



fervo

FACILITY AND ENERGY
MANAGEMENT
GROUP

FEAMS® REAL ESTATE GETS SMART

DIGITAL TECHNOLOGY IN THE SERVICE OF ENERGY
EFFICIENCY, PERFORMANCE OPTIMIZATION, AND
CARBON FOOTPRINT REDUCTION

FEAMS®

REAL ESTATE GETS SMART

WE GIVE VOICE TO ASSETS

▶ A NECESSARY CHANGE

▶ The international real estate world is going through a period of great change, characterized by **new awareness** and **growing needs** that are revolutionizing the industry.

These transformations are being driven by three main trends: acceleration on **sustainability**, focus on **energy**, and **new user paradigms** for buildings and infrastructure. The traditional "immobility" that

characterized asset-facility-energy management in the past gives way to a new "**fluidity**", making a **change in approach and tools necessary**. Adopting proactive and predictive logics to manage uncertainty and improve operational efficiency is an increasingly successful approach, as it reduces unexpected costs and extends the useful life of assets. Without compromising on personal well-being within workplaces and infrastructure.

Crucially, nearly 40% of global carbon dioxide emissions are attributable to the real estate sector and involve all phases of the building life cycle: design, construction, management and maintenance, redevelopment or disposal. Achieving the goals set by the EU's Green Deal can therefore not be separated from strong actions in this field.





SUSTAINABILITY

The adoption of **environmentally friendly business policies** has become **vital** for the preservation of our planet. Numerous initiatives are trying to promote a sustainable future, including the **Paris Agreement**, -which aims to limit global warming through the reduction of greenhouse gas emissions - the **17 Sustainable Development Goals** of the **UN** and the **ESG** criteria that encompass environmental, social and governance aspects. Unfortunately, the current picture sees all countries lagging **behind expected results**, which are based on KPIs, as many programs have been fielded with a qualitative slant, but too few with a quantitative one.

New tools and technologies to implement strategies to **reduce CO2 emissions**.

ENERGY

In recent years, the **energy management** of buildings has undergone radical transformations due to three reasons:

- Unpredictable fluctuation of costs;
- Fluctuations in availability;
- Growing use of renewable sources and associated incentives.

These factors have prompted the market to increasingly look for solutions on procurement and savings plans by means of stand-alone systems and/or upgrading existing systems to increase their efficiency.

Targeted interventions and energy optimization solutions, with the ability to **monitor consumption** and reduce costs.

USE OF INFRASTRUCTURE

The real estate sector is undergoing a **deep transformation** in response to a change in the needs and priorities of people, corporations, and government. The widespread dissemination of remote working has led to a radical transformation of workplaces. Traditional spaces, such as offices and coworking, require renovation and general redesign to meet the growing security and wellness needs of hybrid work. This evolution has resulted in a shift from a **stable employment model** to a **more flexible** one, where the dynamics within the buildings are no longer certain: as a result, it is **difficult to predict** in advance how many employees will be present at any given time, as well as **what services will be needed** to ensure the correct level of well-being at all times.

Implementation of solutions aimed at optimizing services that enable intervention when and where appropriate, thus ensuring efficient management of resources, reduction of unplanned expenses, and extension of the operational life of assets.

To meet these emerging needs, it becomes essential to base operations on timely, reliable data available in real time.



► EFFICIENCY MEANS LISTENING

► **Feams®** (Facility & Energy Asset Management System), the proprietary technology developed by FERVO, is the **innovative integrated software platform** for **management** and **service optimization** of maintenance and energy management throughout the life cycle of a building. This platform can make connections between different systems (dedicated BMS, EMS and SW) and provide a complete overview of each asset.

The software makes it possible to **constantly monitor data** with transparency and in a non-invasive manner, thanks to its **user-friendly interface** and customized **dashboards**. The accuracy of the data, all conveniently accessible and organized in one place, enables proactive and predictive strategies.

Ease of use reaches its peak in settings with complex

real estate parks composed of buildings of different types. Feams® offers the ability to **harmonize** and **aggregate** data efficiently. With a simple click, it is possible to view the health of the entire asset portfolio, part of it or down to the individual property, enabling targeted action on service and consumption management with utmost attention to people's well-being.

▶ WHY FEAMS®

▶ IT IS SIMPLE

- **Easy installation:** thanks to a balanced combination of connection to existing systems and strategic placement of dedicated sensors.
- **Ease of use:** through a single intuitive portal, harmonized data collected from different sources are accessed.
- **Wide availability of data:** a wide range of information, from summary indicators to extremely granular details, according to the rights and roles defined within the organization.

