



Termomeccanica Ecologia

Termomeccanica Group

Our know how
Our commitment
Our environment



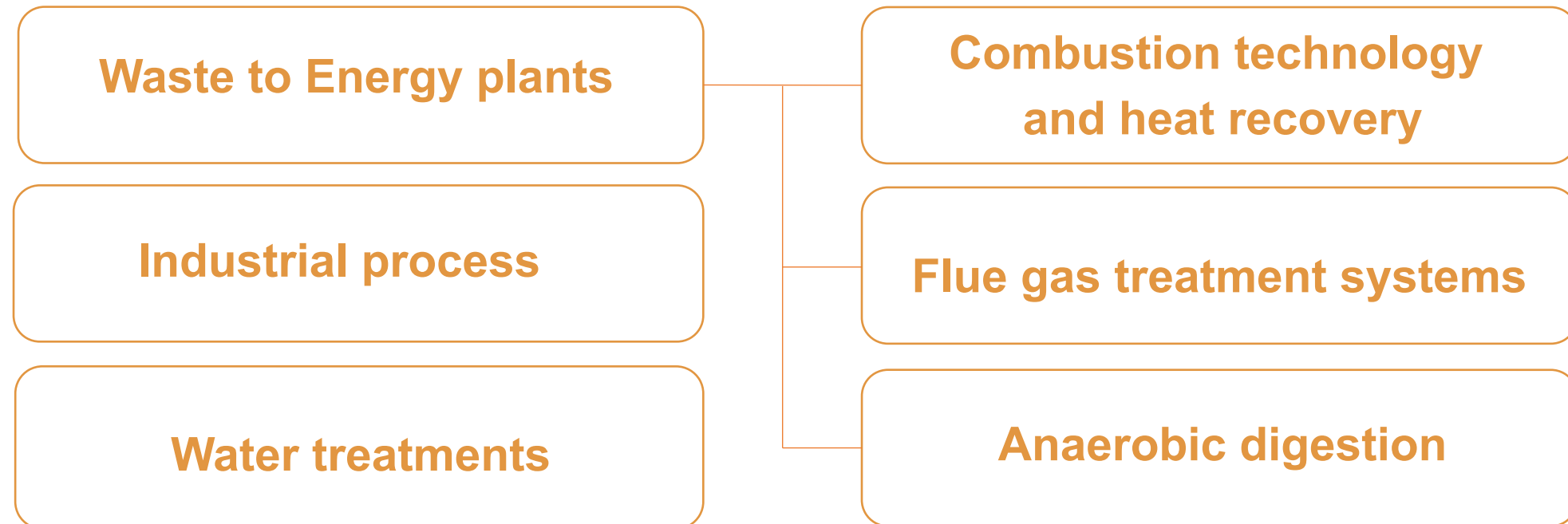
TM.E. S.p.A. - Termomeccanica Ecologia

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TM.E. S.p.A. - Termomeccanica Ecologia Technological Provider with large experience in turnkey EPC **contracts**. Proprietary grate furnace and rotary kiln technologies for waste incineration with heat recovery in TM.E. designed steam boiler and the use of dry, semi-dry and wet flue gas cleaning systems to ensure a highly efficient flue gas treatment process.



BUSINESS LINES



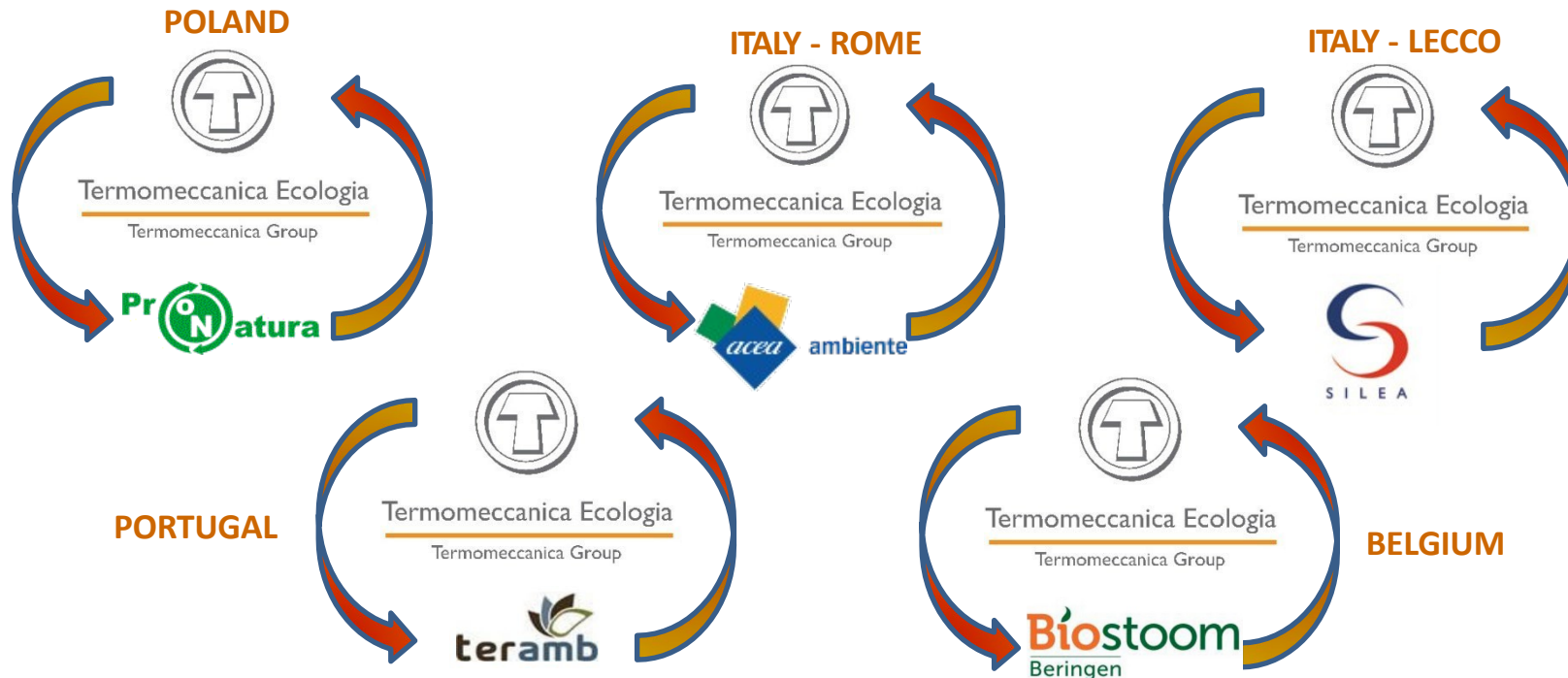
TM.E. Design philosophy

TM.E. STRATEGY : LEAD USER PROCESS INNOVATION

- ✓ Possibility to test on real scale new Technologies, new patents, new references;
- ✓ Possibility to anticipate and drive new marketing strategy
- ✓ Proprietary know how for several technologies with great flexibility to meet different markets and different Energy & Environmental Requirements

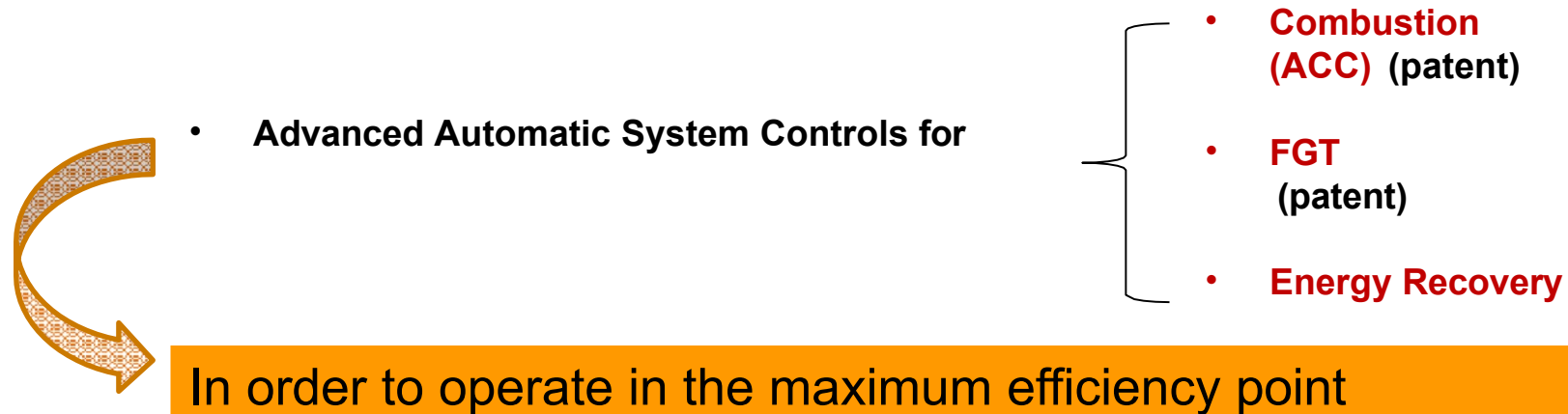
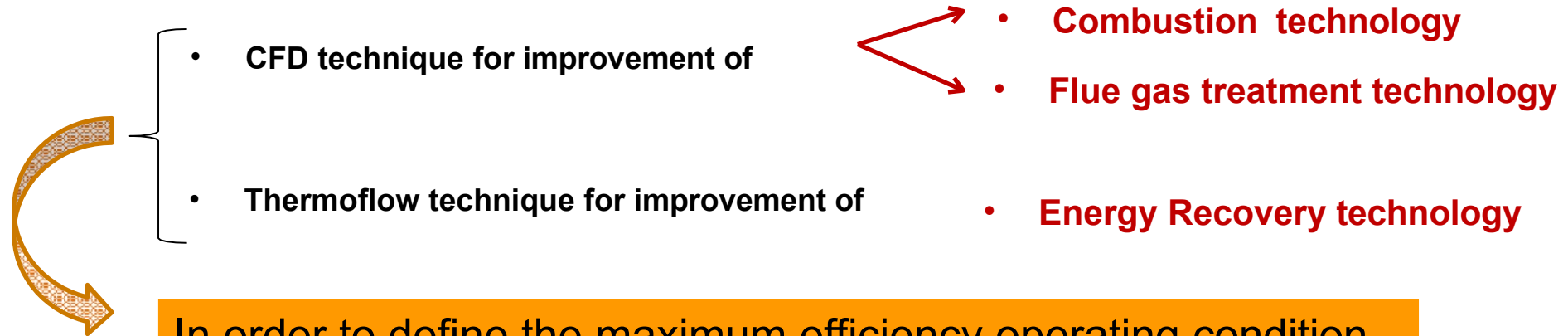
to achieve high level of competitiveness, quality, flexibility, reliability and performance

