MOBIUS
THE RISK MANAGEMENT COMPANY



SOLUTION FOR SCHOOLS AND EDUCATIONAL BUILDINGS

MOBIUS OEAM Schools

Energy efficiency · indoor environmental quality · maintenance and safety

A technical presentation document adapted to urban school campuses in Romania. Building model: a technical basement + ground floor + two upper floors. Objective: safe operation, comfort for pupils and controlled costs.

Domains monitored: energy · indoor air · teaching assets · sports · surveillance · perimeter. The final configuration is set after a survey, an inventory and an audit of the installations. · 19 September 2026

MOBIUS SOFTWARE · TECHNICAL PRESENTATION

LETTER OF INTENT

Energy efficiency and operational management for school buildings

To	The management of the educational institution / the local authority / the administrative service
Reference	Energy efficiency and operational management for school buildings
Objective	Assessment and phased implementation of the MOBIUS OEAM platform, integrated with MOBIUS UEAM
Date	19 September 2026

Dear Principal,

In a school, energy and technical installations directly affect safety, comfort and the continuity of teaching. Uneven heating, poor indoor air, water losses, lighting used outside school hours or repeated faults can generate high costs and unsuitable conditions for pupils and staff.

MOBIUS OEAM brings together in a single picture the data on consumption, assets and interventions in the building, classrooms, the gym and sports grounds, the surveillance system and the institution's perimeter. The solution includes an inventory of school furniture and teaching equipment, tracks their condition, location and the work carried out, detects deviations, prioritizes actions and keeps a verifiable history of repairs.

The central benefit

Reducing energy waste, maintaining comfort and air quality, preventing faults and documenting interventions. Any savings estimate is validated through initial measurement, a reference profile and a pilot; this document does not promise percentages without real data.

Initial proposal

A technical visit, an inventory of installations and assets, choosing a pilot scope — usually the technical basement, the main distribution board and one floor — and then setting the indicators and thresholds.

1 · THE SCHOOL'S OPERATIONAL CONTEXT

An urban building with a technical basement, a ground floor and two upper floors

The ground floor usually concentrates access, administration and common areas; the upper floors include classrooms and laboratories; the basement houses the boiler room, pumps, booster set and main distribution board. The structure is indicative and is adapted to each school.

DOMAIN	ASSETS AND SIGNALS	RISK TRACKED
Electrical	MDB, floor boards, lighting, sockets, IT lab, possibly photovoltaic panels	Overload, imbalance, consumption outside school hours, poor power quality
Heating and ventilation	Boilers / heating substation, pumps, valves, radiators, fans, filters	Uneven temperature, excessive consumption, fault or incorrect setting
Air quality	Temperature, humidity, CO_2 in classrooms, occupancy / timetable	Stale air, discomfort, insufficient ventilation or waste
Water and plumbing	Meters, booster set, tanks, hot water, sewerage	Leaks, night-time consumption, insufficient pressure, freezing
Safety	Fire alarm panel, gas detectors, emergency lighting, doors and access	Alarm, unavailability, difficult evacuation, unauthorized access
Sports and exterior	Gym, sports grounds, changing rooms, outdoor boards and lighting	Consumption outside school hours, faults, discomfort and unavailability
Video surveillance	Cameras, recorders, network switches and storage	Cameras unavailable, loss of recording or communication
Perimeter	Gates, intercom, access control, lighting of paths / facades / fence	Dark areas, unauthorized access and faulty circuits

MANAGEMENT OBJECTIVES

- Consumption and cost visible by building, level, zone and category of use.
- Heating and ventilation correlated with the school timetable, occupancy and weather.

- Alerts prioritized by safety, comfort, continuity of activity and cost.
- A single intervention flow for the administrator, technical staff and contractors.
- A verifiable history for installations, school furniture, teaching equipment, inspections, incidents and results.

2 · THE SCHOOL BUILDING MODEL

Every board and installation linked to the level and zone it serves

This way, a deviation can be located quickly and put into the context of the school timetable.



Figure 1. Conceptual model: technical basement, ground floor, two floors and the data flow to MOBIUS OEAM.

LEVEL	EXAMPLE FUNCTIONS	PRIORITY MONITORING
Second floor	Classrooms, IT / science laboratories	Floor board E2, lighting, temperature, CO_2, consumption by schedule
First floor	Classrooms, offices, library	Floor board E1, lighting, temperature, CO_2, water in the toilets
Ground floor	Access, administration, common areas, gym / canteen where present	Ground floor board, access, lighting, water, temperature, occupancy
Technical basement	Boiler room, pumps, booster set, MDB	Energy, gas, water, temperatures, pressures, statuses and efficiencies

3 · THE SCHOOL CAMPUS — OUTDOOR AREAS AND SECURITY

Beyond the main building

MOBIUS OEAM extends the model beyond the main building. The gym, outdoor grounds, surveillance cameras, gates and perimeter lighting are managed as distinct zones and systems, but correlated with the school timetable and with the same asset records.

