

OASIS

WP2 - Development of Learning Resources on Green Infrastructures

Best Practices of Buildings with Green Infrastructure

Table of Contents

I.	Introduction	3
II.	Case Study Bulgaria: Park Lane Office Center-Allianz Bulgaria Headquarters.....	4
III.	Case Study Italy: Studio Vira	6
IV.	Case Study Italy: ATER TRIESTE.....	9
V.	Case Study Italy: Stora S.r.l.	12
VI.	Case Study Italy: Dormisch Complex.....	15
VII.	Case Study France: KOZY GROUP	19
VIII.	Case Study France: ENVIRO + AND CFA ST DENIS	21
IX.	Case Study France: AQUATIRIS	23
X.	Case Study Greece: PiraeusTower	26
XI.	Conclusion.....	29

I. Introduction

The OASIS project aims to equip VET students and professionals in the construction sector with the green competences and sustainability skills needed to meet the growing environmental demands of the industry. With a particular focus on green infrastructure, the project seeks to align vocational education and training with the evolving needs of the labor market. In addition to advancing technical knowledge, OASIS places strong emphasis on enhancing the mentoring capacity of company trainers and promoting environmental awareness throughout work-based learning experiences. By fostering stronger connections between vocational education providers and industry stakeholders, the project ensures that its output remains practical, relevant, and forward-looking. In doing so, OASIS not only addresses immediate sectoral needs but also actively contributes to Europe's broader green transition.

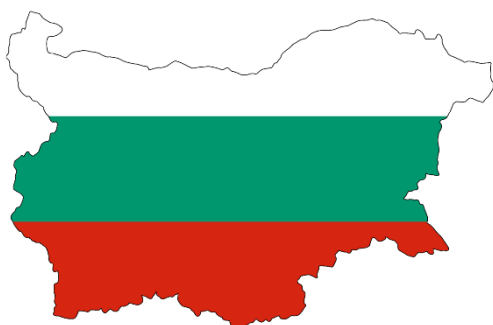
As part of this mission, Work Package 2 (WP2) of the OASIS project focuses on building the foundation for innovative, practice-based learning resources that reflect real-world developments in green construction. In this context, a key component of WP2 has been the collection of best practices - real case studies of buildings that demonstrate effective integration of green infrastructure solutions. These examples were gathered in close collaboration with industry experts and stakeholders from Bulgaria, France, Italy and Greece, who contributed their knowledge and experience to identify projects that showcase sustainability in action.

Each case study follows a structured format to ensure consistency and comparability across countries and contexts, covering the following main elements:

- **Building/Project Overview** – This section provides background information about the building or site, including its location, size, type (residential, commercial, educational, etc.), and purpose. It sets the scene for understanding the scope and intent of the project.
- **Technical Description** – Here, the technical aspects of the green infrastructure are described in detail. This includes the systems used (e.g. plumbing, heating/cooling, wastewater treatment), materials, and any innovative features that enhance environmental performance.
- **Performance Metrics** – This part highlights measurable results, such as reductions in energy or water use, improved efficiency ratings, or other data that demonstrates the effectiveness of the implemented solutions.
- **Social Impact** – The case study also explores how the project has benefited people and communities. This may include improvements to living standards, workplace health, educational value, or support for local employment.
- **Environmental & Economic Benefits** – Finally, each case outlines the broader environmental advantages (e.g. carbon footprint reduction, sustainable resource use) and economic benefits (e.g. cost savings, return on investment) achieved through the green infrastructure solutions.

Together, these best practices form a valuable knowledge base that will directly benefit the development of the OASIS training materials. By providing concrete, successful examples from across Europe, they serve as powerful tools to inspire, educate, and empower the next generation of construction professionals to build more sustainably.

II. Case Study Bulgaria: Park Lane Office Center-Allianz Bulgaria Headquarters



PARTNER

Ruse Chamber of Commerce and Industry (RCCI)

BUILDING/PROJECT OVERVIEW

Park Lane Office Center-Allianz Bulgaria Headquarters is a modern commercial building situated in Sofia, Bulgaria. Completed in 2021, the building encompasses a total area of approximately 35,000 square meters. Allianz Bulgaria occupies 6,000 square meters across three floors, using the space as its national headquarters. The building was designed with a strong focus on sustainability, employee well-being, and long-term operational efficiency. It has received LEED Platinum certification under the LEED v4 BD+C: Core & Shell standard, placing it among the most environmentally responsible and energy-efficient buildings in the region. Park Lane serves as a flagship example of contemporary green infrastructure in Bulgaria.

TECHNICAL DESCRIPTION

The building incorporates a range of advanced green infrastructure systems designed to optimize energy use and indoor environmental quality. One of its most prominent features is a double-skin glass facade, which includes vertical shading fins that reduce solar heat gain and enhance thermal insulation. Internally, the building is managed by a sophisticated Building Management System (BMS) that automates and optimizes heating, cooling, ventilation, and lighting functions. The HVAC system is designed to be highly efficient, with demand-controlled ventilation and integrated UV-C air filtration capable of eliminating over 97% of airborne pathogens. Lighting throughout the building is provided by smart LED systems, which are equipped with both daylight and motion sensors to ensure energy-efficient usage. Additionally, low-flow water fixtures have been installed to reduce water consumption, and all construction materials were selected to meet high standards for environmental safety, including low levels of volatile organic compounds (VOCs).

PERFORMANCE METRICS

Park Lane Office Center demonstrates significant improvements in energy efficiency and environmental performance. The building achieves a 27% reduction in annual energy consumption when compared to a conventional office structure. Lighting energy use is reduced by over 40% thanks to the integration of smart LED systems. The implementation of UV-C air purification improves indoor air quality significantly, contributing to employee health and safety. Furthermore, the building's plumbing system has been optimized to reduce water usage, and these efficiencies contribute to its LEED Platinum certification, a globally recognized mark of sustainable building practices.

