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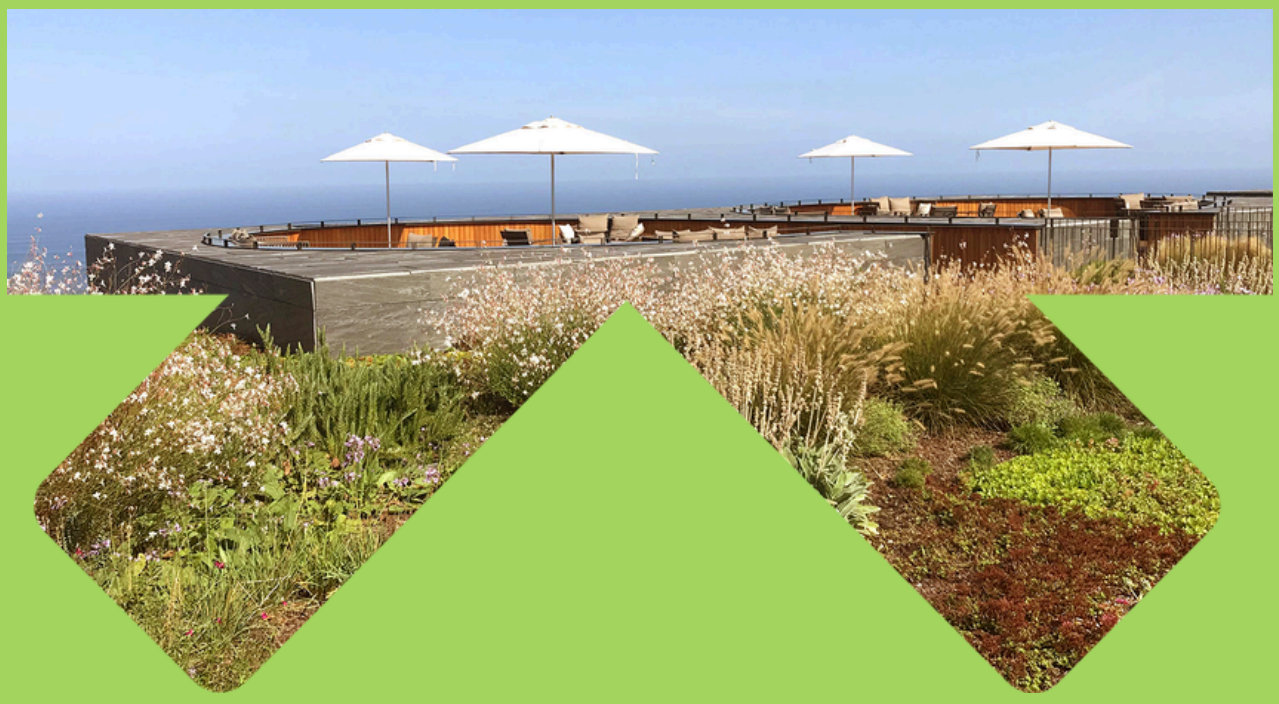
Active RoofTops
South Europe

CASE STUDIES FACTSHEETS

Spain



This project has been funded by various national research and development agencies under the Driving Urban Transitions Partnership, which is co-funded by the European Commission.

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SPAIN

AKELARRE HOTEL


Source: zinco-cubiertas-ecologicas.es

San Sebastián, Spain
Area: 900 m²

Building Typology
Hotel extension/retrofit composed of five cubic volumes

Roof Type
Flat, non-accessible inverted roofs

Rooftop Intervention
Extensive green roofs integrated with hotel terraces and landscape

Intervention Overview
The Akelarre Hotel extension is organised as five low cubic volumes whose roofs are planted to reduce their visual presence in the coastal landscape. Approximately 900 m² of extensive green roof uses aromatic plants, grasses and perennials selected for low maintenance, seasonal variation and compatibility with the temperate oceanic climate. Six terraces connect the new landscaped areas to the existing hotel, creating continuity between architecture, garden and views. The intervention prioritises a calm, integrated roofscape rather than public rooftop programming. The extensive system sits above an inverted roof build-up and contributes additional thermal protection without competing with the hotel's primary programme.

Why this Case matters
A useful hospitality precedent where extensive planting softens a visible building extension, strengthens landscape continuity and adds low-maintenance thermal protection.

Key Features
- Extensive planting installed above an inverted-roof build-up.
- Species palette combines aromatic plants, grasses and perennials.
- Low-maintenance design responds to commercial operation.
- Six terraces connect accommodation and planted roof areas.

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SPAIN

RAMÓN BILBAO WINERY

Haro, La Rioja, Spain
Area: 2000 m²


Source: zinco-cubiertasecologicas.es

Building Typology
Commercial winery - renovation and expansion

Roof Type
Pitched, non-accessible extensive roof

Rooftop Intervention
Native vegetated roof on slopes of up to 35 degrees

Intervention Overview
The Ramón Bilbao Winery uses a large pitched green roof to merge new and renovated production buildings with the surrounding vineyard landscape. Approximately 2,000 m² of native regional vegetation follows roof slopes reaching about 35 degrees. Because gravity can cause the growing layers to creep or slide, the system incorporates substrate-stabilisation measures and retaining barriers that transfer thrust forces back to the supporting structure. The roof is non-accessible and its main roles are landscape continuity, environmental performance and reduction of the visual impact of the expanded winery. Native planting and an extensive specification limit maintenance while allowing the intervention to read as a continuation of the surrounding agricultural terrain.

