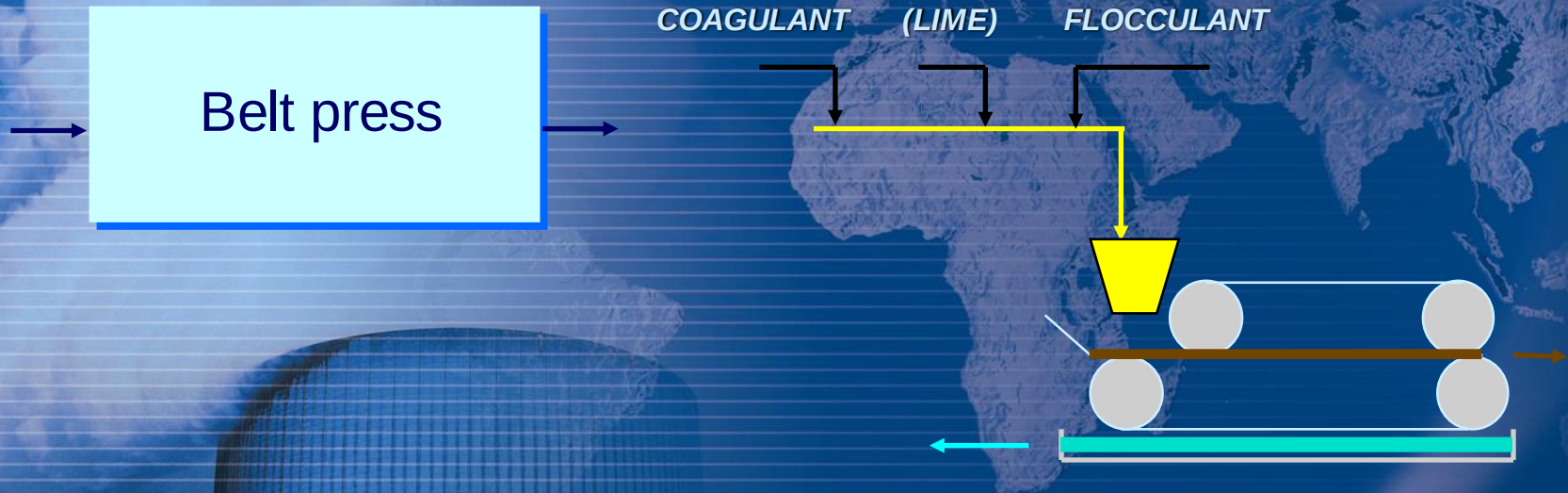
Sludge
dewatering

- ❑ Belt press
- ❑ Filter press
- ❑ Centrifuge

WASTE WATER PLANT



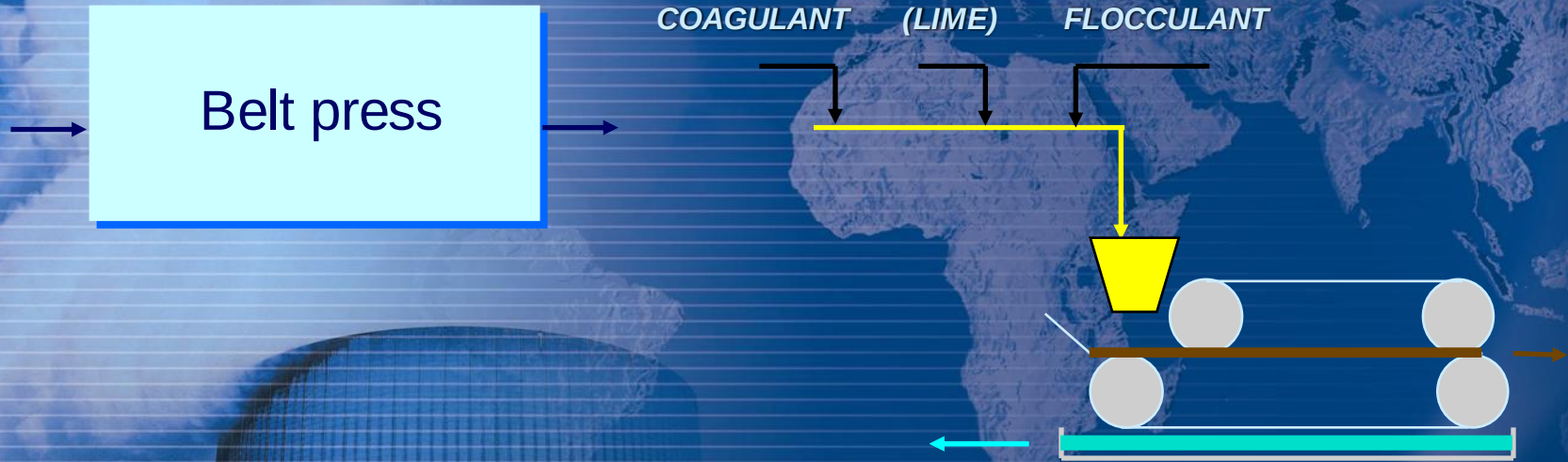
WASTE WATER PLANT



Objective

- Dry material sludge increase

WASTE WATER PLANT



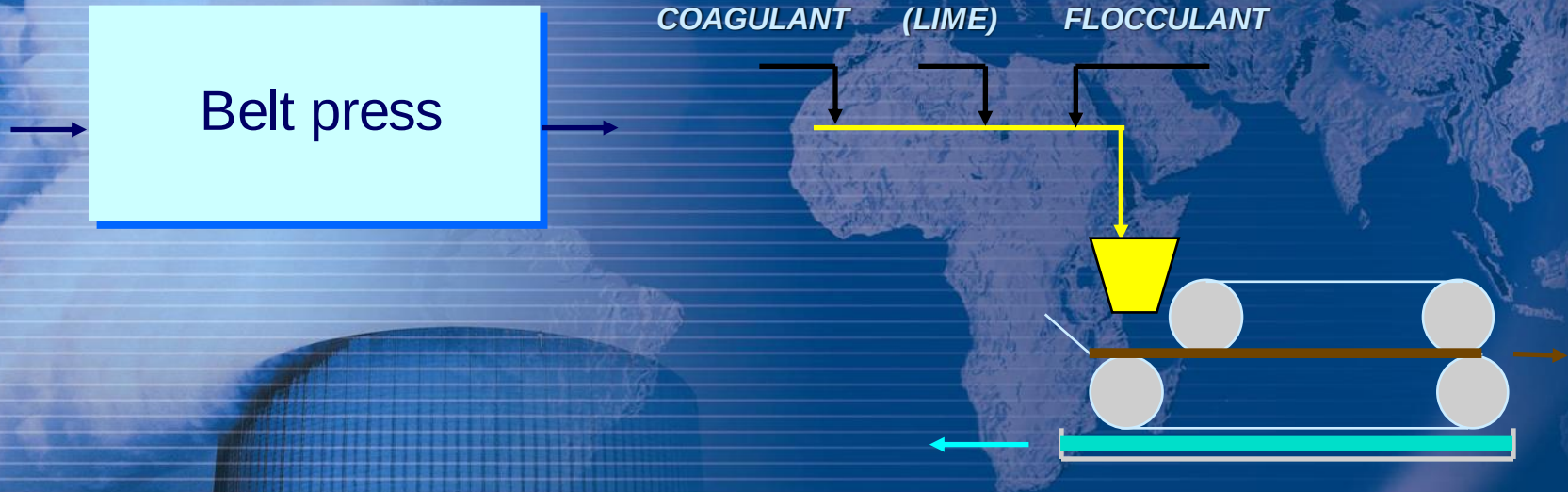
Objective