SOCIAL IMPACT

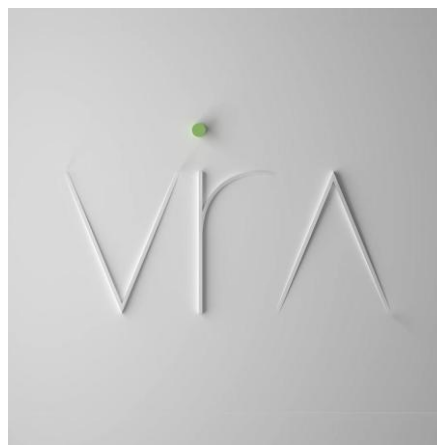
The construction and operation of the Park Lane Office Center have had a positive impact on the local community and workplace environment. Employees benefit from enhanced air quality, optimal indoor temperatures, and abundant natural light, all of which contribute to improved health, well-being, and productivity. The project has also played a role in advancing green building standards in Bulgaria by serving as a reference for sustainable office design. During its development, the project engaged numerous local professionals, suppliers, and contractors, thereby supporting regional employment and promoting the transfer of knowledge and expertise in sustainable construction practices.

ENVIRONMENTAL & ECONOMIC BENEFITS

Environmentally, Park Lane Office Center contributes to the reduction of greenhouse gas emissions and promotes the responsible use of natural resources such as water and electricity. The use of renewable energy-efficient systems and non-toxic building materials reflects a deep commitment to ecological sustainability. Economically, the building offers long-term savings through reduced operational and maintenance costs. Its green credentials increase its market appeal to multinational tenants who prioritize environmental responsibility, and this also enhances the building's value and occupancy rates. In addition, the LEED certification opens the door for eligibility under various green financing mechanisms and incentives, further strengthening its return on investment.



III. Case Study Italy: Studio Vira



PARTNER

FONDAZIONE C.I.O.F.S. - F.P. ETS

BUILDING/PROJECT OVERVIEW

This project involves the deep renovation and expansion of a traditional residential building in the city of Trieste, Italy. Originally constructed with poor-quality masonry and classified as an energy class E building, the property had been semi-abandoned and relied on outdated wood heating. The goal of the renovation was to modernize the structure, significantly improve its energy performance, and bring it up to energy class A4, the highest rating under Italy's energy certification standards. The result is a highly efficient, fully electric home that reflects both sustainable design principles and a commitment to fossil fuel-free living.

TECHNICAL DESCRIPTION

The original house was completely gutted and structurally reinforced to meet seismic safety standards. A major extension was added, and comprehensive insulation was applied throughout the envelope to eliminate thermal bridges. The entire energy system was redesigned to operate solely on electricity, with a photovoltaic system installed on the roof to generate over 7 kWh of renewable energy. This is supported by a battery storage system with a 20 kWh capacity, significantly reducing reliance on the public energy grid.

Heating and cooling are provided by an air-to-water heat pump, which also supplies domestic hot water stored in an integrated thermal unit. Underfloor radiant heating ensures consistent thermal comfort, while cooling is achieved via a combination of underfloor and fan-coil systems. The building also features a controlled mechanical ventilation unit with thermodynamic heat recovery, enabling continuous air exchange without heat loss. A dehumidification module ensures that indoor humidity levels remain optimal, all without the need to open windows. Advanced window systems contribute to maintaining airtightness and thermal efficiency.

PERFORMANCE METRICS

Prior to the renovation, the building was categorized as energy class E, indicating high energy consumption and poor efficiency. Following the intervention, it achieved energy class A4, signifying one of the highest levels of performance. The installed photovoltaic panels generate over 7 kWh, while the storage system holds 20 kWh, enabling the building to operate independently for extended periods. Importantly, no gas connection was reinstated, meaning the house is fully powered by electricity, eliminating the use of fossil fuels altogether.

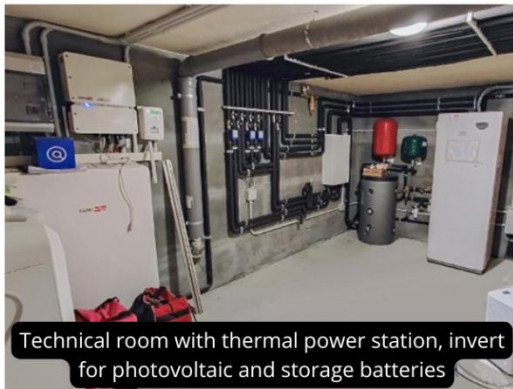
SOCIAL IMPACT

The project delivers not only environmental but also quality-of-life improvements. Residents now enjoy stable indoor temperatures, excellent air quality, and enhanced thermal comfort throughout the year, thanks to the synergy between radiant heating, efficient cooling, and smart ventilation. These systems also help to reduce energy bills and eliminate cold drafts or humidity fluctuations that are common in older buildings. The project contributes to raising awareness in the community about the potential of sustainable renovation, particularly in historic urban areas where old housing stock remains common.

ENVIRONMENTAL & ECONOMIC BENEFITS

From an environmental standpoint, this project significantly reduces carbon emissions by eliminating natural gas use and integrating a renewable energy supply with on-site storage. The comprehensive insulation and smart systems work together to minimize overall consumption. Economically, the home's self-sufficiency lowers utility bills, and the use of advanced, low-maintenance technologies contributes to long-term savings. Moreover, the increase in property value due to the high energy rating and modern comfort features adds to the return on investment. This project serves as a clear demonstration of how sustainable renovation can be both technically feasible and economically advantageous.





IV. Case Study Italy: ATER TRIESTE



PARTNER

FONDAZIONE C.I.O.F.S. - F.P. ETS

BUILDING/PROJECT OVERVIEW

In the suburbs of Trieste, on Cesare dell'Acqua Street, ATER Trieste has developed an exemplary green infrastructure project: the construction of two new social housing buildings following the highest principles of sustainable design. The development includes 48 residential units distributed across five staircases within two juxtaposed structures. These buildings are not only architecturally efficient but also fully aligned with bioclimatic design, renewable energy integration, and environmental sustainability, creating a future-forward model for affordable housing.