Why this Case matters
A key technical reference for steep green roofs, demonstrating how stabilisation, retaining systems and native planting can integrate large buildings into agricultural landscapes.

Key Features
- Native regional planting visually links the building and vineyards.
- Stabilisation system secures substrate on steep roof planes.
- Retaining barriers transfer downslope forces to the structure.
- Extensive specification limits maintenance across a large area.

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SPAIN

ELS TERRATS D'EN XIFRÉ

Barcelona, Spain


Source: neweuropeanbauhaus.es

Building Typology
Historic multi-family residential building

Roof Type
Flat, accessible intensive roof

Rooftop Intervention
Communal native Mediterranean "floating wild garden"

Intervention Overview
Els Terrats d'en Xifré transforms the roof of a historic residential building into an accessible communal garden conceived as a floating wild landscape above the dense city. Native Mediterranean planting and biodiversity-oriented design create habitat while reactivating space that was previously underused. The intensive roof supports a richer and more varied vegetation structure than a shallow extensive system, and the communal layout introduces places for residents to meet, rest and experience seasonal change. Sustainability, aesthetics and social use are deliberately integrated in line with New European Bauhaus principles. The project also improves thermal performance and gives residents a shared outdoor room where biodiversity, seasonal change and collective stewardship become visible.

Why this Case matters
A strong example of residential rooftops becoming shared urban rooms that combine biodiversity, thermal benefits, social use and collective stewardship in a historic district.

Key Features
- Native Mediterranean vegetation selected for climate fit and ecological value.
- Accessible shared roof adds communal space to a historic residential block.
- Intensive planting creates a varied, garden-like environment.
- · Design recognised within the New European Bauhaus context.

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SPAIN

WELLINGTON HOTEL ROOFTOP ORCHARD

Madrid, Spain
Area: 300 m²


Source: expansion.com

Building Typology
Existing city-centre hotel

Roof Type
Flat, accessible productive roof

Rooftop Intervention
Urban orchard supplying the hotel restaurant

Intervention Overview
The Wellington Hotel converted an accessible roof into a productive orchard linked directly to its restaurant. Approximately 2,600 plants are cultivated in about 70 tonnes of soil, creating a substantial food-growing operation within hospitality infrastructure. Organic compost and natural pest-control methods support cultivation, while the proximity of the kitchen creates a short and visible supply chain for herbs, vegetables and other produce. Unlike an ornamental hotel terrace, the roof is organised around routine agricultural work and seasonal output. Regular irrigation, safe access and daily maintenance are therefore integrated into hotel operations rather than treated as occasional landscape tasks throughout the growing season.

Why this Case matters
The orchard demonstrates how rooftop agriculture can support a hotel's operating model, local food supply and sustainability identity while requiring disciplined daily management.

Key Features
- Approximately 300 m² of productive growing area.
- Around 2,600 plants cultivated in a reported 70 tonnes of soil.
- Organic compost and natural pest-management methods.
- Produce supplied directly to the hotel restaurant.

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SPAIN

CUBIERTA EL MADROÑAL

Málaga, Spain
Area: 950 m²


Source: urbanature.es

Building Typology
Five cascading residential villas

Roof Type
Flat, non-accessible inverted roofs with 2% slope

Rooftop Intervention
Extensive sedum roofs with integrated irrigation

Intervention Overview
Five cascading villas at El Madroñal use extensive green roofs to reduce their visual impact and continue the surrounding planted landscape across the stepped development. The combined roof area is approximately 950 m². A sedum-based palette was selected for low water demand and limited maintenance, supported by an integrated irrigation system suited to establishment and prolonged dry periods. The roofs are non-accessible and sit above inverted roof assemblies with a slight 2% fall for drainage. The repeated roof detail creates a consistent visual language across the development while supporting insulation, drainage and protection of the roof membrane over the building lifecycle.

Why this Case matters
A repeatable residential strategy using low-maintenance extensive roofs to reduce visual impact, support landscape continuity and improve performance across several stepped villas.

Key Features
- Green roofs distributed across five stepped residential volumes.
- Sedum planting selected for drought tolerance and low upkeep.
- Integrated irrigation supports performance in a hot, dry climate.
- Inverted roof arrangement and 2% slope coordinate insulation and drainage.

