CASE STUDY



Createch360 provides an operational intelligence platform for water and wastewater facilities that supports real-time control and decision making to reduce operational costs, enhancing reliability and achieving quality consent limits.

With over 100 installations worldwide, experience and continuous innovation guarantees high addedvalue solutions enabling utilities and industrial users to achieve efficiency and facilities performance.

Medium plant for nutrient removal Turbo-compressors



SUMMARY

Brembate STW (Italy)

- Medium plant
- 2 biological lines
- Plug flow reactors
- Nutrient removal

Challenge

To **reduce the aeration costs** whilst **ensuring the effluent quality**.

Results

- 100% quality requirements
- **25%** reduction of aeration consumption

PLANT CHARACTERISTICS





- Design Flow: 53.600 m³/d (185.000 P.E.)
- Biological reactor: 2 Plug-flow units
- Aeration system: 2+1 turbo-compressors (110kW/Ut.)
- Effluent discharge consent:
- TN < 10 mg N/L (annual average)
- N-NH₄ + < 30% of total nitrogen
- TSS < 15 mg/L
- COD < 60 mg O₂/L - BOD₅ < 10 mg O₂/L
- $-BOD_5 < 10 \text{ mg }O_2$ - TP < 1 mg P/L
- II * I IIgI /L
- Measurement equipment:
- Dissolved oxygen in bioreactors
- Ammonium in biorreactors - Ammonium in the final effluent (analyser)
- Ammonium in the final effluent (a



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BREMBATE STW (Italy)

IMPLEMENTED SOLUTION

N-CONTROL (intermittent cycles and hybrid strategy working together)

How it works?

This module is based on N-NH₄⁺, N-NO₃⁻, and DO to optimise:

- a) DO levels to achieve the effluent quality requirements (Dynamic DO SP strategy)
- b) Compressors working velocity to reach optimum nitrification rates (figure 1)
- c) Mixers performance activating them only during non-aeration cycles (figure 2)
- d) Nitrification/Denitrification cycles duration according to nitrogen removal rate
- e) Energy price thanks to implementation of tariff strategy (figure 3), taking into account this variable, and using it to displace energy consumption peaks (effluent quality requirements are based on a 24 hour average value of nitrogen)



BREMBATE STW (Italy)

RESULTS

This section presents the differences in operation between a reference period (January 2013 – June 2015) and a period of 27 months operated with the control platform.

Differences in inlet load

	Reference period	Control platform	Difference
Treated flow (m³/month)	1.626.843	1.541.635	-5 %
Treated load (KgDQO/month)	287.635	297.269	2%
Treated load (KgN/month)	31.349	32.598	4%

Data provided by the client; HIDROGEST SPA.

Average effluent quality





25%

Reduction of the aeration system energy consumption

Difference in performance

Consumption baseline agreed with the plant manager before the project began.



Data provided by the client; HIDROGEST SPA.

13% Reduction of the total plant energy consumption

100% Robustness and reliability

Consumption indicators

	Reference period	Control platform	Difference
kWh/month(Total plant consumption)	214.766	186.126	-13 %
kWh / month	114.216	85.575	-25 %
kWh/m³	0,075	0,056	-25 %
kWh / Kg COD removed	0,53	0,39	-27 %
kWh / KgN removed	5,96	4,45	-25 %
GHG emission (Tn CO_2 / month)	34	26	-25 %

Data provided by the client; HIDROGEST SPA

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BREMBATE STW (Italy)

CLIENT CONCLUSIONS

Dott. Ing. Yafet Ambrossini RESPONSABILE UFFICIO TECNICO E DEPURAZIONE HIDROGEST SPA



"The platform has been financed by "Createch360", and the retribution based on software performance.

The savings achieved have been significantly higher than expected, and effluent quality continuously achieved, so 0€ investment, and no more worries about process behavior.

*Createch360° team does remote assistance, and is continuously improving and adapting software benefits considering any changes in aeration equipment, mixers or new measurement sensors.

Once the platform cost is paid (32 months) **Crea**tech**360** will continue the assistance and supervision of the system with a maintenance contract."



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