- Dry material sludge increase

Costs

- Sludge production
- Chemicals
- Energy

WASTE WATER PLANT



Objective

- Dry material sludge increase

Costs

- Sludge production
- Chemicals
- Energy

Quality and
quantity
of the inlet sludge

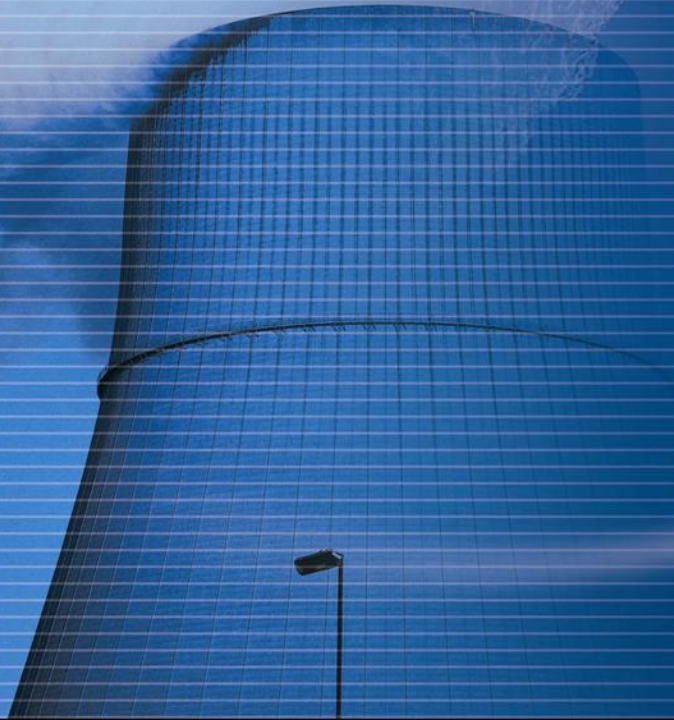


CHINMEC

WASTE WATER TREATMENT

SUMMARIZING:

