NABLADOT
INTRODUCTION TO THE COMPANY AND ITS SERVICES

Antonio Gomez (R&D manager)
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NABLADOT: INTRODUCTION

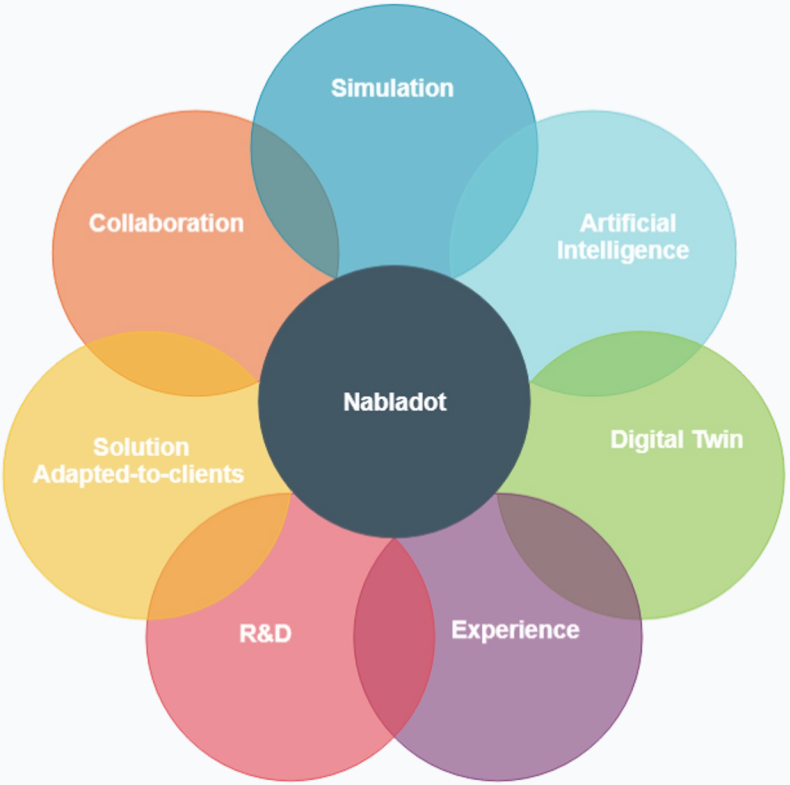
Established in 2010 by researchers specializing in **Computational Fluid Dynamics (CFD)** at the University of Zaragoza.

Innovative Character

We actively engage in research and development projects at both national and European levels.

Business Focus

We offer solutions tailored to the technical and economic needs of companies.



nablaDot: Services

We offer a wide range of specialized services in simulation and digital innovation



NABLADOT: SECTORS

Our experience covers multiple industrial sectors.

ENERGY SECTOR

- HSGR (combined cycles)
- Biomass boilers
- Molten salts heat exchangers
- Rotary kilns

HVAC & AIR QUALITY

- Logistic centers
- Metro station
- Tunnels
- Pharmacy clean rooms

WATER SECTOR

- Hydraulic infrastructure
- UV water disinfection
- Aerobic reactors
- Anaerobic reactors

FLUE GAS CLEANING

- Wet flue gas desulfurization
- NH3 stripping
- Regenerative thermal oxidizer
- Bag filter

INDUSTRY

- Deoil tanks
- Valves
- Pneumatic transport
- Biomass rotary dryer

HYDROGEN SECTOR

- Combustion
- Substitution of fossil fuels
- Injection in gas pipelines
- Leaks / Dispersion

CHEMICAL SECTOR

- Pyrolysis reactor
- Fixed bed reactors
- Real-time energy audit

SMART CITIES

- Urban wind in real time
- Integration BIM & Simulation

NABLADOT: PARTNERS

Our clients and partners represent a wide spectrum of industrial leaders and R&D innovators.

We have extensive international experience, with most projects developed for exporting companies or projects abroad.

EQUIPMENT & PRODUCTS

Companies designing and manufacturing equipment and products involving fluids.

ENGINEERING

Specialized engineering companies across various industrial sectors.

FACILITIES MANAGEMENT

Firms managing energy, water, air quality, and HVAC systems.

RESEARCH & R&D

International R&D centres and collaborative innovation partners.

RINGO VALVULAS

KALFRISA ENERGÍA Y MEDIO AMBIENTE

Haizetek SERVICIOS PARA LA FILTRACIÓN

lointek

IBERDROLA

SISENER INGENIEROS

endesa

IDOM

wood.

ArcelorMittal

Lab GROUPE ENIM

NORTEK FLUIDS TECHNOLOGY

edp hc energía

VEOLIA

ei electro ingenium INGENIERIA Y GESTION DE PROYECTOS INDUSTRIALES

NABLADOT: QUALITY

The quality of our work is certified by:

Staff Training

50% of staff with a PhD in Fluid Mechanics.

Innovative SME

Recognition by the Ministry of Science and Innovation (Spain).



Innovative Company

Accreditation from the French Ministry of Higher Education, Research and Innovation.



International Congresses

Active participation in the most relevant scientific events in the sector.

