

UNARETI & A2A

Company Presentation & Digitalization Initiatives

Turin | 21/06/2023

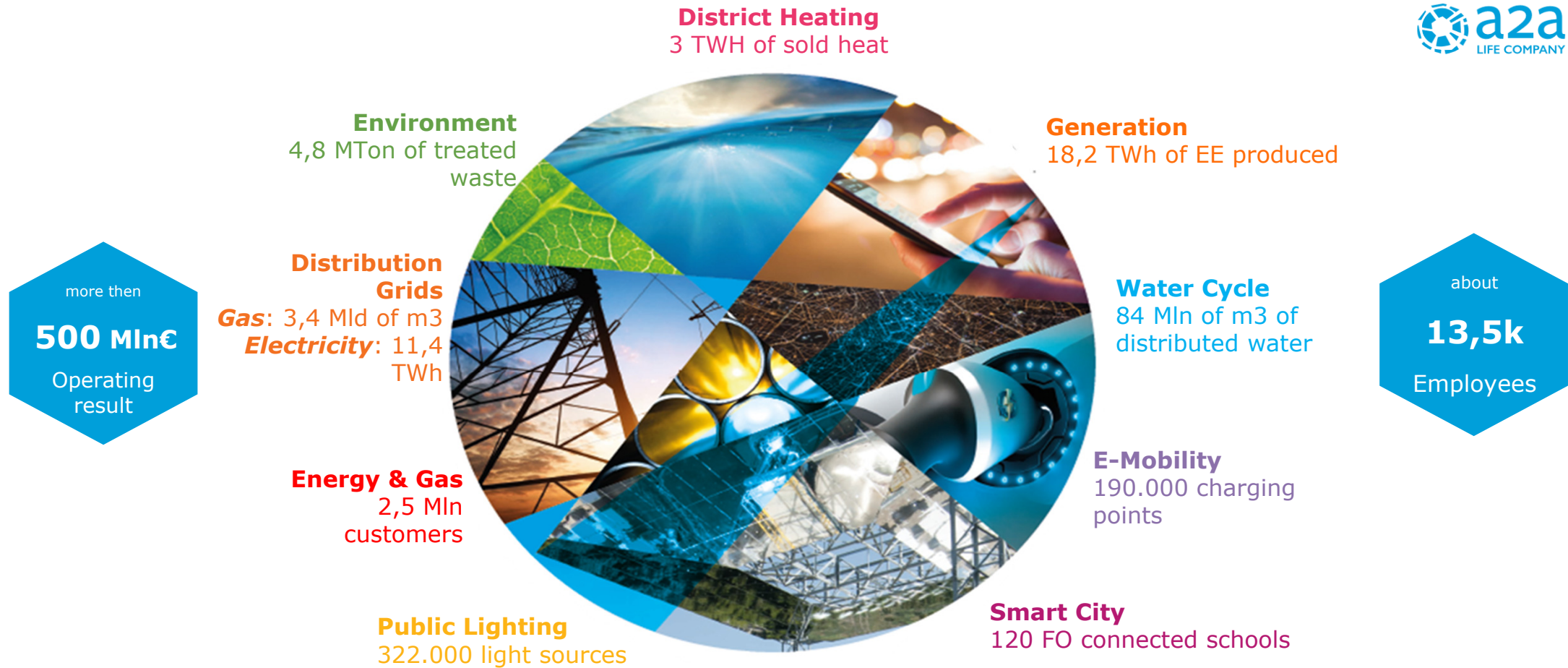
Samuele Forciniti
Maintenance Engineering – Asset Performance
B.U. Smart Infrastructure
A2A group



A2A Group Overview



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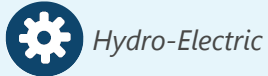
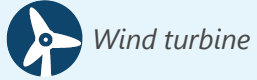
The **A2A Group** is the largest Italian *multiutility* in the **environmental sector** and it is one of the leading companies in the **energy, heat, grids** and **smart city** sectors. It is an integrated reality on territories and capable of **generating** and **distributing value**; moreover, it is oriented towards **sustainability, respect** and **listening** to people.

WE ARE A NATIONAL PLAYER...

