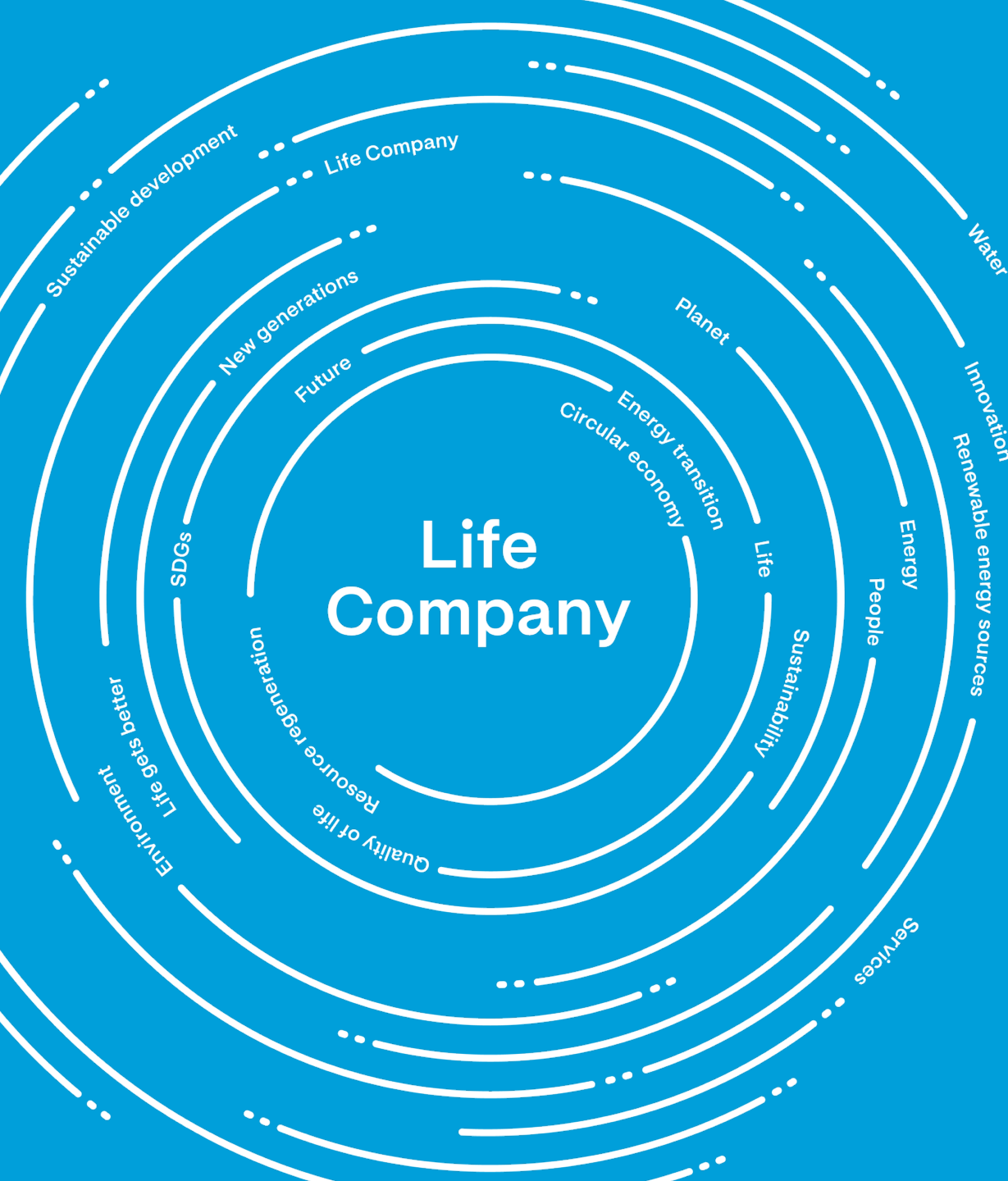




AVEVAWORLD
PARIS



Virtual control room

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Digital Generation and Trading Dept. Manager
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Lorenzo Gianoli, IT Project Manager
A2A

15 October 2024



The Group

A2A. Life Company



We are a **Life Company**: we put life at the heart of everything that we do, for us and future generations.

Our technology and our infrastructures are at the service of **people** and of the protection of **nature**, so we work every day to **regenerate** the potential of every resource.

We promote energy from renewable sources, and we accelerate **decarbonisation**, promoting **electrification of consumption**.

We build a virtuous water cycle to save every drop.
We turn waste into resources so that all waste can become new **material, energy** and **heat**.

Our **vision** looks **forward**.

We build our **future today**, acting, **consciously**.