Scientific Journals

Publications in prestigious international journals.

NABLADOT SERVICES

nablaDot: Simulation as a Service

Advanced simulation on demand to solve engineering challenges

What it includes



CFD & multiphysics studies



Real process and equipment modeling



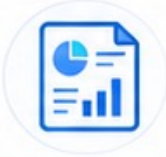
Scenario and what-if analysis



Technical issue diagnosis



Design and operation optimization



Reports, visuals, and decision-ready KPIs

Value for the client



Less technical uncertainty



Lower development cost and time



Fewer risks before implementation



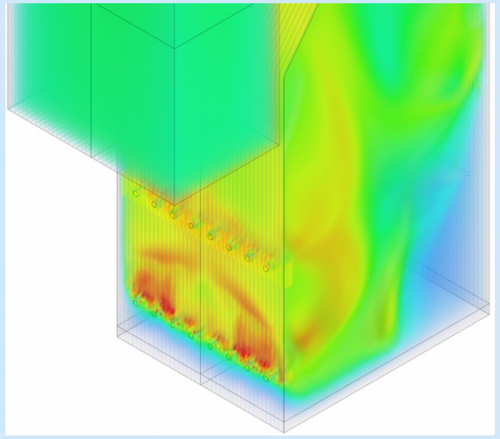
Better efficiency and performance



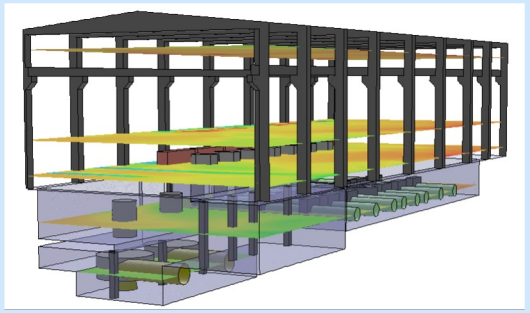
Clear, actionable engineering insight

nablaDot: Simulation as a Service

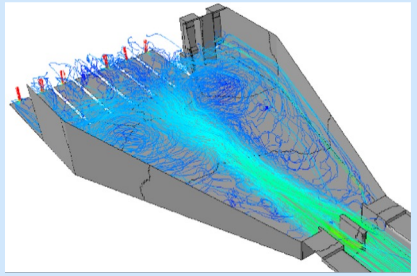
Energy
Biomass boilers



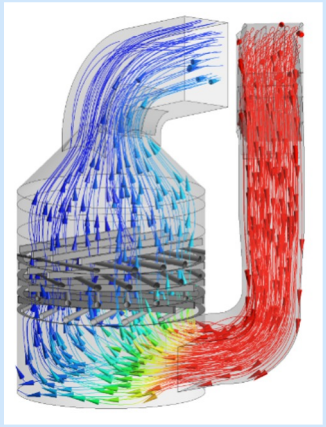
HVAC and Air Quality
Logistics warehouses