▶ IT IS SMART AND HIGH-PERFORMANCE

Feams® employs **advanced AI and machine learning** systems to closely monitor assets, anticipating and preventing any unforeseen events and malfunctions, with the goal of maximizing efficiency.

▶ IT PROVIDES REAL-TIME DATA

Using state-of-the-art sensor technologies and highly efficient cloud systems, Feams® provides real-time data for **constant and immediate monitoring**.

▶ IT IS MODULAR AND SCALABLE

Feams® architecture is designed to provide the flexibility to add, customize, and remove, allowing the integration of additional functionalities without compromising already defined features. This approach ensures a **customized experience** tailored to the needs of each user.



▶ A HOLISTIC VISION

▶ Feams® can cover every area of infrastructure across their entire life cycle. This encompasses both established aspects, such as **technology facilities management**, as well as ancillary activities that can be optimized through the integration of smart solutions, e.g., reception, parking, and fleet management control.

▶ A relevant activity is **smart energy and utilities management**, the main areas of improvement once a piece of infrastructure is operational. In addition, it is possible to monitor **air quality**, a key parameter for well-being within workspaces that is often overlooked.



Technological facilities management



Smart Reception & Surveillance
Smart Parking & Fleet

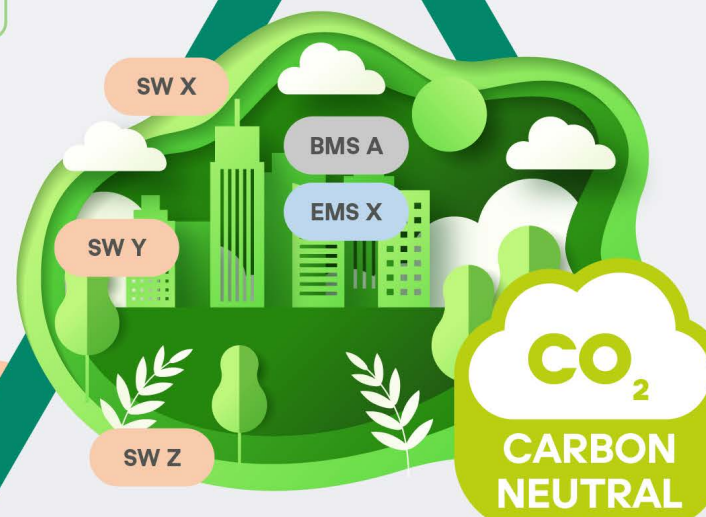
FACILITIES



Landscape & Smart City



Cleaning & Sanitation



UTILITIES

AIR



Energy



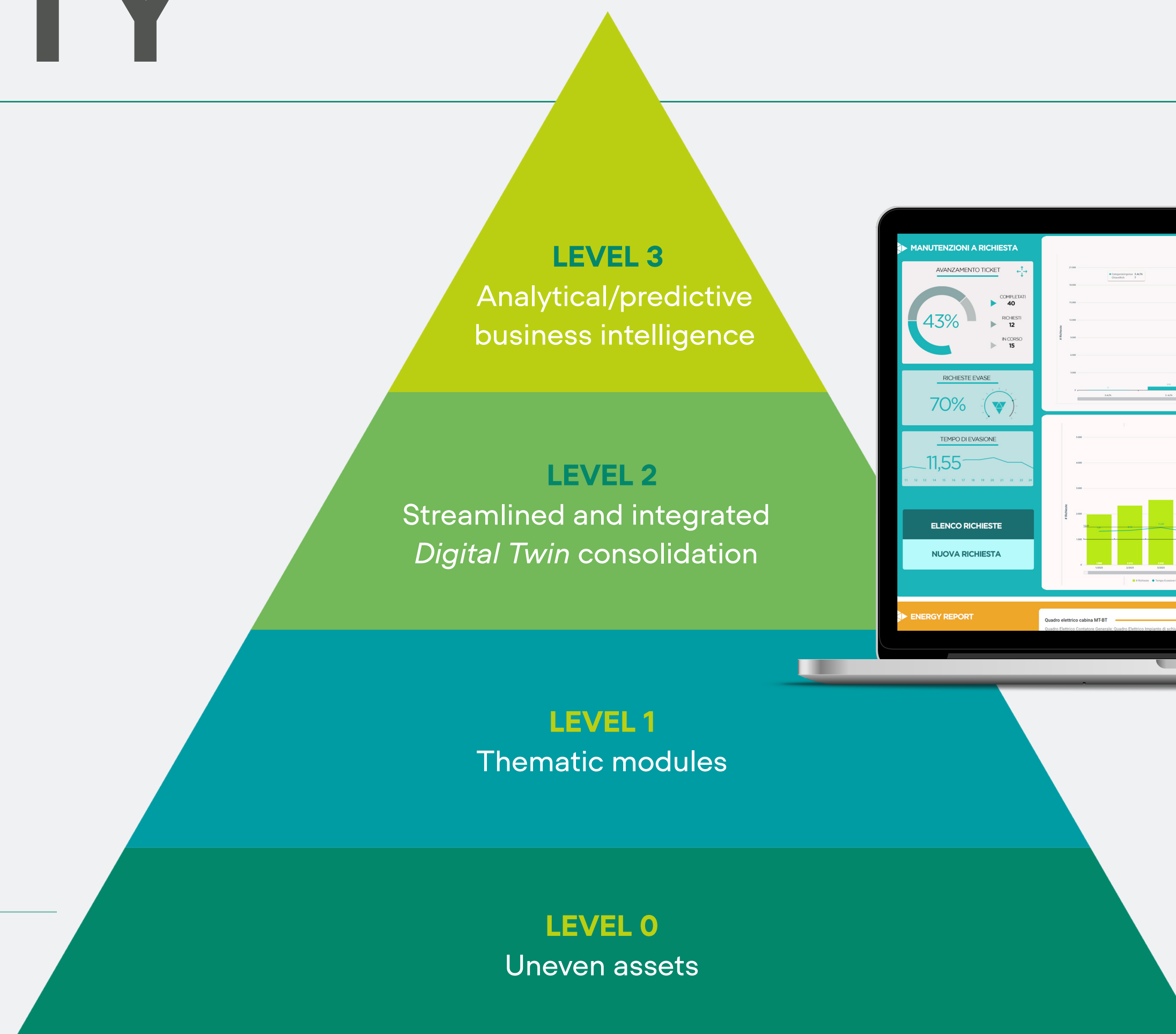
Indoor Air Quality

► The **end goal** is the **collection of data and the proposal of optimization plans** on all aspects of daily living, as each branch is addressed synergistically. For example, it is evident how the management of maintenance or cleaning services is closely related to the occupancy of spaces and their actual use, just as it is to the energy expenditure required to keep them aligned with the desired well-being standards. An integration that also has a direct impact on reducing the carbon footprint.

► It is important to note that the implementation of **Feams® does not require immediate massive investment**. Its extreme versatility allows for a **gradual approach**, both in terms of modules that can be activated and in expanding to new infrastructures, offering the **flexibility** needed to adapt to the specific needs of each organization.