Our 2024-2035 Strategic Plan: a long-term Plan that focuses on future generations

Circular Economy

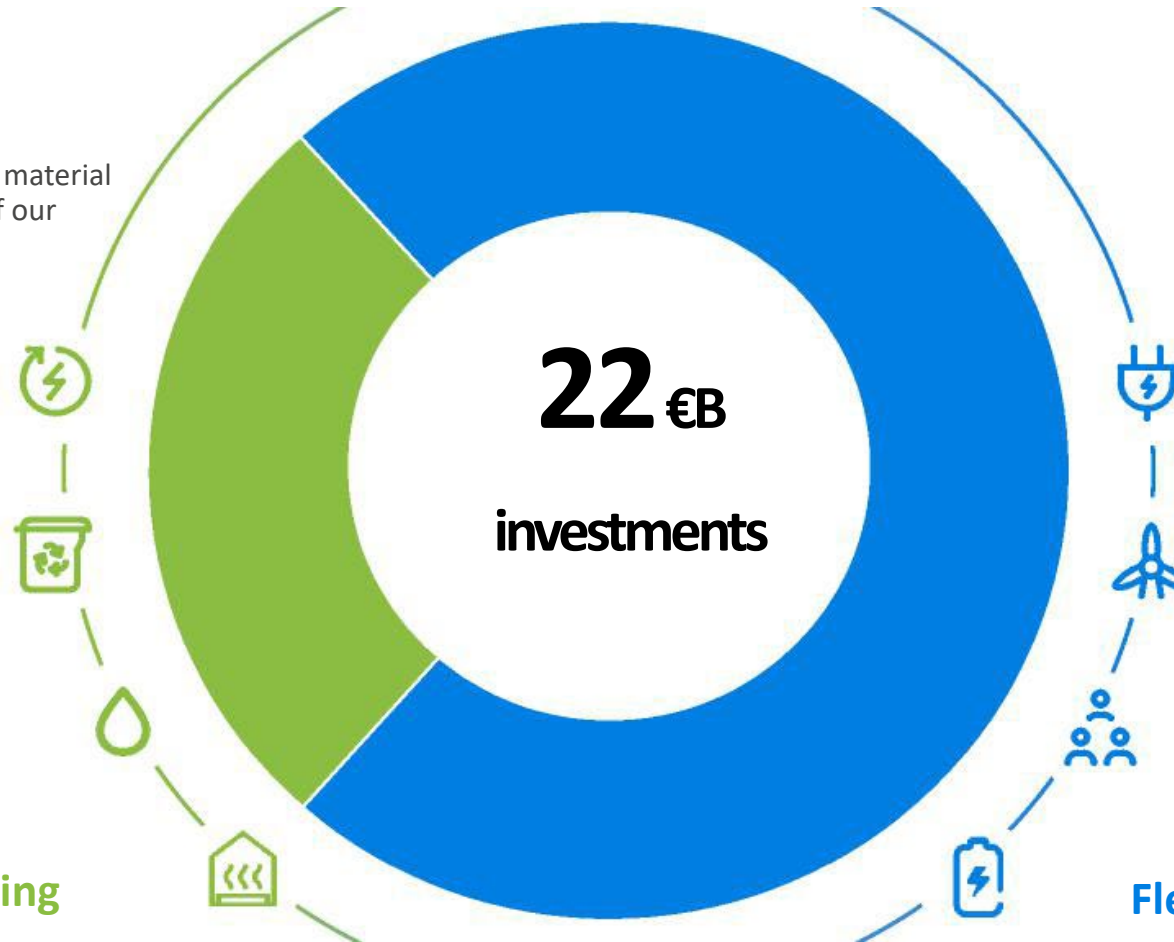
We enable **circular business models** for material and energy to **preserve the resources** of our Planet and protect the environment

Energy recovery

Material recovery

Water cycle

District Heating



Energy Transition

We contribute to **decarbonizing the system** by guiding the **electrification** of consumption and developing sources of **green energy**

Electric networks

Renewable energy

Customers

Flexible Energy

Where we are and what we do

Plants



Wind



Photovoltaic



Thermoelectric



Hydroelectric



Waste treatment



Material recovery



Waste-to-Energy



Landfill



Bioenergy

Services



Gas transport



Electricity distribution



Gas distribution



Waste collection



Public lighting



Integrated water service



Recharge stations E-mobility



District Heating



Virtual Control Room

Initial Situation

Problem

- **Metamorphosis** of the production paradigm
 - **Few** (<20) supervised power plants that produce a lot of energy
- ∨
- **Many** (100+) less-supervised power plants that produce less energy

Need

- **Simplification and Standardization**
- ∨
- **Centralized monitoring and control system**
 - **Standardize and automate management and field processes**

Virtual Control Room Project

Project born from the need of the **IES Manager** – Department of Management and Operation of Renewable Energy Plants (Wind and Solar Plants and Storage Development)

Strong collaboration between different functions

- **IES** – Asset Manager e Operations
- **OPE** – Operational Excellence
- **Digital & OT**
- Digital **Infrastructure, Architecture & Cyber Sec**
- RTI **Factory Software** – Alten
- **A2A Smart City**

Path Innovation

Project pathway

2021

Quick Win Data Centralization

- **Various** renewable energy plant **portfolios**
- **Different systems** based on plant type
- **Segregated data** across different systems – **reporting complexity**
- **Data centralization** from external systems to **a2a systems**

H1

2022

Assessment and Mobilization

- **Business function involvement** (Digital, OT, OPE, IES)
- **As-is assessment** (plants, schemas, hardware, software)
- **Standard definition** for field **data acquisition**
- **Asset inventory** of the plant fleet