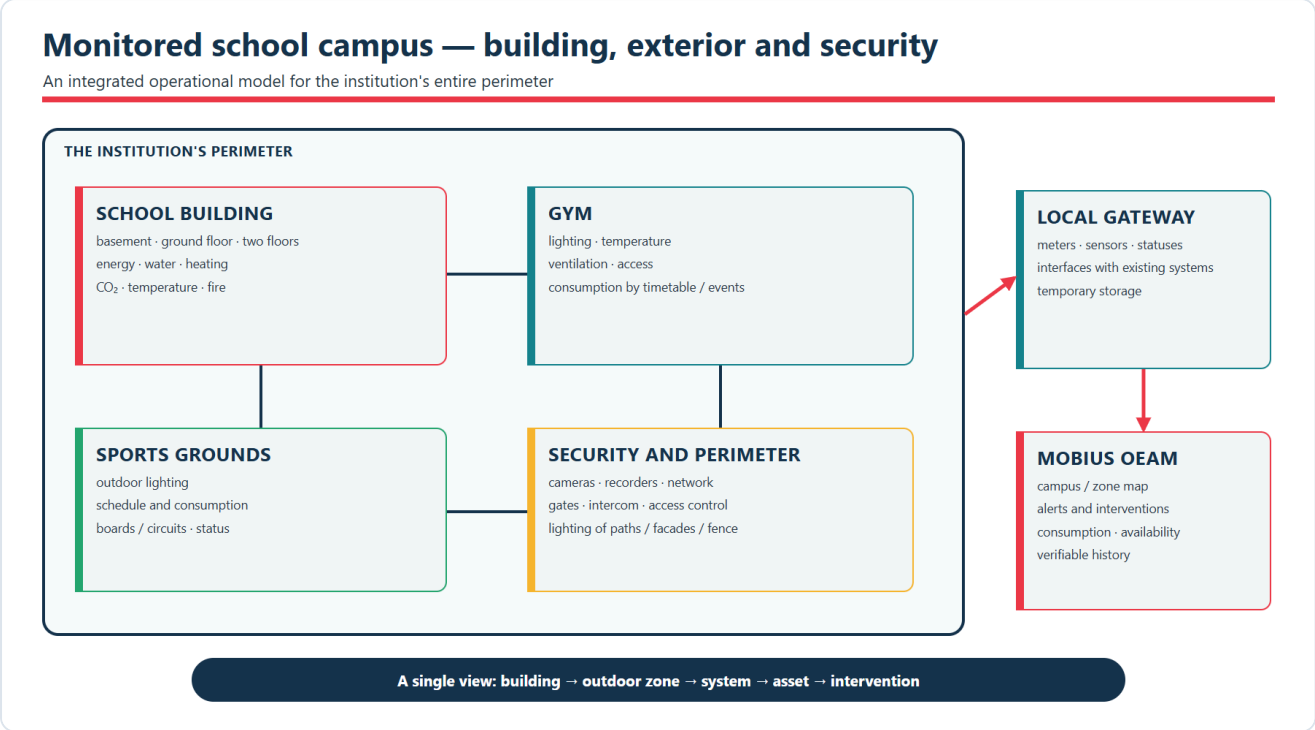


Figure 2. A conceptual model for the whole school campus and the institution's perimeter.

ZONE / SYSTEM	ELEMENTS TRACKED	OPERATIONAL RESULT
Gym	Electrical board, lighting, heating, ventilation, temperature, access and changing rooms	Consumption by schedule / event, comfort and localized maintenance
Sports grounds	Floodlights, outdoor boards, timers, sockets and circuit status	Controlled use, detection of faulty lamps / circuits and unjustified consumption
Video surveillance	Cameras, recorders, power supply, storage and communication	Technical availability and an alert when the signal or recording is lost
Access and perimeter	Gates, intercom, access control, lighting of paths, facades and fence	Operational safety, differentiated schedules and rapid intervention

Limit of use

MOBIUS OEAM monitors technical availability and approved events. It is not used for facial recognition or for analyzing pupils' behavior, and video images remain in the dedicated surveillance system, in accordance with the client's rules and data protection.