► THE STRENGTH OF SIMPLICITY

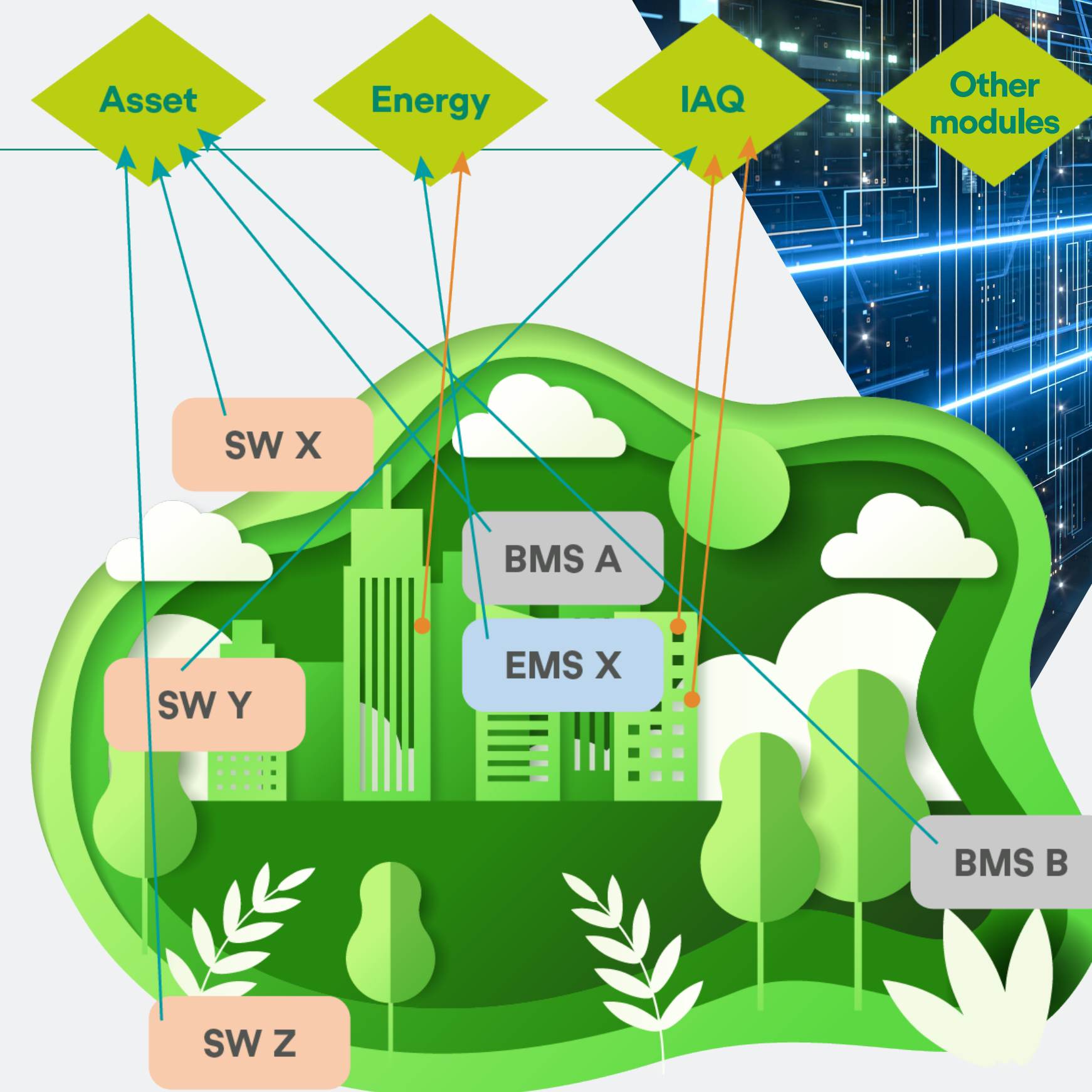
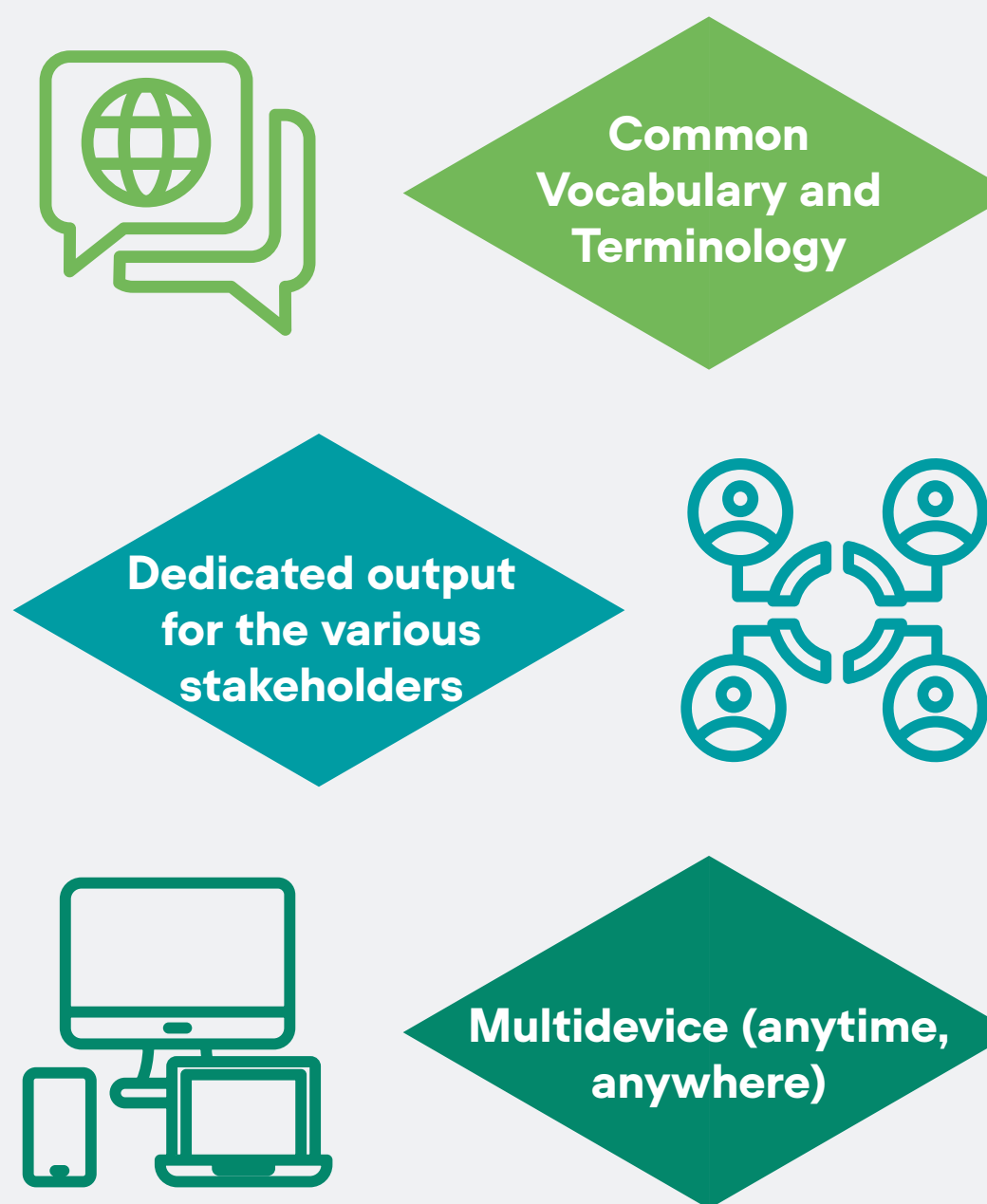
► The platform integrates with **pre-existing systems** and, when necessary, enriches them through the **installation of sensors** placed at key points for **monitoring** key asset operating parameters. These data are aggregated into **thematic modules** within Feams®, and then subjected to a selection, normalization, and harmonization process to ensure a clear and complete representation of the state of the infrastructure. This makes it possible to obtain a **detailed overview** without the need to analyze sub-systems individually.



