Biosolar Green Roofs

Descriptive Summary

Three municipalities of the Metropolitan Area of Barcelona (AMB) will instal three biosolar green roofs: 2 in kindergardens and 1 in a library. This is the combination of a green surface on which photovoltaic (PV) modules are placed. The presence of the vegetation lowers and stabilises the PV module temperature, which increases its performance. This helps to generate energy and reduce energetic demand of the buliding, increase urban green spaces and biodiversity, enhances air quality, etc.

Background

The multiple effects of climate change in the urban environment require solutions that addresses multiple challenges in an effective manner. The installation aims to mainly address the increasing energy demand for cooling purposes, as well as the increasing heat island effect of land air quality decrease. It also aims to address the lack of space for recreation and educative outdoor spaces for children.

Aims and Goals

The goals of the three biosolar green roofs are:

- Generating of clean energy, with low GHG emissions and without noise generation.
- Improving the efficiency of the photovoltaic modules by avoiding overheating of the panels (up to 10% efficiency increase by keeping roof temperature below 25C, above which the efficiency of the PV gets reduced)
- Reduction of the energy demand of the building due to the insulation provided by the vegetation
- Air quality improvement: the vegetation absorbs polluting gases (approximately 100 m2 of green cover can absorb up to 20kg of polluting particles in a year!)
- Biodiversity promotion (for example the presence of pollinators)
- Contribution to the reduction of the heat island effect due to the cooling effect of vegetation.
- Water storage (sponge effect) and, therefore, prevention of local flooding and reduced pressure on the sewer

- Provision of outdoor lucid and educative spaces for kids.

Actions taken

Three biosolar green roofs will be installed during the year 2024 as follows:

- Saint Feliu de Llobregat (Kindergarden roof): 1288 m2 of green roof + 100 PV modules. The space will be adapted for children to play. Total budgetL Eur 274,945, of which Eur 49,000 are for the PV modules.
- Saint Boi de Llobregat (Kindergarden roof)L 810 m2 green roof + 30 PV modules. The space will be adapted for children to play. Total budget: Eur 247,275, of which Eur 845,152 are for PV modules.
- Santa Coloma de Gramanet (Library): 482 m2 of green roof + 78 PV modules + agora space for educational activities. Total budget Eur 100,000 of which Eur 36,000 are for PV modules .

Main Achievement to date

The project is still ongoing in the tendering process and is expected to be completed completed by the end of 2024. The main achievements can then be reported against the targets identified in the actions taken section of the demo in the different locations identified.

Partners
Àrea Metropolitana de Barcelona - AMB

Lessons, replicability and scalability potential

Bio-solar green roofs provide multiple benefits across the WEFE areas such as generation of clean energy with low emissions, improving air quality, providing water storage, facilitating greater bio-diversity, and reducing energy demands. Public and private sector buildings and infrastructures can adopt such technologies.

Affiliation
MedCities (MedCités)

Country
Spain

Start year
Mon, 01/01/2024 - 12:00

Total funding
100 - 500k €

Environmental
High

Social
High

Technological
Medium-High

Financial
High

Institutional
Medium-High

SDGs

Website
https://blogs.amb.cat/educacioambiental/2022/02/23/que-son-les-cobertes-biosola...

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Nexus Dimensions
Ecosystems
Energy
Water

Source URL: https://wefe4med.eu/demo/biosolar-green-roofs