4 · RECOMMENDED MEASUREMENT POINTS

What is measured, and what it is used for

ZONE / SYSTEM	MEASUREMENTS	USE
MDB / incomer	kW, kWh, kVAR, power factor, voltages, currents, THD	Overall balance, peaks, power quality and reconciliation with the bill
Floor boards	Power, energy, statuses and alarms	Allocation by level and locating the deviation
Boiler room	Gas / thermal energy, flow-return temperatures, burner status, operating hours	Efficiency, settings, frequent starts and maintenance
Pumps and booster set	Consumption, pressure, flow, hours, statuses	Abnormal operation, losses and wear
Classrooms	Temperature, humidity, CO_2; optionally occupancy	Comfort and indoor air correlated with the timetable
Lighting	Consumption by zone, status, schedule	Detecting operation outside school hours
Water	Flow, volume, pressure, night-time consumption	Leaks and specific consumption
Fire / gas / access	Technical statuses and events	Monitoring availability; local procedures remain the priority
Gym and sports grounds	kW, kWh, temperature, schedule, status of circuits and floodlights	Consumption by use, comfort and fault detection
Video surveillance	Camera / recorder status, power supply, storage and communication	Technical unavailability alert, with no image processing in OEAM
Perimeter lighting	Consumption, circuit status, schedule and approved command	Reducing unjustified operation and locating faults

Protocols and integration

Depending on the existing installations, collection can use Modbus TCP/RTU, BACnet, OPC UA, MQTT, APIs or digital and analog inputs. The local gateway validates and timestamps the data and keeps it temporarily when the link to the platform is unavailable.

Design principle

The platform does not replace protections, certified automation, the fire alarm panel, the gas detector or evacuation procedures. It integrates data, provides context and coordinates intervention within approved limits.

5 · FUNCTIONAL ARCHITECTURE

Field, local collection, analysis, representation and decision

The separation allows phased extension and keeps local collection going when communication is temporarily interrupted.

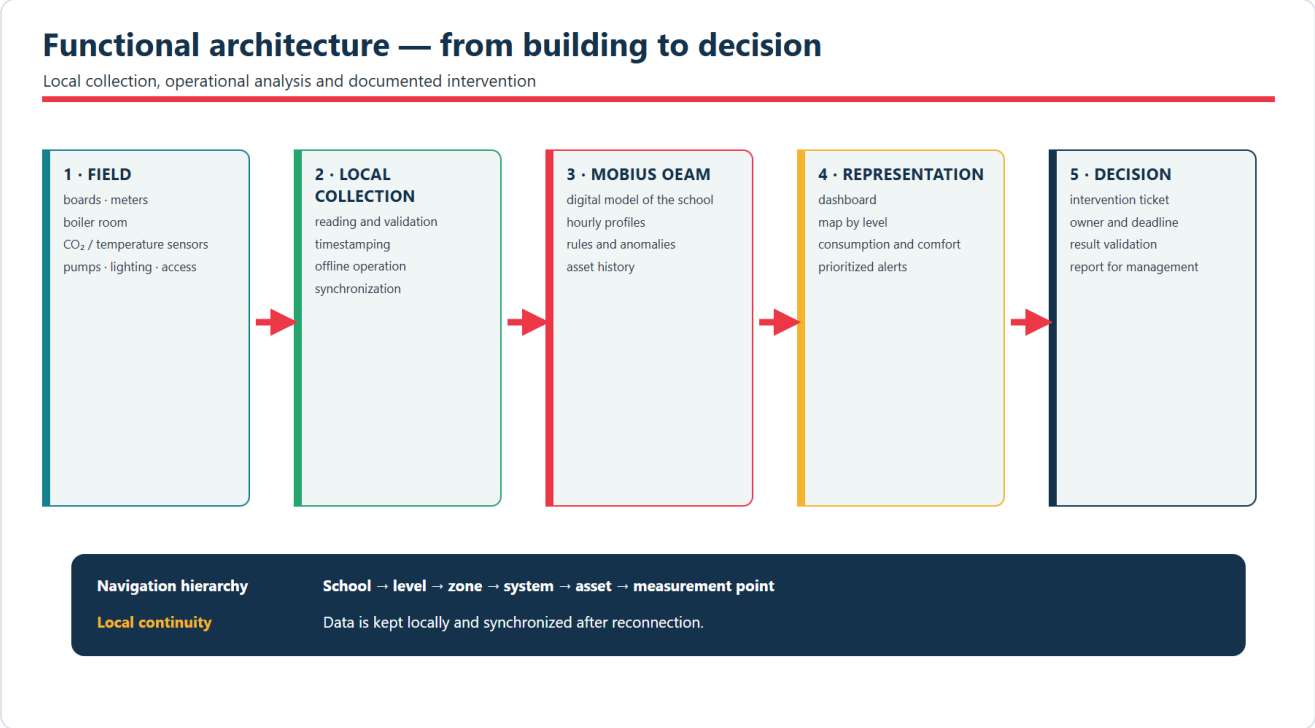


Figure 3. The functional flow from the school's installations to decision and intervention.

QUALITY AND CONTINUITY RULES

- Each signal has a source, unit, frequency, timestamp and owner.
- Missing values, implausible jumps and frozen sensors are explicitly flagged.
- Local data is retransmitted without duplication once the connection is restored.
- Alerts are issued only after the persistence and validation rules established in the pilot.

6 · OPERATIONAL REPRESENTATION

Each role sees what it needs

Management tracks cost, consumption and overall condition; the administrator sees alerts, levels and deadlines; the technician receives the asset, its history, recent values and the applicable procedure.