► CLARITY AND VISUAL POWER

The ability to collect data from different sources, of different granularity and on different perimeters turns Feams® into a perfect management tool, as well as a technical one.

- **Organized** and hierarchical **data**, with common vocabulary among systems and aggregation by levels.
- **Summary indicators for performance measurement**, from which one can descend to the **operational detail**.
- 24/7 **supervision** and **reduction of interpretative effort** within and toward service providers.
- Better **visibility of correlated effects** in a complex system.
- **Reduction of administrative effort and time** required for asset park management. **Delegation and Assignment task** process made easier.



Data collected from existing systems (green arrows) integrated with ad hoc IoT sensors (orange arrows), independent of already installed systems.

▶ FRONT-END FEAMS®



ASSET AREA:

- ▶ CMMS (Computerized Maintenance Management System), BIM (Building Information Modeling, where applicable);
- ▶ Service level monitoring;
- ▶ Maintenance and intervention history;
- ▶ Predictive analysis of consumables change.

ENERGY AREA:

- ▶ EMS (Energy Management System);
- ▶ Monitoring consumption trends;
- ▶ Detection of real vs ideal operation;
- ▶ Predictive analysis for detection of potential malfunctions;
- ▶ Identification of optimization areas.

IAQ AREA:

- ▶ Air quality monitoring;
- ▶ Identification of optimization areas.

CO₂ AREA:

- ▶ Monitoring equivalent emissions during infrastructure life cycle;
- ▶ Verification of adherence to carbon footprint reduction plan;
- ▶ If Eco2Air® direct capture from the atmosphere proprietary technology is activated: monitoring progressive erosion of initial debt to achieve Net Zero Carbon point.

▶ A TAILORED PLATFORM

▶ Through the menu, one can explore the **portfolio of assets**, viewing Key Performance Indicators (KPIs) in the desired scope and assessing their compliance with predetermined goals. When in-depth technical analysis is needed, Feams® enables you to go from **aggregate data to individual data**, including histories, anomalies, discrepancies, peaks, and missing data.

