



Enabling Green and Blue Infrastructure Potential
in Complex Social-Ecological Regions (ENABLE)

Greening roofs in Europe and beyond

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Greening roofs in Europe and beyond

1. Introducing ICLEI
2. Where is greening thriving?
3. Close ups

1. Introducing ICLEI – Local governments for sustainability

1750+ LOCAL
AND REGIONAL
GOVERNMENTS

22 OFFICES
WORLDWIDE

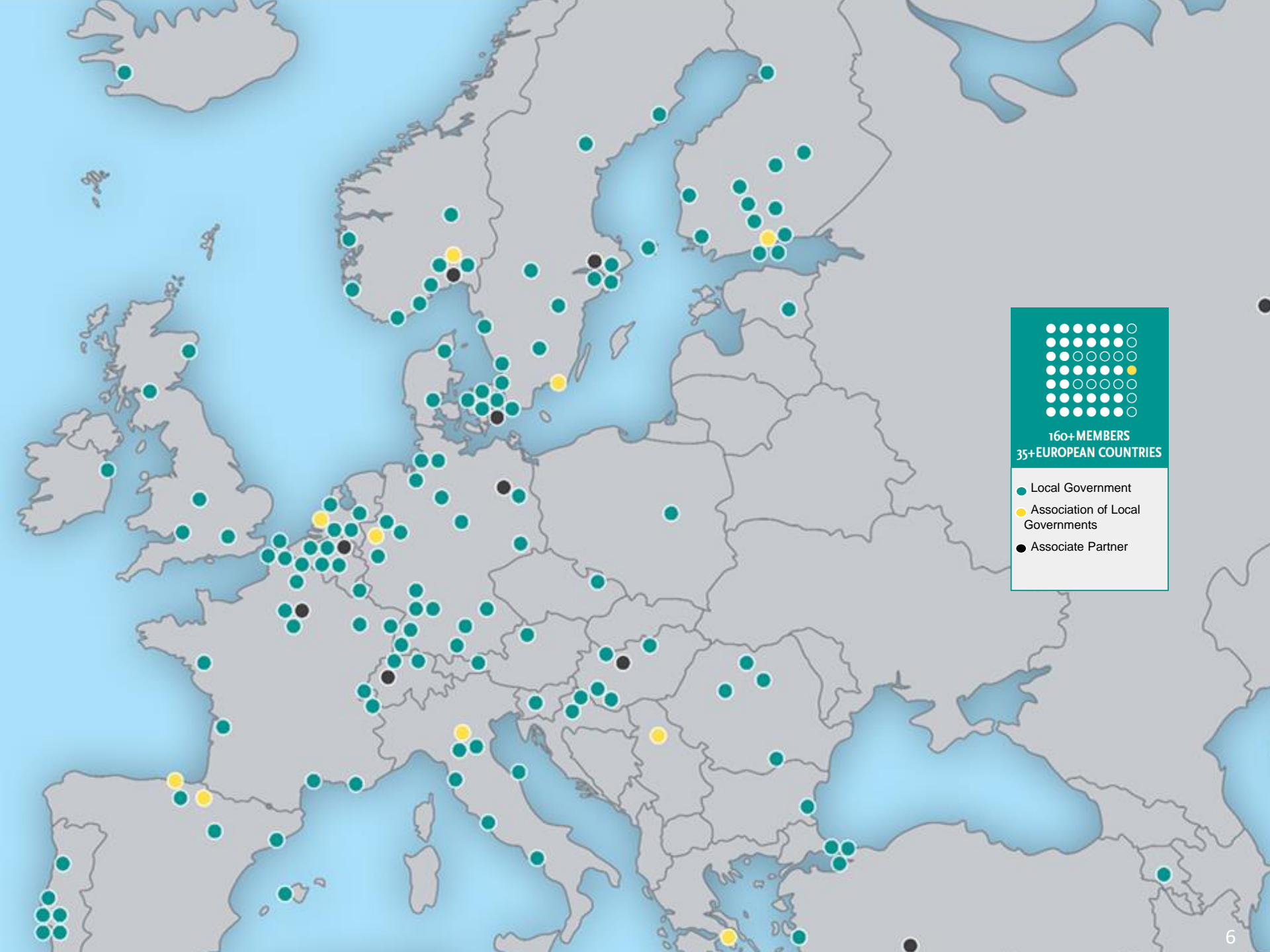
ACTIVE IN
100+ COUNTRIES

IMPACTING MORE THAN
25% OF THE
GLOBAL URBAN POPULATION

AND MORE THAN
20% OF THE
GLOBAL POPULATION

5 INTERCONNECTED
DEVELOPMENT
PATHWAYS





160+ MEMBERS
35+ EUROPEAN COUNTRIES

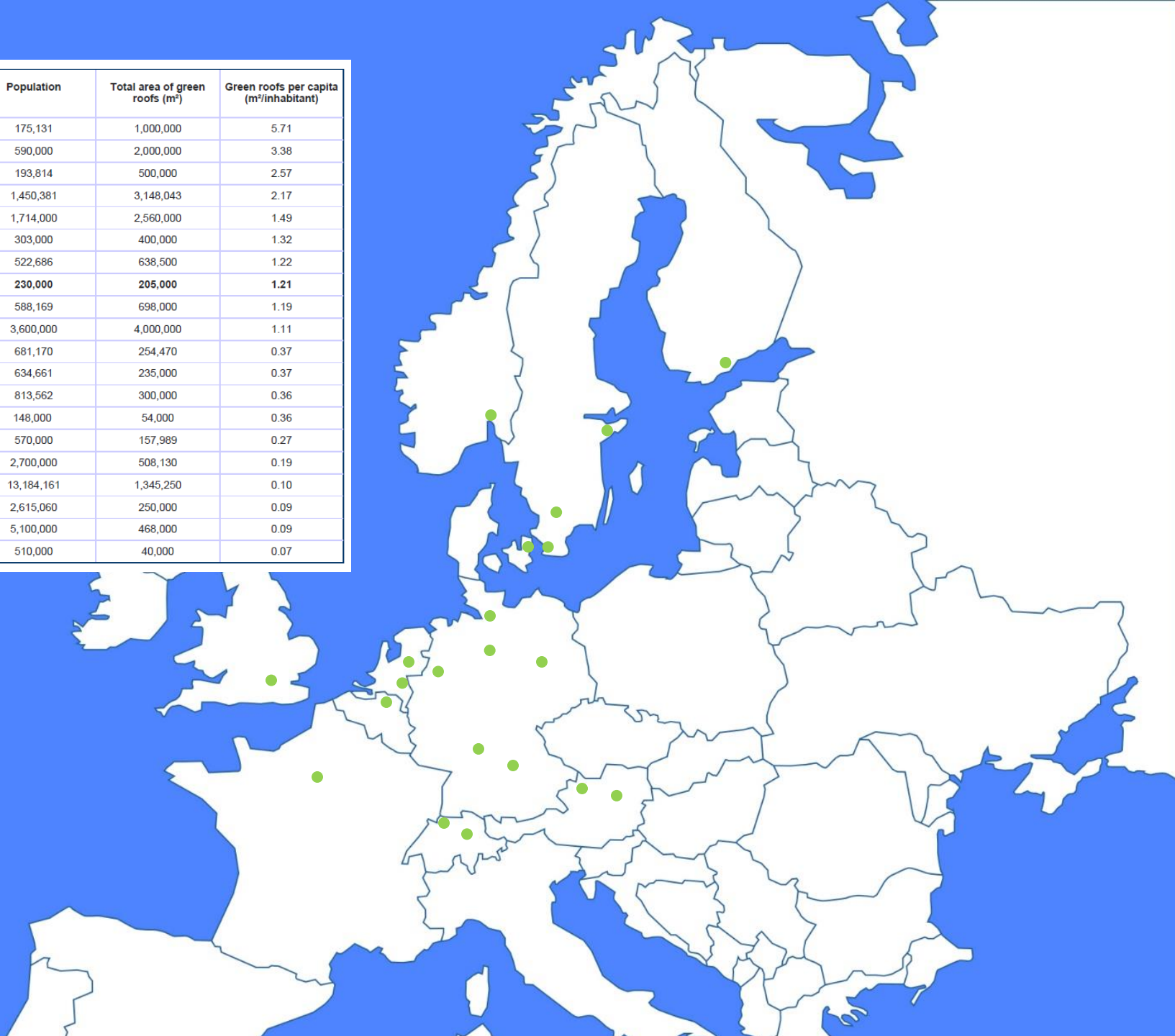
- Local Government
- Association of Local Governments
- Associate Partner