✓ Costs



CHINMEC



WASTE WATER TREATMENT

SUMMARIZING:

✓ **Costs**

- Chemicals
- Sludge production
- Energy



WASTE WATER TREATMENT

SUMMARIZING:

✓ **Costs**

✓ **Link between the sections
of the plant**

- Chemicals
- Sludge production
- Energy

WASTE WATER TREATMENT

SUMMARIZING:

✓ **Costs**

✓ **Link between the sections
of the plant**

- Chemicals
- Sludge production
- Energy
- Global point of view

WASTE WATER TREATMENT

SUMMARIZING:

✓ **Costs**



✓ **Link between the sections
of the plant**

- Chemicals
- Sludge production
- Energy
- Global point of view

WASTE WATER TREATMENT

SUMMARIZING:

✓ **Costs**



✓ **Link between the sections
of the plant**

✓ **Environmental impact
minimization**

- Chemicals
- Sludge production
- Energy
- Global point of view

WASTE WATER TREATMENT

SUMMARIZING:

✓ **Costs**



✓ **Link between the sections
of the plant**

✓ **Environmental impact
minimization**

- Chemicals
- Sludge production
- Energy
- Global point of view
- “Integrated Pollution Control”(air,water,ground)



WASTE WATER TREATMENT

CHIMEC, A “WATER MANAGEMENT” COMPANY, PROPOSES A SPECIFIC APPROACH TO:

- ✓ **Minimize the costs**
- ✓ **Minimize the environmental impact**



WASTE WATER TREATMENT

COST MINIMIZATION:

- ✓ **Treatment cost reduction**
- ✓ **Energy cost reduction**
- ✓ **Sludge disposal cost reduction**



WASTE WATER TREATMENT

TREATMENT COSTS REDUCTION

- ✓ Treatment programs with low cost/performances ratio
- ✓ Feeding and monitoring equipments to optimize chemicals dosage and treatment results



WASTE WATER TREATMENT

ENERGY COST REDUCTION

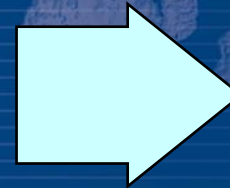
- ✓ **Global point of view**
- ✓ **Engineering approach**
- ✓ **Simulation capability**



