

ENVIRONMENTAL FIELD SERVICES

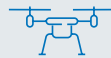
ENVIRONMENTAL FIELD SERVICE MANAGEMENT

We are an **ENVIRONMENTAL** engineering company specialized in industrial waste treatment and waste to energy platforms, soil remediation, wastewater treatment plants and renewable energy

**OWAC
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The integration of cutting-edge technologies, along with an uninterrupted **WORKFLOW** methodology and continued control mechanisms during the project advancements, enable us to design efficiently reducing undetermined details. Technological innovation is one of our levers to create value. It allows us to maintain high quality standards, thanks to an innovative and standardized design methodology.

We use integrated design platforms and BIM methodology, drones for surveys and monitoring, and virtual reality for design phases and measurements. Thanks to an open platform, where the project is shared, other than to a collaborative design approach, all team members have the tools to plan, design and build efficiently, mitigating difficulties that may arise during project development.

SURVEYS

Precision survey for large areas, development of 3D model, visual and thermal study

GEOLOGY AND GEOTECHNICS

On-site surveys, geological and geotechnical characterisation

BIM AND DIGITAL TWIN

Integrated design, BIM certified projects, use of DIGITAL TWIN to monitor the life cycle of buildings

INDUSTRIAL

Emissions monitoring, thermal inspections and visual surveys, piping inspections

ENVIRONMENTAL

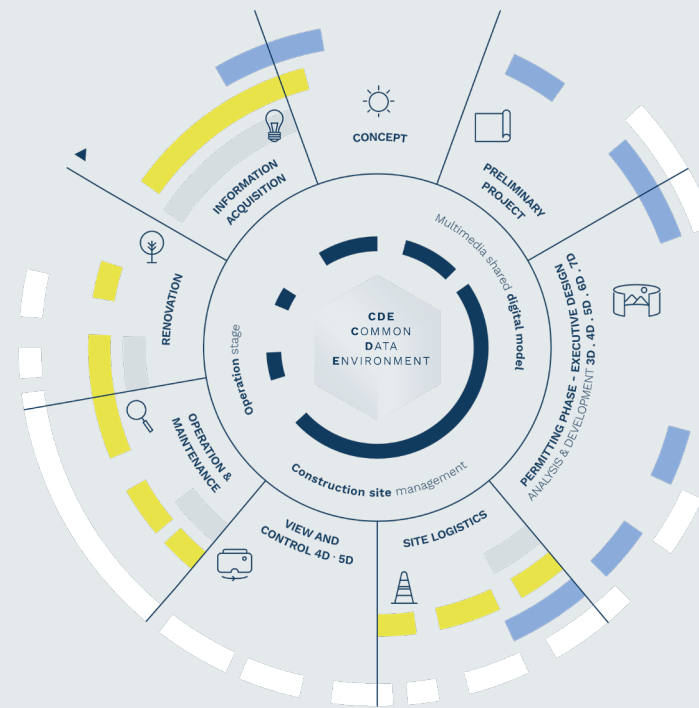
Environmental characterisation, air quality monitoring, development of diffusion models

UNDERWATER

Visual inspections, measurements, sample acquisitions

OWAC counts with **HIGHLY QUALIFIED PROFESSIONALS**, along with advanced technological resources and cutting-edge instrumentation that enable to rapidly acquire and produce data

The company currently holds RINA certification in compliance with ISO 9001:2015 for the “provision of Project Management services, civil and industrial design using Building Information Modelling (BIM) methodology, construction supervision, design validation and approval in accordance with applicable regulations.” This guarantees the interoperability of the BIM management process across all technical disciplines involved, ensuring the highest quality standards in line with the most recent industry regulations. The use and integration of various technologies, such as drones and laser



- BIM METHODOLOGY**
- LASER SCANNER**
- DRONES**
- VIRTUAL REALITY**
- MIXED REALITY**

scanners, as well as the adoption of devices for project visualization and control, like virtual and augmented reality, combined with standard (UNI 11337) activities of interference detection (clash detection) and inconsistency management (code checking), allow for the implementation of an efficient process. This reduces uncertainty and ensures accurate verification in terms of costs and shorter completion times.