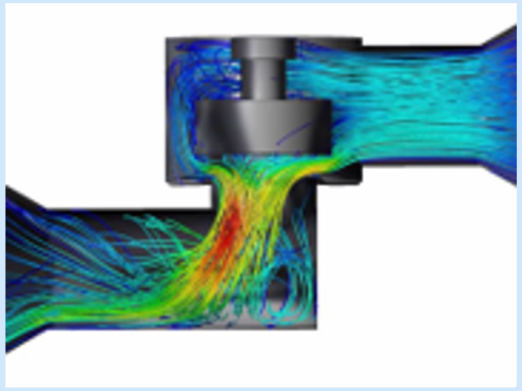
Water sector
Hydraulic infrastructures



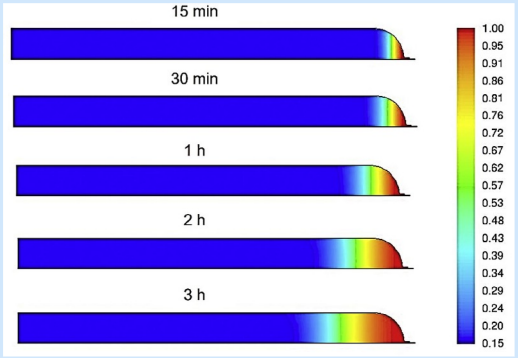
Flue Gas Cleaning
Desulphurisation



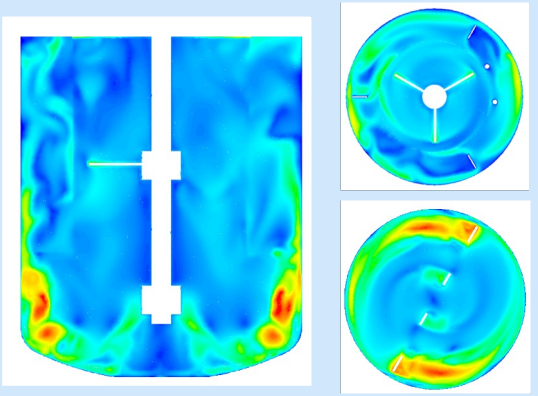
Industry
Valves



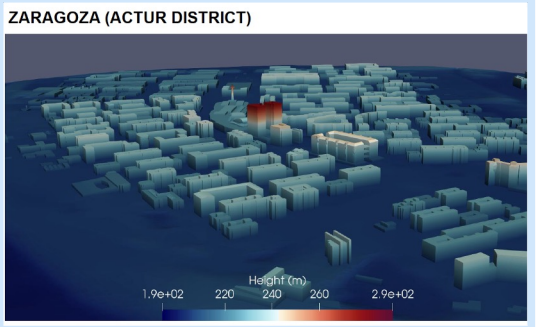
Hydrogen
Hydrogen injection



Chemical sector
Pyrolisys reactor



Smart Cities
Wind forecast in real time



NABLADOT: SIMULATION AS SOFTWARE

Fast simulation software tailored for your engineering workflows

What it includes

- Reduced-Order Models (ROMs) derived from CFD or multiphysics simulations
- Fast scenario evaluation without rerunning full simulations
- Interactive software tools for engineering, operation or technical sales teams
- Physics- and data-based predictive models
- User-friendly dashboards, web apps or internal tools
- Integration with sensors, databases, SCADA, IoT platforms or digital twins

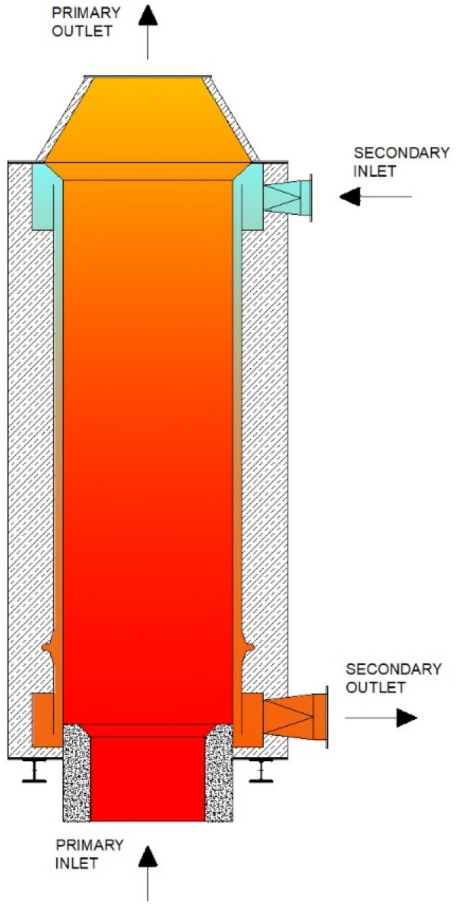
Value for the client

- Turns simulation into a reusable software asset
- Reduces calculation time from hours or days to seconds or minutes
- Enables real-time or near-real-time decision-making
- Makes advanced simulation accessible to non-expert users
- Accelerates design, optimization and operational analysis
- Provides a strong foundation for digital twins and predictive tools

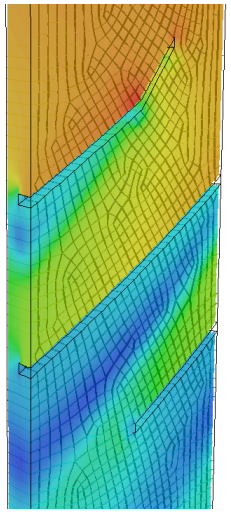
nablaDot: Simulation as Software

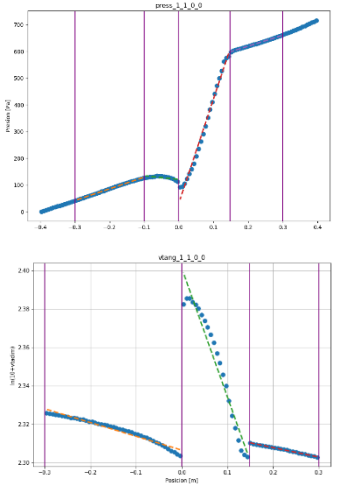
Simulation software (real-time model) for determining heat transfer, pressure drop, and wall temperaturas in heat recovery units

