



## Green roofs and green walls Nature-based solutions in action

Chemnitz May 2023



**Dusty Gedge**



[www.livingroofs.org](http://www.livingroofs.org)



**@greenroofsuk**



[www.dustygedge.co.uk](http://www.dustygedge.co.uk)



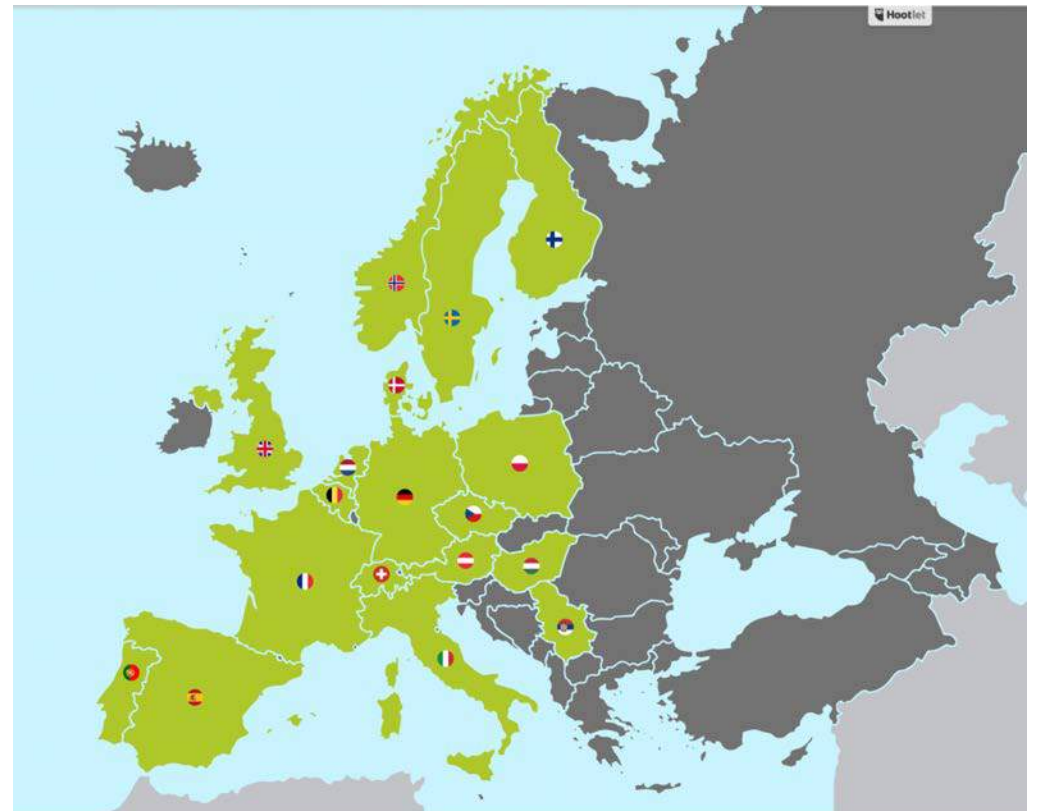
**dusty\_gedge**



[dusty@dustygedge.co.uk](mailto:dusty@dustygedge.co.uk)



**dustygreenroof**



[www.efb-greenroof.eu](http://www.efb-greenroof.eu)

## About the Project

ProGireg uses nature for urban regeneration with and for citizens.

The project is funded by the European Commission under the Horizon 2020 programme and will run from June 2018 until 2023. ProGireg stands for 'productive Green Infrastructure for post-industrial urban regeneration': nature for renewal.

### Innovation in four front-runner cities

Dortmund (Germany), Turin (Italy), Zagreb (Croatia) and Ningbo (China) host Living Labs in post-industrial districts where nature-based solutions are developed, tested and implemented.

### Global cities working together

Cascais (Portugal), Cluj-Napoca (Romania), Piraeus (Greece) and Zenica (Bosnia and Herzegovina) closely follow the progress in the Living Labs and engage in city-to-city exchange to replicate the nature-based solutions.

### Piraeus' nature-based solutions:

Piraeus will implement community-based urban farms and gardens, green corridors and pollinator friendly habitats, and is engaging local schools and universities in the co-design process.







[www.metabuilding-project.eu/](http://www.metabuilding-project.eu/)

# Innovating together for a sustainable built environment

Discover and promote innovative solutions, find collaboration opportunities and financial support for your projects and get easy access to innovation experts.

## WHAT IS METABUILDING PLATFORM

The METABUILDING platform is the digital meeting place for the innovation ecosystem of the European built environment sector. It brings together stakeholders from the construction sector and emerging industrial sectors such as recycling & circular economy, additive manufacturing, nature-based solutions, and the digital industry. The platform allows all the innovation actors in the construction sector to stay updated on latest innovations, find collaboration partners for development or business activities, showcase innovative products and solutions and to get innovation, testing and certification support for their R&D projects.

[www.metabuilding.com/](http://www.metabuilding.com/)