ISO 9001:2015
ISO 45001:2018
UNI/PdR 74:2019
ISO 14001:2015
UNI/PdR 125:2022



22-02054
22-02055



CONCEPT

New project

Data acquisition, surveys, site characterisation



PROJECT

Workflow

Digital models development
architectural, structural, equipment / performance
Analysis
comfort, energy, costs, LCC, LCA, CFD, virtual reality, control and approval



ANALYSIS AND DEVELOPMENT

Characterisation management
Analysis
rendering, VR and MR, verification of built and design through 4D and 5D



OPERATION AND MAINTENANCE

Building life cycle management

assessment and management, general monitoring and performance assurance

ENVIRONMENTAL MONITORING

DRONES AND PRECISION SENSORS

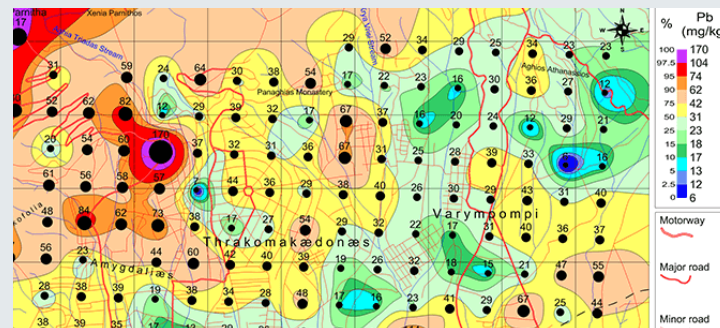
We use high-tech drones that combine aeronautical functions, AI, detection systems and positioning in six directions.

Drone being monitored



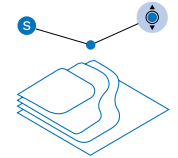
The Matrice 300 RTK is DJI's latest commercial drone platform that enables us to carry out inspections over large areas and monitor emissions along with locating hotspot areas in which gases, liquids or other pollutants exceed. The surveys, which have been previously programmed and

automated, enable us to register data over time for specific geographic areas and compare results using 2D and 3D graphs. A remote-sensing system associated with a multispectral sensor uplifts data related to humidity, pressure, temperature and gas, such as: CO₂, CO, CH₄, H₂S.

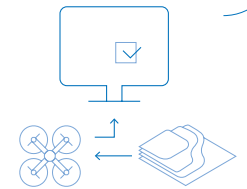


Inspections campaign graphical results and data analysis

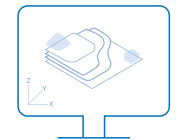
PLAN
PROCESS
ANALYZE
AND EXECUTE



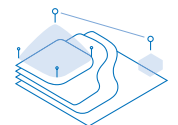
FLIGHT PROGRAMME



DATA ACQUISITION

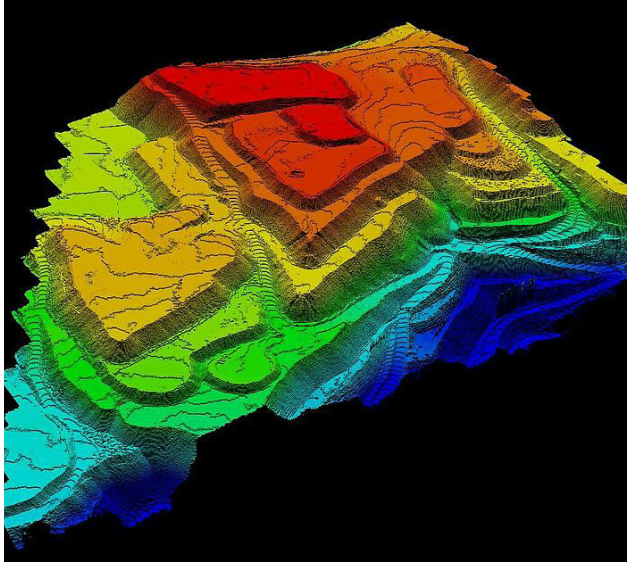


DATA ANALYSIS



DEVELOPMENT OF DIGITAL MODEL

ENVIRONMENTAL MONITORING DATA ACQUISITION

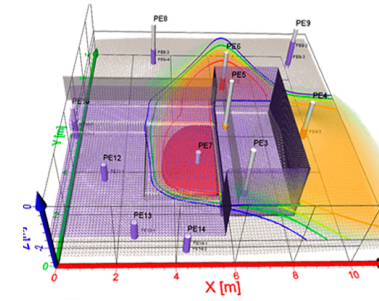
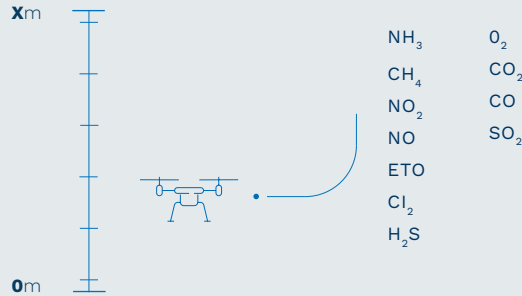