Q2/Q3

2022

Scouting and Tender

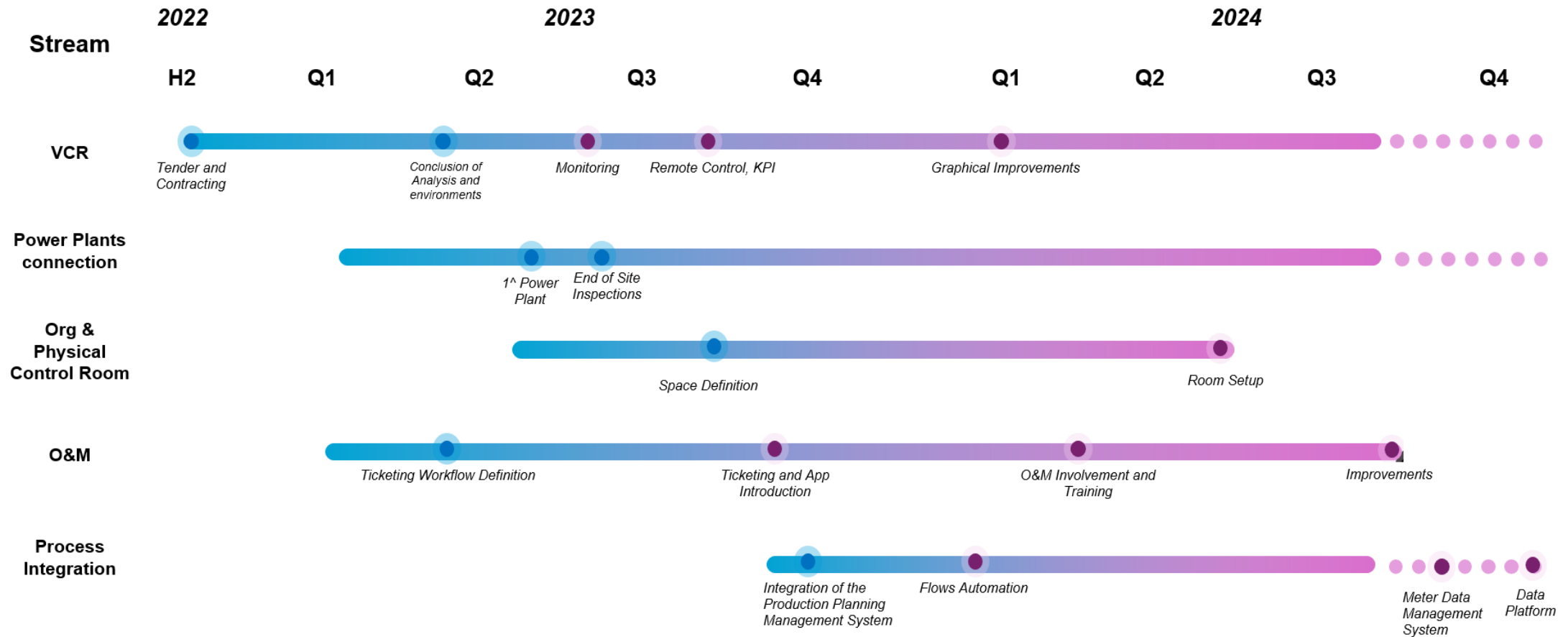
- Market **scouting** for suppliers and solutions
- **Selection and evaluation** based on **technical** parameters (data acquisition, plant remote control, OT, Security), **simplification**, 'Make' or '**Buy & Personalize**'
- Supplier **short list**

22/23

System Implementation and Go-Live

- **Information system**
- **Physical control room**
- **Field integration**
- **Site inspections** and plant connections
- **O&M app**
- **Integration into** the company's **application ecosystem**

Project Plan



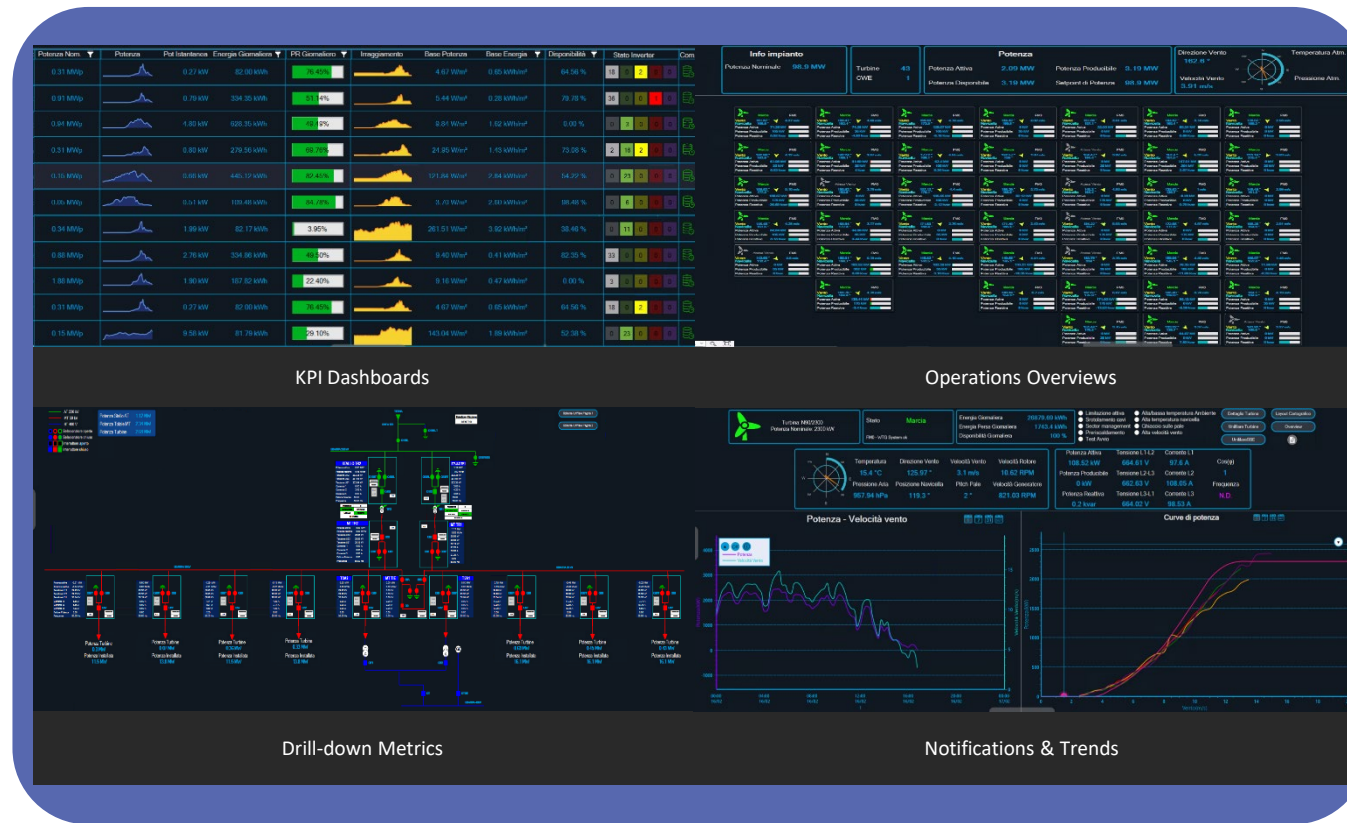
Unified operation center (1/2)