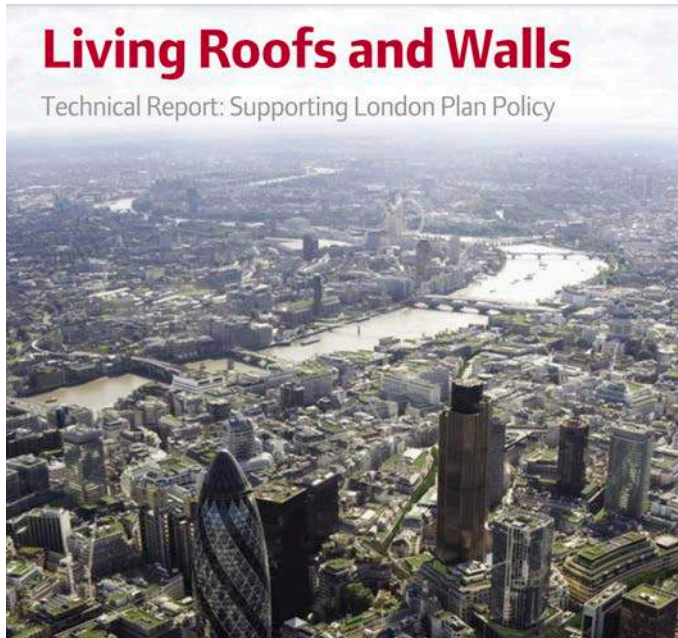




GREENER CITIES IN EUROPE

## Living Roofs and Walls

Technical Report: Supporting London Plan Policy



# gro

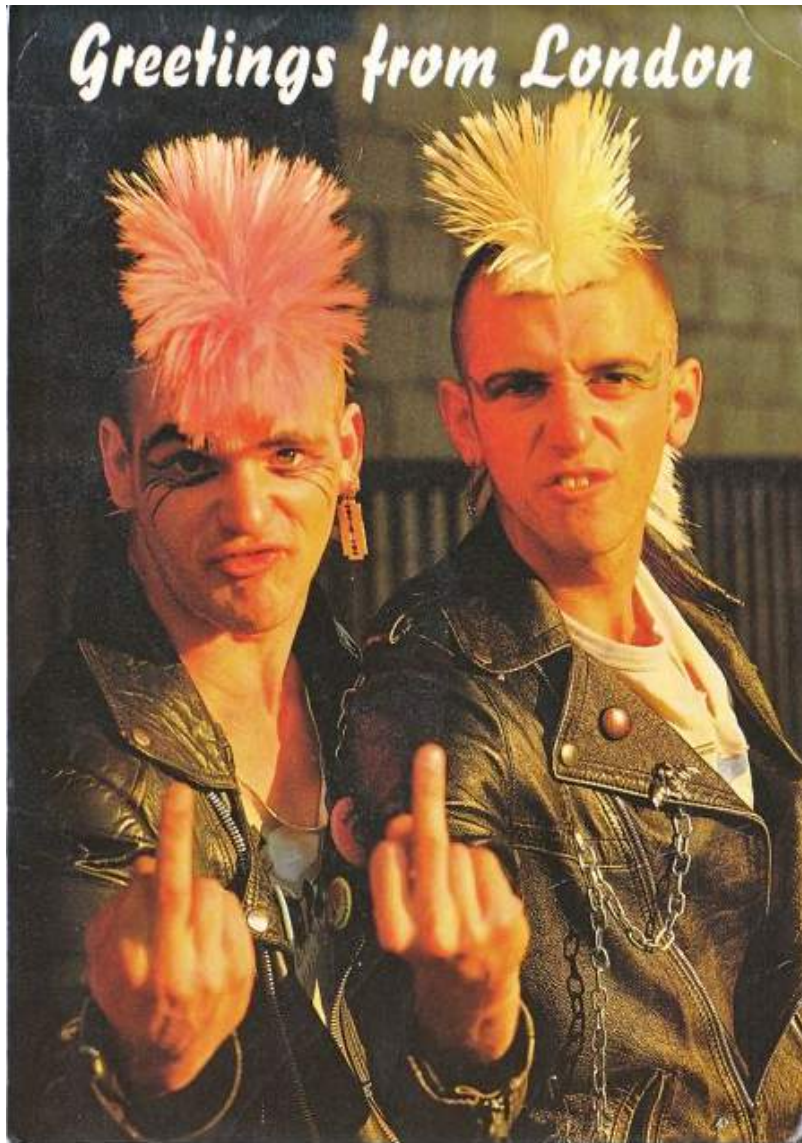


## CREATING GREEN ROOFS FOR INVERTEBRATES

A BEST PRACTICE GUIDE



New green roof biodiversity metric  
3.1 to be published end of October  
Natural England