The industrial drone DJI Enterprise Matrice 300 RTK counts with modern aeronautical systems such as: OcuSync, that enables the transmission of images to up to 15 km and supports 1080p videos on a triple frequency channel. The automated frequency selection allows a more reliable flight in areas with high interference and the AES- 256 cryptography guarantees the secure transmission of data. The system memorizes the drone's movement, the angle shooting of the camera, the recording of images and the zoom levels which can then be reused automatically. The Spot-Check7 automates routine inspections make sure accurate results are obtained. Artificial intelligence systems recognize the framework and selected subjects and keeps the data for future flights.

AIR MONITORING

The drone is equipped with a Aermatica 3D multisensor capable of registering data concerning humidity, pressure and temperature of the upcoming gasses.

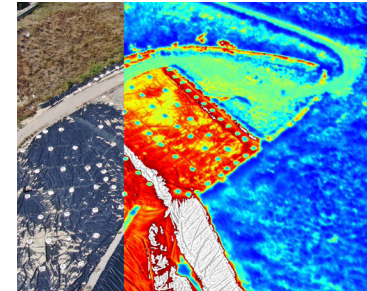
Thanks to the app BLY3D, it is possible to view the data in real time through the controller. The sensor measures:



THERMAL MONITORING

For the thermal inspections we have installed the Zenmuse H20T thermo-camera with a Microbolometro Vox sensor that measures temperature on the spot or over an area. The

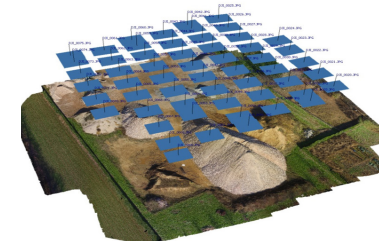
measurement interval goes from - 40° to 150° in H gain and from -40° to 550° in L gain. The data registered can be set into diverse representative forms and graphs.



VISUAL SURVEYS

The visual and topographical surveys are carried out using a Zenmuse Camera with a DFOV 40.6° lens: 13,5 mm (equivalent: 58 mm) opening: f/1.0, Focus: da5m∞. Digital zoom 1x, 2x, 4x, 8x, spectral band 8-14 μm, optical zoom 23× (DFOV: 4°, EQV: 556.2 mm), max zoom 200× (DFOV: 0.5°, EQV: 4800 mm). It is possible to

take a wide-angle image of the area; the zoom lens will automatically divide it into multiple 20 MP images. The photos will be saved in a single ultra-detailed image. Laser rangefinder, wavelength 905 nm, measurement range 3-1200 m, measurement accuracy 3mm at 100m. Night vision, GPS marking, date and time.

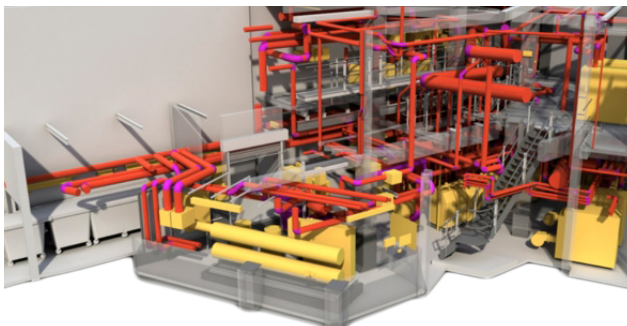


PRECISION SURVEYS

LASER SCANNER AND DRONES

Thanks to the quickness with which it is possible to obtain and process data with drones and laser scanners, the time needed to produce metric and detailed information is reduced

graphics and data



During surveys and operational phases, the use of drones allows us to reach areas or land that are difficult to inspect. We carry out precision surveys of areas with complex morphology, integrating traditional technologies, such as total stations, with drones

and laser scanners. The flow of digital data is compared and integrated through specific software providing a complete geo-referenced model (DEM, DSM, DTM) with centimetric precision and perfectly suited to reality.