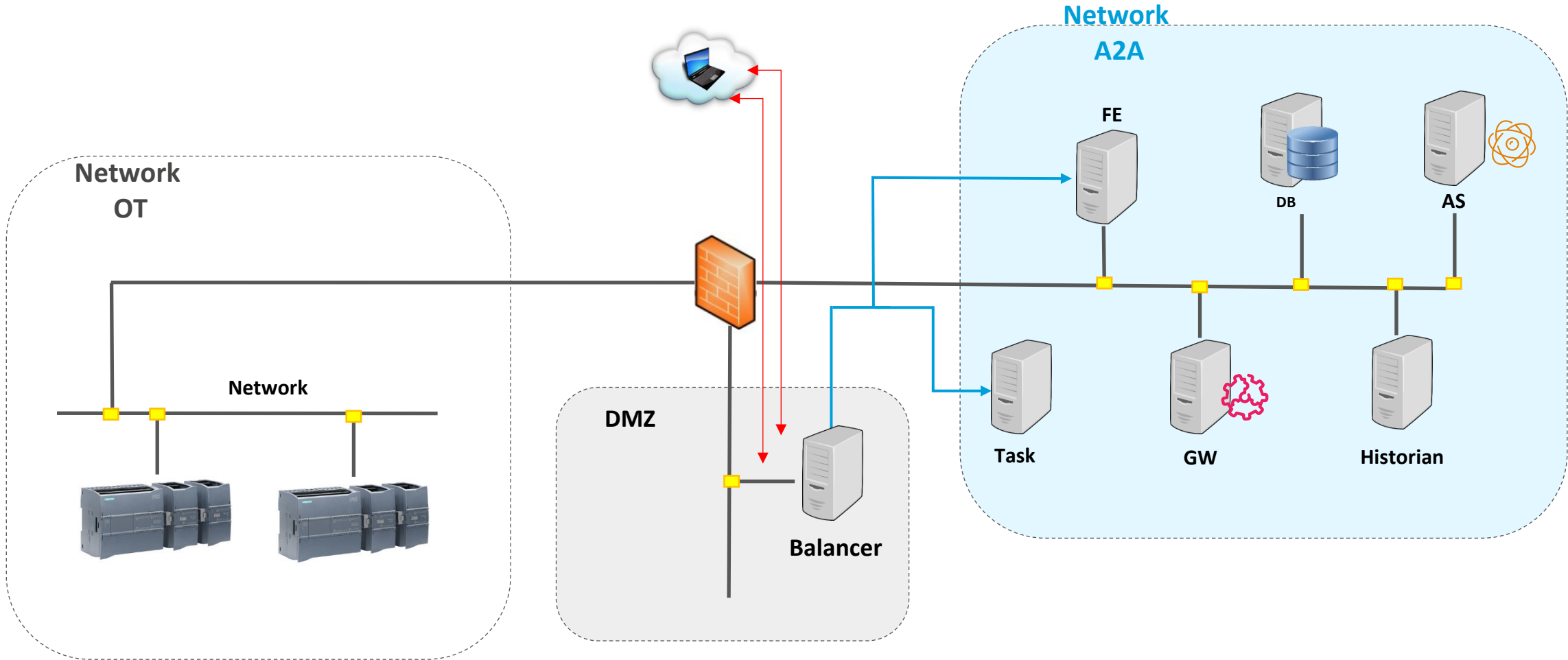
- Creation and management of KPIs
 - Plant/Asset
 - Type of energy produced
- Monitoring and Control
- Georeferencing of assets
- Collaboration between various teams
- Maintenance management
- Optimization in asset management
- Dashboarding
- Reporting
- Downtime Management
- PI Server integration
- Security improvement