2. Where is greening thriving?

	Population	Total area of green roofs (m ²)	Green roofs per capita (m ² /inhabitant)
Basel	175,131	1,000,000	5.71
Stuttgart	590,000	2,000,000	3.38
Linz	193,814	500,000	2.57
Munich	1,450,381	3,148,043	2.17
Vienna	1,714,000	2,560,000	1.49
Malmö	303,000	400,000	1.32
Hanover	522,686	638,500	1.22
London's CAZ	230,000	205,000	1.21
Düsseldorf	588,169	698,000	1.19
Berlin	3,600,000	4,000,000	1.11
Washington D.C.	681,170	254,470	0.37
Rotterdam	634,661	235,000	0.37
Amsterdam	813,562	300,000	0.36
Melbourne City	148,000	54,000	0.36
Portland	570,000	157,989	0.27
Chicago	2,700,000	508,130	0.19
Tokyo	13,184,161	1,345,250	0.10
Toronto	2,615,060	250,000	0.09
Singapore	5,100,000	468,000	0.09
Copenhagen	510,000	40,000	0.07

Source: Living Roofs and Walls from policy to practice (2019)
<https://livingroofs.org/>

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Largest area of green roofs in Europe with a population of less than 200,000.

Basel

Targeting 100,000m² new green roofs by 2020 through Parisculteurs programme.

Paris

First local authority in North America to make green roofs mandatory in 2009, requiring green roofs on all new developments with roofs >2,000m².

Toronto

Incentive programme for green roofs since 2006.

Washington DC

Green roof area in Central Activity Zone more than doubled (2010-2017) through planning system changes (e.g. 2008 London Plan and Biodiversity Action Plan).

London

Green roof law since 2015

Recife

Tax benefits for voluntary green roof retrofits.

Cordoba

One-off green roof property tax abatement on projects commenced since 2008 - new builds and retrofits.

New York City

Copenhagen

Only city in Scandinavia where green roofs are mandated.

Stockholm

Green space factor a requirement on city-owned land, including for current redevelopment of Royal Seaport area.

First Scandinavian city to introduce green space factor - piloted in 2001.

Encouraged through mandatory stormwater management plans since 2011

Green roof area more than doubled over 5 years (2012-2017) through grants, tax benefits and demonstration projects.

Malmö

Antwerp

Rotterdam

Melbourne

Mapped existing roofs to assess potential for greening in 2015.



4. Close ups



Which tools?

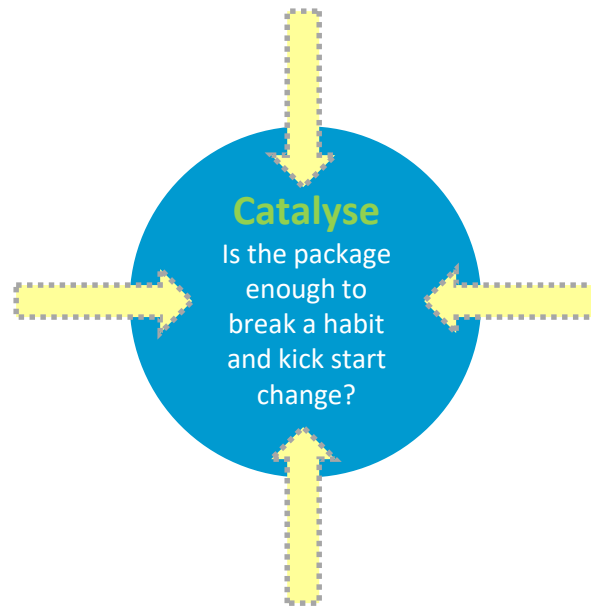
Enable
Engage
Exemplify
Encourage

Exemplify

- Lead by example (demonstrate on public buildings)
- Consistency of Council strategy and policy
- Consistency of strategy and policy across different levels of government