Geo-referenced 3D model (DEM, DSM, DTM) with centimetric precision and perfectly suited to reality

**PLAN
PROCESS
ANALYZE
AND EXECUTE**

DATA COLLECTION WITH DRONE
(scan & photo)

DATA COLLECTION WITH LASER SCANNER

DIGITAL MODELLING

DATA ANALYSIS AND INTERPOLATION OF DATA

GRAPHIC MODEL (3D, orthophoto, dtm, planimetry)

REMOTELY OPERATED UNDERWATER VEHICLE ROV

the ROV allows us to perform marine surveys and inspections in areas in which diving is forbidden, there is excess pollution or the location is hardly accessible

Pick-up mission programming

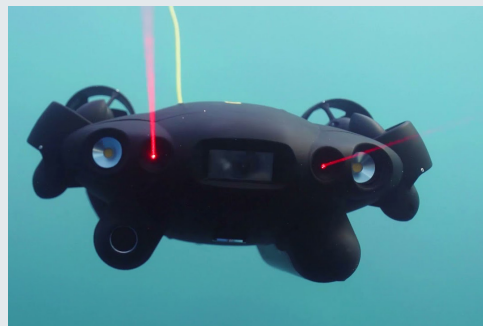


the ROV is a multi-utility tool for underwater missions and operations. 360 ° range of motion and maneuverability. It reaches a speed of 3 knots thanks to the 6 propeller thrusters and a depth of 100 m.



FIFISH V6 Expert from QYSEA is a professional marine ROV. It integrates a package of 6000 lumen LEDs as well as a 4K UHD camera to make quality pictures even in dark spots. A broad range of accessories enable to adapt to diverse scenarios. Moved by 6 thrusts it has 1.5 hours of autonomy with strong currents (1m/s) and up to 6 hours during calm waters and can

work at a maximum depth of 100m. The stabilizer allows excellent shooting results also under strong current conditions. It is equipped with a laser scaler for accurate measurement, a robotic arm with a power of 100N for the collection of solid samples and a sampler for sediments.



- visual inspections up to 100 m depth
- accurate measurements
- sampling of sediment
- taking water samples
- robotic arm for handling

**PLAN
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PROGRAMMING

**VISUAL SURVEY,
SAMPLING**

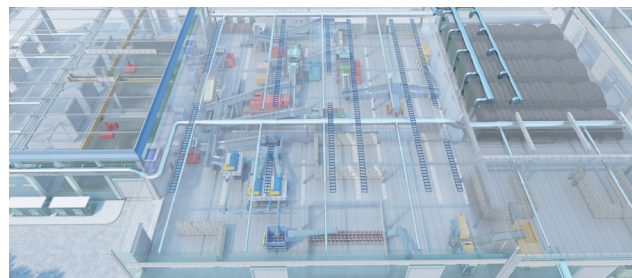
LABORATORY ANALYSIS

GRAPHICS AND DATA

BUILDING INFORMATION MODELING

DESIGN WITH BIM METHODOLOGY

Today we are among the first certified Italian companies UNI / PdR 74:2019 for the planning of architectural, structural and plant engineering in BIM, which guarantees digital management of information processes, construction and BIM modeling, in compliance with the standard UNI 11337-7.



BIM

BIM (Building Information Modelling) is an integrated working approach supported by software's, which allows to unify, in a single digital model, the **entire construction project** (dimensional characteristics, designs, technical and typological aspects, engineering and computational data, permitting information, etc), enabling its control and analysis throughout the entire project life cycle, from design phases to monitoring during construction and operations, up to demolition and recovery of materials.

Thanks to an open platform, where the project is shared, and to a collaborative design approach, all team members have the tools to plan, design and build efficiently, mitigating unnecessary difficulties during project development.

INTEGRATION OF TECHNOLOGY

The use and integration of diverse technology, such as DRONES and LASER SCANNERS during surveys and monitoring activities, and the incorporation of controlling devices like VIRTUAL and MIXED REALITY, enables us to limit errors and guarantee reduced operational costs.