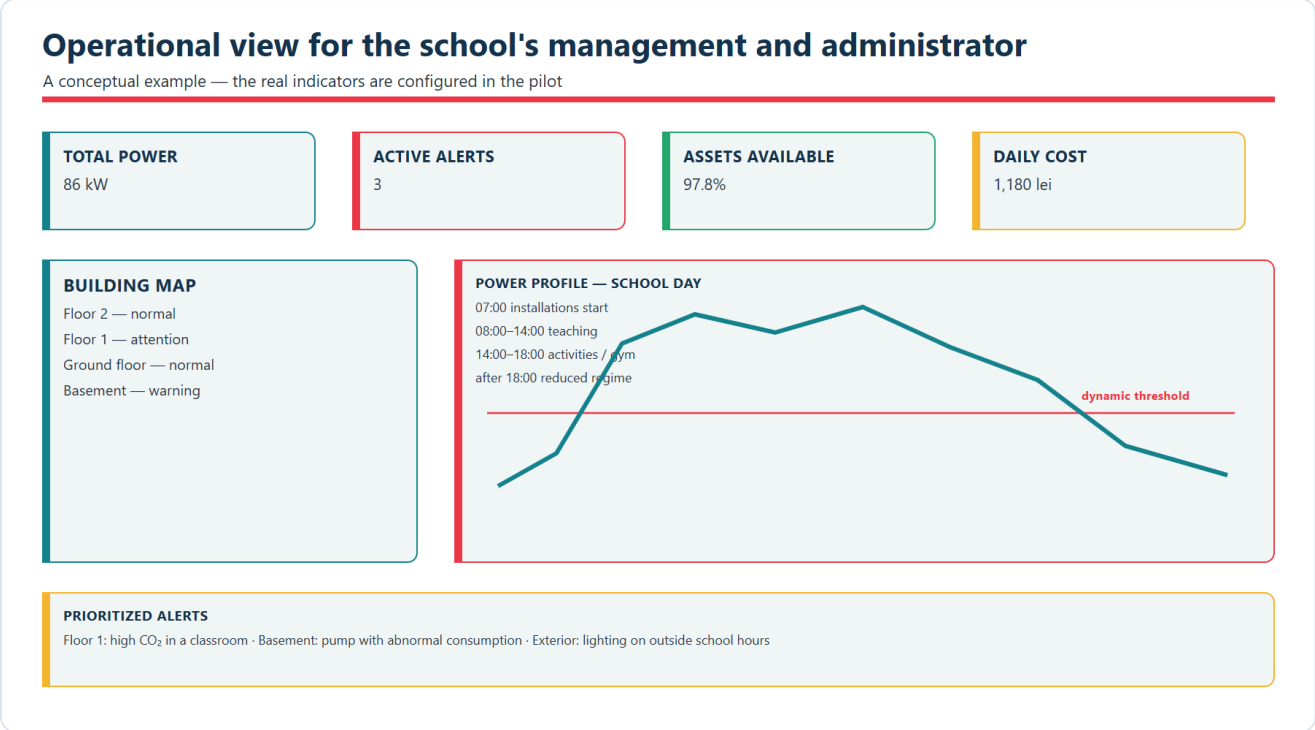


Figure 4. A conceptual example of a dashboard for a school; the values are illustrative.

VIEW	CONTENT	AUDIENCE
Executive	Cost, consumption, deviation from the reference profile, incidents	Principal, local authority, financial officer
Building	Map by level, color-coded status, consumption and comfort	Administrator, technical officer
System / asset	Trends, alarms, history, documents and interventions	Technical staff / contractor
Reporting	Energy indicators, verified savings, log	Energy manager, audit, management

7 · INTERVENTION MANAGEMENT

From detecting the deviation to remediation, validation and an updated history

A validated anomaly is completed with the level, zone, asset and recent values. The rule sets the priority, and MOBIUS UEAM creates the ticket and routes it to the right person, with a deadline and mandatory evidence.