TECHNICAL DESCRIPTION

From the outset, the buildings were strategically positioned to maximize passive environmental benefits: winter sunlight is fully harnessed, natural ventilation from summer breezes is optimized, and shielding from the Bora wind is thoughtfully integrated. Each block features centralized systems for energy and resource management, which are then distributed to individual apartments. These include photovoltaic panels, solar thermal systems, controlled mechanical ventilation, and dedicated systems for water supply, wastewater disposal, and rainwater drainage.

The load-bearing structure is built entirely from X-LAM structural plywood panels, which provide both vertical and horizontal support. This approach ensures strength while significantly reducing the environmental footprint compared to traditional materials. Exterior walls are finished with a dual-layer insulation system, made of mineralized wood wool and compressed wood fiber panels, and coated with silicate paints designed for long-lasting outdoor performance.

Heating is provided by underfloor radiant panels, complemented by low-temperature radiators in the bathrooms. On the rooftops, solar and photovoltaic panels are seamlessly integrated into the building's form. Additionally, the project incorporates water-saving technologies, including systems for the recovery of rainwater and the treatment and reuse of greywater. The outdoor spaces contribute to sustainability as well, featuring green roofs, permeable surfaces, and vertical gardens that enhance biodiversity and reduce runoff.

PERFORMANCE METRICS

While specific year-on-year metrics are still being compiled, early data indicate that the buildings meet B1 classification under the VEA 2009 Protocol, a high standard of energy and environmental performance. For residents, this translates to annual savings of approximately €800 per household in utility costs compared to G-class accommodations. The air-based heating system, designed for maximum efficiency, operates with just 2000 watts - equivalent to the energy use of a common hairdryer.

SOCIAL IMPACT

This project provides dignified, high-quality housing for 48 low-income families, making it a landmark initiative for social inclusion and environmental justice. Beyond affordability, residents enjoy healthy, comfortable living conditions enhanced by clean indoor air, stable temperatures, and reduced environmental exposure. As ATER Trieste's first green residential model, this project also sets a precedent for future public housing developments, demonstrating how innovation in sustainability can directly improve community wellbeing.

ENVIRONMENTAL & ECONOMIC BENEFITS

By leveraging renewable energy, efficient insulation, and resource recovery systems, the buildings drastically reduce their carbon footprint and energy demand. The use of natural materials like X-LAM wood panels, along with passive design strategies, minimizes embodied carbon and extends the buildings' lifecycle. Economically, the reduction in operational costs not only benefits residents through lower utility bills but also enhances the long-term cost-effectiveness of the buildings for public authorities. This project exemplifies how sustainable construction can deliver environmental performance, financial savings, and social equality in one blueprint.

V. Case Study Italy: Stora S.r.l.



PARTNER

Falco&Associati

BUILDING/PROJECT OVERVIEW

In a coastal town in Sicily, just 100 meters from the shoreline, Falco & Associati oversaw the comprehensive renovation of a two-family residential building designed to significantly improve energy performance and operational autonomy. The building is a two-storey villa comprising two independent apartments, one per floor, intended exclusively for residential use. Located in a partially protected landscape area subject to territorial and environmental restrictions, the intervention required careful planning to balance sustainability goals with regulatory and contextual constraints.

Completed approximately five years ago, the renovation aimed to transform the building into a highly energy-efficient and nearly autonomous residence. The strategy focused on upgrading both the building envelope and the technological systems, with particular attention to insulation, renewable energy integration, and low-temperature heating and cooling solutions suited to the local Mediterranean climate.

TECHNICAL DESCRIPTION

Given the building's proximity to the sea and exposure to salt air and strong coastal winds, special attention was paid to preserving the external façade. For this reason, insulation was applied internally rather than externally. A nanotechnological insulation material based on aerogel technology was selected for the internal walls in contact with the exterior. With a thickness of approximately one centimeter, this high-performance material offers thermal resistance comparable to about ten centimeters of traditional rock wool, significantly reducing space loss. Once applied, the insulation was plastered and finished like a conventional wall, with specific care taken in fixing elements due to the presence of a non-load-bearing layer.

The roof was insulated using a more traditional solution, consisting of a ten-centimeter layer of rock wool installed above the existing structure. Waterproofing was ensured through a double-layer bituminous membrane system, combining a standard layer with a slate-finished layer. This approach effectively reduces summer overheating while minimizing heat loss during the winter months.

From a systems perspective, the building relies primarily on an air-to-water heat pump with an approximate peak power of 10 kW, operating at low water temperatures of around 40°C. Heat distribution within the apartments is achieved through fan coil units, allowing for flexible and responsive heating and cooling. To enhance resilience and autonomy, a wood biomass fireplace was integrated as a supplementary and backup heat source. This solution remains permissible in the sparsely populated area and ensures continuity of operation during periods of low solar availability.

Electricity production is supported by a photovoltaic system with an installed capacity of approximately 10 kW, using bifacial modules with an efficiency of around 21%. Due to the building's location in a protected area, installation required additional approvals from both the municipality and the relevant heritage authorities. Solar thermal panels further contribute to domestic hot water production, taking advantage of the high solar irradiation typical of the region.

Domestic hot water is produced through a hybrid and redundant approach. A 300-liter boiler equipped with a heat pump water heater, with a declared coefficient of performance of around 4, serves as the primary system. This is complemented by the possibility of integrating heat from the biomass fireplace through a dedicated coil and controlled valve system, ensuring flexibility and efficiency under varying operating conditions.

Routine maintenance follows standard best practices, including periodic photovoltaic panel cleaning, inverter checks, annual fan coil venting, inspection of temperature probes, and verification of hydraulic components such as pressure vessels and safety devices. No extraordinary maintenance measures are required beyond regular system checks.

PERFORMANCE METRICS

Operational data indicates very low energy consumption levels. For the occupied apartment, electricity costs average approximately €60–70 every two months, despite the presence of a three-phase electrical connection with a capacity of around 16 kW. A significant portion of this cost consists of fixed charges, while actual energy consumption remains minimal, estimated at roughly €10 per month.