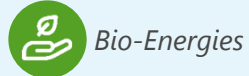
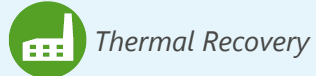
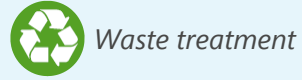
PLANT AND SERVICES OF A2A GROUP

Plants

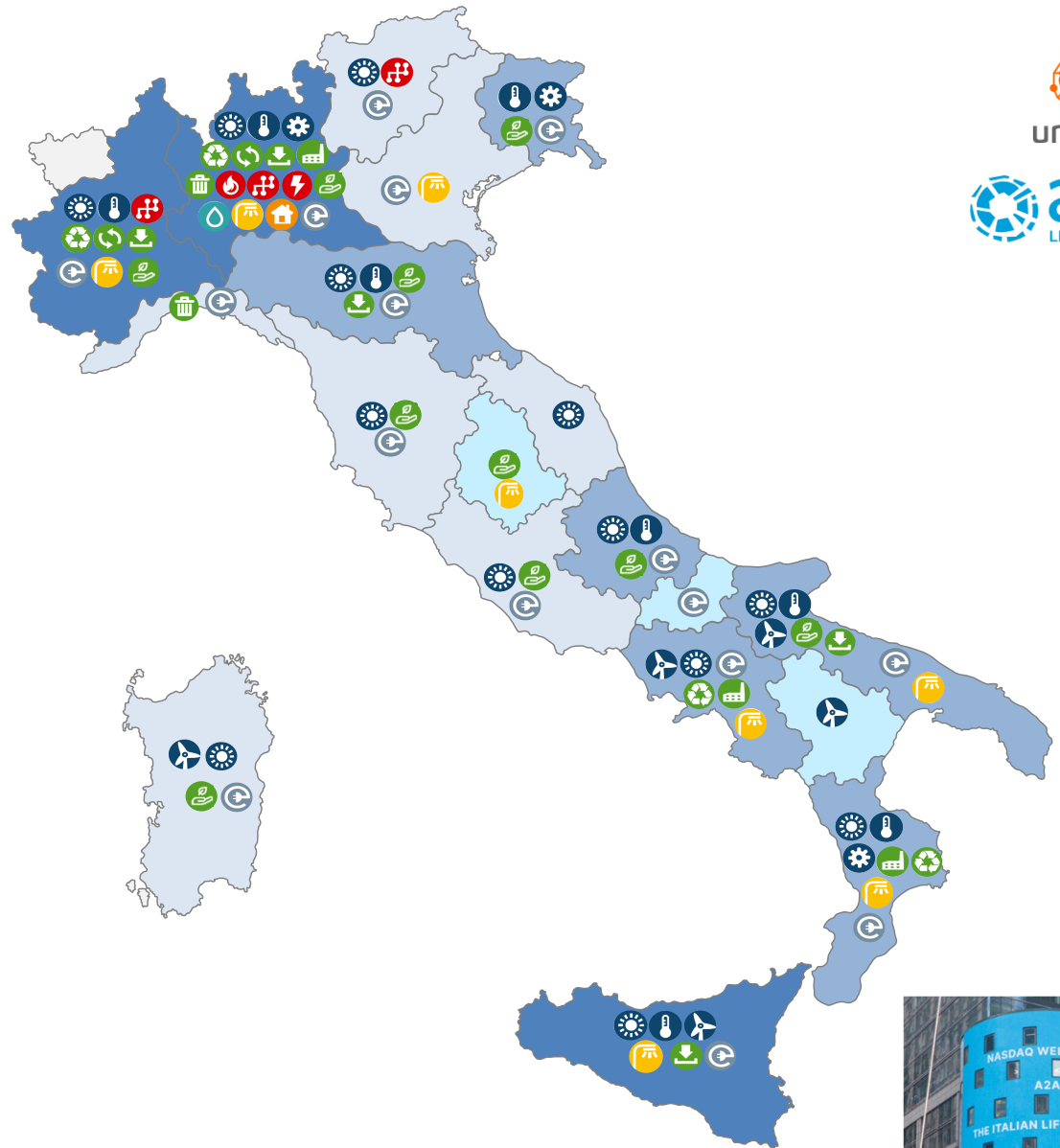
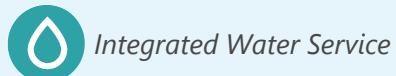
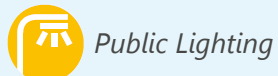
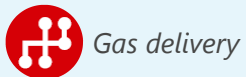
Energy



Waste



Services



unareti



...BUT ALSO

This year A2A joins the **Nasdaq Sustainable Bond Network**, the platform on **Sustainable Finance** which gathers investors, issuers, investment banks and special organizations.