3D

Model

Taking advantage of the 3D model, the project is visualized and any anomaly is detected

4D

Time management

Construction site management, nullifies possible interference and optimizes coordination

5D

Economic management

Enables to accurately control costs and achieve in budget results

6D

Life cycle Assessment

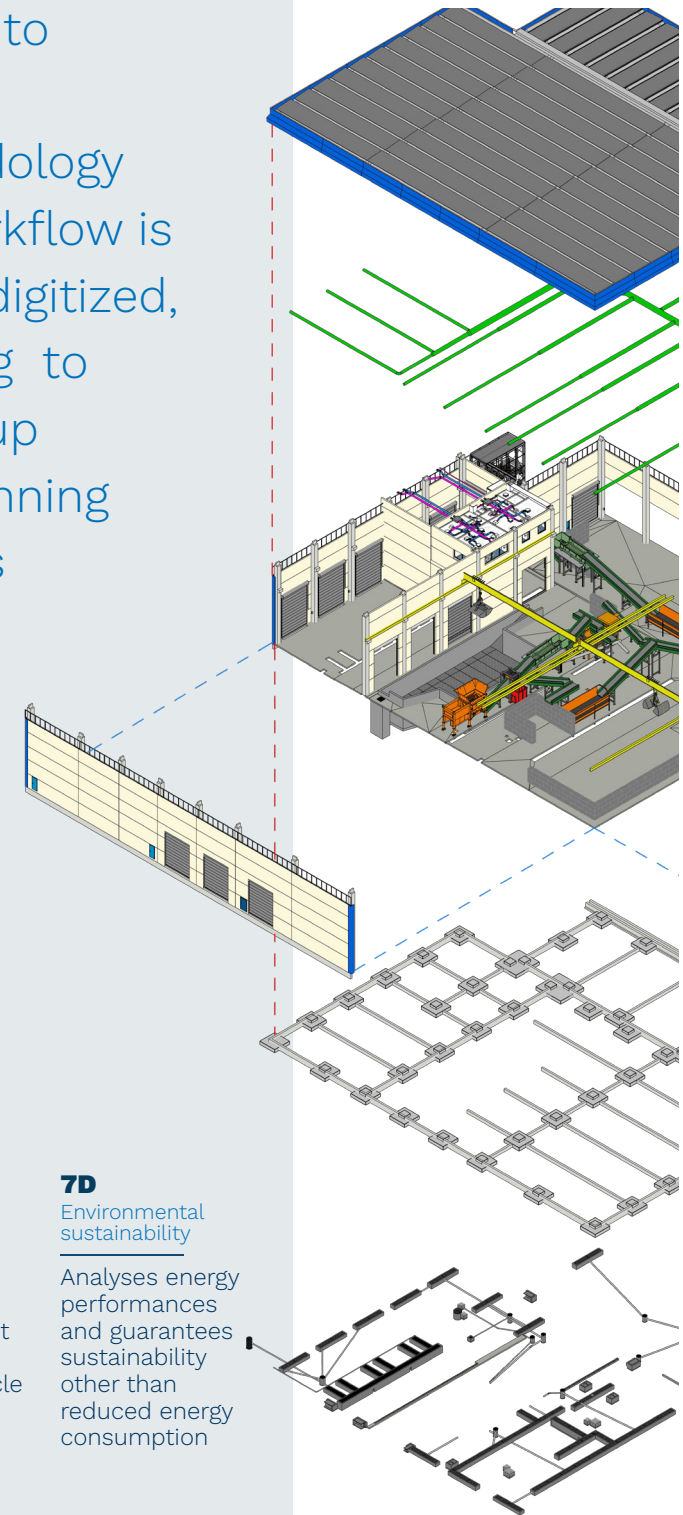
Optimizes material management during the entire lifecycle

7D

Environmental sustainability

Analyses energy performances and guarantees sustainability other than reduced energy consumption