Thanks to high self-consumption rates supported by strong local solar availability and an upgraded building envelope, the building operates in an almost fully autonomous manner. The total investment in technological systems, including photovoltaic and solar thermal installations, domestic

hot water systems, the biomass fireplace, and the upgraded plumbing network, amounted to approximately €80,000. Based on current performance, the estimated payback period ranges between six and eight years, with photovoltaic systems expected to operate for around 20 years and the heat pump for approximately 15 years, provided proper maintenance is maintained.

SOCIAL IMPACT

The renovation directly benefits the two families residing in the building, providing them with improved thermal comfort, stable indoor temperatures, and efficient heating and cooling management throughout the year. The combination of renewable energy systems and redundant technologies significantly reduces energy vulnerability, offering both financial stability and resilience in the event of grid disruptions.

Indirectly, the project supports local employment by generating ongoing work for installers, maintenance technicians, and system specialists. It also serves as a practical example of how advanced energy solutions can be successfully implemented even in regulated and environmentally sensitive contexts.

ENVIRONMENTAL & ECONOMIC BENEFITS

From an environmental perspective, the project achieves a substantial reduction in energy demand through the use of high-performance internal insulation and improved roof stratigraphy. The extensive use of renewable energy systems, including photovoltaic, solar thermal, and biomass significantly lowers reliance on grid electricity and associated emissions. The supplementary use of wood biomass, considered part of a circular carbon cycle, further contributes to reducing the building's overall carbon footprint.

Economically, the renovation delivers consistently low energy bills and a relatively short investment payback period, after which operating costs remain minimal. The improved energy performance and modernized systems also increase the overall value of the property, demonstrating how sustainability-driven renovations can deliver long-term financial, environmental, and social returns within a single residential project.

VI. Case Study Italy: Dormisch Complex



PARTNER

CIOFS FP FVG ETS

BUILDING/PROJECT OVERVIEW

This project involves the demolition and reconstruction of the “ex Dormisch” complex, located in Via Bassi in Udine. The original building was demolished following a fire that irreversibly compromised its structure, making recovery impossible.

The new complex, with an area of approximately 2,000 m² per floor, is conceived as a contemporary architectural organism capable of integrating educational, office, and public functions within a single coherent system. The design develops around a large covered central plaza, conceived as an indoor urban space with double-height volume, serving as the main distribution hub and a place for interaction among the different activities.

From an architectural standpoint, the building is characterized by a compact yet articulated volume, defined by a modular structural grid that ensures high spatial flexibility. This regular structural system allows for large spans and open floor plans, facilitating future reconfiguration of the interior spaces.

The façades are designed with an emphasis on transparency and lightness, featuring extensive full-height glazed surfaces that enhance natural daylighting and establish a strong visual connection between interior and exterior. These are complemented by solar shading systems, such as brise-soleil, which optimize solar control and improve the building’s energy performance.

Particular attention has been given to the building envelope, conceived as a high-performance system ensuring thermal and acoustic insulation, durability, and reduced energy consumption. In this context, photovoltaic panels are installed on the roof to generate renewable electricity, while the complex also relies on hydroelectric energy sources, further contributing to the reduction of its overall environmental impact.

The project also includes a basement level used as a parking garage, with a capacity of approximately 100 parking spaces, designed to meet the needs of users and visitors while improving the organization of external areas.

The covered plaza represents the most significant architectural element: a permeable, bright, and flexible space designed to host events, gatherings, and collective activities. Its generous height and the presence of transparent or skylight elements in the roof allow for an even distribution of zenithal natural light.

The complex is functionally divided into two main parts:

- On one side, the ITS Academy, with classrooms, laboratories, and innovative learning spaces;
- On the other, a public and office area including the covered plaza, a ground-floor bistro, and two upper levels dedicated to office use.

The interior spaces are designed with particular attention to environmental quality, featuring generous ceiling heights, clear circulation paths, acoustic comfort, and integration between natural and artificial lighting. Vertical connections are organized to ensure efficiency, accessibility, and safety.

Overall, the project stands out for its integrated approach, combining architectural quality, functional efficiency, and environmental sustainability, establishing itself as a new contemporary urban hub.

TECHNICAL DESCRIPTION

In the reconstruction project of the ex Dormisch complex, particular attention has been paid to the integration of advanced building systems and green infrastructure solutions, with the aim of optimizing energy efficiency and reducing the overall environmental impact.

The building is equipped with a Building Management System (BMS) that enables centralized control and continuous monitoring of electrical and thermal consumption throughout the entire complex. This system allows for intelligent management of building services, optimizing their operation based on actual usage conditions.

All spaces are equipped with occupancy detection systems, which automatically modulate the fresh air supply rate of the HVAC system according to the effective use of the spaces. This approach has made it possible to adopt an innovative design criterion for the systems, based on actual occupancy rather than the total building volume, resulting in a reduction in the size of the Air Handling Units (AHUs) compared to traditional standards.

In addition, each room is equipped with an independent zone thermostat, capable of autonomously adjusting the temperature based on the presence or absence of occupants, further contributing to the optimization of energy consumption and the improvement of indoor comfort.

Heating and cooling are provided by VRF (Variable Refrigerant Flow) systems, powered by energy produced from the renewable sources available within the complex. This solution enables flexible and efficient management of thermal loads, dynamically adapting to the needs of different spaces.

From an energy production perspective, the building integrates a rooftop photovoltaic system with an installed capacity of approximately 140 kW, as well as a 50 kW hydroelectric system. These

solutions make it possible to fully cover the energy demand for heating and cooling of the complex. The building is also capable of producing excess electricity and feeding it into the grid, thus operating as an active energy system.

Particular attention has also been given to the landscape component and the quality of outdoor spaces. The project includes the creation of a new park on the northern side, previously absent, conceived as a multifunctional public space. This green area is designed to be used also as an open-air theatre, helping to create a place for social interaction and enhancing the social and environmental value of the complex.