Encourage

- Direct financial incentives
- Rebates on local fees and taxes
- Encourage or require using the planning scheme



Enable

- Ensure local laws are not a barrier
- Ensure the building and occupancy permit application process is not a barrier
- Provide information and support
- Create space for experimentation

Engage

- Public promotion
- Work with building industry groups

...in Europe...



Basel, Switzerland

Population: 175,131

Green roofs: 1,000,000m²

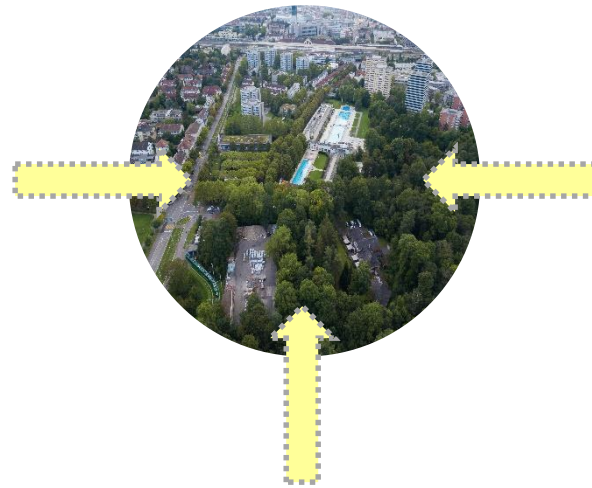
Green roofs per capita: 5.71

Early starter: highest area of green roofs per capita in the world.

Basel

Encourage

- Direct financial incentives: two major subsidy programmes, widely publicised (1996-1998 up to 20CHF per sqm, then 2005-2007 30-40CHF per sqm).
- Higher incentives for green roof installation when not part of an overall renovation project.
- Building and Construction Law amended in 2002 to make green roofs mandatory for flat roofs on new and renovated buildings. No minimum size.



Enable

- Consultation with city-employed green roof expert mandatory for projects over 1,000sqm during design and construction.

Engage

- National poll by Department of Environment and Energy mid-1990s determined public support for an electricity tax to pay for energy-saving measures.
- Various stakeholders consulted before establishing first subsidy programme, including business/industry groups and environmental organisations.

Basel

Other factors

- Local acceptance already quite strong.
- On-bill financing (5%) funded subsidy programmes.
- Research/practice collaboration (researcher 'champion' and PhD research to provide evidence base).
- Trial and improvement – first subsidy programme yielded imperfect results.





Hamburg, Germany

Population: 1,791,120

Green roofs: 1,440,000m²

Green roofs per capita: 0.80

Green Roof Strategy since 2014, diverse mix of policy instruments.

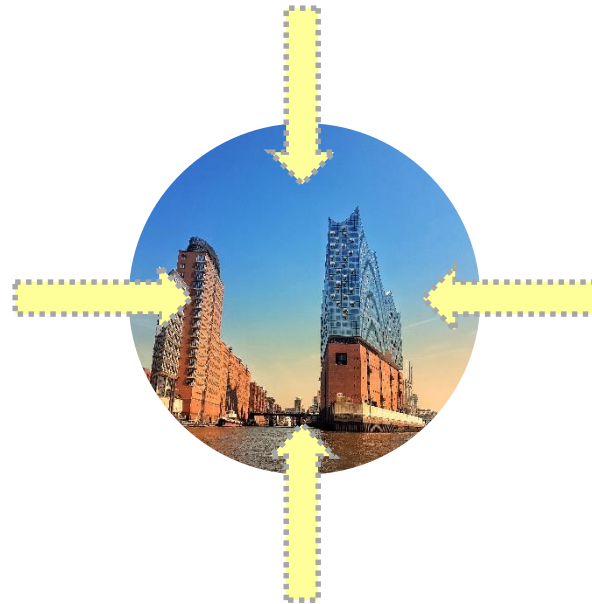
Hamburg

Exemplify

- Flagship project on roof of Environment Ministry building, as well as HafenCity university campus.