## FROM *PUNK* TO PRESIDENT

*BUT YOU CAN'T TAKE*

*THE **PUNK** OUT*

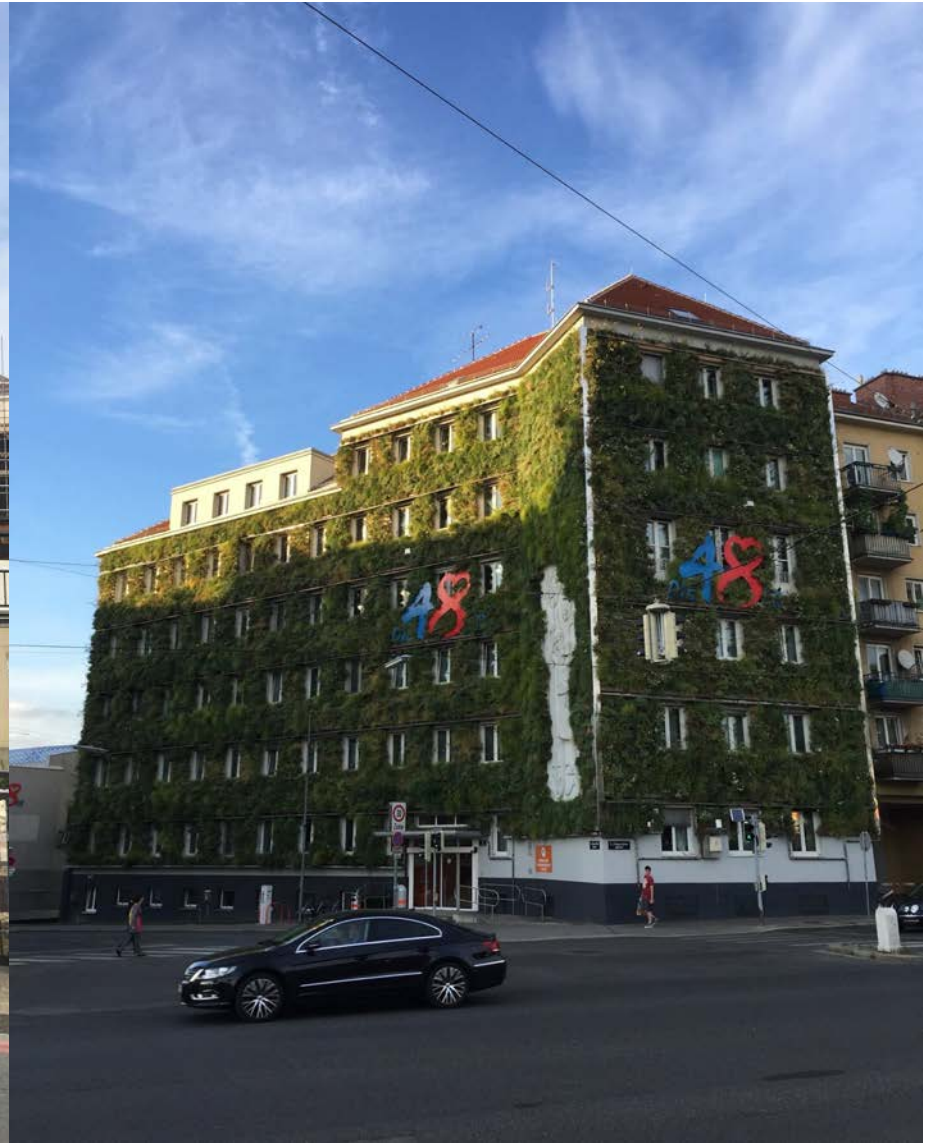
*OF THE PRESIDENT*



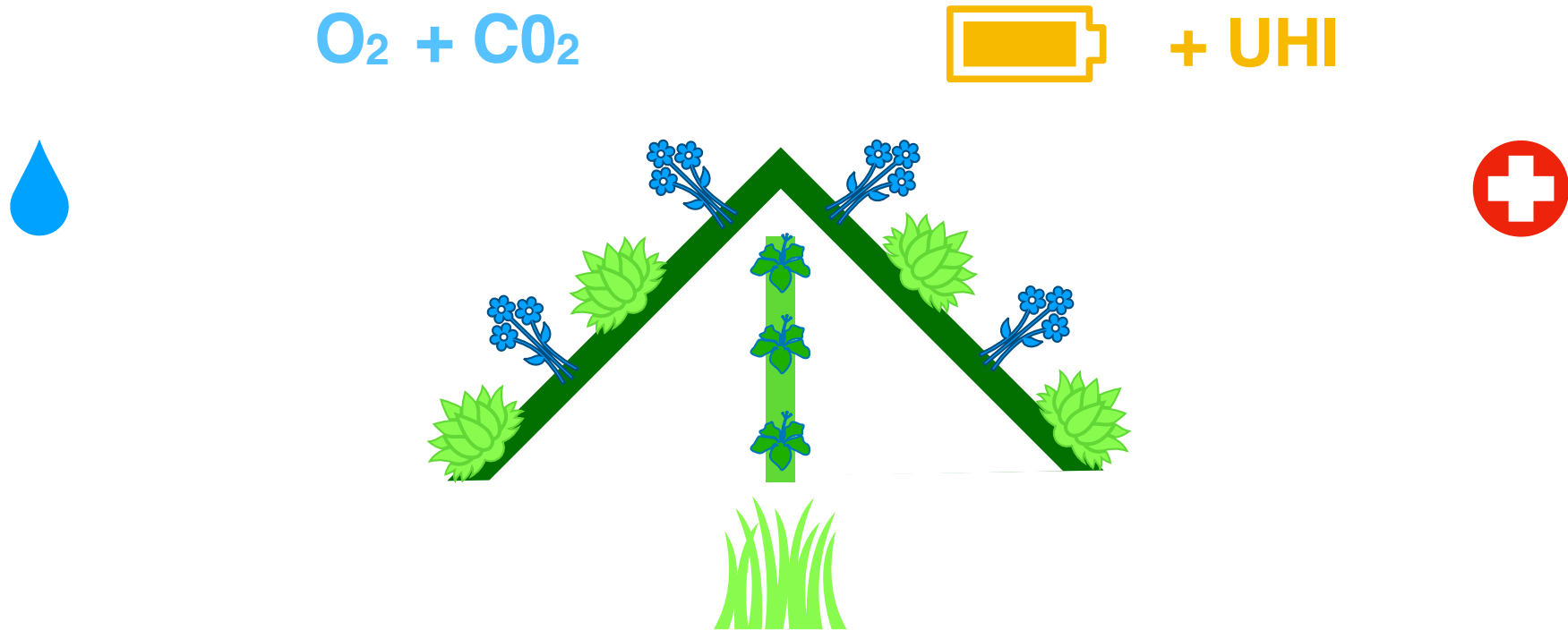