Integration with A2A's security policies and technologies

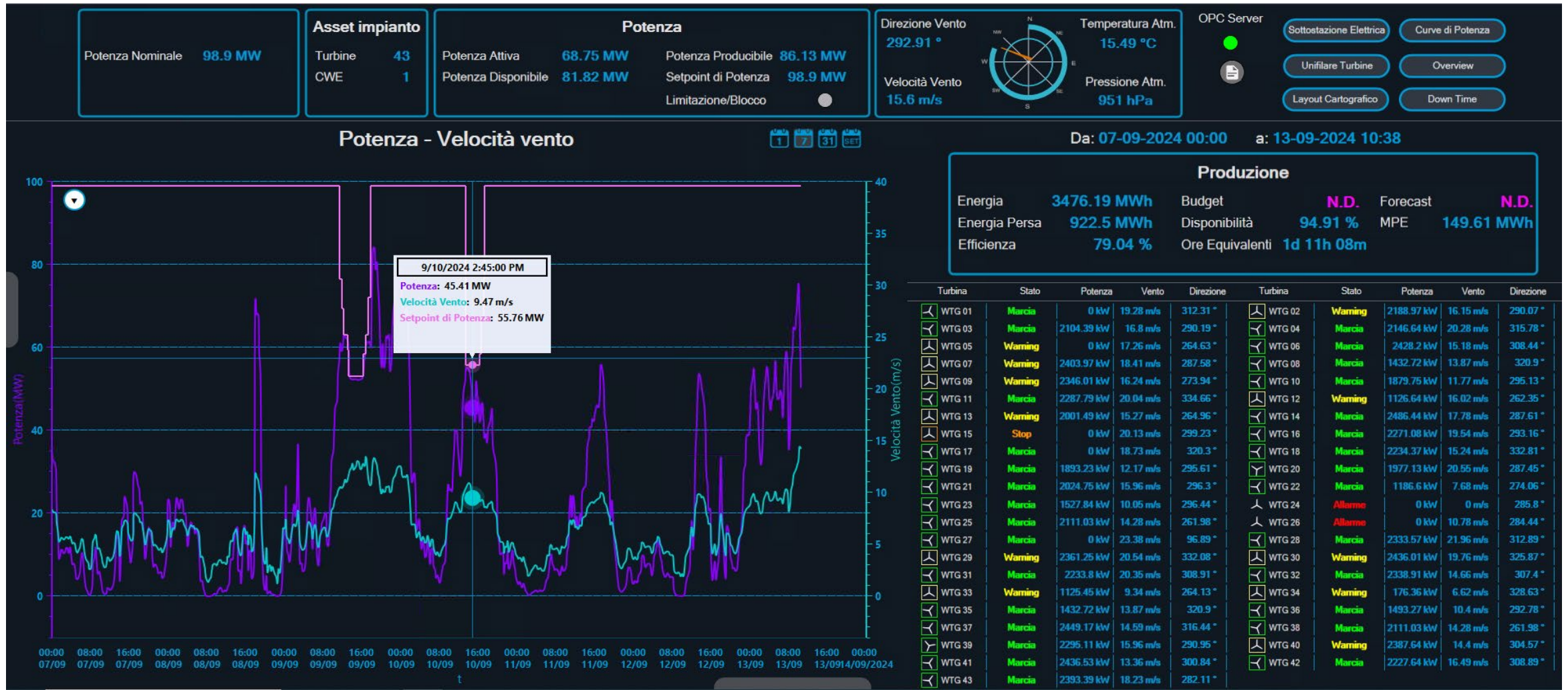
Unified operation center (2/2)