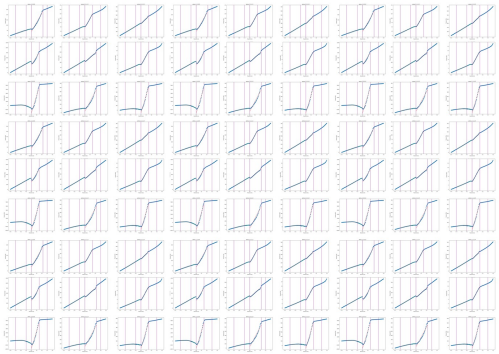
Equipment



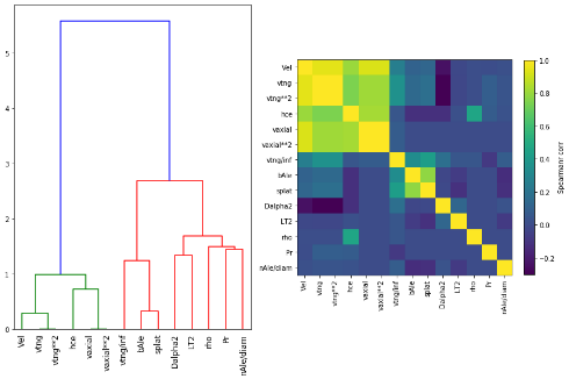
CFD & Design of experiments

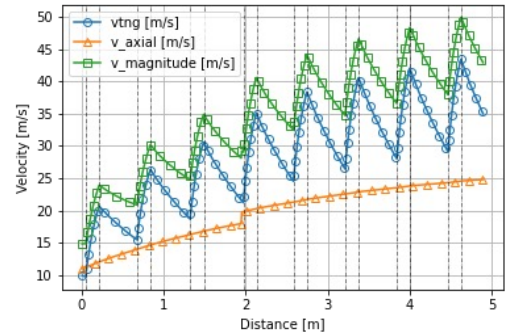






Machine learning & Results





nablaDot: Advanced monitoring

Smart monitoring to transform operational data into reliable, actionable insight

What it includes

Operational data integration
Sensors, SCADA, PLCs, databases and IoT platforms

Data reconciliation & validation
Noise reduction, consistency checks and estimation of unmeasured variables

KPI dashboards
Real-time visualization of performance, efficiency, consumption and alarms

Anomaly detection
Identification of deviations, abnormal behavior and performance losses

Reference models
Comparison between actual operation and expected behavior

Smart alerts & decision support
Prioritized insights to support operation and maintenance teams

Historical analysis & trends
Root-cause analysis and early detection of recurring issues

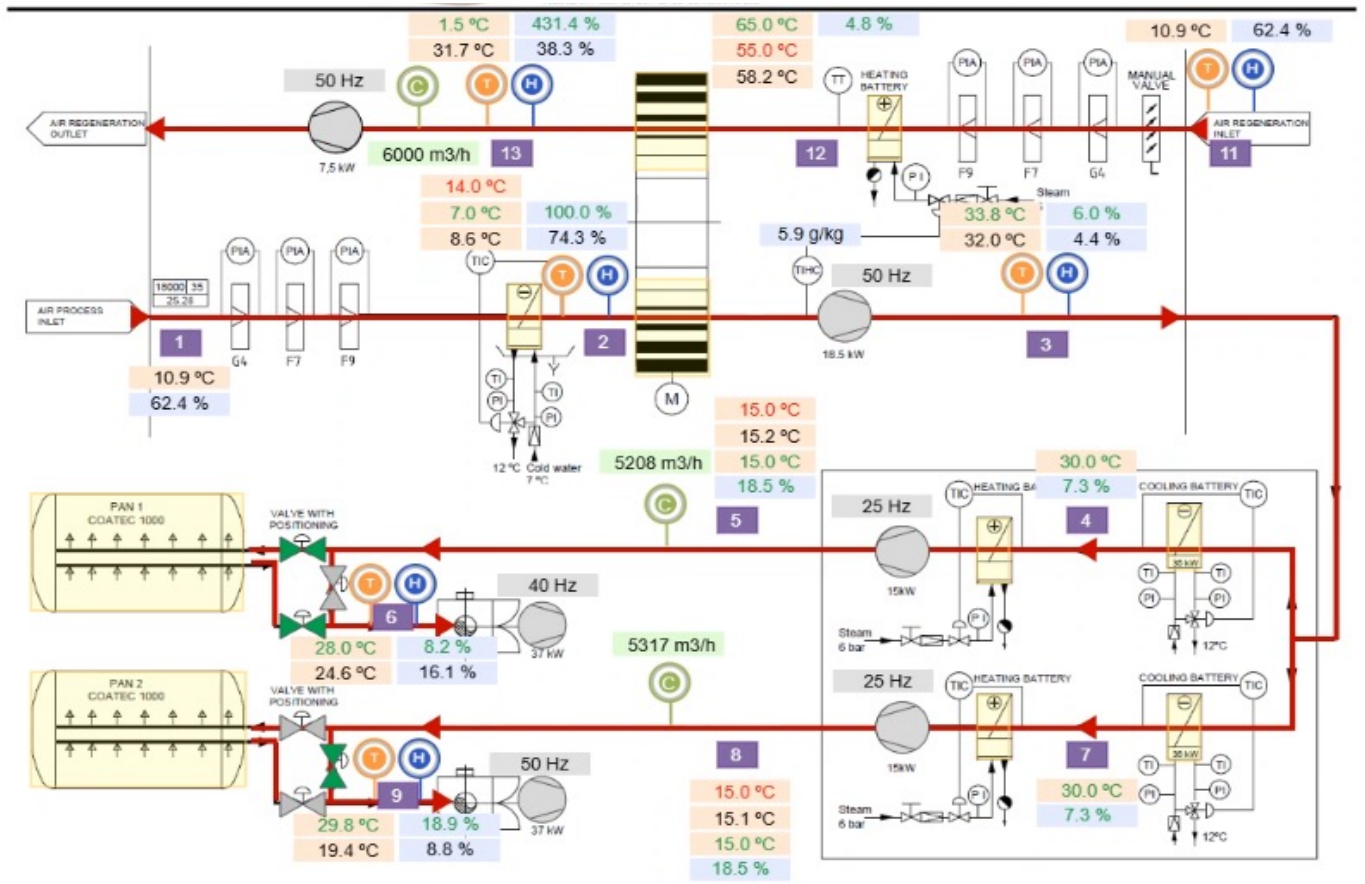
Connection with predictive models or digital twins
Integration with ROMs, physics-based models and optimization tools