"LEAD USER" COOPERATION FOR INNOVATIVE TECHNOLOGIES DEVELOPMENT



TM.E. DESIGN PHILOSOPHY

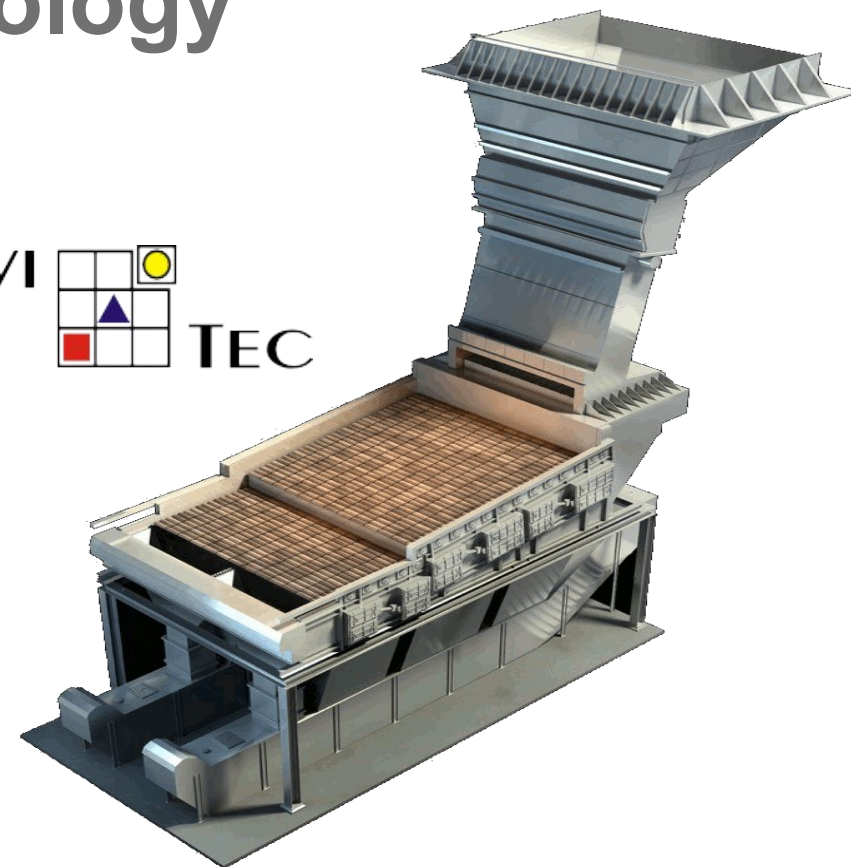
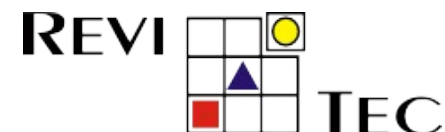
An innovative approach for WtE design



FURNACE –TM.E. Technology

TM.E grate main characteristics

TM.E. S.p.A. - Termomeccanica Ecologia own 100% of the Swiss company Revi tec specialized in construction and service of waste combustion grate



over 15 grates installed in the last 10 years

More than 8000 hours of operation of the equipment

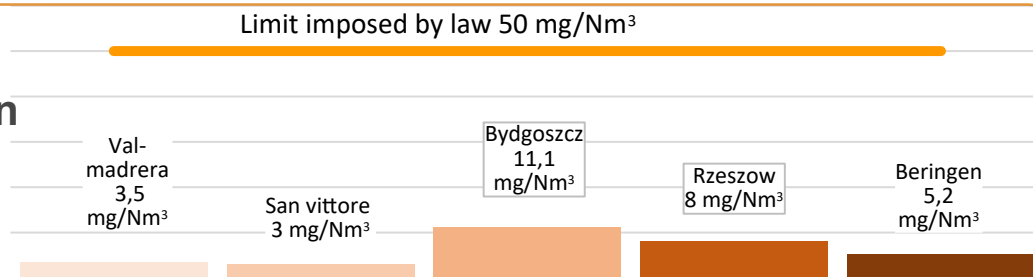
Water or air cooled combustion grate

Wide range of usable fuels with different calorific values

no bar replacements in first 4 years (water cooled)

bars lifetime: 8 years (water cooled)

High combustion quality (CO in the flue gases)

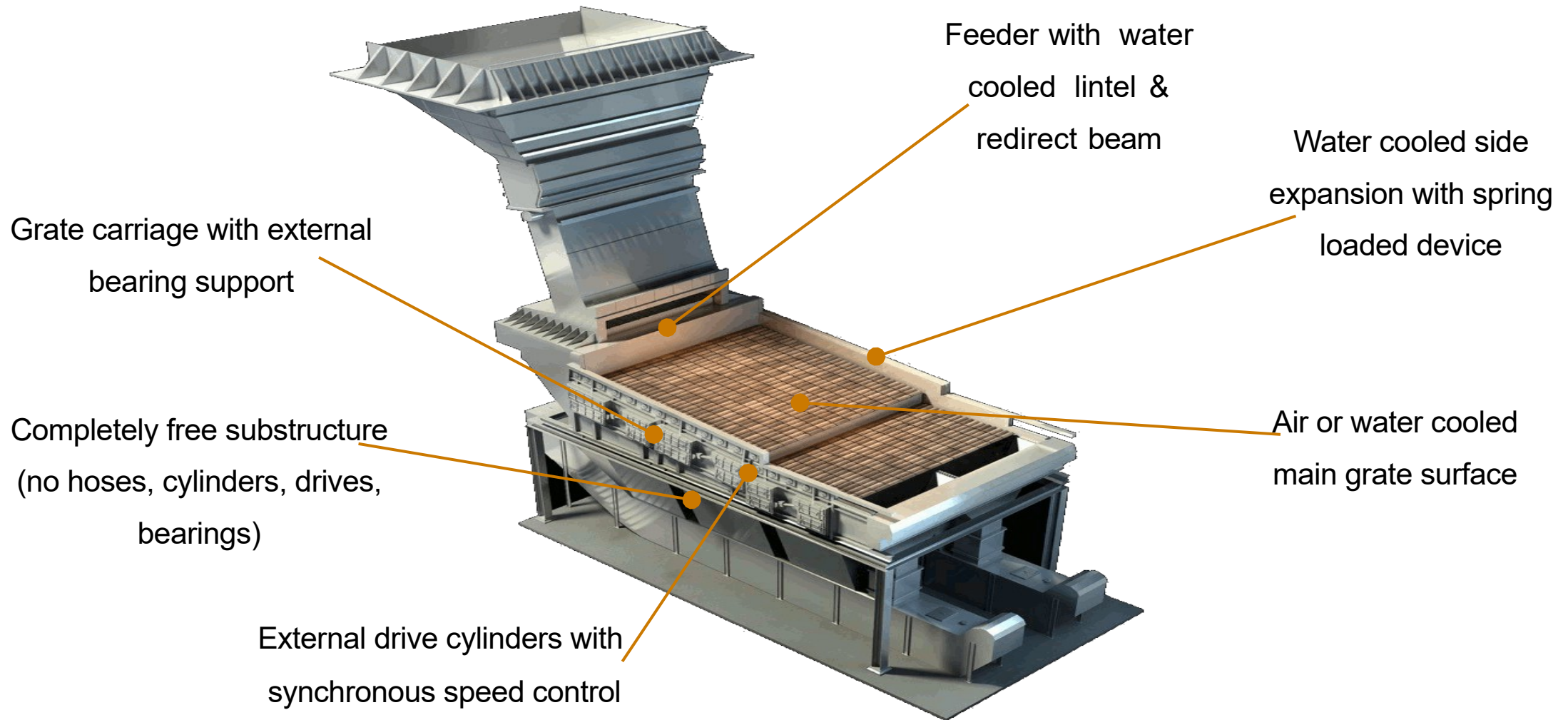


REVI TEC CAN OFFER FULL SERVICE AND MAINTENANCE ON COMBUSTION GRATES



FURNACE –TM.E. Technology

TM.E grate main characteristics



REVI TEC – combustion grates references

WtE Plant	year	Maintenance (M) Renovation (R) New plant (N)	Type of fuel	Caloric Value [MJ/Kg]	Fuel mass flow [t/h]
Gorlice (PL)	2024	Under construction	RDF, MSW	9 - 14	12,5
Rzeszow 1 and 2 (PL)	2016 / 2022	N / Under construction	RDF/MSW/industrial	7,5 - 16	12,5 / 10,0
Sao Miguel (PT)	2022	Under construction	MSW/Biomass	6 - 15	8
Gdansk (PL)	2020	N	MSW/Industrial	8,5 - 16	21,5
Asia Paper (KR)	2019	N	RDF/SRF	16,5 – 21	7,5
Beringen (BE)	2018	N, M	RDF	9 -16	29,5
Asia Paper (KR)	2016	N, M	RDF/SRF	20 - 27	4
Nijmegen 1 and 2 (NL)	2015 / 2016	M, R	MSW/industrial	7,5 - 16	25 / 11
Koentec Busan (KR)	2015	N	RDF/Wood waste	17 - 23	6,8
San Vittore L2, L3 and L1 (IT)	2008 / 2015	N, M	RDF	10 - 18	13,5 / 13,5 / 12,1
Asia Paper (KR)	2016	N, M	RDF/SRF	20 - 27	4
Sodertalje 1 (SE)	2014	M, R	RDF/Wood Waste	14 - 18	20
Bydgoszcz 1 and 2	2013	N, M	MSW/Industrial	6,5 - 13	11,5 /11,5

RDF= Refuse Derived Fuel; MSW= Municipal Solid Waste; SRF= Solid Recovered Fuel



FURNACE –TM.E. Technology – Plant availability

San Vittore del Lazio

year	Line 1 [hours]	Line 2 [hours]	Line 3 [hours]
2012	-	8.060	7.692(*)
2013	-	8.029	8.058
2014	-	7.796	8.321
2015	-	8.324	8.393
2016	1.662(*)	7.962	8.377
2017	8.264	7.829	7.998
2018	8.512	8.299	8.153
2019	8.413	8.481	8.184
2020	8.198	8.258	7.248(*)
2021	8097	7518 (**)	8367