WASTE WATER TREATMENT

ENERGY COST REDUCTION

- ✓ Global point of view
- ✓ Engineering approach
- ✓ Simulation capability



EXPERIENCE



WASTE WATER TREATMENT

SLUDGE DISPOSAL COSTS REDUCTION

- ✓ Specific treatment programs for the sludge dewatering

WASTE WATER TREATMENT

SLUDGE DISPOSAL COSTS REDUCTION

✓ **Specific treatment programs for the sludge dewatering**



**“Cross-linked”
polymers**

WASTE WATER TREATMENT

SLUDGE DISPOSAL COSTS REDUCTION

✓ **Specific treatment programs for the sludge dewatering**



**“Cross-linked”
polymers**

✓ **Specific treatment programs to minimize/eliminate inorganic coagulant**



WASTE WATER TREATMENT

SLUDGE DISPOSAL COSTS REDUCTION

✓ **Specific treatment programs for the sludge dewatering**



**“Cross-linked”
polymers**

✓ **Specific treatment programs to minimize/eliminate inorganic coagulant**



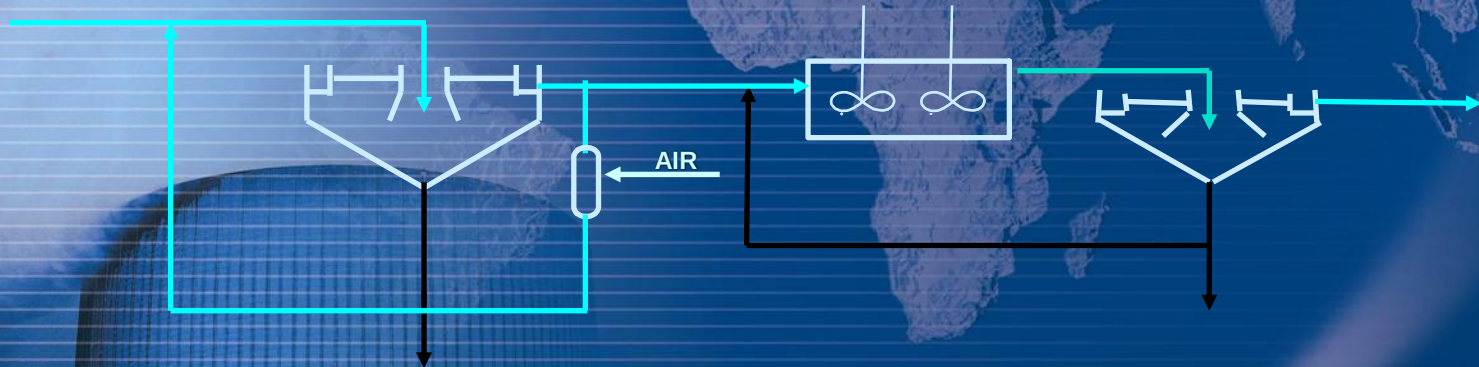
**Customized
organic coagulants**

WASTE WATER TREATMENT

ENVIRONMENTAL IMPACT MINIMIZATION

- ✓ **Minimizing sludge production**
- ✓ **Reducing fresh water use (“water reuse”)**
- ✓ **Minimizing pollutants release**
- ✓ **Utilizing “green technologies”**

CALCULATIONS



- ✓ Flow = 250 mc/h
- ✓ COD inlet = 600 ppm
- ✓ Energy cost = 0,05 euro/KW
- ✓ Sludge disposal cost = 0,08 euro/Kg
- ✓ % solids in the sludge = 22

WASTE WATER TREATMENT

Initial situation

The DAF plant removes only a low percentage of the COD inlet(33%)

Outlet COD = 400 ppm

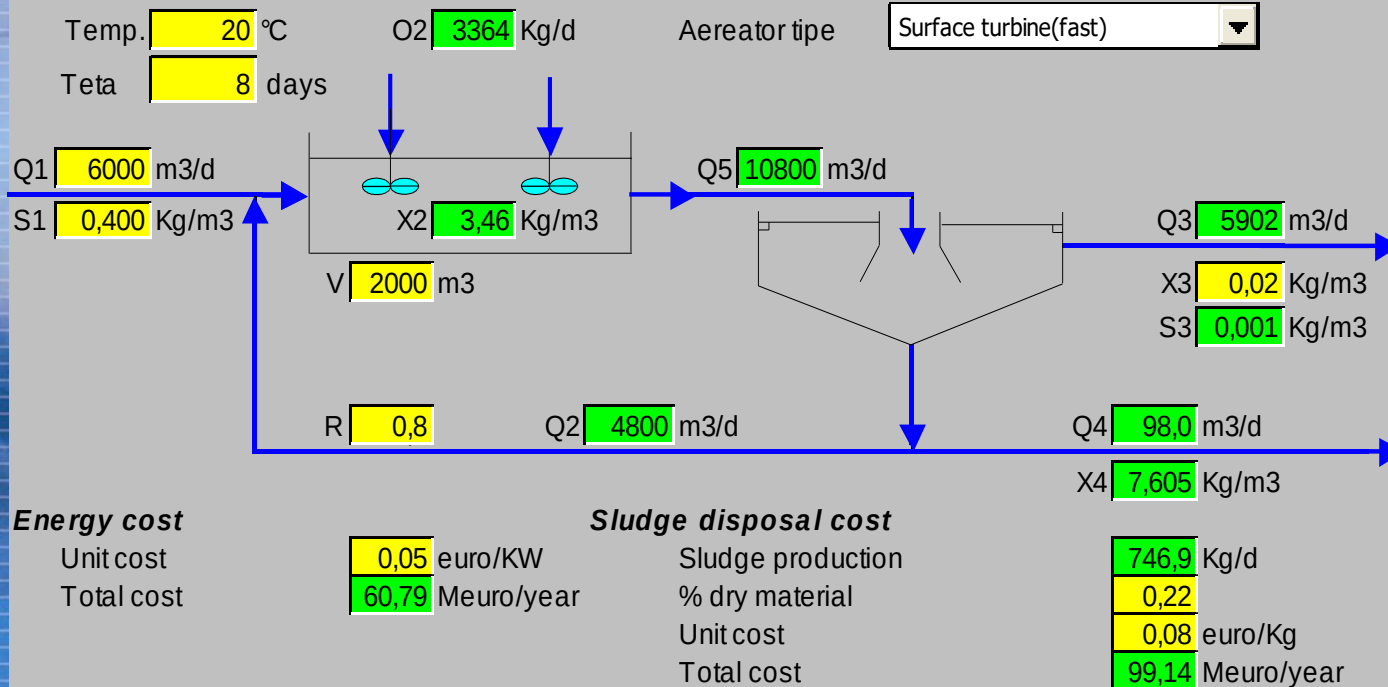
Treatment cost = 0,005 euro/mc

Annual treatment cost = 10.900 euro

WASTE WATER TREATMENT

Biologic Management Program

By F. Rapuano & E. Astorino Rel.1.2B - 19/12/97





WASTE WATER TREATMENT

Final situation

CHIMEC treatment program improve the COD removal of the DAF plant (50%)