Value for the client

- More reliable operational data
- Better visibility of process performance
- Faster detection and diagnosis of issues
- Early warning of failures or efficiency losses
- More stable and efficient operation
- Lower downtime, energy losses and operating costs
- Actionable insight for operation, maintenance and engineering teams

NABLADOT: ADVANCED MONITORING

Real-time energy audit of drying processes in the food industry



Mostrar posiciones

Mostrar valores medidos

Mostrar valores calculados

LEYENDA

Medida
Calculado
Consigna

Temperatura | Caudal | Humedad rel. | Frecuencia

Temp.	REAL	IDEAL
P1	10.89	-
P2	8.59	7.00
P3	32.04	33.81
P4	-	30.00
P5	15.19	15.00
P6	24.57	28.01
P7	-	30.00
P8	15.08	15.00
P9	19.42	29.80
P11	10.89	-
P12	58.17	65.00
P13	31.71	1.53

VALVULAS	APERTURA B15	APERTURA B16
PROCESO	76.0	0.0
BYPASS	0.0	64.0
ASPIRACION	100.0	0.0

NABLADOT: DIGITAL TWIN

Connected virtual replicas that combine physics, data and real-time operation to understand, predict and optimize asset performance

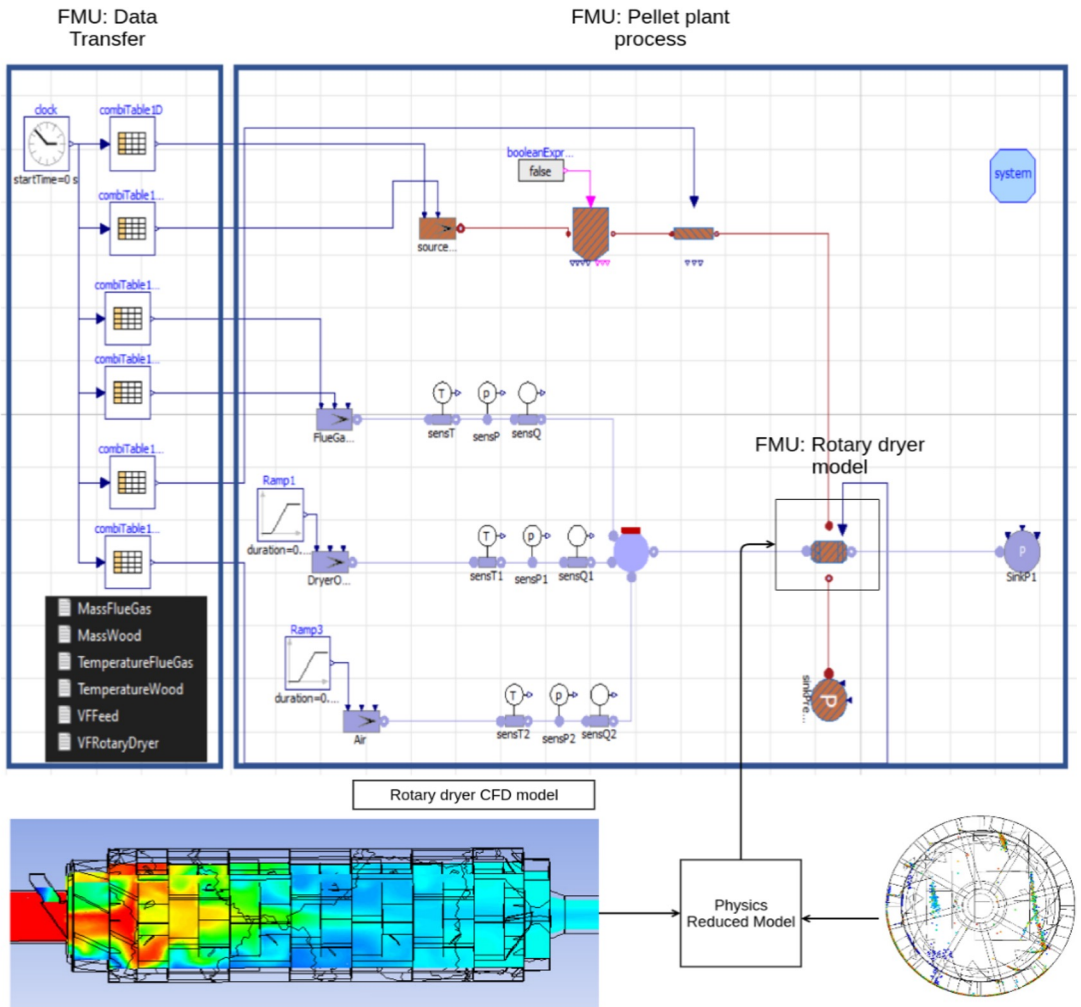


NABLADOT: DIGITAL TWIN FOR A ROTARY BIOMASS DRYER

Digital Twin Features

- Automatic communication with SCADA data
- Automatic data processing
- Real-time simulations using SCADA input
- Optimal operation configuration selection
- Process and system control co-simulation