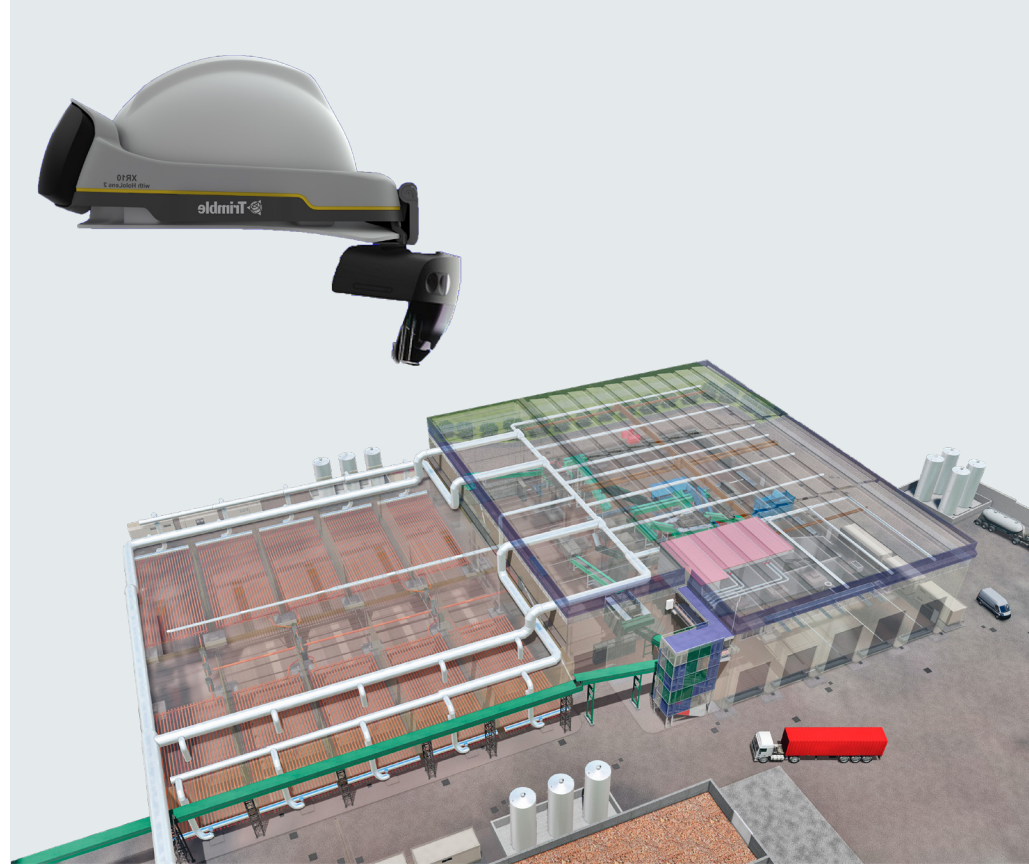
Thanks to the BIM methodology our workflow is totally digitized, allowing to speed up the planning process



DIGITAL TWIN

BIM, VR AND MIXED REALITY

The DIGITAL TWIN is a 3D model that digitally represents a real building and brings together the entire package of information related to the design, construction and operational phases of the project



The difference between BIM and DIGITAL TWIN is that, the first uses 3D models to develop the design stages and monitor construction operations through well-coordinated control mechanisms, while the second has the ability to connect real time data to undergoing site activities and operational phases and offers a

longlisting control mechanism that works for the entire life cycle, up to decommissioning. Digital Twin is a “living” working device that, together with other inspection and monitoring devices, provides information regarding energy, performance ratios, infrastructural health, etc.

digital twin view on site



digital twin analysis and modeling tool containing the geometric, physical, functional and behavioral parameters of the physical twin

DEVELOPMENT OF BIM DIGITAL MODEL

Inclusion into the model of all digital information

PARAMETRIC SIMULATION OF THE DT MODEL

Calculation of technical performance, structural parameters. Viewing interferences