(*) Not full year of operation

(**) Turbine overhaul

Beringen

year	Hours
2021	8008
2022	8323
2023	8067
2024	8130

Fluctuation from Steam Set-point

San Vittore	Rzeszow	Beringen
<1%	<1,5%	<1%

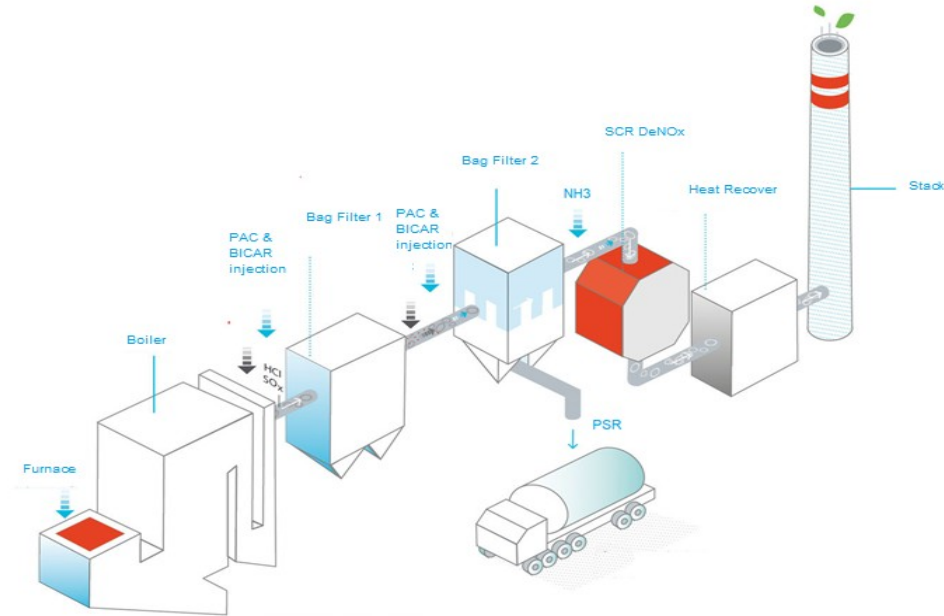


Flue Gas Treatment – TM.E. Tecnology

TM.E. S.p.A. - Termomeccanica Ecologia has huge experience in the design and construction of all types of flue gas treatments for waste-to-energy plants and industrial plants (dry, semi-dry, wet technologies)

Main technologies

- DeSOx
- DeNOx
- Electostatic Precipitator
- Flue Gas Condensation for heat recovery
- Spray drier
- Wet scrubber
- Deodorization plants



**In house know how and
technology**

**over 15 plants
in the last 20 years**

**Increase lifetime of
bags and catalyst**



FGT– references

WtE Plant	Throughput	FGT technology	Reagents
Sesto San Giovanni	20.000 Nm ³ /h	DeNOx SCR, Dry with double bag filter	Urea or ammonia solution, sodium bicarbonate, activated carbon
Gorlice	90.000 Nm ³ /h	DeNOx SNCR, Semi-dry	Solution of urea, hydrated lime and activated carbon
Terni N°1 line	120.000 Nm ³ /h	DeNOx SCR, Dry with double bag filter	Urea or ammonia solution, sodium bicarbonate, activated carbon
Sao Miguel n° 1 line	50.000 Nm ³ /h	DeNOx SNCR, Semi-dry	Solution of urea, hydrated lime and activated carbon
Rzeszow line n° 2	70.000 Nm ³ /h	DeNOx SCR, Semi-dry +Flue gas condenser	Solution of urea, hydrated lime and activated carbon
Danzica n° 1 line	130.000 Nm ³ /h	DeNOx SNCR +SCR, Semi-dry + Flue gas condenser	Ammonia solution, highly reactive hydrated lime, soda solution, activated carbon
Rzeszow n° 1 line	70.000 Nm ³ /h	DeNOx SNCR, Semi-dry + Flue gas condenser	Solution of urea, hydrated lime and activated carbon
Beringen n°1 line	180.000 Nm ³ /h	DeNOx SCR, Dry, ESP	Urea solution, sodium bicarbonate, activated carbon
Terceira Azores Islands n°1 line	24.000 Nm ³ /h	DeNOx SNCR, Dry	Urea solution, sodium bicarbonate, activated carbon
Bydgoszcz n°2 lines	70.000 Nm ³ /h	DeNOx SNCR, Semi-Dry + wet	Ammonia solution, high reactivity, hydrated lime, soda solution, activated carbon
San Vittore del Lazio n°3 lines	90.000 Nm ³ /h	DeNOx SCR, Dry, ESP	Ammonia solution, sodium bicarbonate, activated carbon
Valmadrera Lecco n°2 lines	50.000 Nm ³ /h	DeNOx SNCR + SCR, Dry + wet	Ammonia solution, sodium bicarbonate, activated carbon, soda solution
Granarolo Bologna n°2 lines	100.000 Nm ³ /h	DeNOx SCR, Semi-dry + wet	Ammonia solution, hydrated lime Activated carbon, soda solution



FGT – performance references

Pollutant (concentration referring to dry gas, O2 11% vol.)	Law values - daily average	Valmadrera (LC) Measured values (daily average)	San Vittore Measured values (daily average)	Bydgoszcz Measured values (daily average)	Rzeszow Measured values (daily average)	Beringen Measured values (daily average)	Terni Measured values (daily average)
Type		Bicar dry + wet scrubber	Bicar dry	Lime Semi-dry + wet scrubber	Lime Semi-dry	DeNOx SCR + dry	DeNOx SCR + dry
HCl	2-6 mg/Nm ³	< 1 mg/Nm ³	< 1 mg/Nm ³	< 1 mg/Nm ³	0,92 mg/Nm ³	5,4 mg/Nm ³	0,27 mg/Nm ³
CO	10-50 mg/Nm ³	3,5 mg/Nm ³	3 mg/Nm ³	11,1 mg/Nm ³	8 mg/Nm ³	5,2 mg/Nm ³	0,35 mg/Nm ³
NO+NO ₂ as NO ₂	50-120 mg/Nm ³	95 mg/Nm ³	33,5 mg/Nm ³	64,5 mg/Nm ³	35,2 mg/Nm ³	51,5 mg/Nm ³	23,2 mg/Nm ³
SO ₂ +SO ₃ as SO ₂	5-30 mg/Nm ³	2 mg/Nm ³	0,5 mg/Nm ³	3 mg/Nm ³	13,2 mg/Nm ³	4 mg/Nm ³	0,38 mg/Nm ³
HF	<1 mg/Nm ³	0,1 mg/Nm ³	0,1 mg/Nm ³	0,4 mg/Nm ³	0.39 mg/Nm ³	0,3 mg/Nm ³	0,02 mg/Nm ³
TOC	3-10 mg/Nm ³	0,3 mg/Nm ³	0,3 mg/Nm ³	0,6 mg/Nm ³	1.29 mg/Nm ³	0,1 mg/Nm ³	0,11 mg/Nm ³
dust	10 mg/Nm ³	0,2 mg/Nm ³	0,2 mg/Nm ³	0,3 mg/Nm ³	2,56 mg/Nm ³	1 mg/Nm ³	0,4 mg/Nm ³
Cd + Tl	0,005-0,02 mg/Nm ³	0,001 mg/Nm ³	0,001 mg/Nm ³	0,0037 mg/Nm ³	0.023 mg/Nm ³	< 0,05 mg/Nm ³	0,003 mg/Nm ³
Metals	0,5 mg/Nm ³	0,03 mg/Nm ³	0,003 mg/Nm ³	0,0295 mg/Nm ³	0.08 mg/Nm ³	< 0,5 mg/Nm ³	0,02 mg/Nm ³
Hg	0,005-0,02 mg/Nm ³	0,005 mg/Nm ³	0,0015 mg/Nm ³	0,0014 mg/Nm ³	0.001 mg/Nm ³	< 0,05 mg/Nm ³	0,0008 mg/Nm ³
PAH	0,01 mg/Nm ³	0,0001 mg/Nm ³	0,0001 mg/Nm ³	-	-		0,0000046 mg/Nm ³
PCDD+PCDF	0,04-0,1 ng/Nm ³	0,012 ng/Nm ³	0,023 ng/Nm ³	0,0064 ng/Nm ³	0.007 ng/Nm ³	< 0,04 ng/Nm ³	0,00104 ng/Nm ³



TM.E. – EXPERIENCE IN OPERATION AND SERVICE

1993 – 2007 Management of Waste-to-Energy plants (Italy):



2015 – 2018 Service contract WtE Bydgoszcz (Poland)

2018 – 2021 Service contract WtE Rzeszow 1 (Poland)

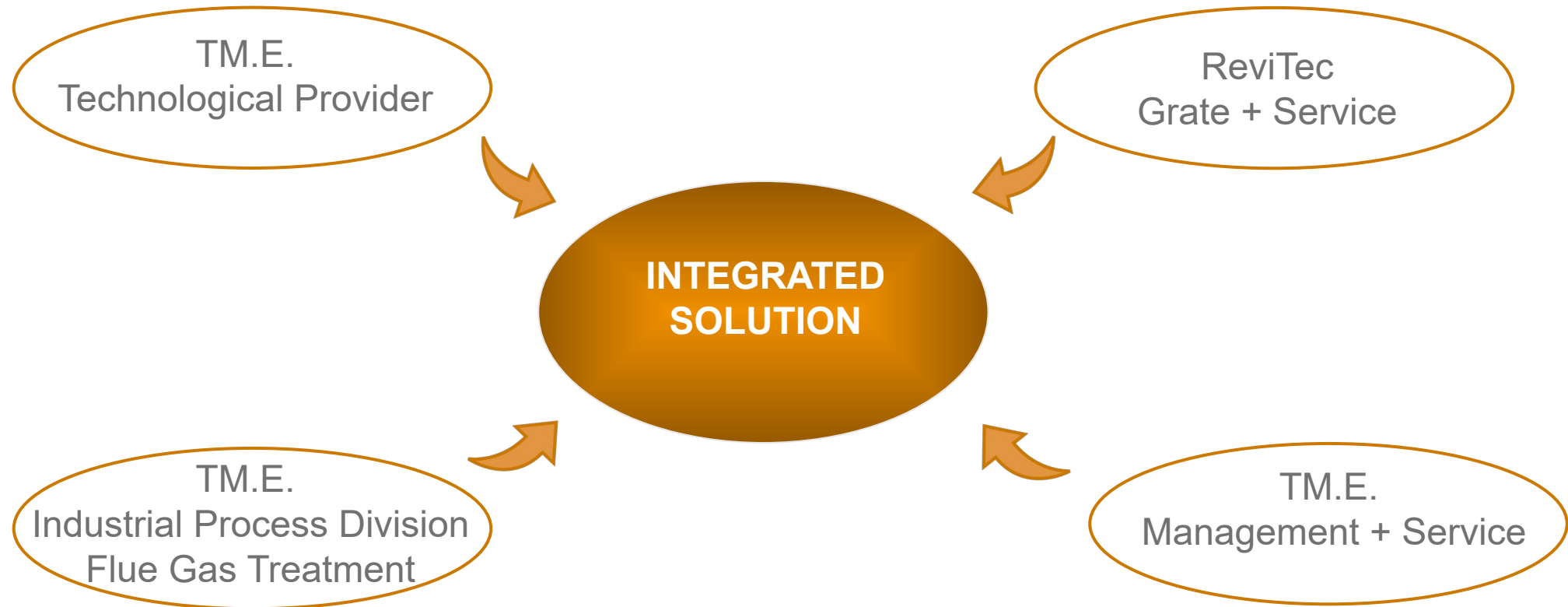
2020 – 2025 Service contract WtE Beringen (Belgium)