Developed from **CFD simulations** and **Reduced Order Physics** techniques



NABLADOT R&D COLLABORATION: RELEVANT PUBLIC FUNDED R&D PROJECTS

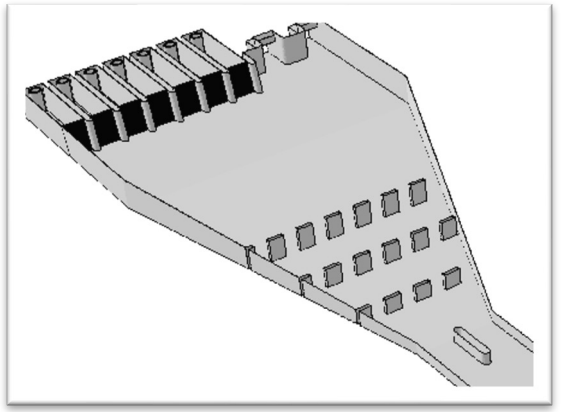
Name	Year	Funding body
CFD Desing of biomass boilers in the Cloud	2016	European Commission
Cloud-based Micrositting of Small Wind Turbines	2017	European Commission
Optimizing solar panel production	2018	European Commission
Digital Twin for Biomass Boilers	2020	European Commission
Development of reduced-order models and machine learning for high-resolution wind prediction	2020	Spanish Ministry of Science, Innovation and Universities
Digital twin of high-efficiency heat recovery units	2021	Spanish Ministry of Industry, Commerce and Tourism
Digital Twin for Rotary Dryers	2021	European Commission
Electrification and digitization of the regenerative thermal oxidizer for the decarbonization of industry (e-RTO)	2022	Spanish Ministry of Industry, Commerce and Tourism
Digital twin for the comprehensive management of ammonia emissions in pig farms.	2022	Spanish Ministry of Industry, Commerce and Tourism
Digital Twin for cost-efficient treatments of wastewater in Anaerobic Reactors	2023	Eureka - Eurostars
New technology to produce hydrogen from renewable energy sources based on AI with optimized costs for environmental applications.	2023	Eranet - Co-funded projects
HPC-based efficiency optimization of industrial fired preheaters	2024	European Commission
Intelligent Platform for Rapid Deployment of Scalable Digital Twins in Thermal Industrial Systems (iTWIN-TIS)	2026	Eureka - Eurostars

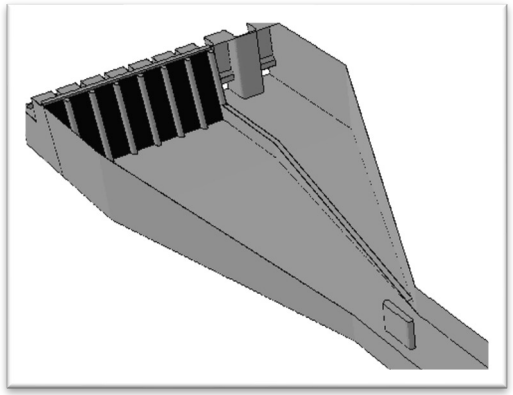
NABLADOT – WATER SECTOR

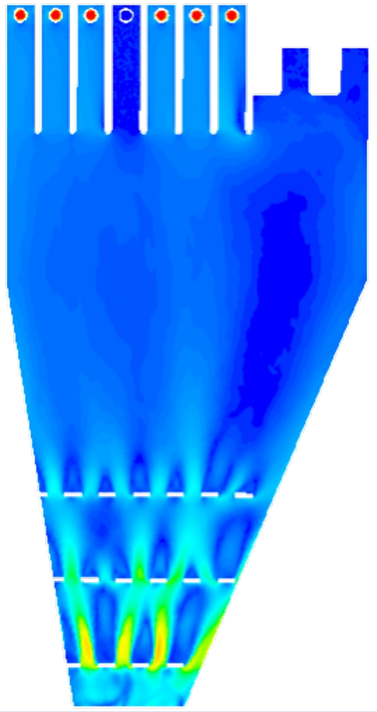
nablaDot: Simulation of a Pumping station