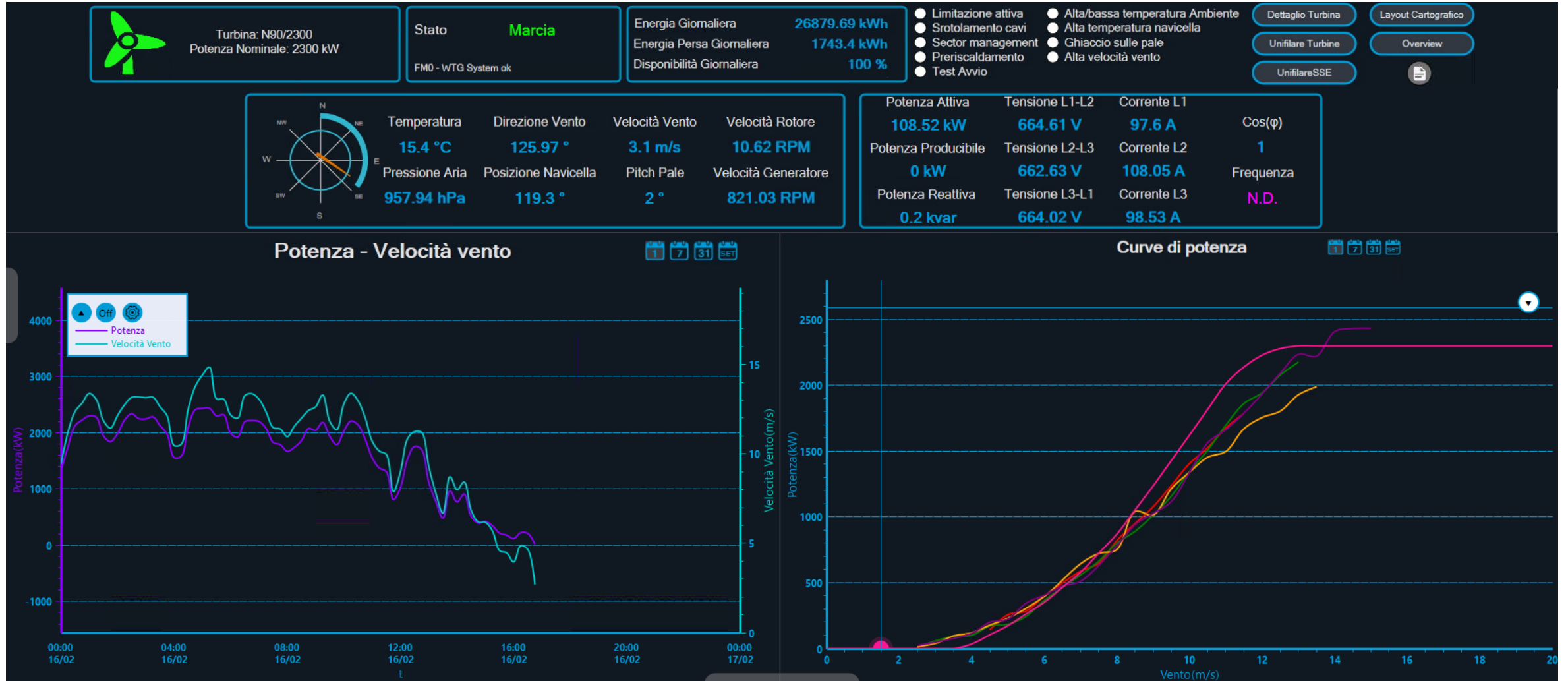
Architecture



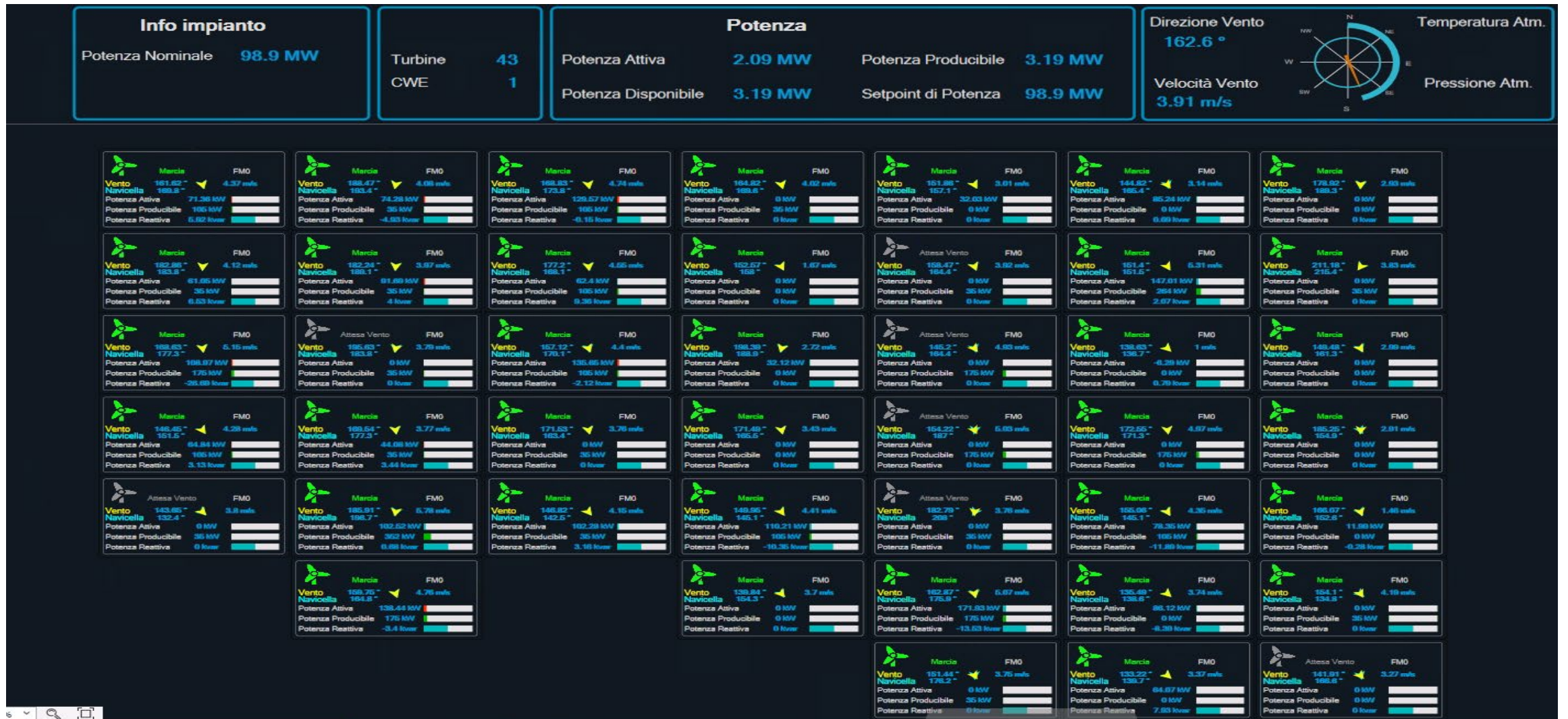
Platform (1/7)



Platform (2/7)



Platform (3/7)