## Types





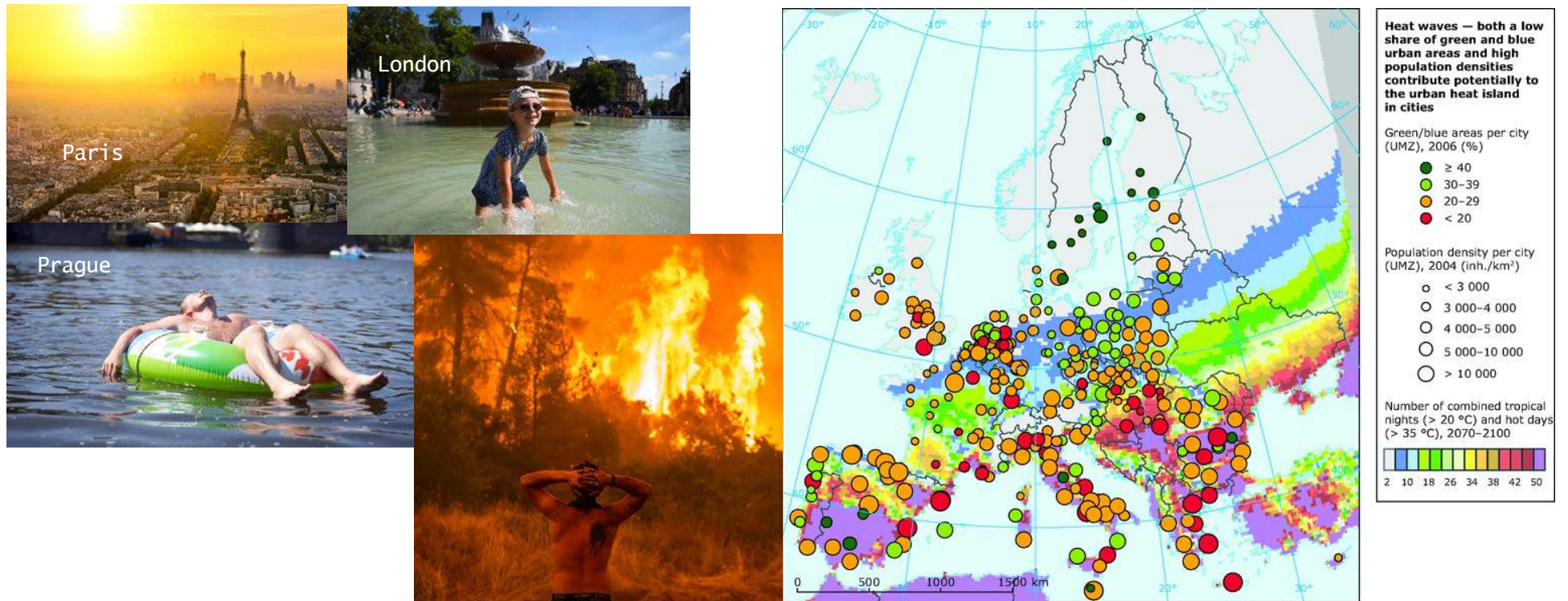


# Why Green (roof) cities are the future?





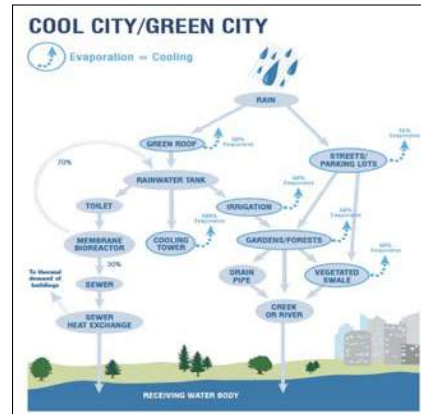
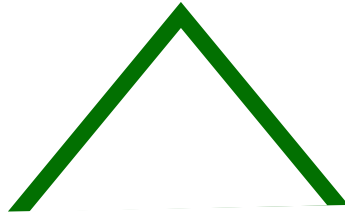
# + UHI