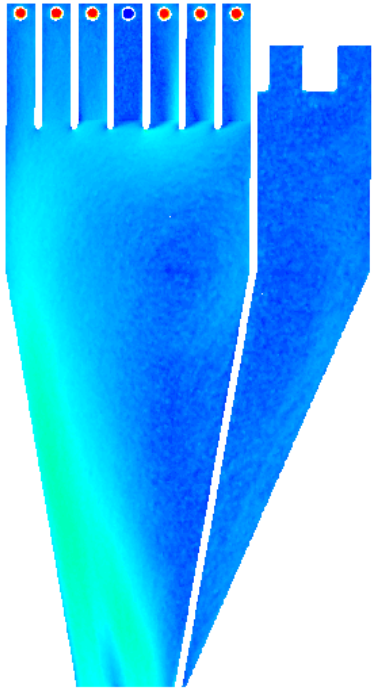
Project objective

- Homogenize water flow rate by each pump (red dots)





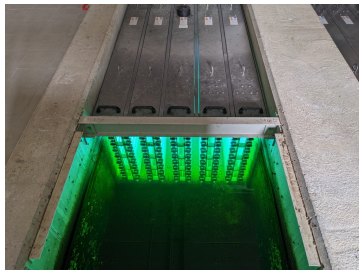


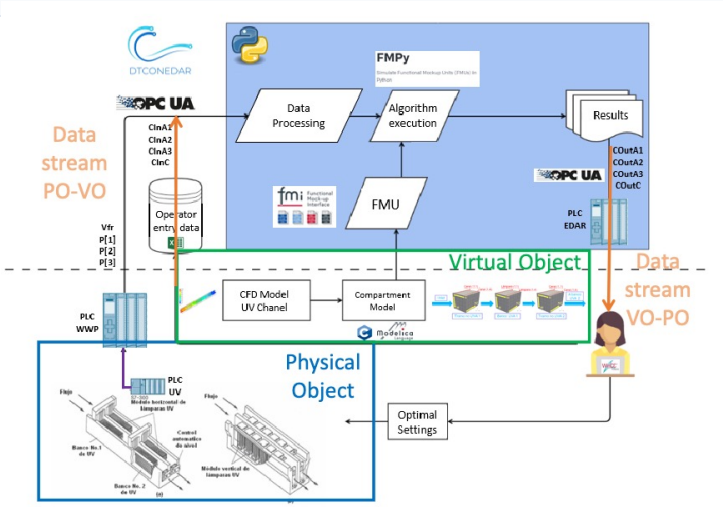


NABLADOT: DIGITAL TWIN OF A UV DISINFECTION EQUIPMENT

40% energy consumption

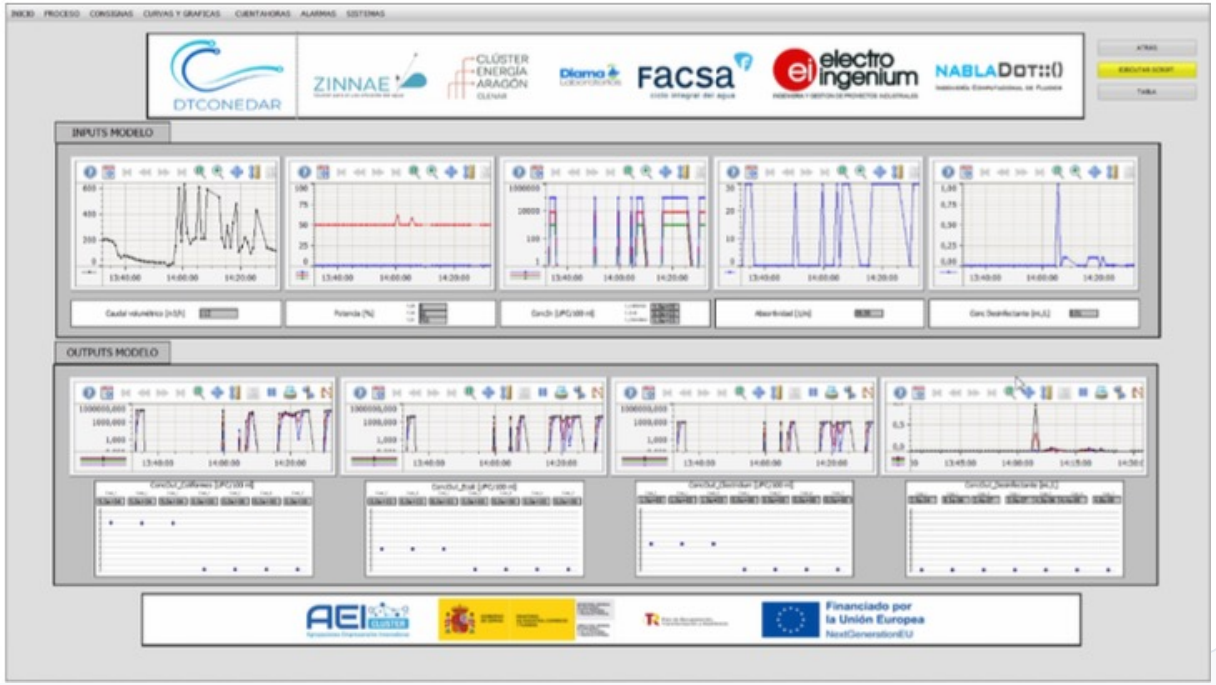
This equipment consumes 40% of the energy of a wastewater treatment plant