Overall, these solutions represent an integrated and innovative approach to sustainable design, where advanced technologies and passive strategies work together to ensure high energy performance and environmental quality.

PERFORMANCE METRICS

The installation of 140 kW of photovoltaic panels and the refurbishment of the hydropower generation system, with a continuous output of 50 kWh available 24 hours a day, make it possible to almost completely offset the electrical consumption for air conditioning and air exchange for most of the year.

For example, during the facility's closing hours, the building feeds electricity back into the grid, ranging from approximately 40 kWh to 120 kWh.

SOCIAL IMPACT

The regeneration of the area has created new spaces for the community, providing venues for cultural, sports, recreational, and public events while fostering social inclusion through accessible gathering places for people of all ages. The revitalisation of the site has also improved safety by reducing degradation and abandonment.

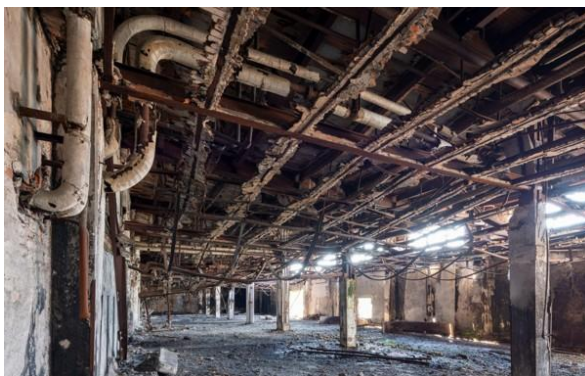
At the same time, the presence (or planned establishment) of an ITS Academy strengthens the area's role as a hub for advanced technical education. By offering training programmes closely aligned with the needs of local businesses, the Academy equips students with job-ready skills, contributes to high youth employment rates, and supports the development of the local labour market. Furthermore, it enhances the attractiveness of Buttrio by drawing students, teachers, and collaborative initiatives, while promoting innovation through the development of laboratories, applied research, and public-private partnerships.

ENVIRONMENTAL & ECONOMIC BENEFITS

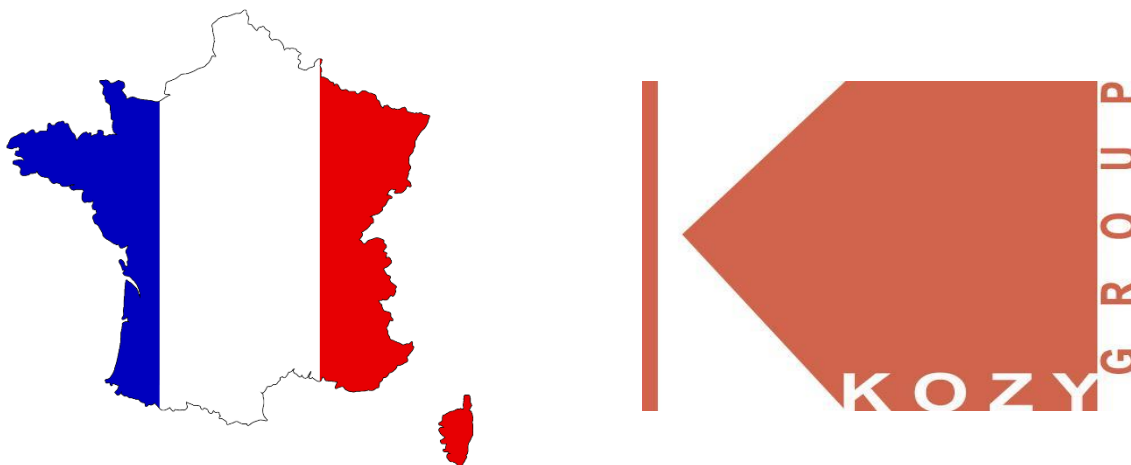
The redevelopment of the area has delivered significant urban, environmental, economic, and infrastructural benefits. A previously disused and degraded site has been successfully regenerated, improving the quality and appearance of the urban environment while avoiding additional land consumption through the reuse of existing space instead of developing undeveloped land. The necessary environmental remediation works have restored the site's environmental conditions, and the project has created new opportunities for green and public spaces.

From an economic perspective, the regenerated area has become attractive for investments, providing suitable conditions for businesses, services, and innovative activities. The redevelopment has generated new employment opportunities both during the construction phase and through the activities now hosted on the site, while also increasing the value and attractiveness of the surrounding area.

The project has also enhanced the area's functionality by transforming the site into a modern, multi-purpose space accommodating education, services, cultural, and residential uses. Improved integration with existing infrastructure and urban services has strengthened connectivity, while the adoption of sustainable solutions, including energy-efficient technologies and sustainable mobility measures, supports the long-term environmental and functional sustainability of the redevelopment.



VII. Case Study France: KOZY GROUP



PARTNER

CAPEB Grand Paris

BUILDING/PROJECT OVERVIEW

Located in Montreuil, in the Île-de-France region (department 93), this three-level residential house offers a practical example of how homeowners can reduce their energy dependency while maintaining comfort and quality of life. The home has relatively high electricity consumption due to electric heating, electric water heating powered by an air-to-water heat pump, and the additional use of a sauna during the winter. While the owner also uses a log fireplace, it is more for personal enjoyment than primary heating. The main objective of this project was to significantly reduce the household's electricity bill while increasing its share of renewable, self-produced energy.

TECHNICAL DESCRIPTION

To achieve these goals, the homeowner opted to install a rooftop photovoltaic (PV) system with a total capacity of 6 kWc. The system includes 16 high-quality photovoltaic panels, each rated at 375 Wc, all manufactured in France, as well as a central inverter. The panels were installed in a superimposed configuration directly onto the existing roof structure. This PV system is estimated to produce between 5,000 and 6,000 kWh of electricity annually, providing a steady supply of clean energy that directly offsets grid consumption. The use of locally made components also reflects the homeowner's preference for sustainable and regionally sourced solutions.