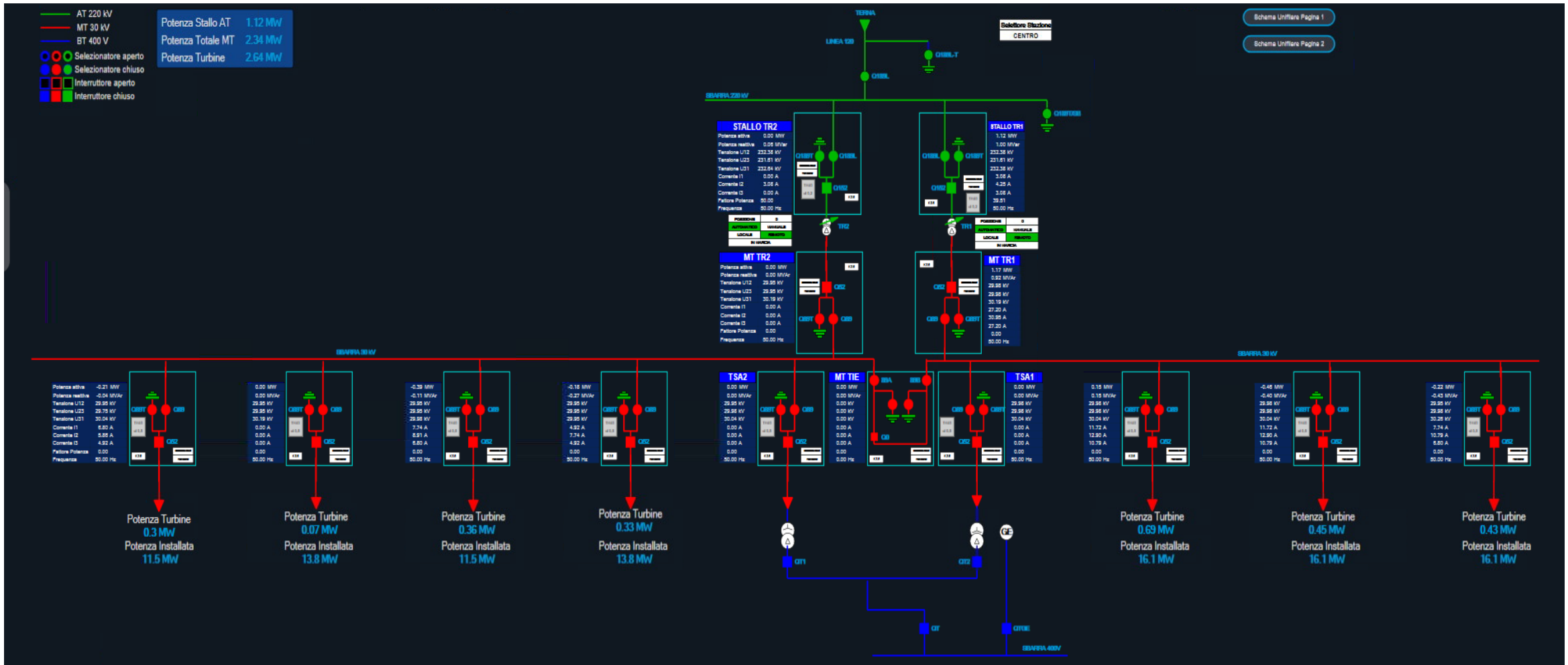
Platform (4/7)

Potenza Nom. ▼	Potenza	Pot Istantanea	Energia Giornaliera ▼	PR Giornaliero ▼	Irraggiamento	Base Potenza	Base Energia ▼	Disponibilità ▼	Stato Inverter	Com
0.31 MWp		0.27 kW	82.00 kWh	76.45%		4.67 W/m²	0.65 kWh/m²	64.56 %	18 0 2 0 0	
0.91 MWp		0.79 kW	334.35 kWh	51.14%		5.44 W/m²	0.28 kWh/m²	79.78 %	36 0 0 1 0	
0.94 MWp		4.80 kW	628.35 kWh	49.49%		9.84 W/m²	1.62 kWh/m²	0.00 %	0 3 0 0 0	
0.31 MWp		0.80 kW	279.56 kWh	69.76%		24.95 W/m²	1.43 kWh/m²	73.08 %	2 16 2 0 0	
0.15 MWp		0.66 kW	445.12 kWh	82.45%		121.84 W/m²	2.84 kWh/m²	54.22 %	0 23 0 0 0	
0.05 MWp		0.51 kW	109.48 kWh	84.78%		3.70 W/m²	2.60 kWh/m²	98.48 %	0 6 0 0 0	
0.34 MWp		1.99 kW	82.17 kWh	3.95%		261.51 W/m²	3.92 kWh/m²	38.46 %	0 11 0 0 0	
0.88 MWp		2.76 kW	334.86 kWh	49.50%		9.40 W/m²	0.41 kWh/m²	82.35 %	33 0 0 0 0	
1.88 MWp		1.90 kW	187.82 kWh	22.40%		9.16 W/m²	0.47 kWh/m²	0.00 %	3 0 0 0 0	
0.31 MWp		0.27 kW	82.00 kWh	76.45%		4.67 W/m²	0.65 kWh/m²	64.56 %	18 0 2 0 0	
0.15 MWp		9.58 kW	81.79 kWh	29.10%		143.04 W/m²	1.89 kWh/m²	52.38 %	0 23 0 0 0	

Platform (5/7)