Why European cities need to adapt to climate change - **heat waves**



 + UHI



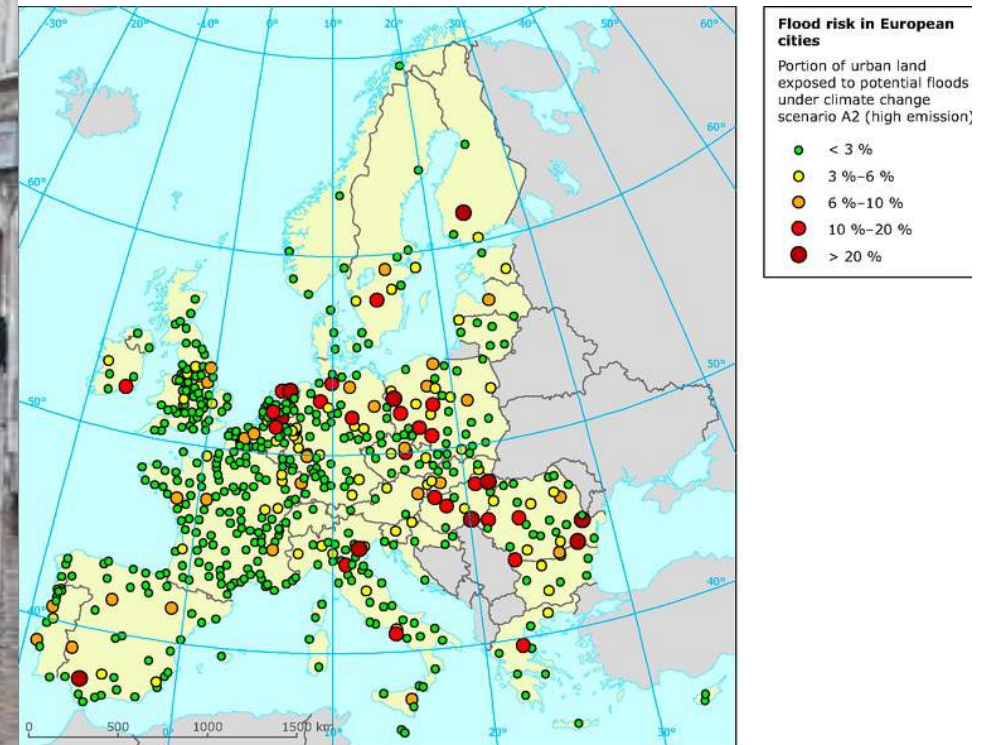
 + UHI



cools the city

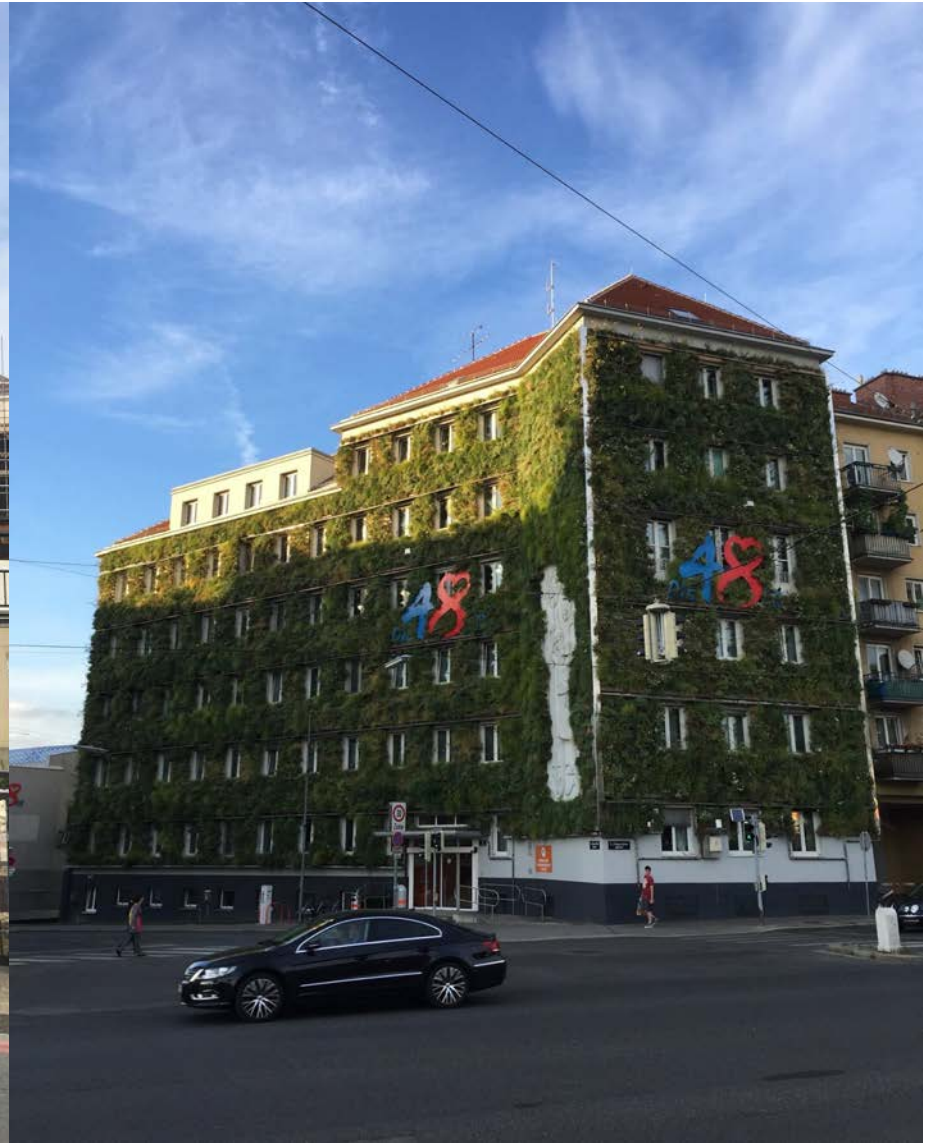


cools the 'canyon'