2025 – 2028 Service contract WtE Rzeszow 2 (Poland)



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TM.E. OFFER





WtE PLANT
BERINGEN – BELGIUM
200 000 ton/year



GRATE and BOILER
for WtE
PERPIGNAN –FRANCIA
60.000 ton/ year



WtE PLANT
SAO MIGUEL
AZZORRE-PORTUGAL
60.000 ton/ year



WtE PLANT
TERCEIRA
AZZORRE PORTOGALLO
40 000 ton/ year



WtE PLANT
BOLOGNA – ITALY
206 000 ton/ year



WtE PLANT
STETTINO – PO-
LAND
150 000 ton/ year

WtE PLANT
DANZICA-
POLAND
160 000 ton/ year



WtE PLANT
BYDGOSZCZ – PO-
LAND
180 000 ton/ year



WtE PLANT
WŁOCŁAWEK – PO-
LAND
100 000 ton/ year



WtE PLANT
RZESZÓW - POLAND
180.000 ton/ year



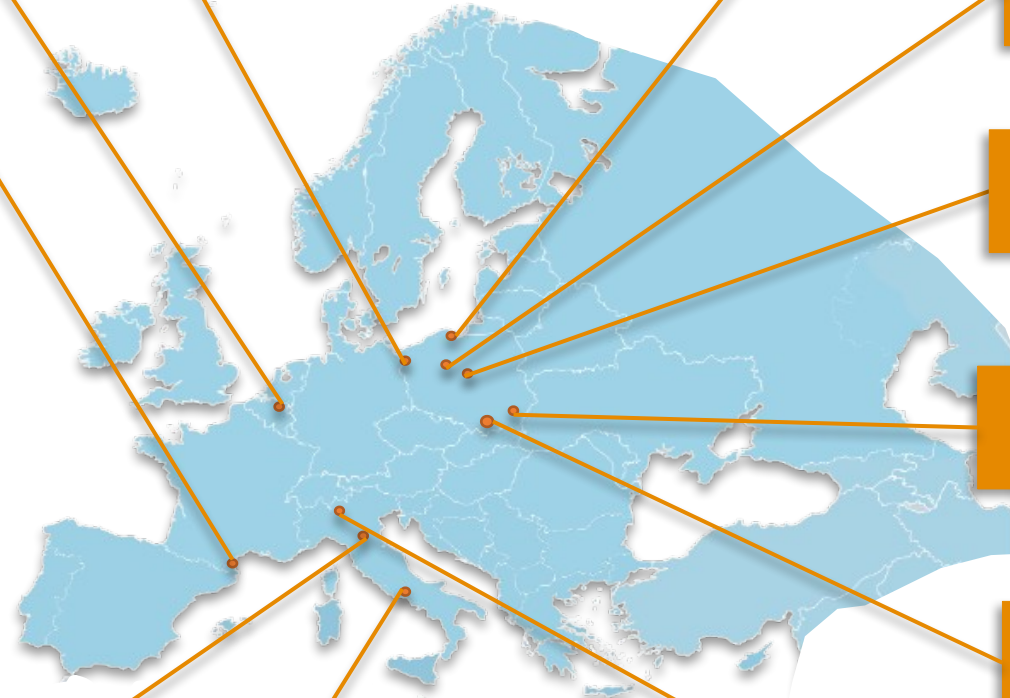
WtE PLANT
GORLICE - POLAND
100.000 ton/ year



WtE PLANT
SAN VITTORE DEL LAZIO - ITALY
500.000 ton/ year



WtE PLANT
VALMADRERA LECCO - ITALY
123 000 ton/ year



WASTE TO ENERGY PLANT WŁOCŁAWEK - POLAND



Customer: PRE ZERO

Throughput: 100.000 ton/year

Plant Type: line 1: air cooled moving grate

Waste type: RDF + pre-RDF (12,5 MJ/kg)

Energy Recovery:

- 10,6 Mwe in full condensation
- 9,1 Mwe + 14 MWth in cogeneration
- Flue Gas Treatment:
 - SNCR + semi-dry+ Flue Gas Condenser

EPC CONTRACT IN PROGRESS
execution time: 29 months



WASTE TO ENERGY PLANT GORLICE – POLAND



Customer: EMPOL

Throughput: 100.000 ton/year

Plant Type: 1 line, combustion grate

(water cooled)

Waste type: RDF +
Selected Municipal Waste
(9 - 14 MJ/kg)

Energy Recovery: 11 Mwe

23 MWt

Flue Gas Treatment: Semi Dry + Wet + SNCR

EPC CONTRACT IN PROGRESS
execution time: 36 months



WASTE TO ENERGY PLANT RZESZÓW - POLAND



Customer: PGE

Throughput: 180.000 ton/year

Plant Type: line 1: air cooled moving grate
line 2: water cooled moving grate

Waste type: RDF + MSW (6,5 – 16 MJ/kg)

Energy Recovery: line 1: • 8 Mwe • 17 MWth
line 2: • 7,3 Mwe • 16 MWth

Flue Gas Treatment:

Line 1 SNCR + semi-dry+ Flue Gas Condenser

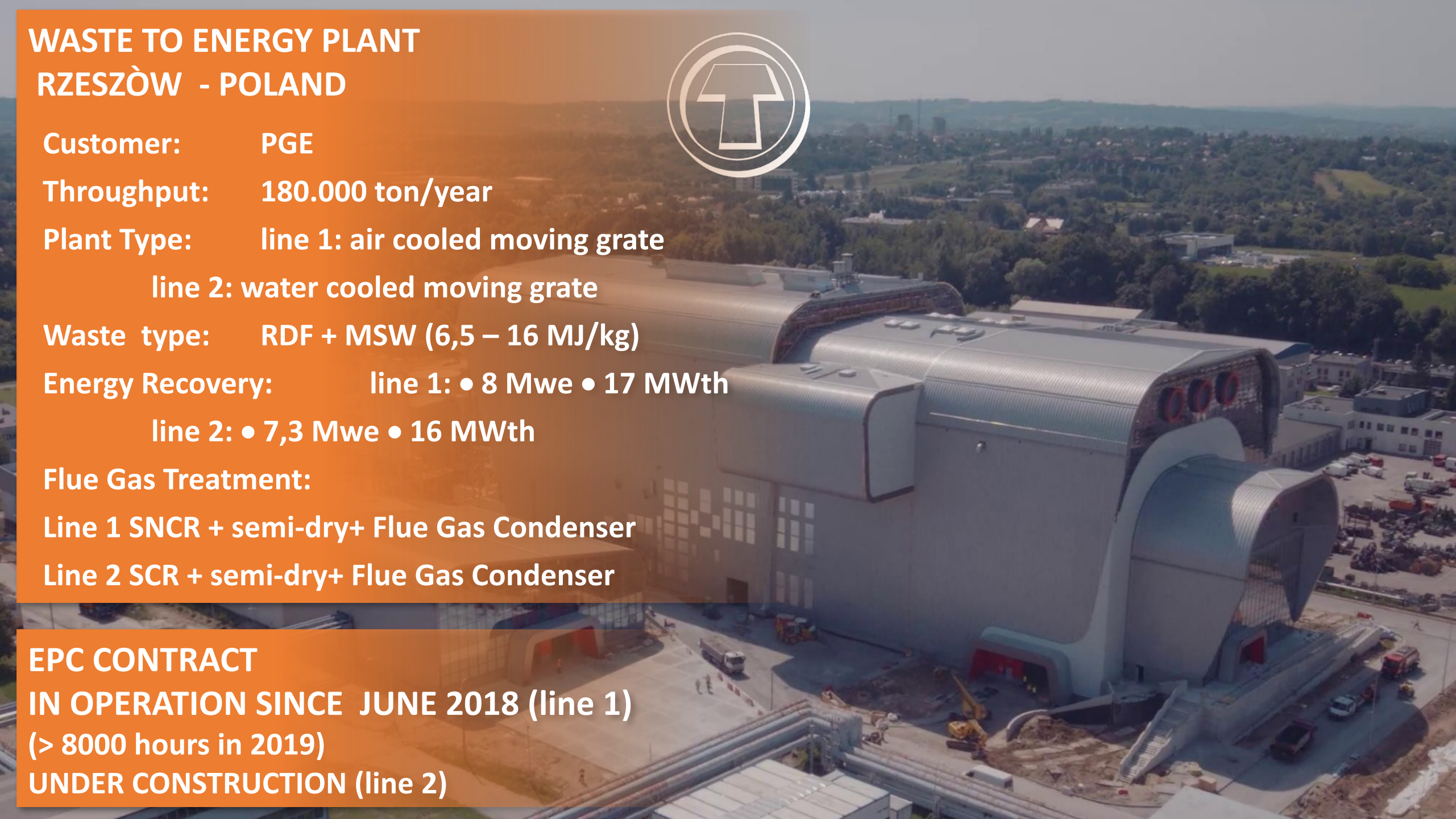
Line 2 SCR + semi-dry+ Flue Gas Condenser

EPC CONTRACT

IN OPERATION SINCE JUNE 2018 (line 1)

(> 8000 hours in 2019)

UNDER CONSTRUCTION (line 2)





WASTE TO ENERGY PLANT SAN VITTORE DEL LAZIO – ITALY

Customer: EALL-ACEA Group

Tot. Throughput: 320.000 ton/year

Plant Type: 3 lines, moving grate
(water cooled)

Waste type: RDF (15 MJ/kg)