Encourage

- Direct financial incentives: public subsidies to cover 30-60% of capital costs (3M EUR over 2015-2019).
- Indirect financial incentives: split wastewater fees.
- Provision for green roofs as ecological compensation measure in local planning policy (since 1991).



Enable

- Economic analysis of green roof costs commissioned by city (2017).
- Guidelines and FAQs on City website.

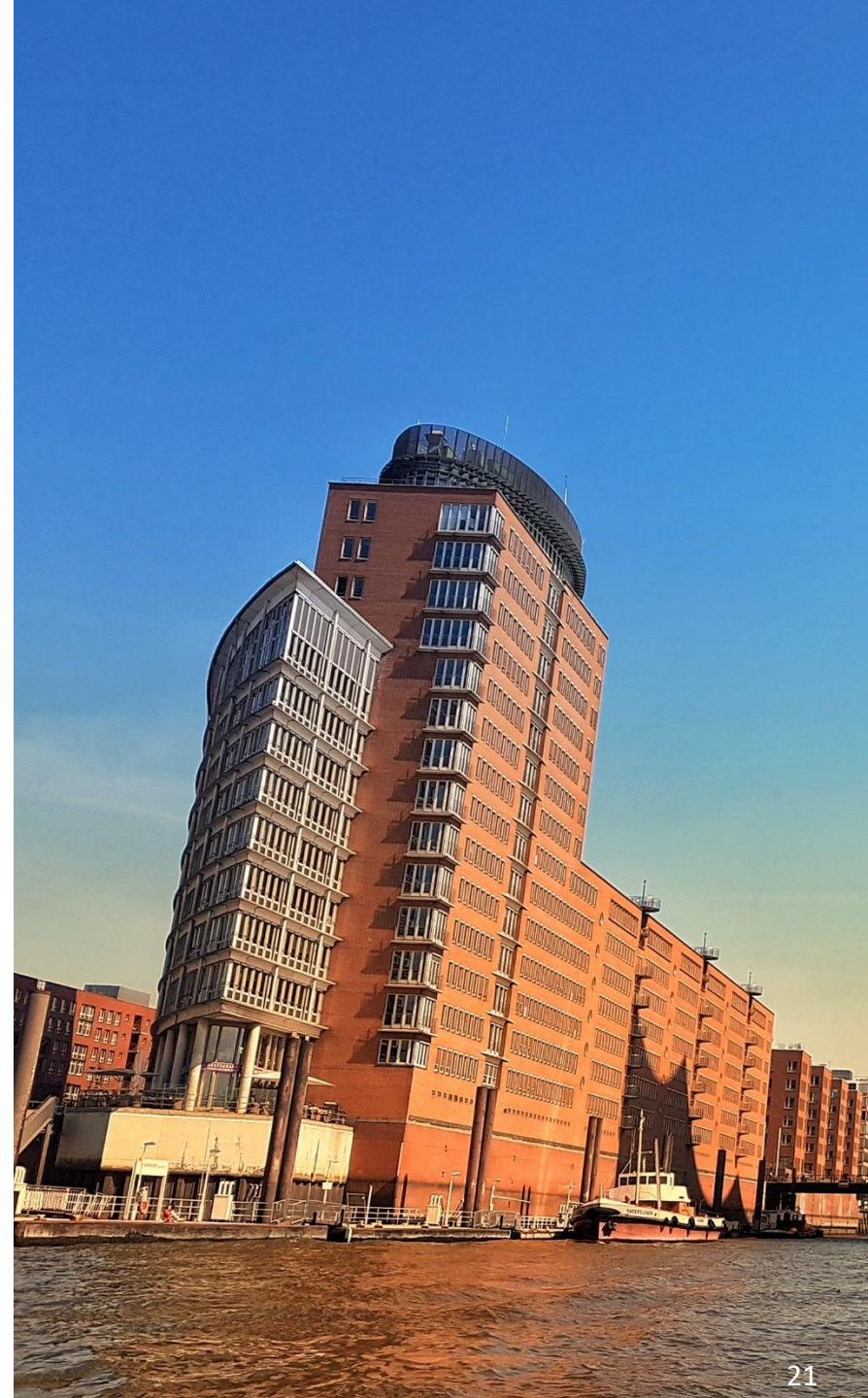
Engage

- Emphasis on 'Dialogue' as part of strategy: workshops, info events, site visits and a design competition.
- Environmental Partnership between city administration and key business groups (2003-2018).

Hamburg

Other factors

- German federal law since 1993 has enabled local or regional governments to mandate green roofs as an ecological compensation measure.
- Plans for 100 new hectares by 2020 seem to be too ambitious (so far an increase from 124 to 144 hectares 2015-2019).
- Not enough uptake of incentives. Possibly financing too low, or further guidance, training and examples needed.
- Conflicting goal for fast and affordable housing construction undermines green roof provision.
- Policy implementation followed by research team at HafenCity University to evaluate success and examine possible transfer to other cities.



...and beyond



Portland, USA

Population: 570,000

Green roofs: 157,989m²

Green roofs per capita: 0.27

Zoning incentives and leading by example.

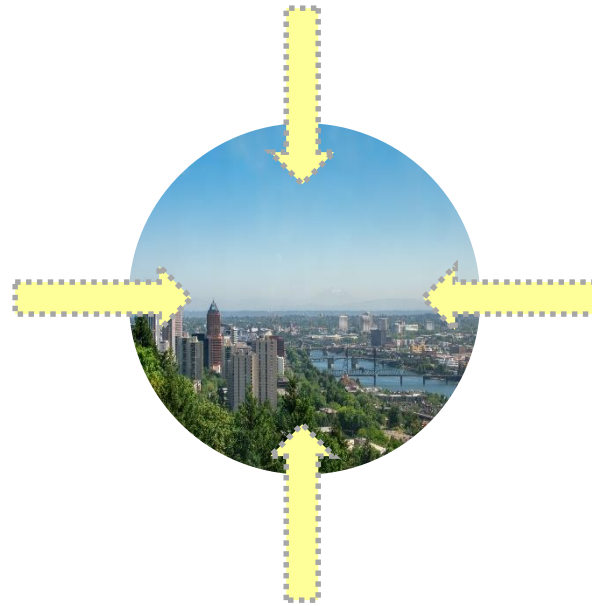
Portland

Exemplify

