Hessian Agency for
Nature Conservation, Environment and Geology

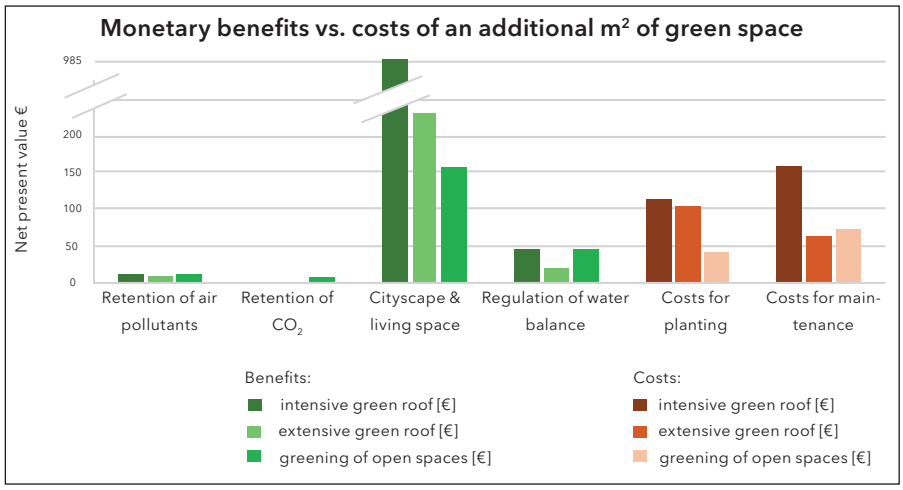
Centre for Climate Change and Adaptation

HESSEN

Business Parks – climate-resilient and fit for future

Climate adaptation in numbers

Climate change is becoming increasingly noticeable and requires investments to adapt to the consequences. Model calculations show that without adaptation measures, the annual damage could amount to 0.1 to 0.75 % of the GDP, while investments in climate adaptation would only account for 0.1 to 0.2 % of the GDP. This fact sheet provides an overview of the costs of installing and maintaining greenery on buildings.



Benefits and costs of an additional square meter of green roof and open space over the respective lifespan (40 years for green roofs, 50 years for green open spaces) (Source: BREsilient 2020).

Investment costs	
Green roofs	**Façade greening**
30 - 60 € / m² (extensive)	0,40 € / m² (ground-based façade greening without climbing support)
80 € or more / m² (intensive)	100 - 300 € / m² (ground-based façade greening with climbing support)
	400 - 1.000 € / m² (wall-mounted façade greening)

Maintenance costs (annual)	
Green roofs	**Façade greening**
0,5 - 2 € / m² (extensive)	10 - 40 € / m² (depending on system)
2,50 - 4 € / m² (intensive)	

Example comparison of investment costs vs. annual maintenance costs for various green roofs and façades.

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Effects and benefits of greening buildings

Facts and figures

- **Retention of rainwater:** approx. 20 - 50 l/m² (extensive roof greening), approx. 80 l/m² (intensive roof greening).
  Advantages: Relief for the sewer system during heavy rainfall and possible reduction in wastewater charges.
- **Buildings:** Extensive green roofs extend the durability of roof waterproofing by approx. 10-20 years.
  Advantage: Protection of the structural substance and extension of the service life of buildings through greening.
- **Energy:** approx. 3-10 % less heat loss in winter (green roof, construction height 10-15 cm) compared to a gravel roof;
  an 850 m² green façade area can replace the cooling capacity of 75 air conditioning systems with 3.000 watts of power and 8 hours of operation. Prerequisite: Irrigation or a sufficient amount of water is available.

Best Practice: A green roof with solar panels

- A photovoltaic system (around 73 kWp output) is combined with extensive green roofs on 1.850 m² of roof space at the Dietzenbach Capitol (picture bottom right).
- The greening can increase the performance of the system by reducing the reflection of solar radiation and lowering heating.
- In addition, the building is protected from heat and cold, which can reduce energy costs for air conditioning, especially in the summer months.
- The greenery ensures effective retention of rainwater, which relieves the burden on the sewer system, especially during heavy rainfall.
- Up to 60% of the Dietzenbach Capitol's in-house electricity requirements can be covered by the electricity produced by the photovoltaic system.


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Sources:

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FACHZENTRUM KLIMAWANDEL UND ANPASSUNG

Further information:

Hessian Agency for Nature Conservation, Environment and Geology
Centre for Climate Change and Adaptation
More Fact Sheets: https://www.hlnug.de/themen/klimawandel-und-anpassung/projekte/ib-green/hilfestellungen-fuer-kommunen