Unareti is the **gas** and **electricity** distributor of the **A2A group**



THE INDUSTRIAL REALITY

1.2M EE customers



1.1M GAS customers



5 km HV cables
5.770 km MV cables
8.766 km LV cables

**ELECTRIC
GRID**

25 km High Pressure pipeline (mPa)
802 km Medium Pressure pipeline (mPa)
4.300 km Low Pressure pipeline(mPa)

**GAS
NETWORK**

49 Primary Substations HV/MV – MV/MV
98 HV/MV – MV/MV transformers
8.657 MV/LV substations

**Substations
& Trafo**

**Pressure
Reduction Plants**

42 HP/MP plant
2.842 MP/LP plant

Milan + Rozzano

2 Districts supplied
Approx. 0,9 M POD

Brescia Area

46 Districts supplied
Approx. 0,3 M POD

Milan Area

7 Districts supplied
Approx. 0,8 M PDR

Other Areas

58 Districts supplied
Approx. 0,3 M PDR

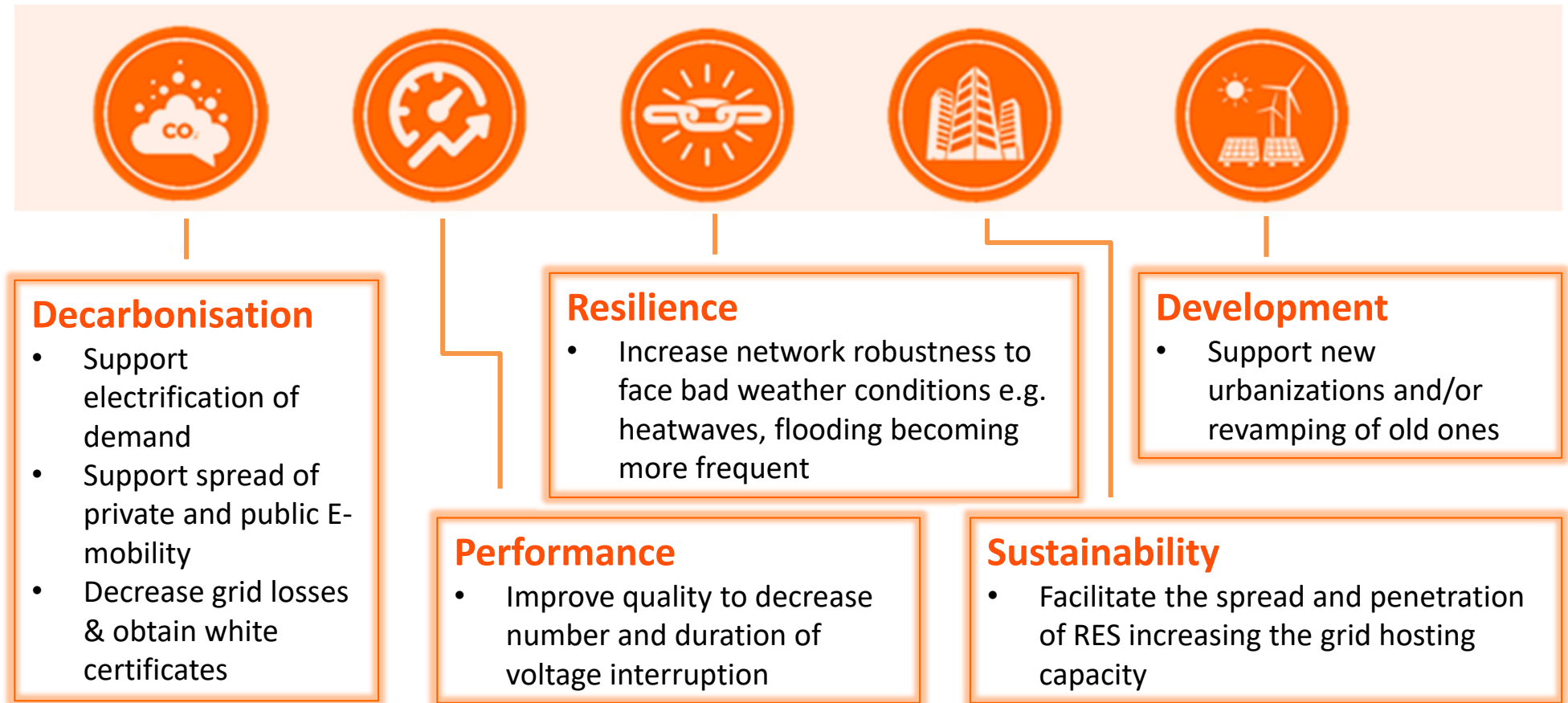
Unareti was the first distribution company in Italy to combine EE and GAS distribution in the search for **industrial synergies**, thanks to the large territorial overlap in the management of the two carriers