Intense summer storms are happening in cities because of climate change

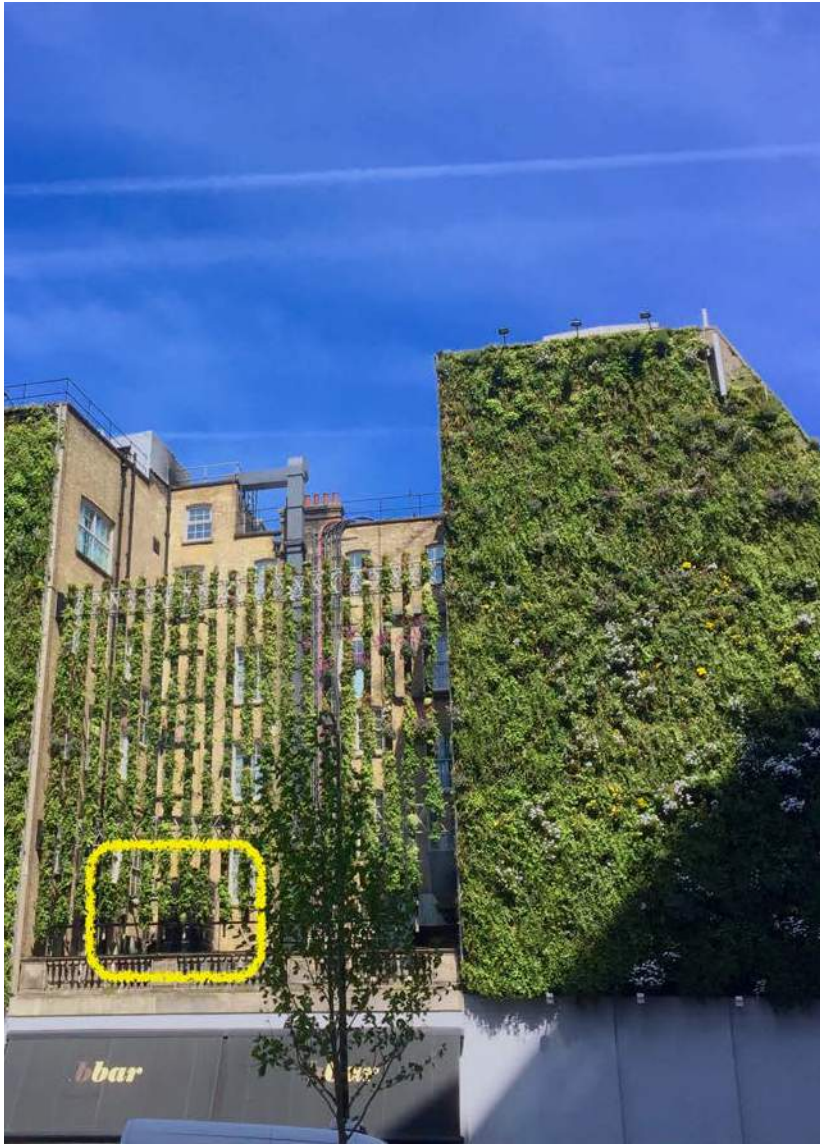




















Health and Well-being



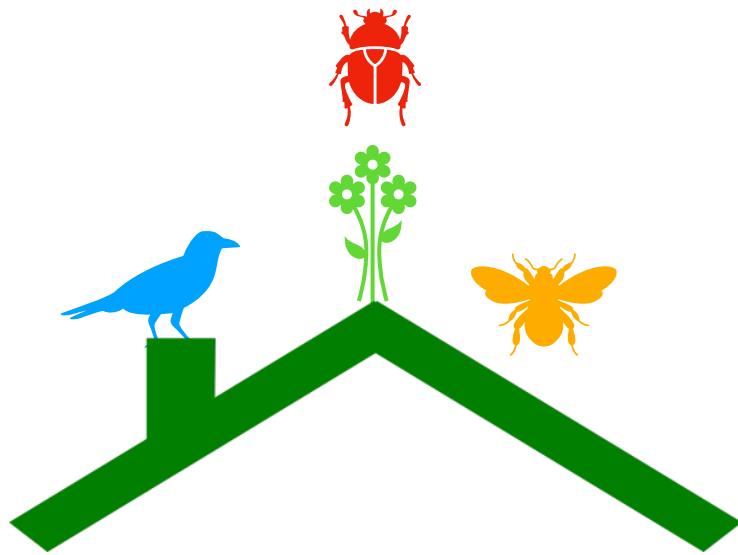












**Biodiversity**



**Black redstart**

Rare species in UK

Protected status





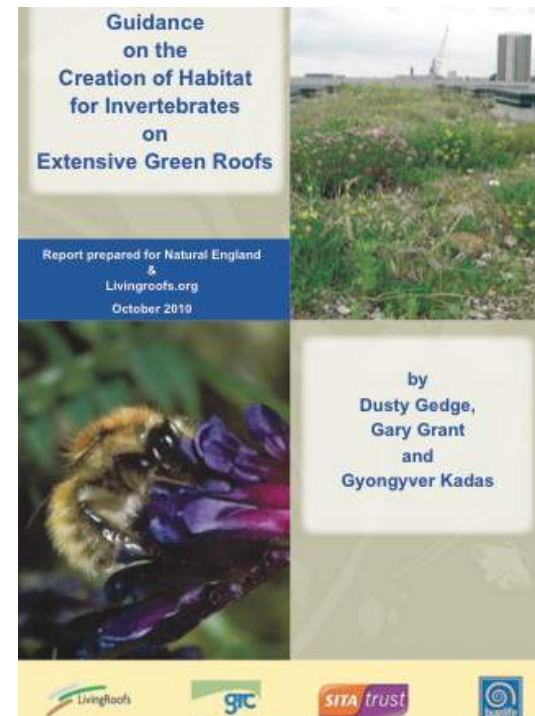






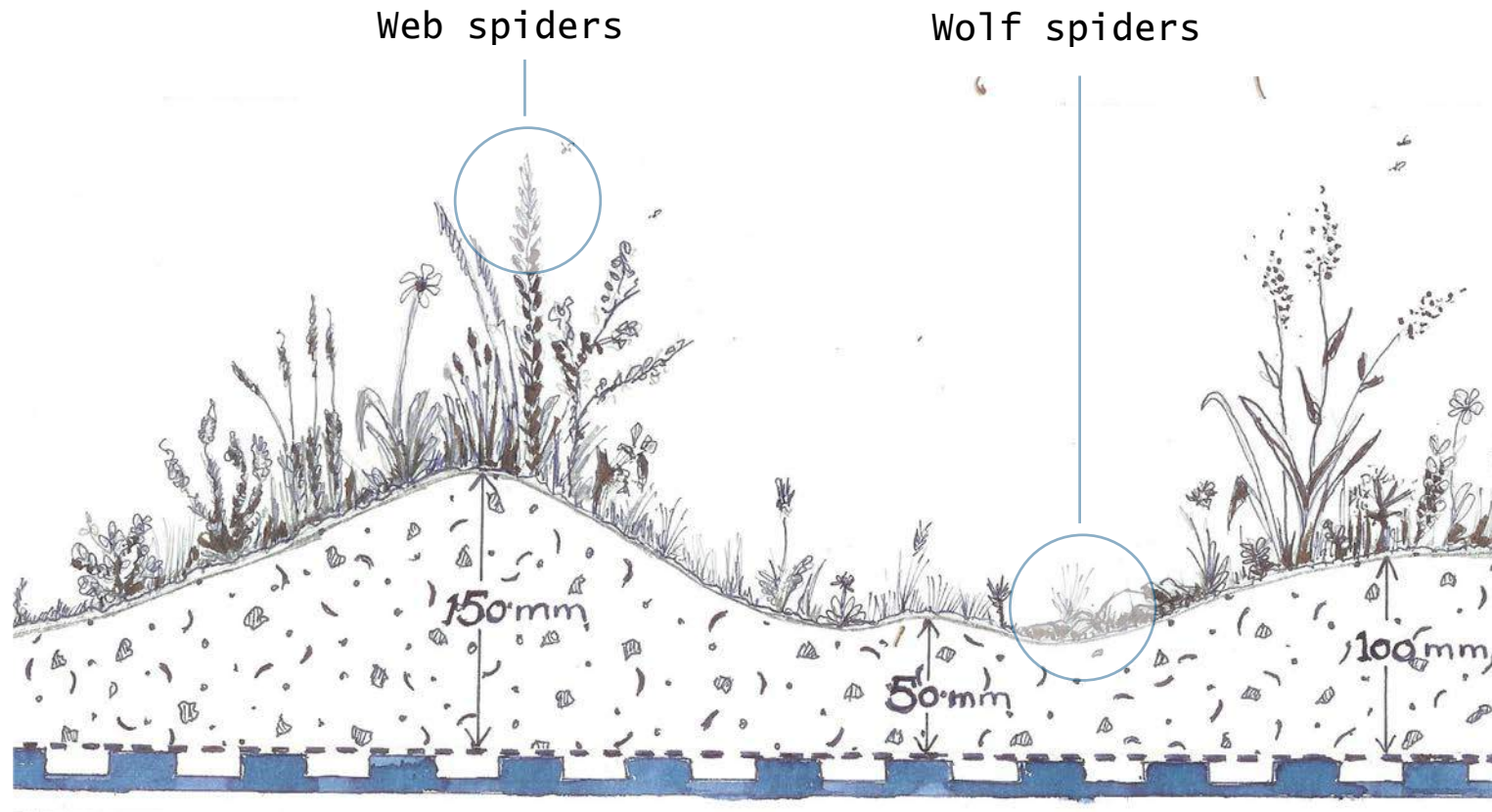
# Designing extensive green roofs for biodiversity

- Topographic variety - 80mmc - 150mm
- Seeded with native wildflowers associated with dry grasslands
- Additional habitat features - dead world, rubble mounds