Tot Energy Recovery: 43

Mwe

Flue Gas Treatment EPC CONTRACTS

Line 2 and 3 – IN OPERATION SINCE 2011

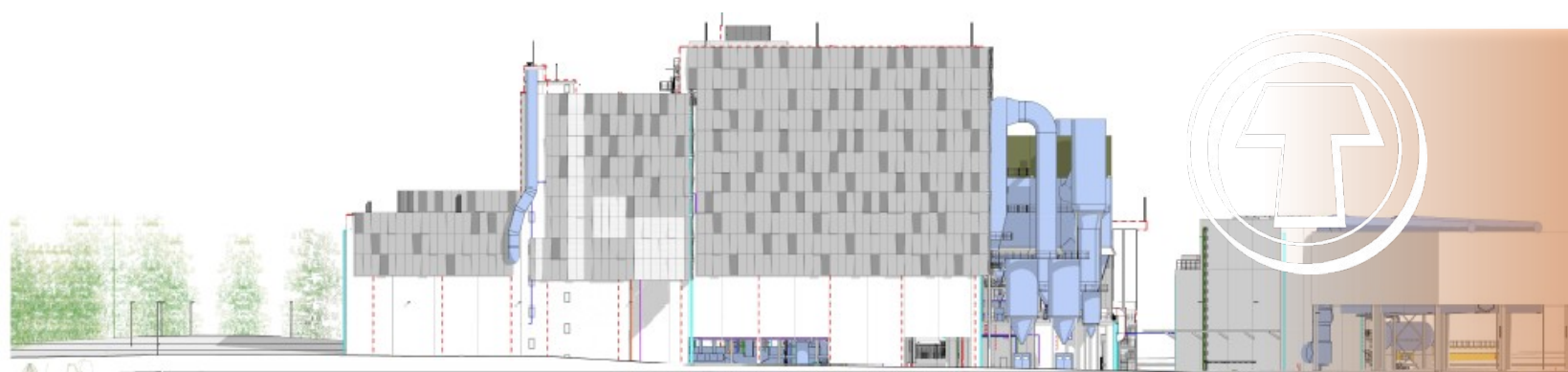
Line 1 – IN OPERATION SINCE 2017

execution time : Line 1 → 615 days

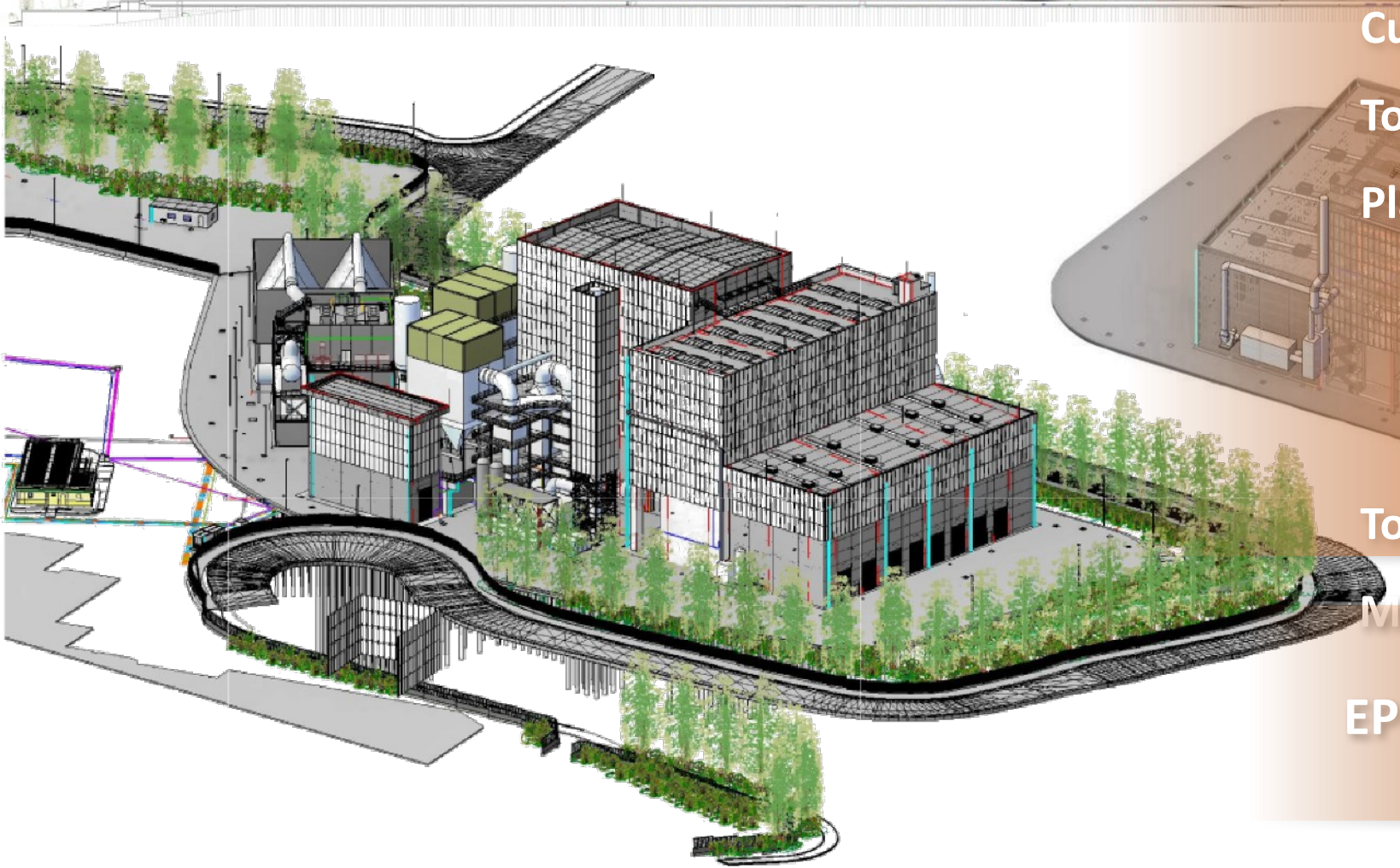
Line 2 → 1115 days

Line 3 → 1120 days





WASTE TO ENERGY PLANT SAN VITTORE DEL LAZIO LINE 4 ITALY



Customer: Acea Ambiente S.r.l.

Tot. Throughput: 186.000 ton/year

Plant Type: single line (the 4th of the facility)
moving grate (water cooled)

Waste type: RDF (10,6 – 14,9 MJ/kg)

Tot Energy Recovery: 26 Mwe

EPC CONTRACT Line 4 IN PROGRESS



WASTE TO ENERGY PLANT BERINGEN - BELGIUM

Customer:

Bionerga

Throughput: 200.000 ton/year

Plant Type: 1 line, moving grate (water cooled)

Waste type: Household waste, solid recovered fuel,
industrial waste (9 - 16 MJ/kg)

Energy Recovery: 24 Mwe

Steam sale: 56 tph

Flue Gas Treatment: Dry + SCR

EPC CONTRACT
IN OPERATION SINCE DECEMBER 2020
execution time : 30 months



WASTE TO ENERGY PLANT SAO MIGUEL AZORES - PORTUGAL

Customer: MUSAMI

Tot. Throughput: 60.000 ton/year

Plant Type: 1 line, combustion grate

Waste type: Treated Municipal
waste

(6 - 15 MJ/kg)

Energy Recovery: 7 Mwe

Flue Gas Treatment: SNCR + secondary

EPC CONTRACT IN PROGRESS

execution time: 5+25 months

(design+construction)



WASTE TO ENERGY PLANT GDANSK - POLAND

Customer: ZUT

Throughput: 160.000 ton/year
Plant Type: 1 line, moving grate
(water cooled)

Waste type: RDF (8,5 - 16 MJ/kg)

Energy Recovery Capacity:

- 16,8 MWe
- 45 MWth

Flue Gas Treatment: SNCR + SCR, Semi-dry +
FGC

BDO CONTRACT
IN OPERATION SINCE JANUARY 2025
execution time: 12+36 months (permits+construction)
25 years of operation

WASTE TO ENERGY PLANT TAKREER – ABU DHABI



Customer: INTECSA INDUSTRIAL

Throughput: 24.000 ton/year

Plant Type: 1 line, Rotary kylvn

Waste type: industrial waste from
Takreer Refinery

Energy Recovery: 37 MWth

Flue Gas Treatment: Dry

**DESIGN & SUPPLY
CONTRACT
IN OPERATION SINCE 2021**





WASTE TO ENERGY PLANT SZCZECIN - POLAND

Customer: ZTUO Szczecin

Throughput: 150.000 ton/year

Plant Type: 2 line, moving grate (air cooled)

Energy Recovery: 15 MWe (full cond)

Max Thermal Power (DHT) 32 MWt

Flue Gas Treatment: SNCR+ Wet

**EPC CONTRACT
IN OPERATION SINCE DECEMBER 2017
execution time : 14 months**



WASTE TO ENERGY PLANT BYDGOSZCZ – POLAND

Customer:	Pro- Natura
Throughput:	180.000 ton/year
Plant Type:	2 lines, moving grate (air cooled)
Waste type:	MSW (6 – 13 MJ/kg)
Energy Recovery:	13,6 MWe 27 MWt
Flue Gas Treatment:	Semi Dry + Wet + SNCR

EPC CONTRACT
IN OPERATION SINCE SEPTEMBER 2015
execution time : 12+24 months (permits+construction)



WASTE TO ENERGY PLANT TERCEIRA – AZORES ISLANDS PORTUGAL

Customer: TERAMB

Throughput: 40.000 ton/year

Plant Type: 1 line, moving grate
(air cooled)

Waste LHV range: 6 MJ/kg → 10 MJ/kg

Energy Recovery: 2,5

Mwe

(2 Mwe+2 MWt in cogeneration mode)

Flue Gas Treatment: SNCR + Dry

**EPC CONTRACT
IN OPERATION SINCE DECEMBER 2015
execution time : 24 months**



GRATE AND BOILER FOR WTE PLANT PERPIGNAN – FRANCE

Customer: CYDEL (TIRU Group)

Throughput: 60.000 ton/year

Waste type: MSW (6 - 10 MJ/kg)

Plant Type: 1 lines, moving grate
(air cooled)

(the third line of total three lines)

Flue Gas Treatment: SNCR + Dry

EPC CONTRACT

IN OPERATION SINCE IN 2009

execution time : 18 months





WASTE TO ENERGY PLANT

VALMADRERA - LECCO - ITALY

Customer: SILEA

Throughput: 123.000 ton/year

Waste type: MSW + Hospital (9-17 MJ/kg)

Plant Type: 2 lines, moving grate
(air cooled)

(a new line and a refurbished
line in a existing plant)