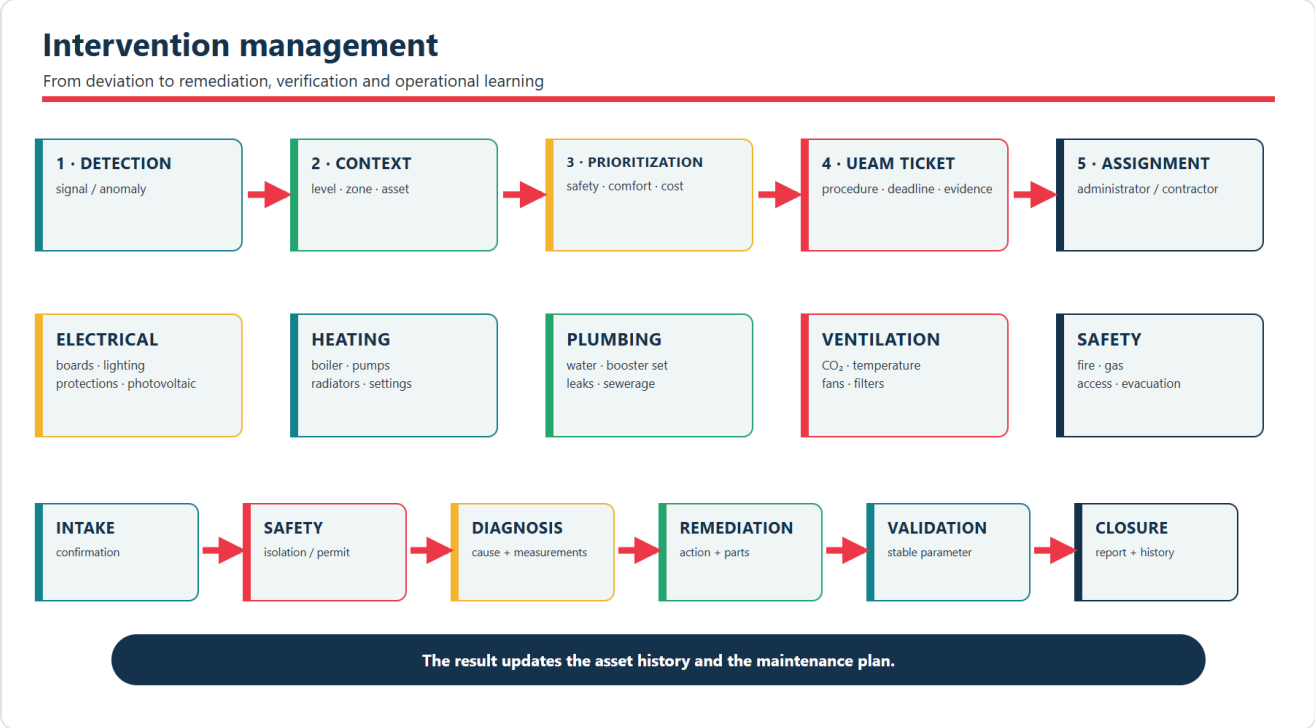


Figure 5. From detecting the deviation to remediation, validation and updating the history.

MINIMUM TICKET CONTENT

- Time, source, parameter, value, threshold, duration and data quality.
- Building, level, room, system, asset and potential impact.
- Owner, required competences, deadline, escalation and contact person.
- Action, measurements, materials, photos, cause and result.
- Confirmation of return to the accepted range before closure.

8 · TEAMS AND RESPONSE MATRIX

Each event reaches the right person

TEAM / ROLE	EVENTS	INITIAL ACTION
Administrator / technical officer	General alert, unusual consumption, access, repeated incident	Confirms the context, protects the area, assigns and escalates
Authorized electrician	Overload, imbalance, board unavailable, faulty lighting	Locates, isolates safely, measures and repairs
Heating installations	Boiler off, abnormal pump, insufficient temperature	Checks the source, pumps, valves and settings; ensures continuity
Plumbing	Leak, night-time consumption, low pressure	Protects the area, isolates the approved circuit and checks the fittings
Ventilation / environment	High CO_2, temperature or humidity out of range	Checks occupancy, ventilation, filters and settings
Fire / safety	Fire alarm, gas, emergency lighting or access	Immediately applies the dedicated procedure; the platform informs and documents
Security / IT	Camera unavailable, recorder or network fault, access not working	Checks power, communication and storage; escalates without exposing images
Exterior / sports	Faulty floodlight, night-time consumption, outdoor board or gym unavailable	Locates the circuit, checks the schedule and repairs under safe conditions

INDICATIVE LEVELS

LEVEL	CRITERION	RESPONSE
Information	Deviation with no immediate impact	Monitoring and scheduled analysis

LEVEL	CRITERION	RESPONSE
Warning	Persistent deviation, discomfort or increased cost	Ticket and technical check
Critical	Risk to people, the operation of the school or an essential asset	Rapid confirmation and escalation
Emergency	Fire, gas, major flooding or immediate danger	The emergency procedure takes priority; traceability in parallel

9 · EXAMPLE SCENARIOS

How the platform behaves in everyday situations

A — high CO_2 in a classroom

The sensor shows a persistent increase during the lesson. The platform checks occupancy and history, issues a warning and recommends checking ventilation. After airing the room or fixing the fan, closure takes place only once the parameter has returned to the set range.

B — abnormal consumption by the heating pump

At comparable outdoor temperatures and schedules, the pump consumes more than the reference profile. The team checks the filter, valve, bearing and operating point. MOBIUS OEAM compares the subsequent profile with the reference and quantifies the result.

C — lighting on during holidays or at night

Consumption exceeds the threshold specific to the unoccupied regime. The alert indicates the level and circuit. The administrator checks the schedule, the automation or a faulty contactor, then documents the cause and the measure taken.