TRIDIMENSIONAL VIEWING OF DT MODEL ON SITE

Clash spotting, on site verifying, remote amendments of the model

OVERPOSITIONING OF THE DT MODEL AND REALITY ON SITE

Verification and determination of the digital model AS BUILT

DIGITAL TWIN DEVELOPEMNT FOR OPERATION AND MANTAINANCE PHASES

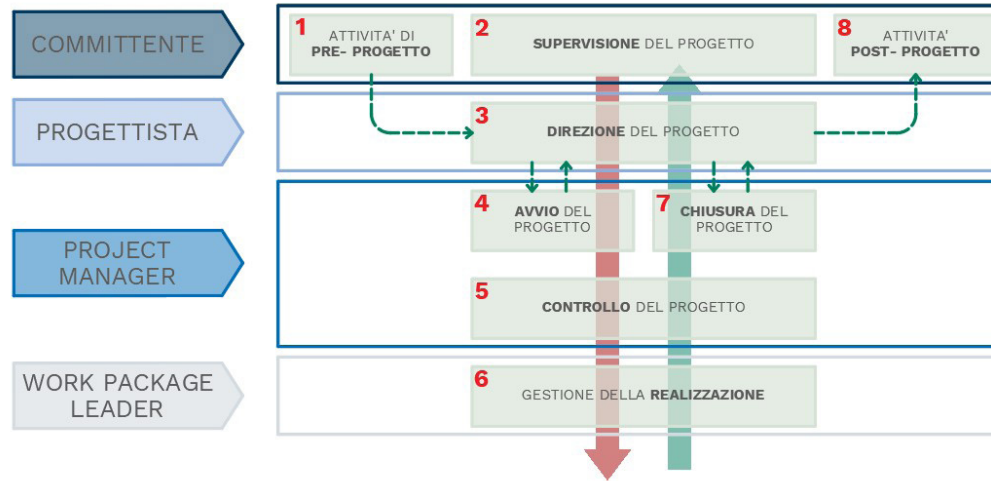
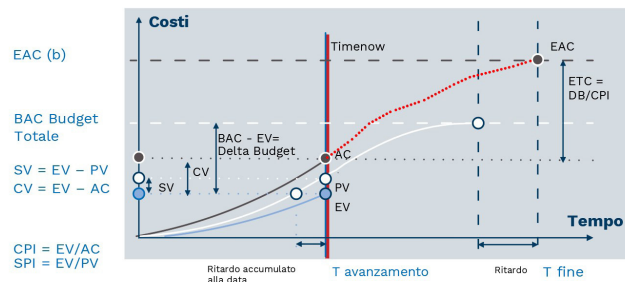
Verification and control of building performance

PROJECT MANAGEMENT

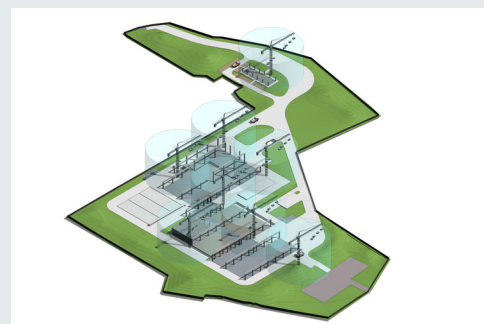
INTEGRATED PROCEDURES AND METHODOLOGIES

Analysing, Designing, Planning and Implement, Managing all evolutionary phases of work in respect of precise project constraints with a structured approach
 Today OWAC is RINA certified according to standard ISO 9001:2005 for **services of Project Management**

Verification and update time/cost (EV)



Analysing, Designing, Planning and Implement; Managing all evolutionary phases of work in respect of precise project constraints is what is required today as a qualifying factor in large building projects. It is evident, therefore, the need to apply standardised management procedures integrated with BIM methodologies, in order to be able to plan and manage all design phases, realisation and operability of the work, thus guaranteeing maximum transparency towards the contracting entities. Integrated planning, sharing, verification and constant updating are native activities



of both BIM methodology and project management procedures.

For several years now, OWAC has embraced both BIM methodology and procedures of Project Management with a structured integrated approach, succeeding in optimising the internal processes of design and management of work orders, guaranteeing a strong decrease in unexpected events, greater reliability of costs and timescales for the execution of planned works. OWAC Engineering Company today can assist and support economic operators on the adoption of BIM and PM procedures, within various activities such as design competitions, integrated contracts, partnership procedures, project financing, etc. This allows the Economic Operator interested to have access in the published tender documents of the main Italian Contracting Stations, to the expected bonuses.

Site progress check with federated BIM model

IN THE MANAGEMENT OF A PROJECT **THE APPLICATION OF THE BIM METHODOLOGY CANNOT BE IGNORED**, FOR A PERFECT INTEGRATED DESIGN FROM PLANNING AND MANAGEMENT OF COSTS AND TIMING. **IN THIS THE BIM MEETS PROJECT/ PROGRAM MANAGEMENT** AND BOTH METHODOLOGIES ARE APPLIED AND INTERPRETED FROM PLANNING TO THE MANAGEMENT OF THE BUILT ENVIRONMENT

THE APPLICATION OF INTEGRATED **PM** PROCEDURES WITH THE USE OF THE **BIM** FEDERATED MODEL ALLOWS

- the sharing of information between the contracting station designers and companies throughout the process of design, realisation and o&m;
- the constant updating and sharing of workflows, ensuring a connected programming and integrated directly to modelling objects 3d and related wbs as information attributes of the digital objects;
- to integrate, via information software, the time scheduling of activities within the digital objects