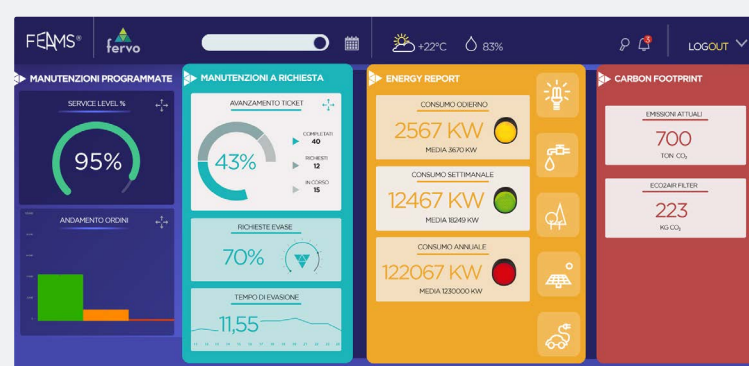
This opens the door to two different ways of using the platform output:

- ▶ a more **managerial** manner, suitable for property users/tenants who wish to monitor trends and comply with improvement schedules in order to be in line with set goals;
- ▶ a more **technical** manner, ideal for facility/energy managers or utility managers, who need a higher level of detail to map phenomena, identify and mitigate deviations, and optimize asset operations.

► Each visualization can be personalized and associated with users by assigning rights, thus ensuring that each user sees only data relevant to his or her responsibilities, reducing the sharing of irrelevant or sensitive information.

Owner/Property Manager High Level

The entire park



FEAMS® Front-end
Summary indicators



Property Manager/Tenant Mid Level

Focus on subsets of assets.

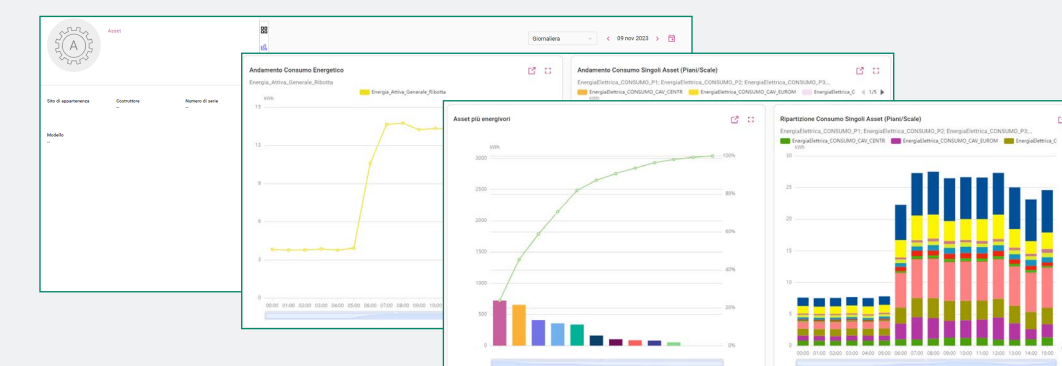


FEAMS® Front-end
Summary indicators focused on specific
needs by means of active selection



Asset Manager/Service Manager Lower Level

Detail on individual asset



High granularity of data within individual
FEAMS® modules (Facility, Energy, Indoor
Air Quality etc)
Easily accessible directly or through
Front-end navigation, thanks to Single
Sign-on