THE INDUSTRIAL REALITY

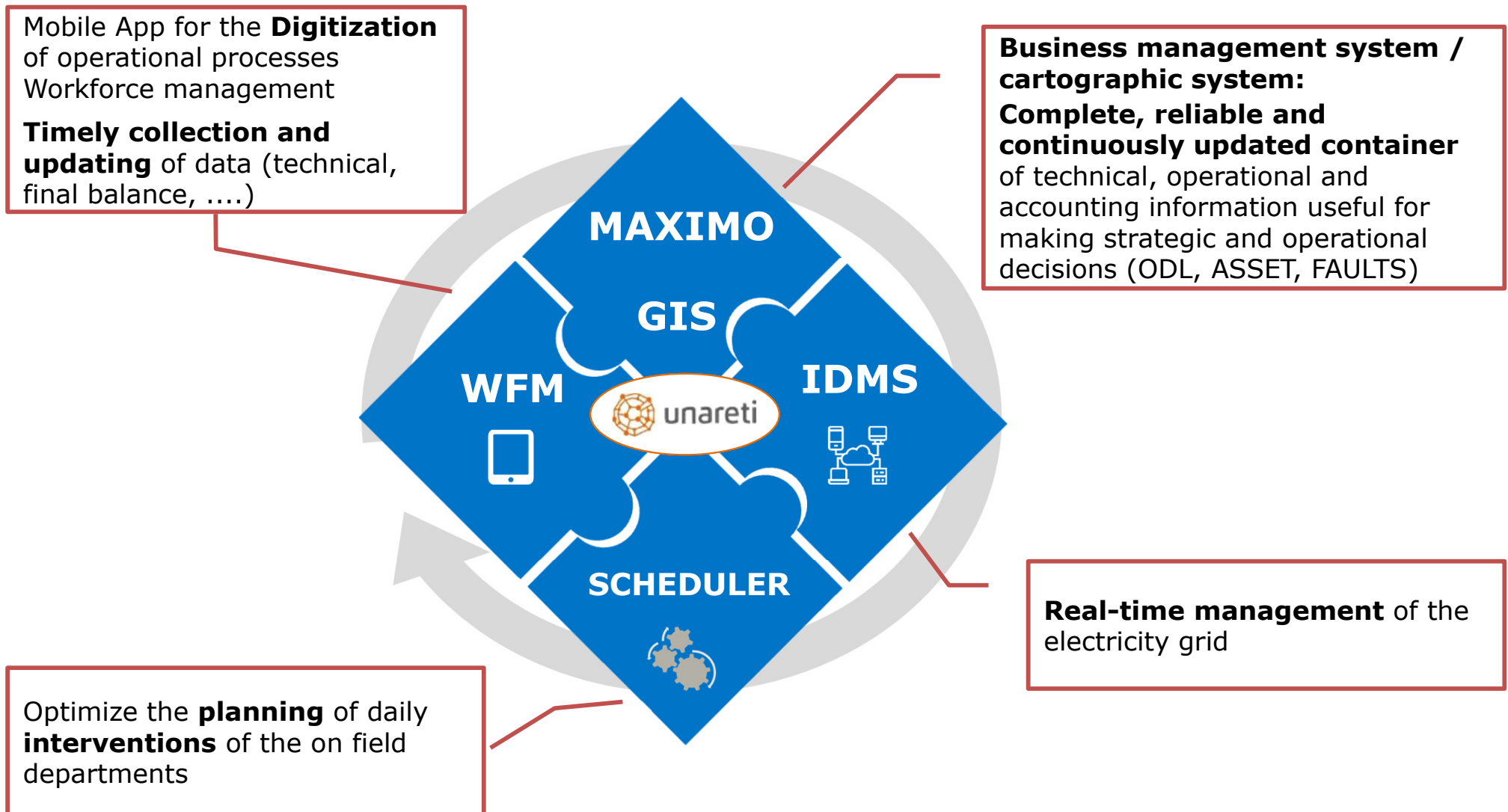
Development Plan



Our **Strategic Development Plan** intends to design the network and to **develop** the assets based on the following purposes:

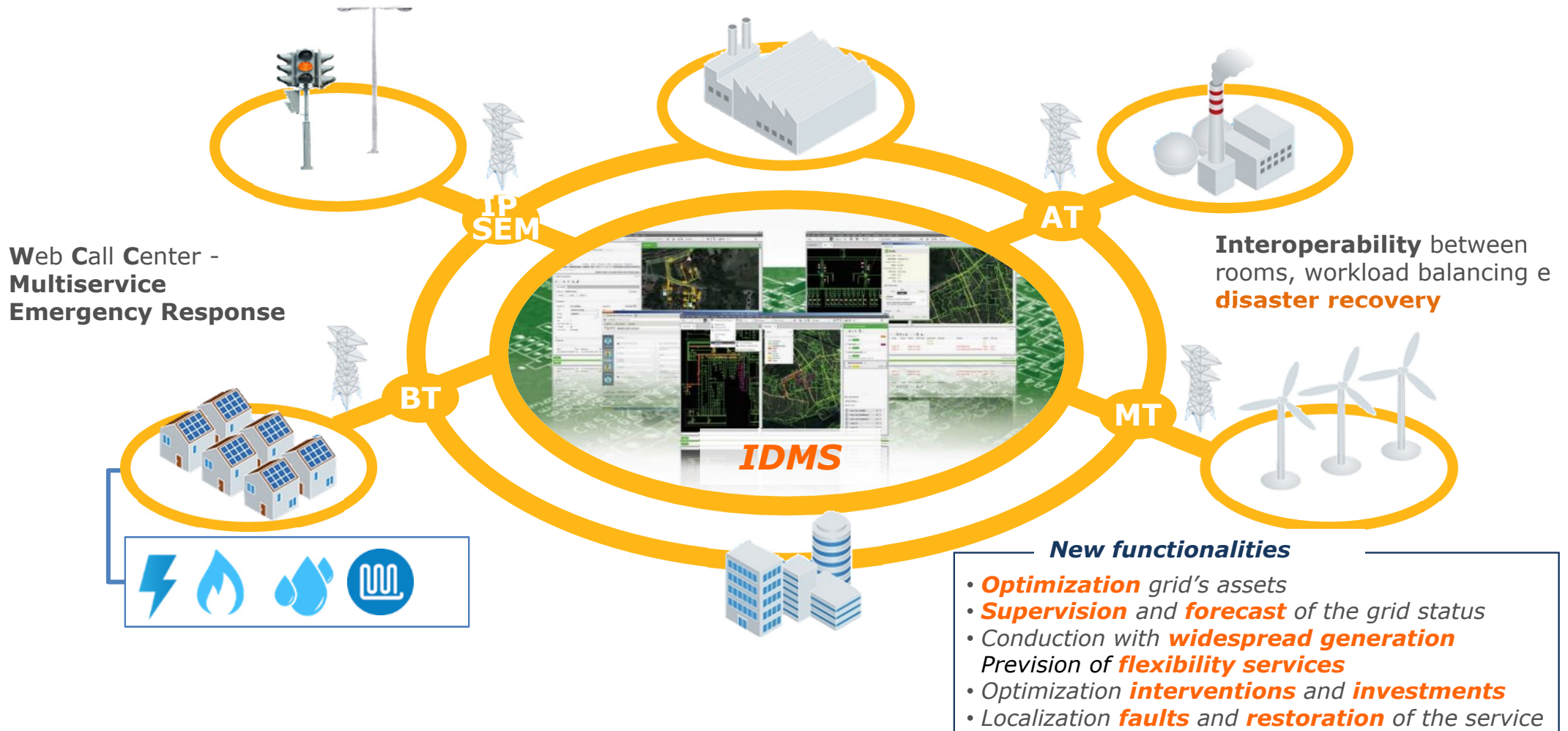


THE DIGITALIZATION INITIATIVES



THE DIGITALIZATION INITIATIVES

IDMS - Integrated Distribution Management System



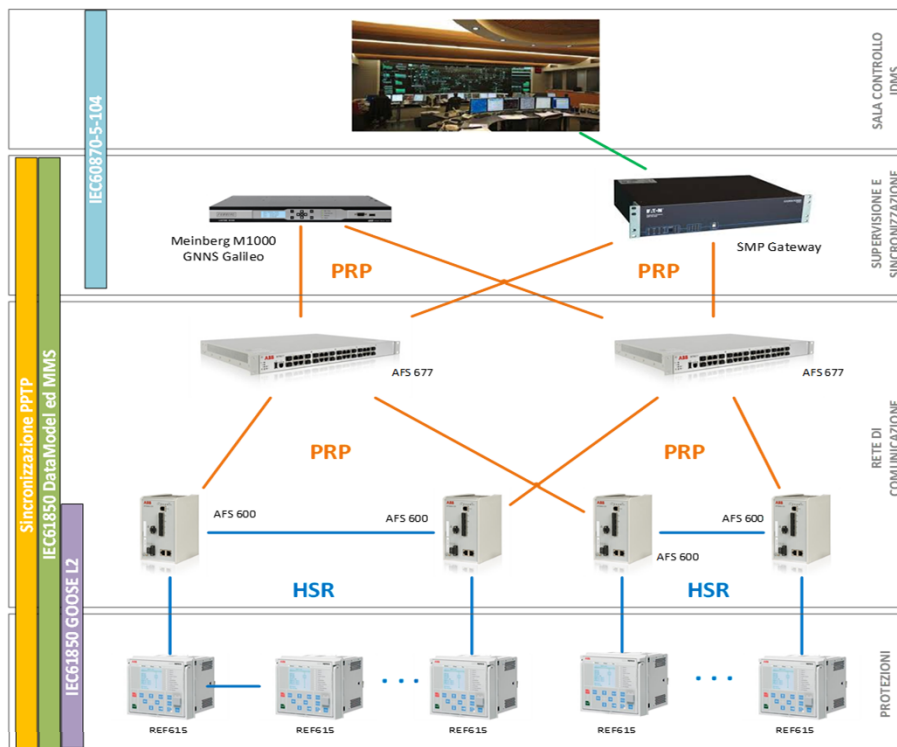
Brescia's control room is in operation since **January 2020**

In Milan's control room is activated since **December 2022**