Potenza Nominale	Potenza	Pot Istantanea	Energia Giornaliera	Efficienza	Disponibilità	Velocità Vento	Direzione Vento	Stato WTG	Com.																
41.40 MW		1.95 MW	32.48 MWh	90.11%	100.00%	4.51 m/s	-2°	<table border="1"> <tr> <td>0</td><td>18</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> </tr> <tr> <td colspan="3">Disponibile</td> <td colspan="3">Indisponibile</td> <td colspan="2">Fuori Scansione</td> </tr> </table>	0	18	0	0	0	0	0	0	Disponibile			Indisponibile			Fuori Scansione		
0	18	0	0	0	0	0	0																		
Disponibile			Indisponibile			Fuori Scansione																			
30.00 MW		24.24 MW	544.64 MWh	99.93%	100.00%	9.30 m/s	139° SE	<table border="1"> <tr> <td>0</td><td>8</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> </tr> <tr> <td colspan="3">Disponibile</td> <td colspan="3">Indisponibile</td> <td colspan="2">Fuori Scansione</td> </tr> </table>	0	8	0	0	0	0	0	0	Disponibile			Indisponibile			Fuori Scansione		
0	8	0	0	0	0	0	0																		
Disponibile			Indisponibile			Fuori Scansione																			
98.90 MW		2.24 MW	320.57 MWh	84.01%	99.39%	3.38 m/s	293° NO	<table border="1"> <tr> <td>7</td><td>36</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> </tr> <tr> <td colspan="3">Disponibile</td> <td colspan="3">Indisponibile</td> <td colspan="2">Fuori Scansione</td> </tr> </table>	7	36	0	0	0	0	0	0	Disponibile			Indisponibile			Fuori Scansione		
7	36	0	0	0	0	0	0																		
Disponibile			Indisponibile			Fuori Scansione																			
42.00 MW		32.99 MW	196.56 MWh	98.92%	99.02%	9.55 m/s	1° N	<table border="1"> <tr> <td>0</td><td>21</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> </tr> <tr> <td colspan="3">Disponibile</td> <td colspan="3">Indisponibile</td> <td colspan="2">Fuori Scansione</td> </tr> </table>	0	21	0	0	0	0	0	0	Disponibile			Indisponibile			Fuori Scansione		
0	21	0	0	0	0	0	0																		
Disponibile			Indisponibile			Fuori Scansione																			

Platform (6/7)



Platform (7/7)



Tipo Turbina: N90/2300
Potenza Nominale: 2300 kW

Stato **Marcia**

FM0 - WTG System ok

Energia Giornaliera **9398.03 kWh**
Energia Persa Giornaliera **1545.22 kWh**
Disponibilità Giornaliera **100 %**

- Limitazione attiva
- Srotolamento cavi
- Sector management
- Preriscaldamento
- Test Avvio
- Alta/bassa temperatura Ambiente
- Alta temperatura navicella
- Ghiaccio sulle pale
- Alta velocità vento

Dettaglio Turbina

Layout Cartografico

Unificare Turbine

Overview

UnificareSSE



Dati potenza

Potenza Attiva **146.35 kW**
Potenza Reattiva **6.49 kvar**
Potenza Apparente **146.5 kVA**
Cosphi **1**

Moltiplicatore

*T cuscinetto principale **26.8 °C**
*T cuscinetto gearbox lato generatore **58 °C**
*T olio nella coppa **55.7 °C**

Ambiente

Direzione Vento **299.63 °**
Velocità Vento **4.9 m/s**
Temperatura **8.5 °C**

Sistema di passo

Pitch Pala 1 **2.1 °**
Pitch Pala 2 **2.1 °**
Pitch Pala 3 **2.1 °**
Velocità Rotore **10.53 RPM**



Navicella

Posizione Navicella **297.8 °**

Generatore

*T Liq. raffred. Generatore **38.8 °C**
*T. Liq. raffred. ritorno Generatore **40.8 °C**
*T avv. L1 **55 °C**
*T avv. L2 **54.3 °C**
*T avv. L3 **55.3 °C**
*T Cuscinetto gener. lato gear **43.5 °C**
*T Cuscinetto gener. finale **41.9 °C**
Velocità Generatore **818.99 RPM**

Sistema idraulico

Press. olio accumulatore rotore **98.19 bar**
*T olio idraulico **16.2 °C**

Sistema imbardata

Attorcigliamento cavi navicella **342.8**
Stato imbardata **Auto**
Direzione imbardata **Stat**

A2A manage their renewable plant fleet with a unique tool designed to support future growth

Challenge

- Energy production paradigm metamorphosis
- From few bigger plants to many plants (>100) that produce less energy each - more complexity to manage
- Different systems and segregated data based on plant type

Solution

- Deployed AVEVA™ Unified Operation Center™ to streamline data collection, access, real time analysis, and control across plants

Results

- **Unique real time monitoring tool and remote control implemented**
- **Centralized information and simplified management**
- **Increased company scalability and responsiveness to the market changes**
- **Integrated reporting and ML initiatives proposed for data correlations**



When we take care of **energy, water** and
environment, life turns sky-bluer

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AVEVA is a world leader in industrial software, providing engineering and operational solutions across multiple industries, including oil and gas, chemical, pharmaceutical, power and utilities, marine, renewables, and food and beverage. Our agnostic and open architecture helps organizations design, build, operate, maintain and optimize the complete lifecycle of complex industrial assets, from production plants and offshore platforms to manufactured consumer goods.

Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life's essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world's most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. The company is headquartered in Cambridge, UK.

Learn more at www.aveva.com