- Facility Energy
- Indoor Air Quality
- Carbon Footprint

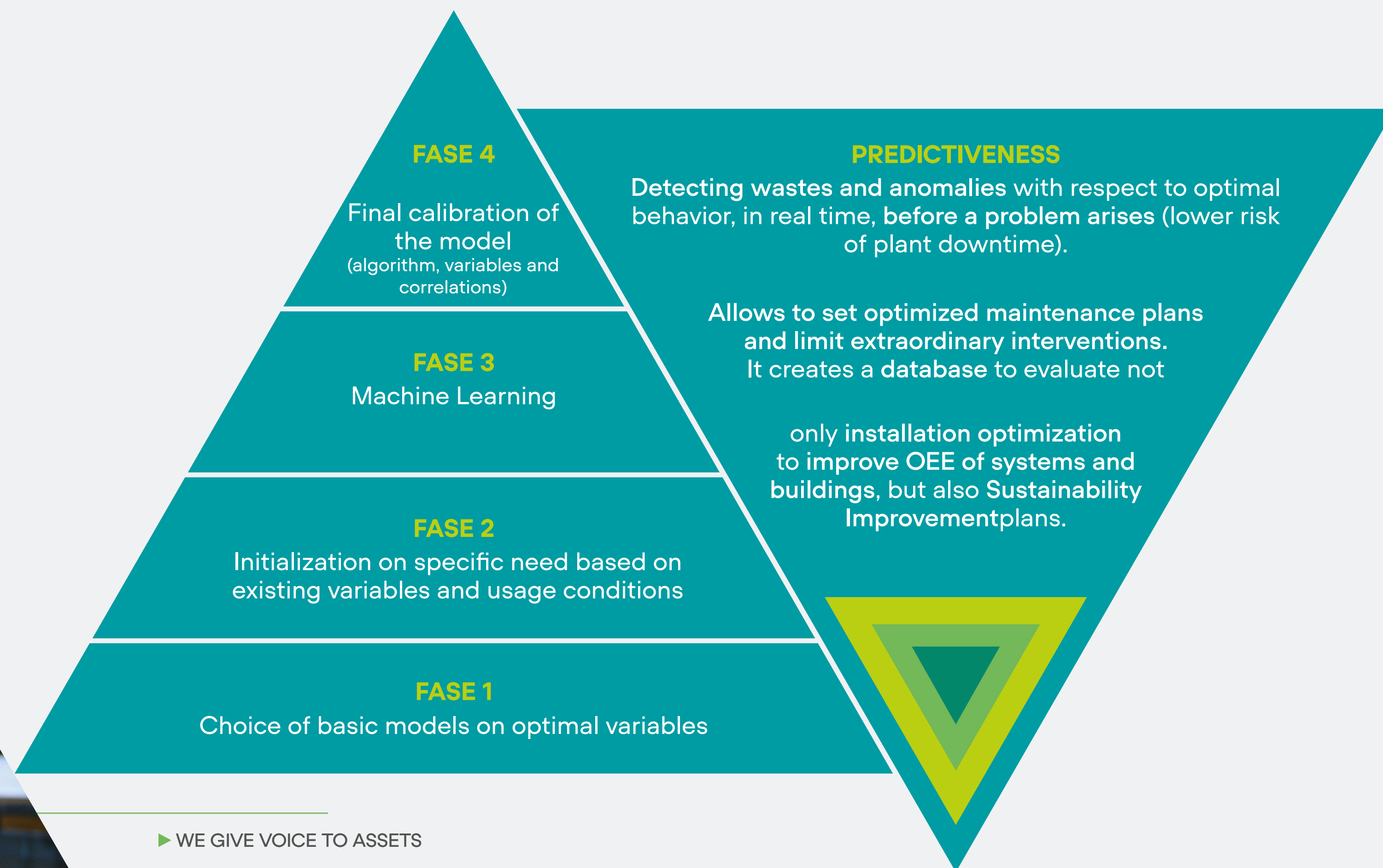
► THE FUTURE OF MAINTENANCE

► Predictive **maintenance** is aimed at anticipating and preventing potential failures in the systems within a building, such as thermal, electrical, or special systems. This is possible through the use of **IoT sensors, Algorithms of AI** and **dedicated software**. In this perspective, the use of technology plays a key role because it enables **timely interventions** that improve asset productivity, prolong asset life, and limit the number of unscheduled interventions.

The process begins with the **analysis of the collected data**, which are entered into **optimal operating models** and incorporate a number of specific features to monitor the status of each asset. Through the use of **machine learning** algorithms, within 6-8 months, the typical operating characteristics of each asset are stored, so that a customized **model** is created for each system. These are then constantly monitored for deviations from optimal operating parameters.



► Analysis of data and parameters can be entrusted to those managing maintenance services, enabling them to plan and optimize interventions.



► INTEGRATION AND SYNERGY

► Optimal use of Feams® emerges when it is implemented in collaboration with the **Operations Center**, the organizational unit responsible for planning maintenance activities, both routine and extraordinary. Also included within the latter are activities generated by tickets from AI systems that are analyzed and resolved before a disruption occurs.

Feams® in fact becomes the "**input**" tool of the Operation Center: **it aggregates, processes, and forwards** all relevant data. The Central Unit then takes charge of activating the teams of technicians in a preventive manner, **minimizing emergency situations**. Teams of geo-located technicians equipped with **advanced tools** such as viewers, cloud connection, and tablets, receive information about the required intervention and, once the operations are completed, upload details about the work performed to the system. This process takes place **in real time**, in a transparent and highly traceable manner. The entire process is thus optimized to the fullest extent possible, with a **smart and integrated approach** that enables a comprehensive asset management service, called **SERVICE 4.0**.