In the course of **2021 - 2023**, activation of specific integration tools

THE DIGITALIZATION INITIATIVES

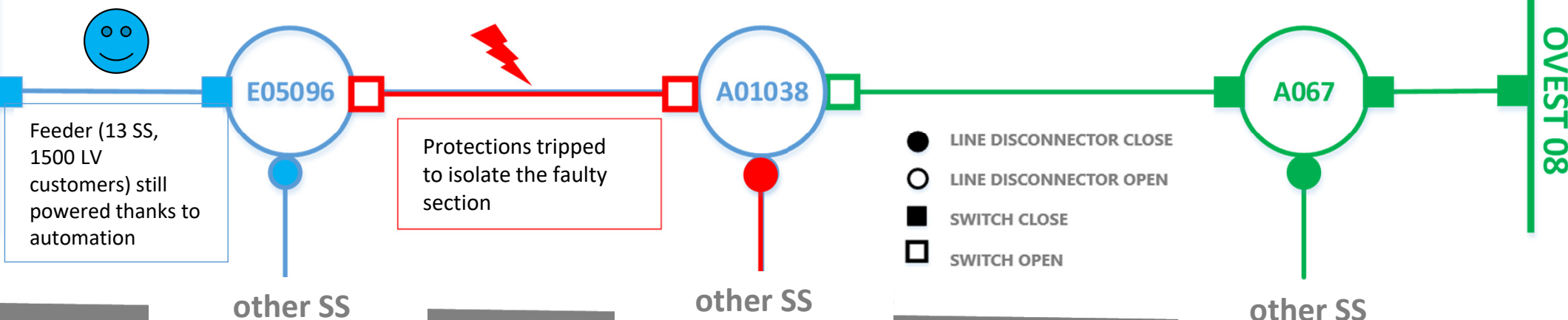
Network automation - Use of protections with IEC61850



Communication Protocol:

- Send messages for:
 - interblock
 - **coordination between IEDs**
 - logical selectivity
- Security Notice:
 - breaker failure
 - Block
- Control service
- Diagnostics