Digital Twin Features

- Automatic communication with SCADA data
- Automatic data processing
- Real-time simulations using SCADA input
- Optimal operation configuration selection
- Process and system control co-simulation

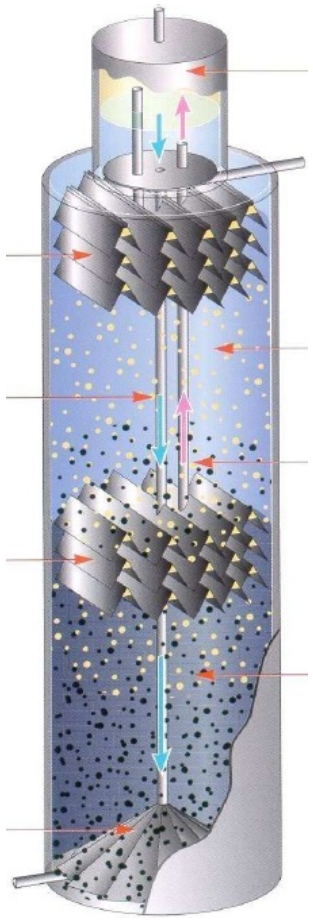


Developed from **CFD simulations** and **Reduced Order Physics** techniques

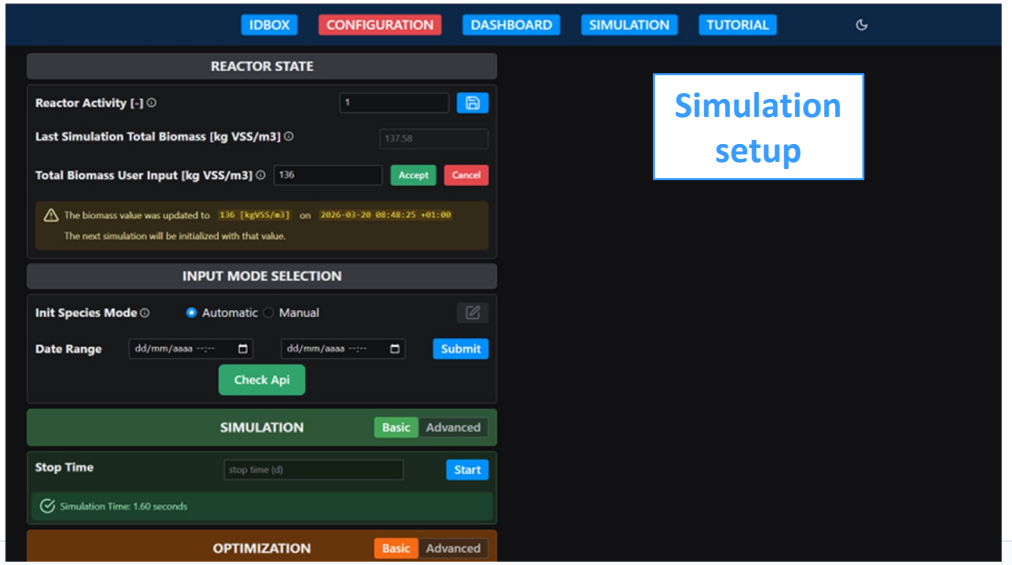
NABLADOT: DIGITAL TWIN OF AN ANAEROBIC REACTOR

Digital Twin for cost-efficient treatments of wastewater in Anaerobic Reactors (DT4ART)

- Nabladot (Spain)
- Univ. of Verona (Italy)
- BioReal (Italy)
- ElectroIngenium (Spain)
- Veolia (Spain)







nablaDot & Water Sector

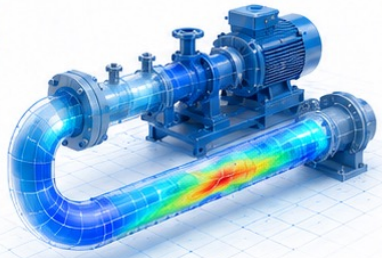
nablaDot

Water Sector Experience

Engineering, simulation and digital solutions for water infrastructure and wastewater treatment.

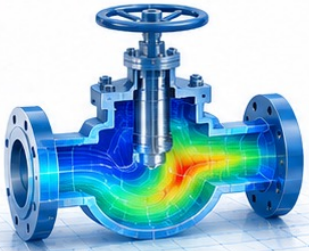
Hydraulic Infrastructure Simulation

Simulation of hydraulic infrastructures, including pumping stations, to analyze flow behavior, pressure losses, operating conditions and performance.



Valve Simulation

Numerical simulation of valves to assess pressure drop, flow distribution, cavitation risk, transient behavior and design performance.



Digital Twins for Wastewater Treatment

Digital twins for secondary and tertiary wastewater treatment to support monitoring, optimization, process understanding and decision-making.



CONTACT



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