

GROOF – Final Assessment

“Reducing CO₂ emissions via rooftop greenhouses:
research conducted on 4 pilots in Europe»

End of the project and coaching

Press release – April 2023

Barcelona, 3rd of May 2023 - The Interreg North-West Europe co-founded GROOF project (Greenhouses to Reduce CO₂ on rOOFs), which ran from 2017 until 2023 and has become a key source of urban agriculture expertise for the region with a specific focus on how building integrated greenhouses offer opportunities to exploit metabolic, operational, and social synergies with the Built Environment. GROOF built 4 pilot projects as demonstrators and research tools, leading to the development of guidelines underlining best practices in the field.

Focus on a Spanish project

A pioneering project on rooftop agriculture is the implementation of 7 hydroponic gardens on municipal buildings promoted by the municipal institute for People with Disabilities (IMPD) and with a special focus on the social benefits and horto-therapy. Here around 100 users visit the gardens each week to do activities and learn, distributing the product in soup kitchens and social pantries.

Where does Urban Agriculture stand in Spain?

- In recent years the city of Barcelona has started the integration of an urban agriculture strategy to promote biodiversity, organic agriculture and the commitment, education, and involvement of citizens. Starting with the 2020 Green and Biodiversity Plan promoted in 2013, to the new Natura 2021- 2030 Plan, Barcelona hosted the 7th international meeting of the Milan Urban Food Policy Pact, becoming the World Capital of Sustainable Food in 2021. More recently, in April 2022, Barcelona was chosen by the European Commission, to be part of the European Mission 100 Smart and Climate-Neutral Cities by 2030.
- These actions are included in the Urban Agriculture Strategy (UAE) for the re-naturalization of urban spaces through the increase of agricultural area with an agroecological model. The vision in a period of ten years is that of an ecological, healthy, and resilient city, and with a citizenry involved in the management of the orchards and in the promotion of agroecology and food sovereignty.
- Currently, more than 180 urban and peri-urban gardens can be found in the metropolitan area of Barcelona (AMB), comprised by 23 municipalities, with an involvement of more than 870 people.

What is GROOF - Greenhouses to Reduce CO₂ on rOOFs?

1. A 5-Year project, led by 12 European partners

GROOF is a **cross-sectoral innovation project** involving **12 European partners** (Luxembourg, France, Belgium, Germany, and Spain).

It explored how building integrated greenhouses can improve their host buildings' thermal, operational, and metabolic performance while replacing the need to import perishable greenhouse products over long distances to their urban markets.

It also examined the social impact that this realignment of the food-city nexus could offer.

Please see the following video introducing the research project: [Presentation of the GROOF project](#)

- The GROOF partners built **4 pilot greenhouses** on four host buildings of varying functions in Belgium, France, Luxembourg, and Germany. These 4 pilots have allowed us to carry out research on:
 - [Installation costs of such devices](#)
 - [Potential CO₂ emission mitigation by both improving building performance and cannibalizing the market for fresh produce sourced from conventional supply chains.](#)
- In September 2019, GROOF launched its **first project call** and **coached 10 building-integrated greenhouse projects** until September 2021. GROOF then helped five of them move through more advanced design stages and into construction.
- In February 2022, GROOF issued its **second project call** and **coached 8 building-integrated greenhouse projects** from March 2022 until March 2023.

2. A final assessment and guidelines for future development

- The GROOF consortium has **generated a set of guidelines** for the design, development, and delivery of building-integrated greenhouses, based on the experience gained from their collective activities. They are intended to facilitate the development of similar projects in the future by helping adopters ask the right questions at the right time.
- All the **results** produced by GROOF are available in [the Communication Report 2023](#).

Why build rooftop greenhouses?

In terms of **energy**, a building-integrated or rooftop greenhouse can offer an active layer of insulation during colder months, and, when filled with plants, a dynamic layer of evapotranspiration cooling during hotter months. Where possible these structures should be applied to vacant or underutilized spaces in the city that do not displace other more lucrative functions. In this regard, the rooftop offers the most obvious opportunities. If committed to horticultural production, all requirements are usually readily available.

In terms of **social benefits**, their hyperlocal nature means that consumers can interact directly with the sources of production rather than through retailers, improving food literacy and awareness and eliminating, as far as is practicable, any fossil fuel-fed transportation.

What was the role of Spanish partners in the GROOF project?

- The **Sostenipra** research group in the **ICTA-UAB** institute has contributed to the GROOF project in the guidelines, coaching, and implementation of the social study and dissemination activities. Sostenipra has also participated as a plant production expert and represented the Barcelona urban area and the Spanish territory for the state-of-the-art description. To discover their contribution and their project, they created an explanation video.
- Although the location of the institute would exclude it from the call target region, the innovative integrated rooftop greenhouse structure made it one of the reference projects to develop the GROOF concept of building and agriculture synergies.

To know more about it

- The **closing event of GROOF** took place on April 25 at the IFSB Bettembourg, Luxembourg. This event aimed at sharing the results and marks the end of this large-scale project.
- A series of **podcasts** and **videos** highlighting the coached projects will be released in the coming weeks.
- On March 20th, GROOF received the **Energy Global Award Luxembourg** from the Austrian Embassy in Luxembourg.

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