D — a leak or night-time water consumption

Flow remains active outside school hours. The platform distinguishes justified consumption from a persistent deviation and creates the intervention for checking the toilets, the tank and the fittings.

E — a camera or recorder unavailable

The platform receives the technical status of the surveillance system and locates the equipment without taking the images. The person responsible checks power, communication, storage and configuration, and the intervention is logged.

F — perimeter lighting or a sports ground on without justification

A circuit remains active after school hours or a floodlight does not confirm operation. MOBIUS OEAM correlates the status with the timetable, zone and consumption, then opens the intervention for the outdoor board or the light fitting.

G — a gas detector / fire event

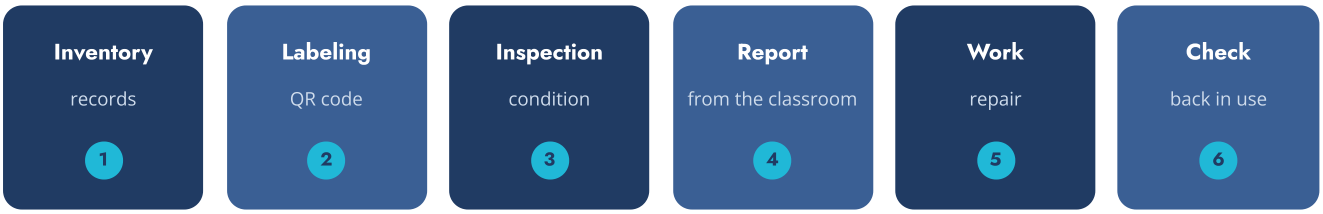
Local systems and legal procedures act independently and without delay. MOBIUS takes the status, locates the event, notifies the approved roles and keeps the operational log; it does not replace calling the emergency services.

10 · SCHOOL FURNITURE AND TEACHING EQUIPMENT

Asset records down to each classroom

MOBIUS UEAM extends asset records down to the level of each classroom. Each item can be given a unique code and a QR code label, so that its inventory, condition, location, owner and intervention history are available in a single record.

CATEGORY	ITEMS INVENTORIED	DATA AND ACTIONS
School furniture	Desks, chairs, teacher's desks, cabinets, shelves, boards and panels	Quantity, condition, classroom, repair, transfer and scrapping
Teaching equipment	Interactive whiteboards, projectors, computers, printers and laboratory equipment	Serial number, warranty, inspection, fault, consumables and documents
Mobile equipment	First-aid kits, fire extinguishers and other approved equipment	Presence, inspection deadline, owner and non-conformities



Reports can be opened directly from the classroom by scanning the QR code. For each intervention, the fault found, priority, owner, materials, photos, cost, deadline and confirmation of return to use are kept. Periodic inspections support repair planning, redistributing equipment between classrooms, substantiating purchases and the documented retirement of items that can no longer be used safely.

11 · MOBIUS OEAM MODULES FOR SCHOOLS

Seven modules and a campus extension

MODULE	APPLICATION
01. Acquisition and integration	Meters, analyzers, sensors, automation, existing systems and the school timetable
02. Real-time monitoring	Power, energy, temperature, CO_2, water, statuses and current cost
03. Alerts and dispatch	Thresholds, persistence, notifications, tickets and escalation
04. Analysis and diagnostics	Balance, reference profile, specific consumption, power quality and comparisons
05. Optimization and assisted control	Heating / lighting schedules and peak reduction, only with approvals and interlocks
06. Reporting and compliance	ISO 50001, indicators, budgets, audit and exports
07. Artificial intelligence / machine learning	Forecasting, anomalies, energy signatures and human-reviewed recommendations
Campus extension	The gym and sports grounds, technical surveillance, access and perimeter lighting on the same operational map

PROPOSED PHASES

PHASE	CONTENT	RESULT
1. Diagnosis	Inventory, diagrams, timetable, criticality and data map	Scope confirmed
2. Pilot	Basement + MDB + one floor; dashboard and tickets	Data and scenarios validated
3. Extension	All levels, utilities and teams	Complete visibility
4. Modeling	Reference profile, indicators, costs and reports	Verifiable savings

PHASE	CONTENT	RESULT
5. Optimization	Advanced rules and assisted control where safe	Demonstrated benefit

12 · THE EFFIPOWER PARTNER COMPONENT

Energy measurement and seismic protection, separately or together

MOBIUS OEAM can integrate the effiPower partner solution for measuring and analyzing energy, as well as for seismic protection. The components are distinct and can be implemented together or separately, depending on the technical assessment and the client's priorities.