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SPAIN

SALESIANS SCHOOL GREEN ROOF

Barcelona, Spain
Area: 190 m²

Building Typology
Existing public educational building

Roof Type
Flat, accessible roof with pergola

Rooftop Intervention
Hybrid green roof, photovoltaics, small wind turbine and habitat features

Intervention Overview
The Salesians School roof was redesigned as a compact environmental teaching space. Aromatic planting is supported by drip irrigation and moisture sensors, while photovoltaic panels and a small wind turbine introduce renewable-energy systems that students helped to install. An insect hotel and vertical green wall broaden the biodiversity and learning programme. The accessible roof and pergola make the technical systems visible and usable, turning the retrofit into an outdoor classroom rather than a concealed building-service upgrade. The project therefore combines biodiversity, water management, energy generation and social use within a single, clearly legible educational installation for students, teachers and visitors.

Why this Case matters
A compact school roof where visible systems support hands-on learning about planting, irrigation, renewable energy, biodiversity and environmental monitoring.

Key Features
- 191 m² accessible planted roof with aromatic species.
- Drip irrigation and moisture sensing support efficient water use.
- PV panels and a small wind turbine integrated into the educational programme.
- Insect hotel, vertical wall and pergola add habitat and social value.

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SHOPPING CENTRE PREMIÀ DE MAR

Premià de Mar, Spain
Area: 8000 m²


Source: drimmediambient.com

Building Typology
Large commercial shopping centre

Roof Type
Flat, non-accessible extensive roof

Rooftop Intervention
Low-maintenance green roof focused on retention and water efficiency

Intervention Overview
An 8,000 m² non-accessible roof at the Premià de Mar shopping centre was converted to an extensive green roof under the Barcelona Green Roofs programme. The multi-layer build-up was designed to retain approximately 12 litres of water per square metre, reducing rapid runoff from a very large impermeable surface. Hydroseeding allowed vegetation to be established efficiently across the broad roof area. The system operates without automated irrigation, so species choice, substrate performance and establishment strategy are central to long-term success. Applied at this scale, the roof contributes significant stormwater storage, thermal buffering and ecological surface without requiring public access or intensive maintenance.

Why this Case matters
The project demonstrates the cumulative stormwater and environmental value of simple extensive systems applied across very large, non-accessible commercial roofs.

Key Features
- Very large continuous green-roof area of approximately 8,000 m².
- Reported water-retention capacity of about 12 L/m².
- Hydroseeding used for rapid, even installation at scale.
- No automated irrigation; low maintenance and water efficiency prioritised.

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POLYTECHNIC UNIVERSITY MADRID

Faculty of Agricultural Engineering Green Roof

Madrid, Spain

Building Typology
University educational and research building

Roof Type
Flat, non-accessible roof

Rooftop Intervention
Extensive green roof used within a research programme

Intervention Overview
The case-study record identifies an extensive green roof at the Polytechnic University of Madrid's Faculty of Agricultural Engineering as a research installation. Its location within an agricultural and technical university setting makes the roof relevant as a test bed for examining vegetation, substrate, water and building-performance questions under Madrid's demanding dry climate. The available source material does not state the installation year, size, precise system build-up, monitored variables or published outcomes; these details should therefore be confirmed from the underlying university research before publication of quantitative claims. As a non-accessible university installation, it can support controlled comparison of materials, planting strategies, irrigation and maintenance under semi-arid

Why this Case matters
The case highlights universities' role in testing rooftop systems under controlled conditions before wider municipal or commercial adoption, although primary research details require confirmation.

Key Features
- University-based extensive green-roof research setting.
- Flat, non-accessible roof on an existing educational building.
- Semi-arid climate offers demanding conditions for plant and water performance.

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SPAIN

OFFICE BUILDING GREEN ROOF

Madrid, Spain

Building Typology
Existing commercial office building

Roof Type
Pitched roof, non-accessible

Rooftop Intervention
Lightweight extensive green roof adapted to a dry climate

Intervention Overview
This Madrid office retrofit applies a lightweight extensive green-roof system to a pitched roof. The documented approach combines a relatively light growing medium with low-maintenance vegetation suited to dry conditions. The objectives are improved thermal performance and better urban environmental quality, while the planted roof also softens the visual character of service areas and adjacent hard surfaces. The source material does not provide the installation year, roof area, slope, planting schedule or detailed build-up, so the case should be read as a qualitative reference rather than a fully specified technical precedent. As a pitched retrofit, the design requires secure growing layers, reliable drainage and careful protection of existing waterproofing

Why this Case matters
A representative private-office retrofit highlighting the technical checks required for lightweight planting on pitched roofs in Madrid's dry climate.

Key Features
- Extensive planting on an existing pitched commercial roof.
- Lightweight substrate limits additional load.
- Vegetation selected for low maintenance and dry-climate tolerance.
- Detailed technical parameters are not stated in the available source.

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WP1: Setting the Scene, Co-Design and Consultancy Package.

D1.1A: Regulatory and Technical Landscape on Rooftop Design and Installation. Executive Summary.

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Spain case study: Raquel Guerra Aragonez
Design credits: Marina Pasia

CONSORTIUM

COOPERATION PARTNERS

This project has been funded by various national research and development agencies under the Driving Urban Transitions Partnership, which is co-funded by the European Commission. In addition, the project EP/DUT/0923/0063 is implemented under the programme of social cohesion "THALIA 2021-2027" co-funded by the European Union, through Cyprus Research and Innovation Foundation.