PERFORMANCE METRICS

Since the system's completion in June 2024, the results have been promising. You can expect the installation to cover approximately 40% of the home's electricity needs through direct self-consumption. In addition, the household has achieved around 25% self-sufficiency from the grid, meaning that one-quarter of total consumption now comes from solar energy alone. These figures translate into both environmental and economic value over the long term.

SOCIAL IMPACT

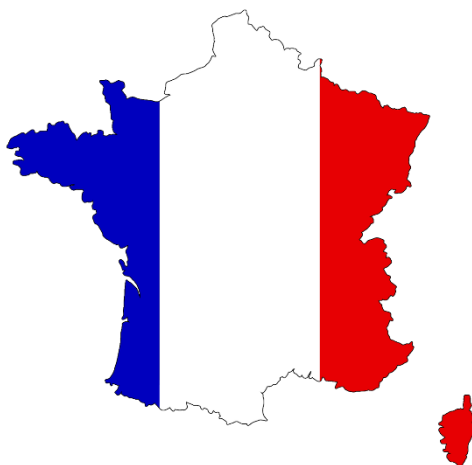
Although the project is residential in nature, it reflects a broader social trend of empowering individuals to take ownership of their energy footprint. By choosing French-made components and investing in clean energy, the homeowner sets a positive example within the community. The installation also contributes to local industry and employment, as the system was installed by local professionals and utilizes domestically produced equipment. As more individuals adopt similar solutions, a collective shift toward localized, low-carbon energy can be expected.

ENVIRONMENTAL & ECONOMIC BENEFITS

By integrating solar energy into everyday life, this project significantly reduces the home's carbon footprint and reliance on fossil fuel-based electricity. The use of French-made photovoltaic panels further minimizes the carbon emissions typically associated with long-distance transport, especially when compared to PV systems sourced from Asia. From an economic perspective, the system offers multiple benefits: approximately 60% of the generated solar energy that is not used on-site is sold back to EDF OA at a guaranteed rate of €0.1301/kWh, generating an estimated €400 per year in passive income. Combined with a roughly 40% reduction in the home's annual electricity bill, the homeowner is on track to achieve a full return on investment within 9 years.



VIII. Case Study France: ENVIRO + AND CFA ST DENIS



PARTNER

CAPEB Grand Paris

BUILDING/PROJECT OVERVIEW

Located in the heart of Seine-Saint-Denis, the BTP CFA Saint Denis 93 is a vocational training center dedicated to preparing apprentices for careers in the construction sector. In 2022, the center took a significant step toward environmental responsibility by addressing three recurring challenges: excessive water consumption, the release of colored wastewater from cleaning paint tools, and persistent issues with clogged plumbing systems. These concerns not only affected operational efficiency but also contradicted the center's growing commitment to sustainable training practices.

TECHNICAL DESCRIPTION

In October 2022, CFA Saint Denis installed the RCF XL ENVIRO PLUS station, a groundbreaking zero-liquid-discharge solution specifically designed for educational institutions. What makes this system particularly innovative is its ability to function entirely off-grid in terms of water usage. Rather than relying on a traditional water supply or drainage system, the station operates in a 100% closed circuit, using a cleaning agent derived from cereal waste. This eco-solution eliminates any discharge of micropollutants into the sanitation network, aligning with the center's commitment to environmental stewardship.

The RCF XL station is tailored to the intense needs of a training environment, where many learners complete their tasks simultaneously, leading to bottlenecks at cleaning areas. This system allows multiple tools to be cleaned in succession without delay. Beyond its functionality, it also serves as a hands-on educational tool, helping students become familiar with sustainable work habits, proper ergonomics, use of personal protective equipment (PPE), and responsible waste handling. The unit is compact and mobile, requiring only a standard 220V 8A power outlet and can be relocated easily thanks to its wheels.

PERFORMANCE METRICS

The introduction of the RCF XL station has delivered measurable results in both efficiency and sustainability. By replacing the traditional sink block that previously occupied 6 square meters in the paint workshop, the center not only gained valuable training space but also dramatically reduced its environmental footprint. Over two years, the system helped save approximately 150 cubic meters of water and cut tool consumption in half. It also eliminated recurring plumbing issues caused by paint residue, reducing maintenance needs and improving the functionality of the training environment.

SOCIAL IMPACT

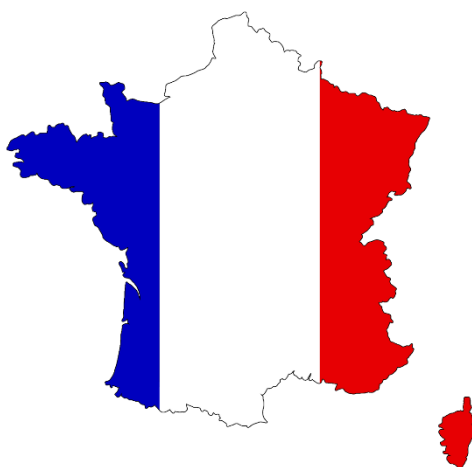
The implementation of the RCF XL station has had a meaningful impact on the learning experience. Students have acquired new, environmentally responsible practices and take pride in applying these modern techniques. The system reduces exposure to harmful chemicals, creating a safer and healthier training environment. This shift not only enhances student wellbeing but also fosters a culture of sustainability and innovation within the institution.

ENVIRONMENTAL & ECONOMIC BENEFITS

This project represents a strong example of corporate social responsibility in action. By eliminating the use of potable water for tool cleaning and preventing the discharge of chemically tainted wastewater, the center has significantly reduced its environmental impact. In addition, the solution encourages a transition from disposable to durable tools, extending equipment lifespan and reducing waste. From an educational standpoint, the station improves workflow and reduces downtime, especially during color changes in painting exercises. It also enhances the image of finishing trades by aligning them with modern, eco-conscious practices. Due to its success, CFA Saint Denis has decided to expand the use of this technology, with plans to equip the masonry and tiling workshop with the same waterless system by the end of 2024.