- Mandatory green roofs since 2005 for all new buildings and redevelopments on city-owned properties >20,000 sqf and/or construction budget >\$5M.

Encourage

- Indirect financial incentives: density bonus scheme since 2001.
- Direct financial incentives: Green Investment Fund (2005-2009) and Ecoroof Incentive Programme (\$5/sqf, \$2M committed in total 2008-2012).
- Up to 100% discount on stormwater utility fees by implementing management practices, including green roofs (2006).
- Mandatory green roofs since 2018 for all new buildings >20,000sqf and/or construction budget >\$5M.



Enable

- Extensive technical guidance and list of consultants on City website.

Engage

- Green Roof information Think-tank (GRiT) a non-profit that provides education and outreach to support the use of green roofs.

Find out more

Living Roofs and Walls from policy to practice (focus on London, but worldwide overview)

<https://livingroofs.org/>

Portland

<https://www.portlandoregon.gov/bes/44422>

Hamburg

<https://www.hamburg.de/gruendach/>

Basel

<https://climate-adapt.eea.europa.eu/metadata/case-studies/green-roofs-in-basel-switzerland-combining-mitigation-and-adaptation-measures-1>

Melbourne's Rooftop Project

<https://www.melbourne.vic.gov.au/building-and-development/sustainable-building/Pages/rooftop-project.aspx>

Green Roofs and Walls of the World, Virtual Summit, November 2019!

<https://www.greenroofthinktank.org/>



Project partners



Subcontractors



Self-funded partners



National funders