COMPONENT	WHAT IT DOES	BENEFIT
Energy monitoring	Measures consumption and power quality in the MDB, floor boards and major installations	Visibility, diagnostics, cost breakdown and measurement-based decisions
Seismic protection	Detects seismic loading and locally commands, according to the design, the transition of certain utilities to a safe state	Reduced secondary risk of fire, leaks and blocked access

THREE LEVELS OF ENERGY ANALYSIS

LEVEL	QUESTION	RESULT
N1 — Visibility	What is happening now?	Current consumption, history and balance by level
N2 — Diagnostics	Why does the deviation occur?	Alerts for power quality and installation problems
N3 — Economic	How much does it cost and what savings are confirmed?	Costs, avoidable penalties and the result per intervention

The analyzers can measure voltages, currents, power, energy, power factor and total harmonic distortion. The configuration, measurement class and mounting points are set in the design.

13 · SEISMIC PROTECTION AND TRANSITION TO A SAFE STATE

Protecting pupils in an earthquake

For a school, seismic protection can target in particular the gas supply to the boiler room, evacuation doors with electric locks, the local alarm and shedding of some non-essential circuits. The exact logic is designed with authorized specialists and tested in a controlled way.

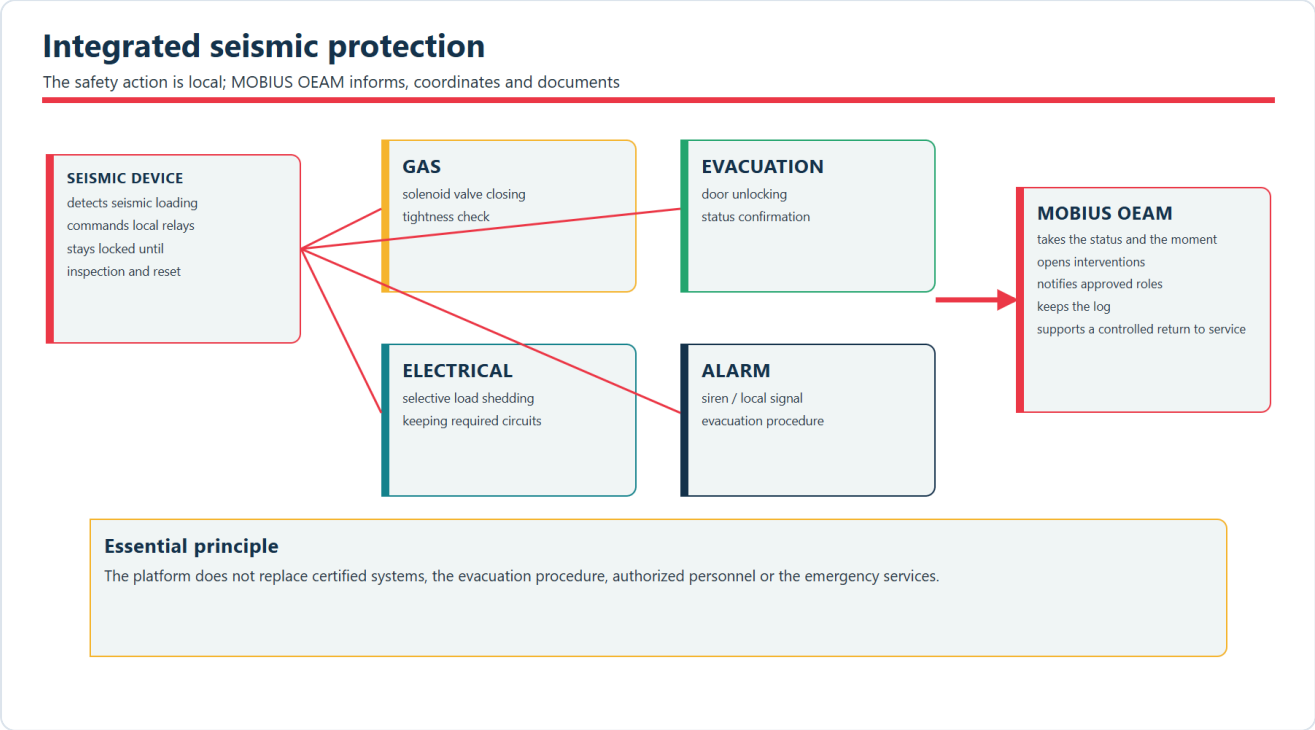


Figure 6. Conceptual integration of local safety actions with MOBIUS OEAM.