Tot Energy Recovery: 11MWe

Flue Gas Treatment: Multi stage Dry and wet + SCR

EPC CONTRACT

IN OPERATION SINCE 2009

execution time : new line → 24 months

Refurbished line (included demolition) → 24 months

WASTE TO ENERGY PLANT BOLOGNA – ITALY



Customer: F.E.A. Bologna

Throughput: 206.000 ton/year

Plant Type: 2 lines, moving grate (water cooled)

Waste LHV range: 7,9 MJ/kg → 15 MJ/kg

Energy Recovery: 22 Mwe

Flue Gas Treatment: Dry and wet with SCR

EPC CONTRACT

START UP IN 2007

execution time : 969 days





WASTE ANAEROBIC DIGESTION APRILIA - ITALY

Customer: ACEA

Throughput: 96.300 ton/year

Plant Type: Anaerobic digestion
and composting plant

Waste type: organic waste from
separate collection

Energy Recovery Capacity: • 2,8 MWe

Air Treatment: Scrubber + biofilter

**EPC CONTRACT
IN OPERATION SINCE 2021**

FLUE GAS TREATMENT WTE PLANT TERNI – ITALY



Customer: ACEA

Throughput: 120000 Nm³/h Flue Gas

Plant Type: Dry System with Double Filter and
DeNOx with PAC and BICAR

Emission Limits: BAT standards

TURN-KEY SUPPLY

START UP IN 2024

execution time : 45 + 969 days



FLUE GAS TREATMENT BARGA – ITALY

Customer: KME ITALY

Throughput: 60.000 Nm³/h Flue Gas

Plant Type: Dry FGT for fumes from
metallurgical

Emission Limits: 2 mg/Nm³ dusts,
0.06 ngTEQ/Nm³ Dioxin

TURN-KEY CONTRACT
IN OPERATION SINCE 2023

TM.E. – WATER TREATMENT DIVISION

WATER TREATMENT DIVISION REFERENCES KEY NUMBERS	Number of units built	Total installed capacity (m ³ /day)	Population served (n° of inhabitants)
Industrial water treatment plants	1,300	5,400,000	-
Drinking Water production plants	25	6,400,000	25,600,000
Municipal waste water treatment plants	110	5,900,000	26,600,000



REVAMPING OF BAKU POTABILIZATION PLANTS (Azerbaijan) Kura and Jeiranbatan

Customer : Aspheron Reg. Water Company

Total Capacity : 17 m³/s

Water source: basin and river water

Inlet turbidity: up to 60 g/l

Treated water quality : drinking water according to W.H.O. standards.

Jeiranbatan plant composition:

- N° 8 clarifiers 50 m Dia.
- N° 36 concrete gravity sand filters
- 1800 m² total filtering area.

Kura plant composition :

- N° 14 presettlers 50 m Dia.
- N° 42 horiz. settlers L= 50 m
- N° 54 concrete gravity sand filters
- 2700 m² total filtering area.



CONCESSION FOR DESIGN, BUILDING AND OPERATION FOR 15 YEARS OF WASTE WATER PLANTS AND SEWERAGE SYSTEMS IN NAPLES AREA (ITALY)



Customer : Commissario di Governo Emergenza rifiuti e tutela delle
acque nella Regione Campania.

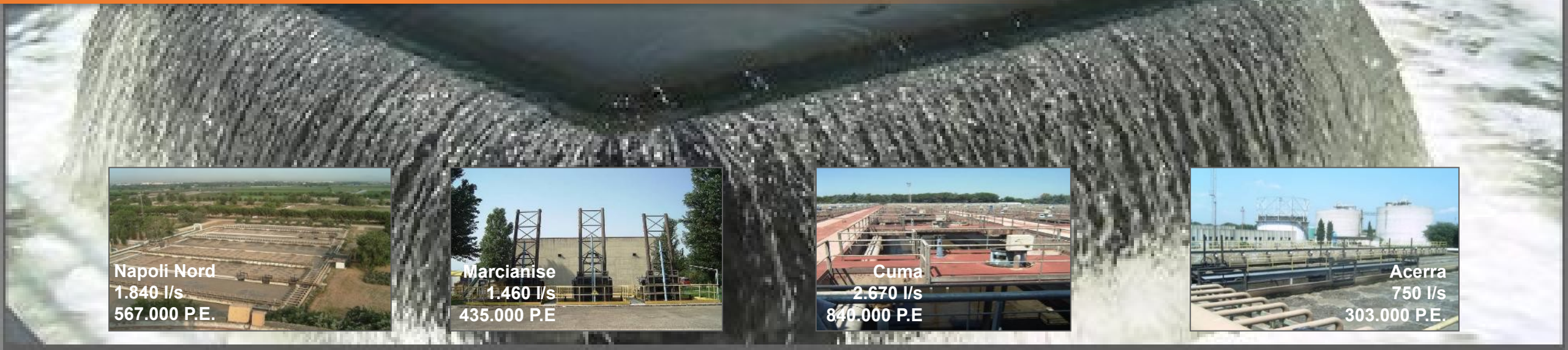
Plants: Acerra, Cuma, Foce Regi Lagni, Marcianise e Napoli Nord

Capacity for all the plants: 242.000.000 m³/year

N° of P.E. : 2.500.000 P. E.

Sewerage systems length: 2.300 Km

Investment: € 130.000.000



Napoli Nord
1.840 l/s
567.000 P.E.



Marcianise
1.460 l/s
435.000 P.E.



Cuma
2.670 l/s
840.000 P.E.



Acerra
750 l/s
303.000 P.E.



WASTE WATER TREATMENT PLANT

MASSA (ITALY)

Customer: Massa Municipality

Capacity: 208 l/s

N° of P.E. : 60.000

BOD: 4.140 kg/d

Line: water and sludge





WASTE WATER TREATMENT PLANT

CATANIA (ITALY)

Customer : Catania Municipality

Capacity : 1.240 l/s

N° of P.E. : 430.000

BOD: 26.500 kg/d

Line: water and sludge





WASTE WATER TREATMENT PLANT EAST NAPLES (ITALY)

Customer : Regione Campania

Capacity: 7.200 l/s

N° of P.E.: 1.750.000

BOD: 105.000 kg/g

Line: water and sludge



WASTE WATER TREATMENT PLANT



GABAL EL ASFAR (CAIRO-EGYPT)

Customer: Cairo Wastewater Organisation

Capacity: 11.500 l/s

N° of P.E. : 6.000.000

Line: water and sludge



WASTE WATER TREATMENT PLANT DAMASCUS(SIRYA)



Customer :

Damascus Governorate

Line: water e sludge

Capacity : 5.600 l/s

N° of P.E.: 2.500.000



**WASTE WATER TREATMENT
PLANT
FROSINONE (ITALY)**



Customer : Regione Lazio

Capacity : 1.200 l/s

N° of P.E.: 315.000

BOD: 20.400 kg/g

Line: water e sludge



**WASTE WATER TREATMENT PLANT
SARNO (ITALY)**



FOCE

Customer : Consorzio Consarno

Capacity : 1.200 l/s

N° of P.E.: 422.000

BOD: 25.000 kg/g

Line: water e sludge





**WASTE WATER TREATMENT PLANT
FOCE SARNO (ITALY)**

Customer : Consorzio Consarno

Capacity : 1.200 l/s

N° of P.E.: 422.000

BOD: 25.000 kg/g

Line: water e sludge



WASTE WATER TREATMENT PLANTS IN LIBYA

SUBJECT OF THE CONTRACTS: Construction, start up and two years of O&M of 3 waste water treatment plants.

- Customer : HIB (HOUSE AND INFRASTRUCTURE BOARD)
- Numbers of plant: 3 in TRIPOLI and MISURATA (LIBYA)
 - 110.000 m³/d - 640.000 P.E. (ALHADBA – TRIPOLI)
 - 60.000 m³/d - 350.000 P.E. (TAJORA – TRIPOLI)
 - 60.000 m³/d - 350.000 P.E. (ALSAKT – MISURATA)
- Total flow: 230.000 m³/d
- Population Equivalent P.E.: 1.530.000
- Value of the contracts: € 250.000.000
- **PLANTS DESCRIPTION:** WWTP with pretreatment, primary and secondary treatment, final filtration and disinfection. The sludge line is composed of thickening, anaerobic digestion, dewatering, drying and energy recovery by biogas. The effluent will be reused for irrigation.
- Start: May 2009
- End of works: contract suspended

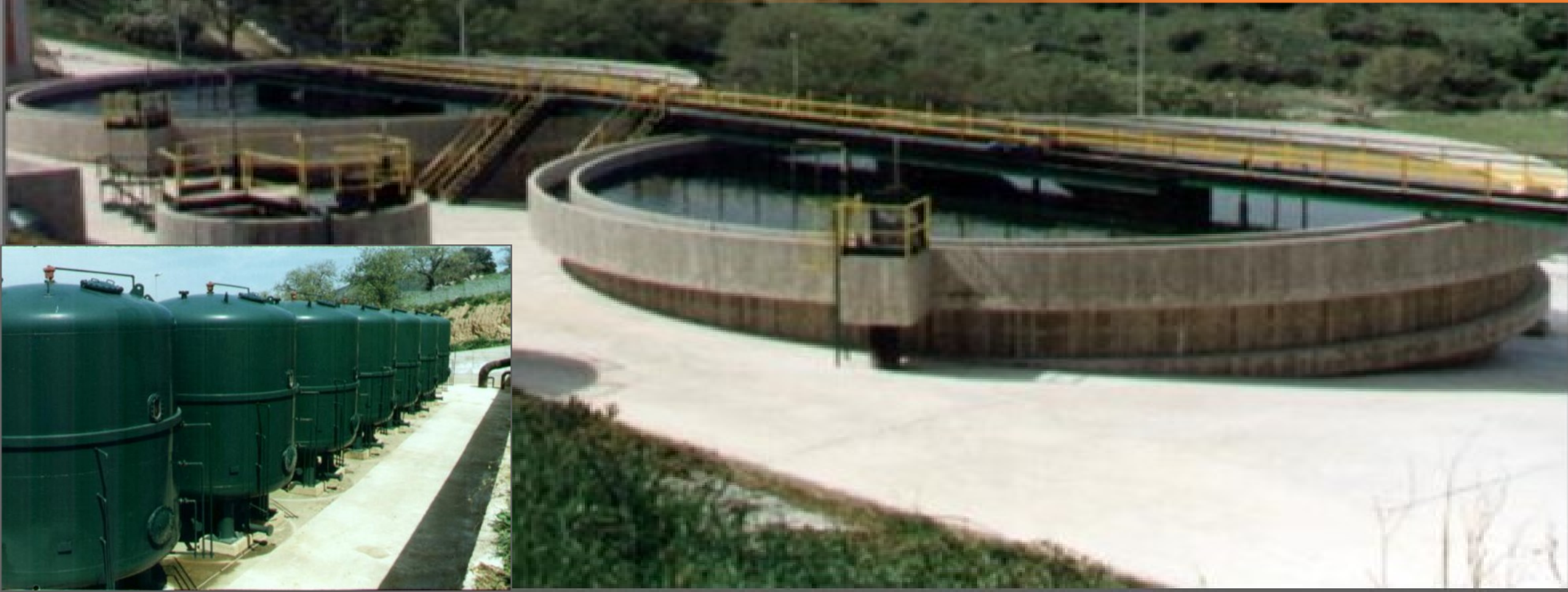


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**POTABILIZATION PLANT
PATTADA (ITALY)**