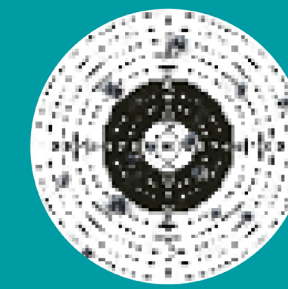
WHAT



Managing fluidity:
Listening, Learning
and Predicting



Implementing ad
hoc plans



Measuring
consistently



HOW

DATA DRIVEN APPROACH

Analytical tool

FEAMS®
fervo

Smart planning

Operations Center 4.0



fsi eco2zone vme
reclean omnireal

Optimized operations

Technical teams 4.0



Expertise
Logistics
Tools

Supporting leverage

New business
models, service
level, scalability

Innovation

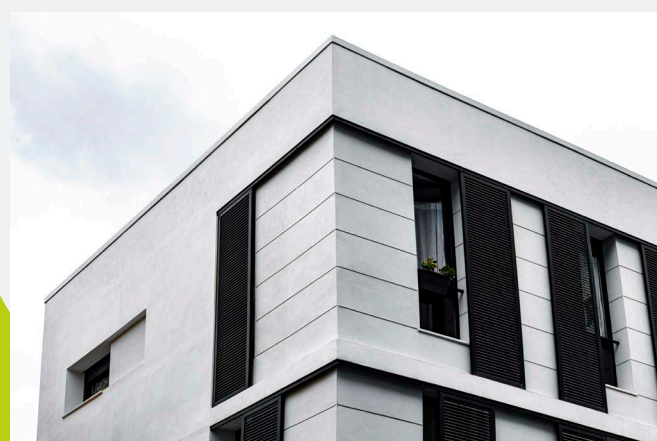
Training

Integrated management

SERVICE 4.0
Full asset
management



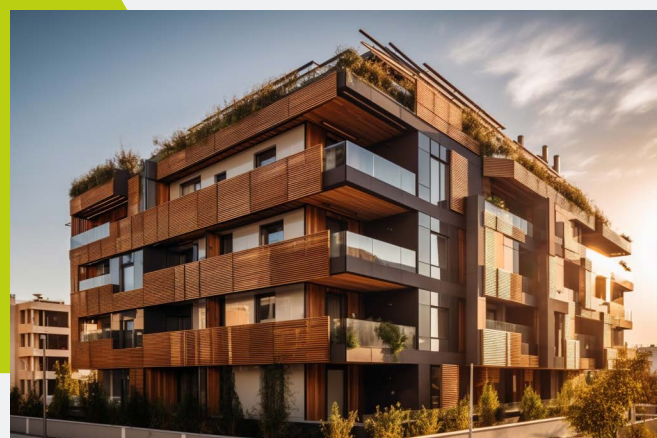
▶ FEAMS® IN ACTION



- ▶ Luxury building, completely renovated
- ▶ 40,000 sqm single-tenant office building

Facility Module Energy Module

We optimize accurate **monitoring** of **energy consumption**, including cost and metering management, as well as providing **input** for EGS dashboarding (example CO₂ production feeding industry platforms such as Deepki). We also implement **predictive maintenance** solutions to extend the life of assets and reduce the carbon footprint in the **sustainability balance** of Tenants/Property.



- ▶ Luxury building, new construction in Net Zero Carbon perspective
- ▶ 40,000 sqm multi-tenant office building

Facility Module Energy Module CO₂ Module.

We perform detailed **monitoring** of **energy consumption**, including related **costs** and metering, and provide **input** to feed into energy management system (EGS) dashboards. In addition, we implement **predictive maintenance** solutions that help extend the life of assets and reduce the attributable carbon footprint in the **sustainability budgets** of Tenants/Property.



- ▶ Industrial complex with a vocation for sustainability
- ▶ Offices + production on which a photovoltaic system has been installed

Energy Module Energy Module (specific)

We perform accurate **monitoring** of **consumption energy**, providing analysis of **costs**, accounting records and **input** to feed into energy management system (EGS) dashboards, for example concerning CO₂ production. We implement **predictive maintenance** solutions that help extend the life of assets and reduce the carbon footprint in the **sustainability balance** of Tenants/Property. We monitor the efficiency of **photovoltaic systems** and use the collected data to provide the legally required **energy diagnosis**.



▶ FERVO GROUP

- ▶ **Engineering, data, and technology** to rethink your real estate and work environments.
- ▶ We apply innovative **digital solutions and tools** to enhance and improve spaces through customized **consulting**, ad hoc **design**, and the **provision of facility and energy management services**.

▶ **6 OFFICES IN ITALY** ▶ **+ 1 OFFICE IN MIDDLE EAST**

▶ **over 620** STAFF (INCLUDING RECLEAN)

▶ **over 68** MILLION EURO REVENUE IN 2022

▶ **over 2** MILLION SQUARE METERS MANAGED

Nova Milanese

Verona

Genoa

Bologna

Florence

Rome

Damman

ALL THE INNOVATION IN ONE PLATFORM



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► WE GIVE VOICE TO ASSETS

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