Outlet COD = 300 ppm

Treatment cost = 0.008 euro/mc

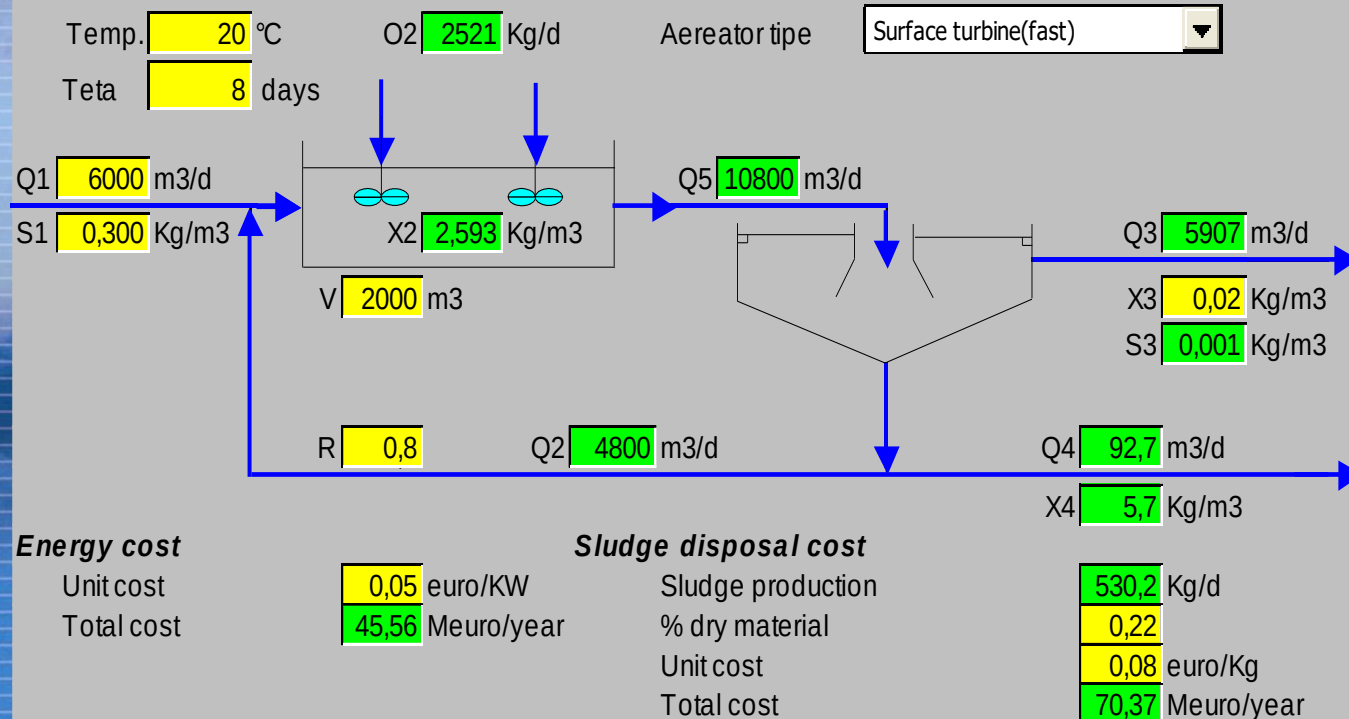
Annual treatment cost = 17.500 euro



WASTE WATER TREATMENT

Biologic Management Program

By F. Rapuano & E. Astorino Rel.1.2B - 19/12/97



WASTE WATER TREATMENT

COST ANALYSIS

	BEFORE	AFTER
Treatment cost	10.900	17.500
Energy cost	60.790	45.560
Sludge disposal cost	99.140	70.370
Total	170.830	133.430

WASTE WATER TREATMENT

COST ANALYSIS

	BEFORE	AFTER
Treatment cost	10.900	17.500
Energy cost	60.790	45.560
Sludge disposal cost	99.140	70.370
Total	170.830	133.430

DELTA = 37.400 euro/year



**Thank you for
your attention**