UTILITY	POSSIBLE LOCAL ACTION	MOBIUS OEAM / UEAM ROLE
Fuel gas	Closing the solenoid valve with positive safety, according to the design	Ticket for a tightness check before return to service
Evacuation doors	Automatic unlocking, if the system is designed this way	Confirming the status and logging the event
Non-essential circuits	Selective load shedding, without affecting safety systems	Visualization and a controlled re-energizing plan
Alarm	Siren or local signal according to the approved scenario	Notification, coordination and traceability

14 · INDICATORS, SECURITY AND GOVERNANCE

What is measured, and how the system is protected

CATEGORY	EXAMPLE INDICATORS
Energy	kWh/m², kWh/pupil, maximum power, power factor, THD, deviation from the reference profile
Comfort and air	Hours within the temperature range, time above the CO_2 threshold, humidity and complaints
Heating	Weather-corrected consumption, flow-return temperatures, boiler / pump hours and starts
Water	m³, night-time consumption, estimated losses and flow alerts
Assets	Availability, recurring faults, mean time to repair and preventive maintenance
Campus and security	Camera / recording availability, access status, perimeter lighting hours and sports ground / gym consumption
Financial	Cost per building / level / system, cost during holidays and verified savings
Data	Completeness, latency, invalidated values and duration of local operation

SECURITY AND GOVERNANCE REQUIREMENTS

- Separation of technical networks from educational and administrative networks.
- Role-based access and logging of viewing, configuration and interventions.
- Encryption, authentication, backups and tested restore.
- No automatic command to a safety system without risk analysis, interlocks, testing and approval.
- A single nomenclature for assets, sensors, rules and owners.
- Occupancy data is limited to what is operationally necessary; identifying pupils is not assumed.

15 · PILOT PROPOSAL

A representative pilot, without disrupting teaching

The recommended pilot includes the technical basement, the main distribution board and a representative floor, including an inventory of furniture and teaching equipment in the selected classrooms. The scope allows energy to be correlated with heating, lighting, air quality and the condition of equipment.

DELIVERABLES

- A technical and equipment inventory for the pilot classrooms, with asset records and QR code labels.
- A digital model of levels, zones, systems, assets and measurement points.
- An energy analyzer in the MDB and, where applicable, in the board of the chosen floor.
- Temperature and CO_2 sensors in representative classrooms.
- Technical monitoring of a sports area, a perimeter lighting circuit and the availability of the video system.
- A local gateway and connectors for the approved sources.
- An executive dashboard, a map by level and technical views.
- At least five tested alert and intervention scenarios.
- A reference profile for a school day, a weekend and a holiday.
- Training for the administrator and designated officers.

ACCEPTANCE CRITERIA

AREA	EXAMPLE CRITERION
Data	Completeness, latency and synchronization meet the agreed thresholds
Functional	The map, indicators and alerts reproduce the approved scenarios
Operational	Officers receive, confirm, document and correctly close tickets
Comfort	Temperature and CO_2 are correctly correlated with the timetable and occupancy
Benefit	A measurable improvement or technical conclusion is demonstrated

16 · CONCLUSION AND NEXT STEPS

From the boiler room to each classroom, one coherent picture

MOBIUS OEAM can create a coherent picture of a school's energy, indoor conditions and assets, from the main distribution board and the boiler room in the basement to the furniture and teaching equipment in each classroom, the gym and sports grounds, the surveillance system and the perimeter lighting.

The main value is the complete circuit: validated data → building and timetable context → prioritized alert → competent person → intervention → confirmation of the result and a verifiable history.

For public schools, the solution supports budget justification, prioritization of works and reporting to the local authority. For private networks, the same structure allows comparison between sites and a uniform assessment of performance. In both cases, savings and thresholds are established through measurement, not general estimates.

THE RECOMMENDED NEXT STEP

1. technical visit and collection of diagrams
2. inventory of assets, meters and protocols
3. choosing the pilot scope and indicators
4. installation, testing and acceptance plan

17 · GLOSSARY / LIST OF ABBREVIATIONS

Terms used in this document

ACM	Domestic hot water (Romanian abbreviation).
ANRE	The Romanian Energy Regulatory Authority.
API	A software interface used for integrating systems.
BACnet	Communication protocol for building automation.
BMS	Building management system.
CO_2	Carbon dioxide; an indicator used to assess ventilation and indoor air quality.
EnPI	Energy performance indicator, used in energy management.
HVAC	Heating, ventilation and air conditioning.
IoT	Connected devices and sensors for data collection.
ISO 50001	Standard for energy management systems.
KPI	Key performance indicator.
Modbus RTU / TCP	Industrial communication protocol over a serial line / Ethernet network.
MOBIUS OEAM	Platform for the operational management of energy and assets.
MOBIUS UEAM	Module for managing assets, tickets and interventions.
MQTT	Messaging protocol for connected devices.
Reference profile	A model of normal consumption, established from historical data and comparable conditions.
TDG	Main distribution board (MDB).
TD-P / TD-E1 / TD-E2	The electrical boards of the ground floor and the upper floors.
THD	Total harmonic distortion; an indicator of power quality.

NVR / DVR	Network / digital video recorder, used by the dedicated surveillance system.
CCTV	Closed-circuit television video surveillance system.
Ticket	An operational record of a report or intervention, with an owner, deadline and evidence.

Note

The list is adapted to this presentation. The terms and equipment actually used are confirmed by the building's technical design.

MOBIUS
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TECHNICAL ASSESSMENT & PILOT PROJECT

Safe, comfortable and efficient schools.

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