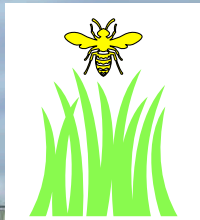


## Topographic diversity - diversity of floral structure



**Diversity of spiders = diversity of invertebrates**



























## Biosolar roofs - deliver greater biodiversity



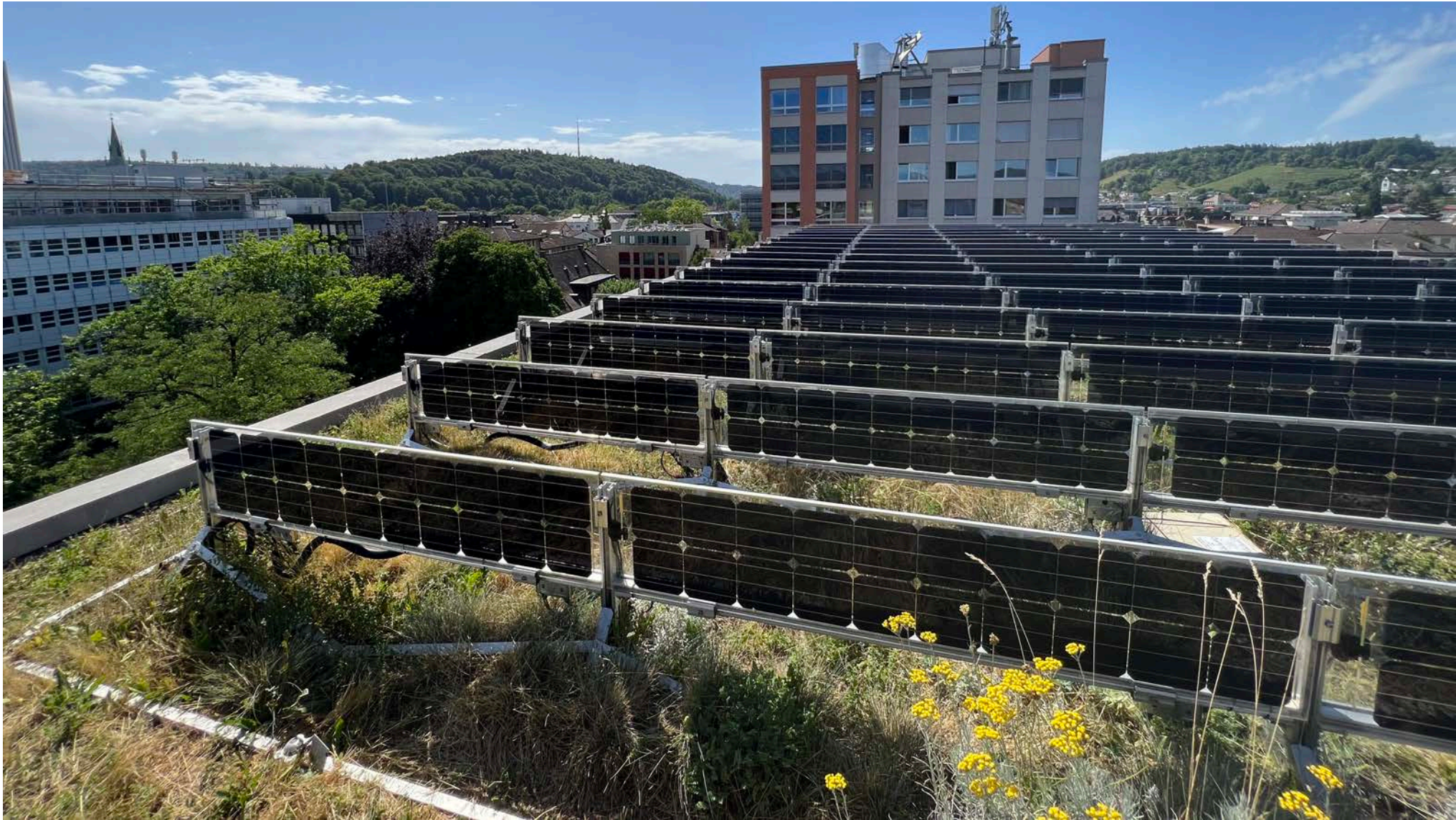
Wind and sun shade  
= greater diversity of  
native wildflowers  
behind panels -

Vegetation and soil  
can increase  
solar production by  
3.6%















# Improving the carbon story of green roofs



Carbon story

- Investigating materials that have high embedded carbon
- Engineered items
- Substrates
- Aim to develop systems that can be given a carbon credit value
- With CC value - will this lead to a mechanism to pay 4 retrofit



# London Borough of Lewisham

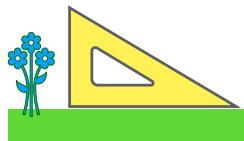
Lewisham Incinerator

Lewisham Parks



Seeds

Sedum cuttings



Lewisham Multi-storey Carpark



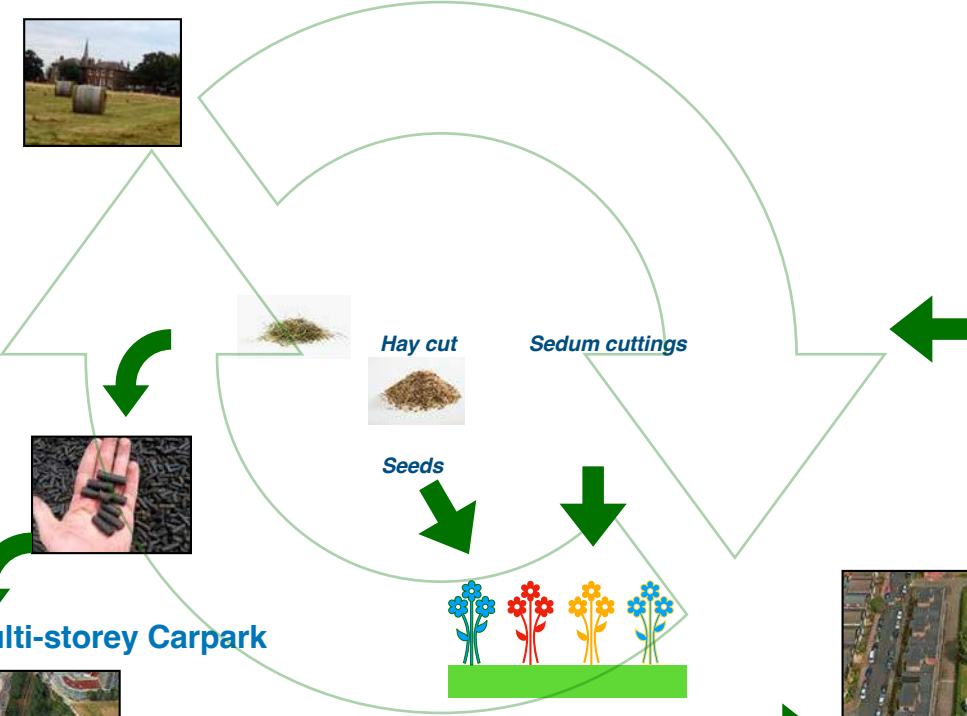
Lewisham Social Housing



Real estate Sector

Can implementation be paid for by Carbon and other credits?

Annual stewardship





# City of Vienna

Spittelau incinerator



Vienna Parks



Vienna multi-storey Carpark



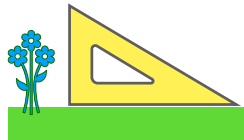
Hay cut



Seeds



Sedum cuttings



Can implementation  
be paid for by  
carbon and other  
credits?