IX. Case Study France: AQUATIRIS



PARTNER

CAPEB Grand Paris

BUILDING/PROJECT OVERVIEW

AQUATIRIS has pioneered two innovative green infrastructure solutions designed to treat and reuse wastewater in both residential and commercial settings. The FLOATING PHYTO system is tailored for floating habitats, such as barges and cabins on water, while SKYWATER CLEAR is a rooftop-based solution developed for professional buildings and shared residential spaces.

In Port Marly (78), individual homes on barges are equipped with the FLOATING PHYTO system, ensuring effective water treatment directly on the waterway. A similar setup is used in the floating tourist cabins of Grand C page (84). To date, around fifteen installations of FLOATING PHYTO have been completed.

On land, the SKYWATER CLEAR system has been implemented in buildings like the SOPREMA headquarters in Strasbourg (67) and the Saint Denis fire station (93), where used greywater is reused for toilet flushing and irrigation. Four additional projects are currently under development, highlighting the growing interest in this dual ecological and practical solution.

TECHNICAL DESCRIPTION

The FLOATING PHYTO system combines a plant-based wastewater purification process (phyto-purification) with a floating platform. This solution is designed to treat greywater and blackwater from floating residences before discharging it safely into surrounding waterways. It is currently a unique offering, developed exclusively through the collaboration between Aquatiris and Carr  de Vie.

Meanwhile, SKYWATER CLEAR integrates the same phyto-purification principle into a green roof system. This allows buildings to treat their own greywater—typically from showers and sinks—for reuse in flushing toilets and irrigating green spaces. The system is particularly beneficial during the

summer months, when water restrictions are common. AQUATIRIS developed SKYWATER CLEAR in partnership with SOPREMA, making them the only providers of this kind of integrated rooftop wastewater treatment in France. Both systems promote self-sufficiency, sustainability, and harmony with the surrounding landscape.

PERFORMANCE METRICS

FLOATING PHYTO installations are assessed based on their ability to meet water purification standards for safe discharge into natural hydraulic environments. The systems are also evaluated for their visual integration with the landscape and for their economic viability compared to conventional wastewater connection infrastructure.

For SKYWATER CLEAR, performance metrics include purification effectiveness for water reuse, aesthetic and ecological benefits like rooftop cooling and greening, and the cost-benefit ratio. Additionally, the system is measured by the volume of water made available for reuse, particularly during times of municipal watering restrictions, an increasingly relevant factor under changing climate conditions.

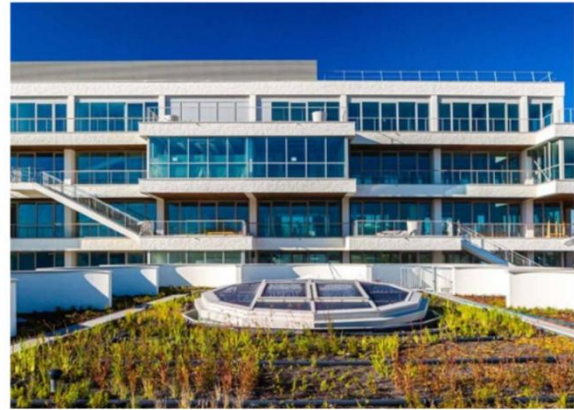
SOCIAL IMPACT

As these technologies are still relatively new, long-term data on their social impact is limited. However, both FLOATING PHYTO and SKYWATER CLEAR demonstrate strong educational and awareness-building potential. By integrating visible and sustainable water management solutions into everyday environments, these systems foster a deeper public understanding of eco-friendly practices and resource preservation. Their innovative nature also inspires a new way of thinking about urban infrastructure and living in harmony with natural cycles.

ENVIRONMENTAL & ECONOMIC BENEFITS

FLOATING PHYTO contributes to the decontamination of wastewater and the protection of aquatic ecosystems, offering a cost-effective alternative to traditional sewage connections in floating or isolated settings.

SKYWATER CLEAR delivers multiple environmental advantages: it treats greywater for reuse, thereby reducing consumption of drinking water, and enhances urban greening through its integration into green roofs, which also help to cool buildings and mitigate heat island effects. Economically, both systems offer long-term savings by minimizing water bills and infrastructure costs, making them attractive options for eco-conscious homeowners, municipalities, and commercial property developers.



X. Case Study Greece: PiraeusTower



PARTNER

Hellenic Solar Industry Association (EBHE)

BUILDING/PROJECT OVERVIEW

PiraeusTower is architectural landmark considered as the starting point of the new Athenian Riviera and is located in the heart of one of Europe's largest passenger ports. The Piraeus Tower, with 22 floors, a total height of 88 meters, and a built-up area of 34,623 square meters, hosts offices, retail stores, a gym, a wellness area, and F&B spaces.

PiraeusTower is the first green high-rise building in Greece with the highest LEED Platinum certification. Additionally, it is set to be certified as a WELL building, a certification focused on the health and well-being of its users.

TECHNICAL DESCRIPTION

Piraeus Tower incorporates advanced building technology to optimize energy efficiency, reduce carbon emissions, and ensure operational resilience. Key applications include:

Building Management System: A comprehensive BMS integrates and controls various building systems, including HVAC, lighting, electric vehicle (EV) charging, and power monitoring. By optimizing the interaction of these systems, the BMS can further enhance energy efficiency, improve occupant comfort, and reduce operational costs.

Metering of Major Energy Loads: By precisely measuring the energy usage of critical systems, the tower can identify areas for optimization and implement targeted energy-saving measures.

Power Monitoring: Continuous monitoring and recording of energy consumption and equipment performance helps to identify inefficiencies, optimize operations, and extend asset lifespans.

PERFORMANCE METRICS

- Façade designed to provide 45% solar heat gain reduction resulting in significant cooling load reduction, which is crucial for the climate in Greece
- Under the usual Lighting scheme, the 10,000 sqm facade is illuminated with the extremely minimum power of 4.5KW
- Minimum water consumption (more than 40% than the baseline consumption of LEED standard)
- 1,000 sqm vegetation irrigated by rainwater
- More than 90% recycling of the Construction waste

SOCIAL IMPACT

PiraeusTower employs approximately 2,000 people and welcomes hundreds of visitors daily from Greece and abroad. It also provides a healthy, modern, and human-friendly environment without burdening the natural environment.