**Customer : ESAF
Capacity : 750 l/s**



ZLD (Zero Liquid Discharge) PLANT

Turano Lodigiano (ITALY)

Customer : Ansaldo Energia

Capacity : 20 m³/h



Plant sections

Oxidation

Sand Filters

Ultra Filtration

UV Sterilization

Reverse Osmosis (first and second stage)

EDI (ElectroDeionization)

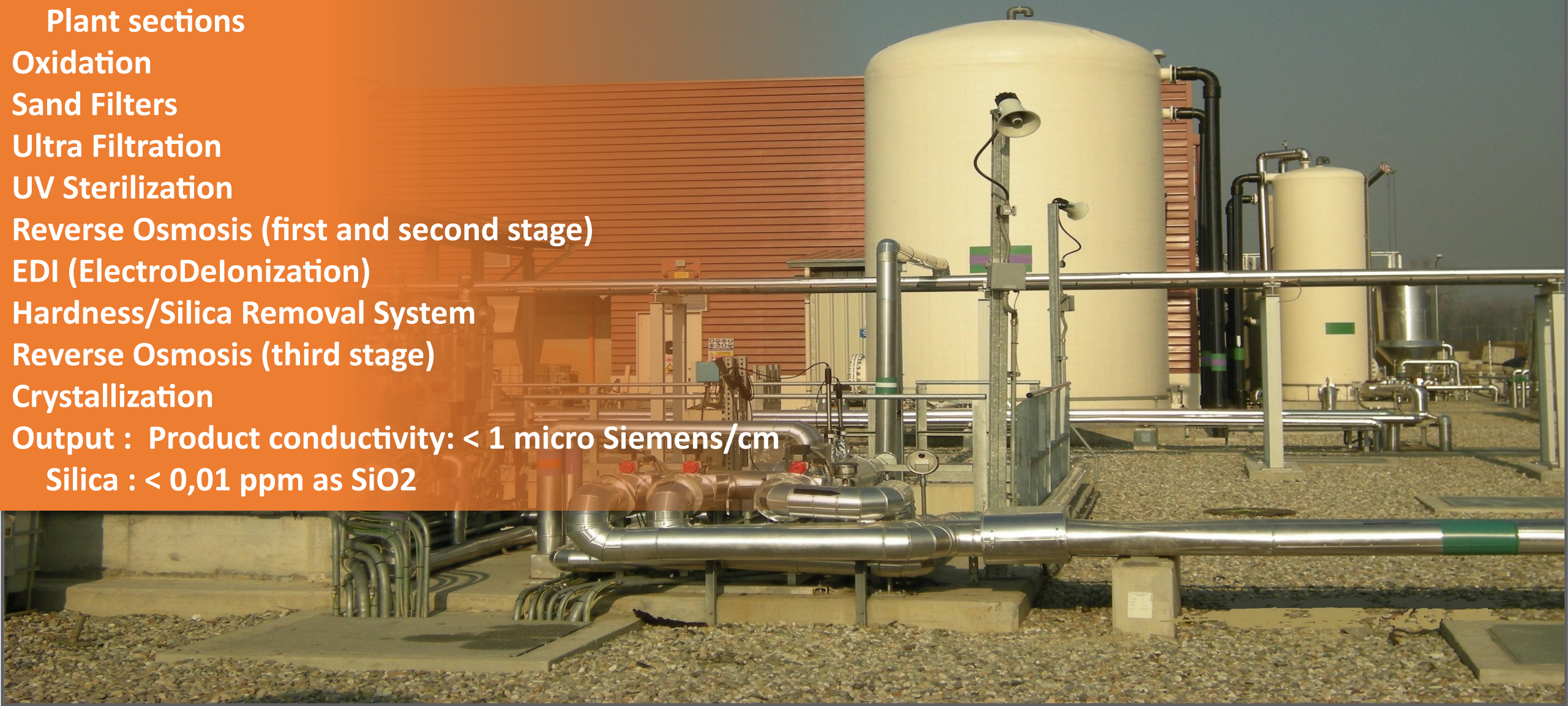
Hardness/Silica Removal System

Reverse Osmosis (third stage)

Crystallization

Output : Product conductivity: < 1 micro Siemens/cm

Silica : < 0,01 ppm as SiO₂





**ZLD (Zero Liquid Discharge) PLANT
San Severo (ITALY)**

Customer : Ansaldo Energia

Capacity : 20 m³/h

Plant sections

Oxidation

Sand Filters

Ultra Filtration

Reverse Osmosis (first and second stage)

EDI (ElectroDeionization)

Hardness/Silica Removal System

Reverse Osmosis (third stage)

Crystallization Output: Product conductivity: < 1 micro

Siemens/cm

Silica : < 0,01 ppm as SiO₂

09.02.2011

DEMINERALIZATION PLANT BATNA (ALGERIA)

Customer : Ansaldo Energia

Capacity : 2 x 130 m³/h

Raw water:

- Total Anion 500 ppm
- Silica 20 ppm

Treated water:

- < 0,1 μS/cm
- Silica < 0.01 ppm

Deareator: 130 m³/h





**DEMINERALIZATION PLANT
LARBAA (ALGERIA)**

Customer : Ansaldo Energia

Capacity : 3 x 130 m³/h

Raw water:

- Total Anion 500 ppm

- Silica 20 ppm

Treated water:

- < 0,1 μS/cm

- Silica < 0.01 ppm

Deareator: 260 m³/h





DEMINERALIZATION PLANT

ELEFSINA (GREECE)

Customer : Tecnicas Reunidas

Capacity : 3 x 180 m³/h

Raw water: - TDS 180 ppm

- Silica 2 ppm

Treated water:

- < 0,2 μS/cm

- Silica < 0.02 ppm

Deareator: 2 x 180 m³/h





DEMINERALIZATION PLANT AIN-DJASSER (ALGERIA)

Customer : Ansaldo Energia

Capacity : 2 x 140 m³/h

Raw water:

- **Total Anion 1055 ppm**
- **Silica 20 ppm**

Treated water:

- **< 0,1 μS/cm**
- **Silica < 0.01 ppm**

Deareator: 140 m³/h



DEMINERALIZATION PLANT

IZMIT (TURKEY)

Customer : Tecnicas Reunidas

Capacity : 3 x 380 m³/h

Raw water:

- Total Anion 120 ppm

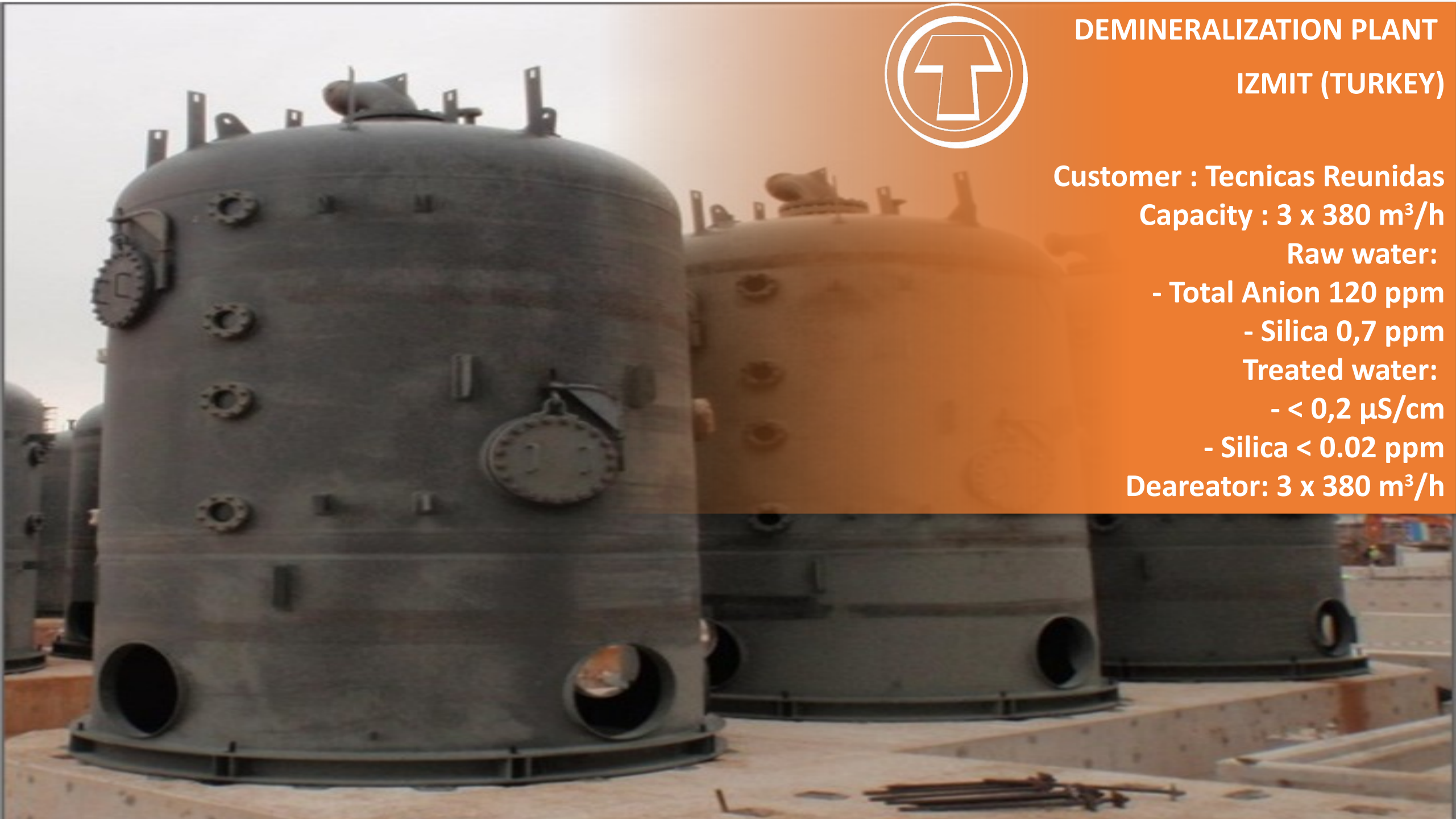
- Silica 0,7 ppm

Treated water:

- < 0,2 μS/cm

- Silica < 0.02 ppm

Deareator: 3 x 380 m³/h





DEMINERALIZATION PLANT AND DEAREATOR THESSALONIKI (GREECE)

Customer : Hellenic Petroleum

Capacity : 3 x 80 m³/h

Raw water: TDS 400 ppm

Treated water:

- < 1 mS/cm

- Silica < 0.02 ppm

Deareator: 250 m³/



FILTRATION AND DEMINERALIZATION PLANT BAHIA BLANCA (ARGENTINA)



Customer : Snam Progetti-Techint

Filtration Capacity : 4 x 90 m³/h

Demi Capacity : 2 x 180 m³/h

Mixed bed Capacity: 2 x 315 m³/h

Raw water: TDS 250 ppm

Treated water:

- < 0.1 mS/cm
- Silica < 0.01 ppm



CONDENSATE POLISHING PLANT ELEFSINA (GREECE)



Customer : Tecnicas Reunidas

Capacity : 3 x 210 m³/h

Mixed bed n° 3

Internal regeneration system

Treated water:

- < 0,2 μS/cm

- Silica < 0.02 ppm





CONDENSATE POLISHING PLANT VADO LIGURE (ITALY)

Customer : Enel Power

Capacity : 3 x 870 m³/h

Mixed bed n° 3

External regeneration system

Treated water:

- 0.1 mS/cm

- Silica 0.02 ppm





CONDENSATE POLISHING PLANT SULCIS CAGLIARI (ITALY)

Customer : Enel Power
Capacity : 3 x 870 m³/h

Mixed bed n° 3

External regeneration system

Treated water:

- < 0.1 mS/cm

- Silica < 0.01 ppm





**CONDENSATE POLISHING PLANT
MONTALTO DI CASTRO (ITALY)**

Customer : Enel Power

Capacity : 3 x 870 m³/h

Mixed bed n° 3

External regeneration system

Treated water:

- < 0.1 mS/cm

- Silica < 0.01 ppm





CONDENSATE POLISHING PLANT PIACENZA (ITALY)

Customer : Enel Power

Capacity : 3 x 760 m³/h

Mixed bed n° 3

External regeneration system

Treated water:

- < 0.1 mS/cm

- Silica < 0.01 ppm



NANOFILTRATION AND DEMINERALIZATION PLANT ISKENDERUN (TURKEY)

Customer : Iskenderun Works Co.

Capacity : 600 m³/h net demineralised water

Raw water consumption: 860 m³/h

Product conductivity: < 1 micro Siemens/cm

Silica : < 0,02 ppm as SiO₂

Pre-treatment : dual media filters,
cartridge filters, disinfection with NaOCl

Nanofiltration unit with 598 total membrane
elements for sulphates and
carbonates removal

N° 4 Demi trains composed by :
cationic stage (weak & strong),
decarbonators, anionic stage (weak & strong).

DESALINATION PLANT AND MIXED BED MILAZZO (ITALY)



Customer : AGIP PETROLI

Thermocompression : 2 x 500 m³/day

Mixed bed Capacity: 2 x 42 m³/h

Sea water: TDS 35000 ppm

Treated water:

-< 0.1 mS/cm

-- Silica < 0.01 ppm



REMINERALIZATION PLANTS DOHA WEST & AZ-ZOUR SOUTH (KUWAIT)



Customer : MEW

(Ministry of Electricity and Water)

Total Plant Capacity : 28.000 m³/h

Technology : Dissolution limestone
filters after CO₂ enrichment

Raw water: from Multiflash
desalination plants

CO₂ source: top stages of MSF

Treated water: 60 to 80 ppm
alkalinity as CaCO₃



**REVERSE OSMOSIS PLANT
LA SPEZIA (ITALY)**



**Customer : Enel Power
Capacity : 3 x 50 m³/h
Sea water: TDS 35000 ppm
Treated water: TDS 300 ppm**



REVERSE OSMOSIS PLANT CIVITAVECCHIA (ITALY)



Customer : Enel Power

Sea water source: TDS 38000 ppm

Capacity industrial water: 5 x 100 m³/h

Industrial water TDS < 400 ppm

Capacity demi water: 5 x 60 m³/h

Demi water TDS < 12 ppm

**Pre-treatment: Coarse filtration, Dissolved air flotation,
Ultrafiltration, U.V. Sterilization**

**Reverse Osmosis 1st Pass with 840 total sea-water
membranes**

**Reverse Osmosis 2nd Pass with 280 total brackish-water
membranes**



REVERSE OSMOSIS PLANT MONTEROSSO (ITALY)



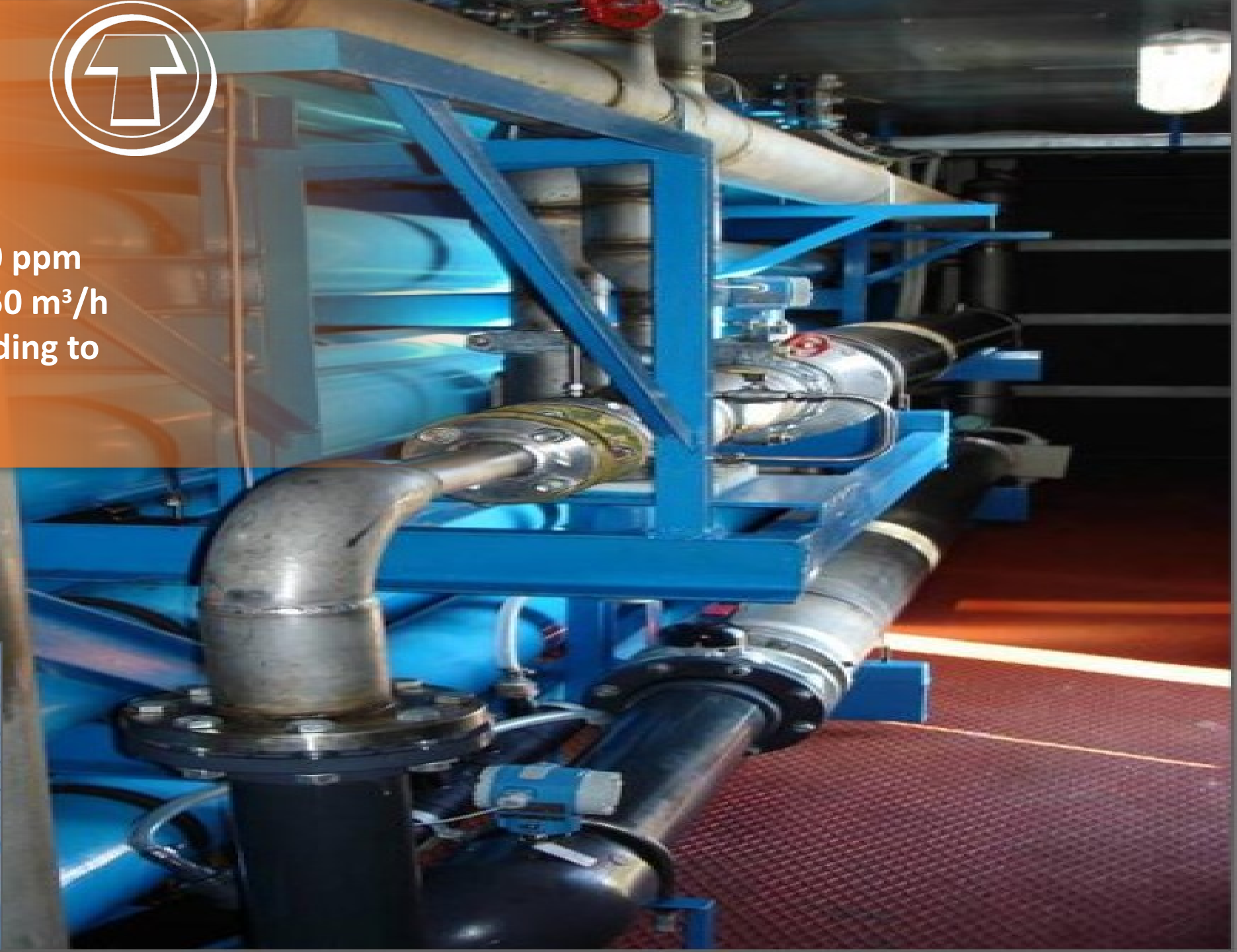
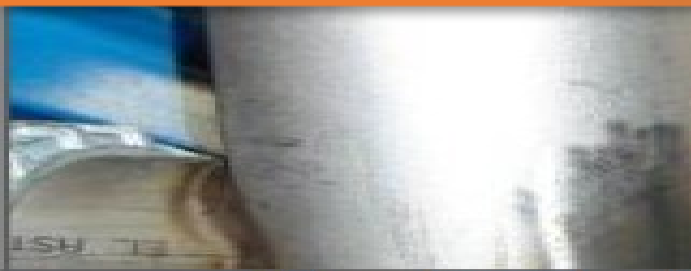
Customer : ACAM S.p.A.

Technology: reverse osmosis

Sea water source: TDS 38000 ppm

Drinking water production: 50 m³/h

Potable water quality: according to
WHO standards



REVERSE OSMOSIS PLANT CAPRAIA ISLAND (ITALY)



Customer : Capraia Municipality

Technology: reverse osmosis

Sea water source: TDS 38000 ppm

Drinking water production: 50 m³/d

Special features :Noise reduction design
due to the presence of tourist resorts
(sound level < 45 dB(A))





**INDUSTRIAL WASTE WATER
TREATMENT PLANT
FIUMESANTO (ITALY)**

Customer : Enel Power

Capacity : 150 m³/h

Treatment :

- Chemical-physical**
- Oil treatment**
- Sludge treatment**
- Biological treatment**





**DRINKING WATER PRODUCTION PLANT
PONTELAGOSCURO (ITALY)**

Customer : ACOSEA

Active carbon filters : 3960 m³/h

Mixed bed Capacity : 2 x 42 m³/h

River water : River Po polluted with

organic and chemical compounds

Treated water: Potable water

according W.H.O.





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