Annual

stewardship



Vienna Social  
Housing



Real estate  
Sector





# Contract with European Space Agency

## Mapping green roofs and retrofit potential

Greater London: Green Roof Areas Hot Spot



City Of London: Green Roof Areas Hotspot Map

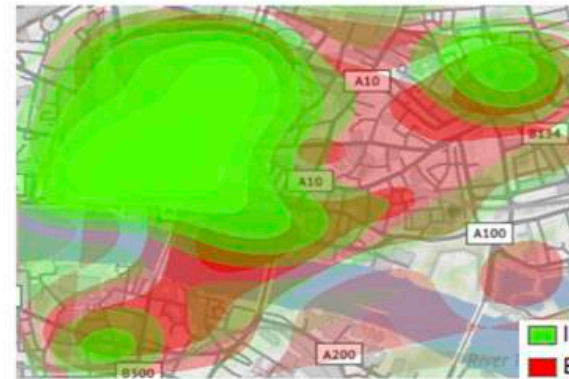


<https://livingroofs.org/london-map-green-roof-boroughs/>



## [GR ID] Green Roof Identification

- Ability to distinguish between Intensive and Extensive GR, and Astroturf (with a high level of accuracy)
- Ability to create GR statistics and heat maps, enhancing the value of the data you receive





## [GR RF] Green Roof Retrofit

- Identifying roofs suitable for Green Roof retrofitting using material automatic detection
- Successful pilot completed with Manchester City Council

### Pilot sites

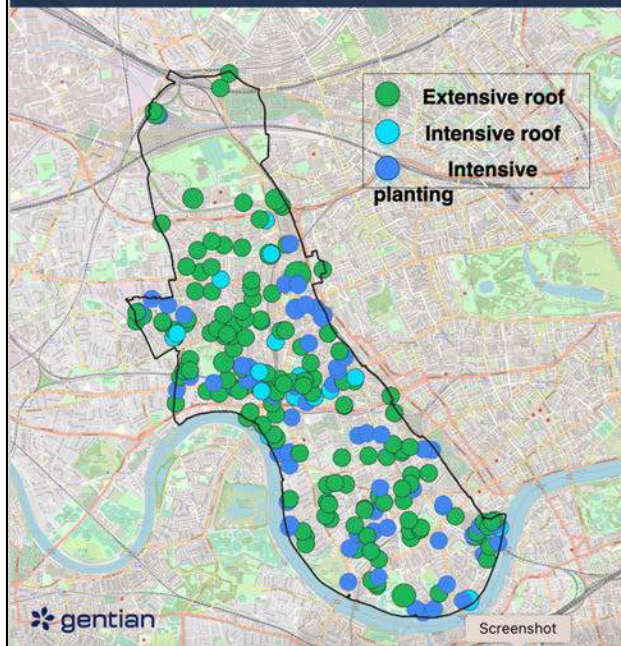
1. *Central London (Bloomsbury):*  
**Date:** April 2021- now  
**Size:** 3.5km<sup>2</sup>  
**Comments:** Area selected as part of a partnership with Wild Bloomsbury project and UCL. Suitable buildings for GR retrofit manually identified by Gentian's urban ecology expert. Polygons mapped in partnership with UCL.
2. *Greater Manchester*  
**Date:** June-July, 2021  
**Size:** 13km<sup>2</sup>  
**Comments:** Paying client requested two products (GR ID and GR RF). Suitable buildings for GR retrofit manually identified by Gentian's urban ecology expert. Polygons mapped manually by the Gentian Tech team.





[info@gentian.teams](mailto:info@gentian.teams)

## Green Roof Identification



## Example Retrofit Opportunities

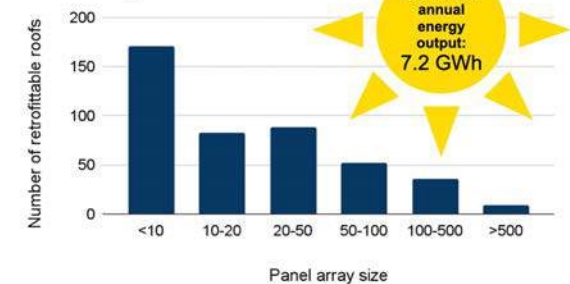


## Biosolar Opportunities

Biosolar statistics were calculated for all roof surfaces identified as retrofittable. Number of panels was estimated using a standard size 60-cell solar panel measuring 100 x 165cm. Panels were assumed to cover 50% of a roof surface. Energy output was estimated using a per panel power rating of 350W with an estimated annual output of 315kWh<sup>1</sup>.

Total number of panels that could be installed on retrofittable roofs	Annual energy output from all panels [kWh]	Largest panel array opportunity
22,833	7,192,395	1355

Panel array distribution



gentian

<sup>1</sup>Calculation based on the generation of 900 units of energy production per solar panel per year (UK Centre for Alternative Technology). 900 units is an average estimate. [cat.org.uk/info-resources/free-information-service/energy/solar-photos](http://cat.org.uk/info-resources/free-information-service/energy/solar-photos)

Screenshot

REMOTE MAPPING OF GREEN ROOFS/POTENTIAL RETROFIT/BIOSOLAR POTENTIAL

Weights may restrict to non-integrated system









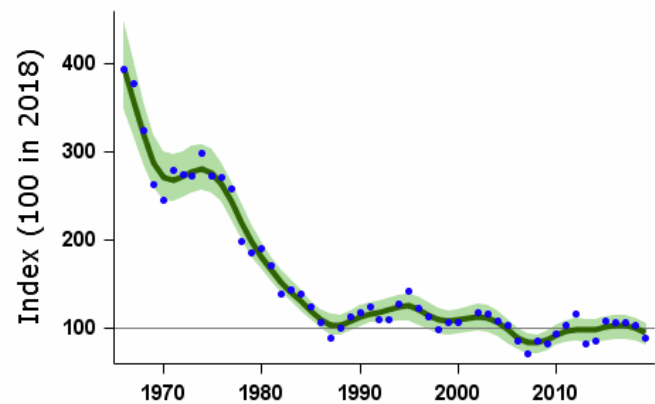








CBC/BBS England 1966-2019  
Linnet







15- 20 Pairs of Linnets on Greenwich Peninsula 2021





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## Campaigning for Twentieth century architecture

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### C20 Society Lost Modern Campaign



Photo © Richard Glover, courtesy Chetwood Associates

Sainsbury's, Greenwich, London



most sustainable retail store be in 2019



What will be the most sustainable retail store in 2039?





**Thank you**



**Dusty Gedge**



**@greenroofsuk**



**dusty\_gedge**



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