CLUSTER 2

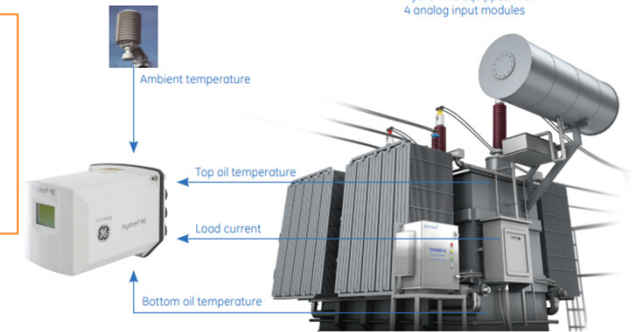


THE DIGITALIZATION INITIATIVES

Testing of transformer monitoring systems

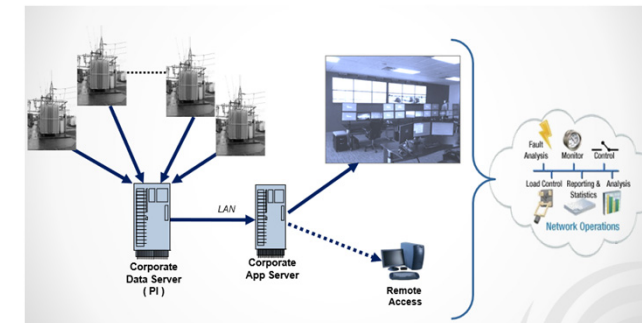


Hydran M2 equipped with 4 analog input modules



- **Dielectric oil monitoring:** monitoring of dissolved gases and humidity contained in the transformers' oil.

- **Sensors for detecting Stress Waves:** sensors for early detection of problems inside the transformer (oil level, electric arc, formation and collapse of gas bubbles)

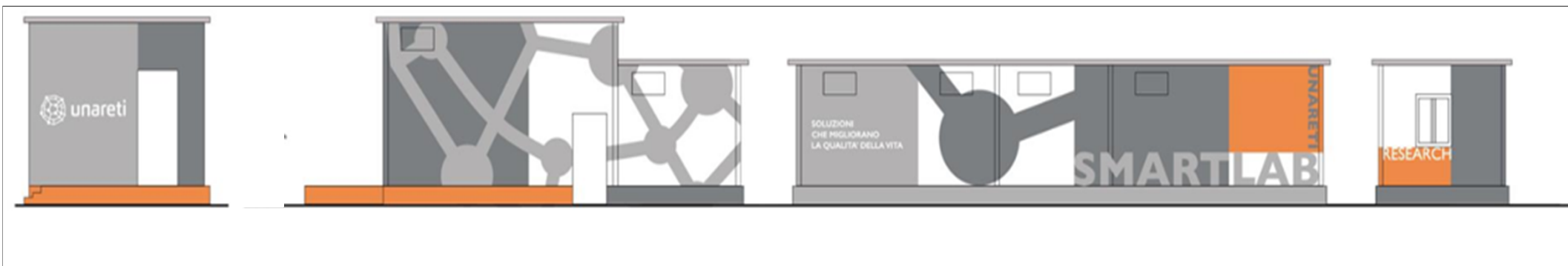


- **Infrared cameras:** monitoring / control of outdoor HV / MV sections allowed to send Real Time images and alarm signals to Control Room



THE DIGITALIZATION INITIATIVES

SmartLab Test Facility



SCOPE

- Test of innovative technologies that allow a better grid's management
- Face out with the new needs of the DSO
- Staff training
- Educational visits

PROJECTS CURRENTLY DEVELOPED IN THE SMARTLAB

- Horizon EdgeFlex
- Digital Substation
- LV remote controlled switchgears
- LV monitoring Systems

THE ARTIFICIAL INTELLIGENCE INITIATIVES

Relysense-Preventive Diagnostics



- ❑ Anticipate the failure or schedule maintenance interventions to reduce the risk of possible service interruptions.
- ❑ Development of a **reliability classification tool** for sections to prioritize **network diagnostics**.

APPROACHES

Model	Database Used	Methodology
Expert Driven	1. Construction features 2. Cartography	Robust portfolio Modeling techniques based on expert opinion
Condition Monitoring	1. Petersen Coil's signals 2. Service Protocols	Machine learning techniques based on Petersen Coil's measurements

RESULTS

Expert-Based (2019 back-testing)	Expert-Based (2020 field-testing)
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Effectiveness of Diagnostics
(faults intercepted on total sections diagnosed)

31%
Scheduled diagnostics (full year projection)

43%
Diagnostics indicated by the tool
(with 250 diagnostics potentially 80 avoidable failures)



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Thank you for your attention

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