ENVIRONMENTAL & ECONOMIC BENEFITS

Regarding sustainability, the first Greek Green skyscraper - Piraeus Tower - achieved the highest level (Platinum) of LEED rating system - the most widely known green building rating standard. In our effort to fight climate change and deliver the “landmark of the future”, special emphasis has been given to the reduction of both the embodied and the operational carbon footprint.

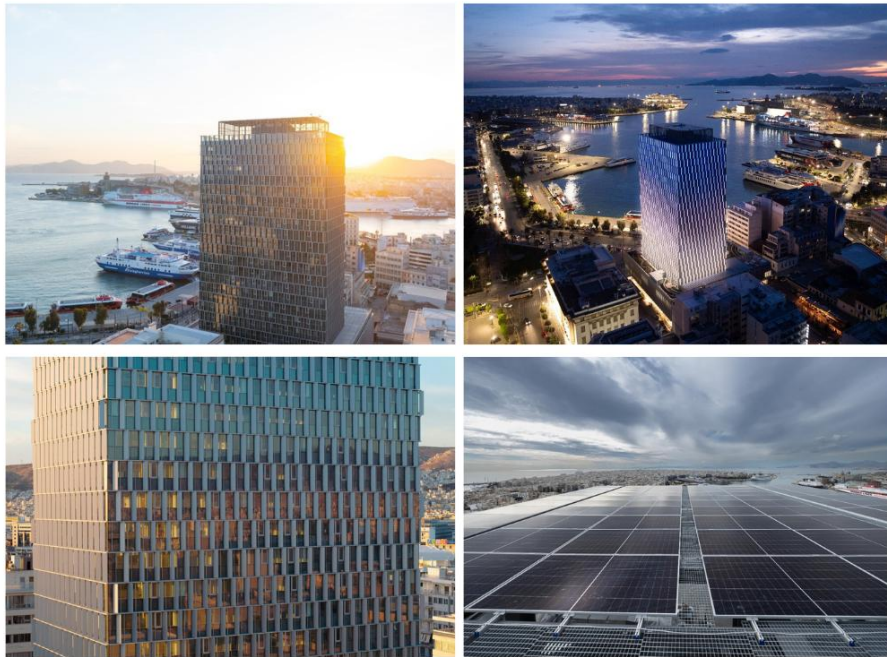
Innovative (circular) recycling of the existing façade, biophilic design, renewable energy, increased vegetation irrigated 100% by rainwater and a multi-parameter façade that finds optimum balance between daylight, energy consumption reduction and views are some of the sustainable characteristics.

In addition, as quick responders to the pandemic crisis and at the same time by being aware of the major importance for increased peoples’ health and well-being, Piraeus Tower project is pursuing WELL certification which is the leading tool for advancing health, well-being and productivity in buildings globally.

Sustainable characteristics in more detail:

- A+ according to Greek energy regulation (KENAK) (while legislation requires B for existing buildings-major renovations)
- 21% better energy performance than ASHRAE 90.1-2010
- Façade designed to provide 45% solar heat gain reduction resulting in significant cooling load reduction, which is crucial for the climate in Greece
- Under the usual Lighting scheme, the 10000sqmt facade is illuminated with the extremely minimum power of 4.5KW
- 100KW PV panels
- Glazing combining high visibility (VLT) & low solar gain (g)
- All electric parking
- Daylight sensors
- Lighting with high color rendering index (CRI>90))
- Low lighting power density (20% better than ASHRAE 90.1-2010)

- Low UGR lighting (glare free more productive working environment)
- Increased ventilation (30% more fresh air than local and “global” standards)
- Advanced air filtering
- No touch anti-covid philosophy
- Minimum water consumption (more than 40% than the baseline consumption of LEED standard)
- 1,000 sqm vegetation irrigated by rainwater
- Sustainable, Recycled & low emitting materials
- Constant measurement of outdoor air quality and signal when outside conditions are optimum (to open the window)
- Advanced indoor air quality monitoring and displaying
- Abundant daylight based on scientific modelling
- Potable water quality monitoring
- Restorative / Wellness space available to tenants
- Great access to public transportation



XI. Conclusion

The compilation of best practices across Bulgaria, France, Italy, and Greece provides a comprehensive extract of how green infrastructure is being integrated into construction projects across various contexts, including residential, educational, public, and commercial. These case studies demonstrate that sustainable building practices are not only feasible, but also adaptable to diverse geographical, economic, and social settings.

Several recurring themes emerge from the analysis. First, the strategic use of renewable energy systems, such as photovoltaic panels and solar thermal solutions, has become a cornerstone of green construction. These technologies consistently lead to measurable reductions in energy consumption and operating costs, while increasing self-sufficiency and lowering carbon emissions. Second, innovative water management approaches, ranging from greywater reuse systems to rainwater harvesting and waterless cleaning stations, highlight the importance of resource circularity in sustainable design.

Importantly, the best practices also reveal the critical role of bioclimatic design, smart material choices (like X-LAM wood panels or natural insulation materials), and integrated systems (e.g., mechanical ventilation with heat recovery) in enhancing both energy performance and indoor comfort. These technical innovations are matched by strong social and economic impacts, including improved living conditions, reduced utility bills, enhanced training environments, and job creation in green sectors.

While the environmental and economic benefits are clear, many projects also contribute to education, awareness, and behavioral change, particularly when implemented in vocational training centers or public housing initiatives. By exposing students, tenants, and professionals to sustainable technologies and methods, these buildings become living laboratories for the green transition.

These findings will directly form the development of the OASIS training programme. By enriching educational resources with real-world examples, the project ensures that its content is both aspirational and actionable. These best practices serve not only as models for technical excellence, but also as tools for engaging learners in the broader mission of sustainability and reinforce the central idea of the OASIS project: equipping today's VET students and professionals with the skills, mindsets, and practical insights needed to shape a more sustainable construction sector.