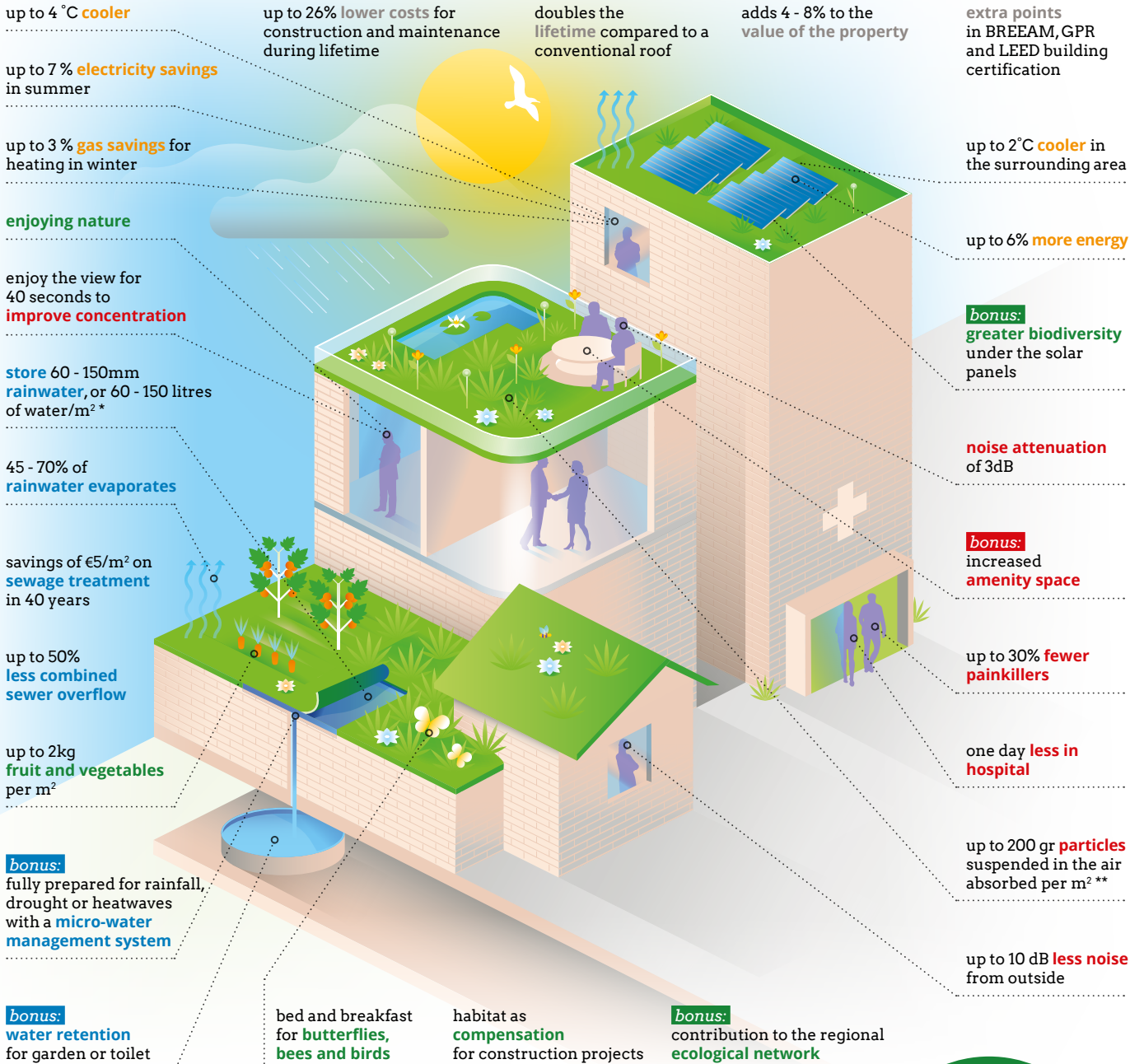


# Facts and Values

## Green-blue roofs

Smart green roofs have many benefits. They are in fact multifunctional roofs and they bring multiple benefits for municipalities, water boards, building owners, users, neighbours, insurers and mortgage lenders. The Green Deal on Green Roofs is all about establishing the mutual gains of these multiple benefits. Here we summarise all these gains that are based on scientific research.

€ Technical and financial
 💧 Water
 🌿 Biodiversity
 ❤️ Health
 ☀️ Energy



\* for existing buildings, a maximum of 100mm or 100 litres/m<sup>2</sup>  
 \*\* with a natural roof or grass roof

Contributes to the following Sustainable Development Goals



Want to promote biodiversity?  
 Take a look at the *Nature Roofs Handbook* on [greendealgroenedaken.nl](http://greendealgroenedaken.nl)  
 to find out more about the benefits for your roof

# Climate adaptation benefits of green roofs

- ▶ They retain rainwater, enabling the water stored to evaporate naturally. This means that less water ends up as run-off or needs to be processed through the sewage system. On average, about 850 mm of rain falls every year in the Netherlands.
- ▶ A green roof eases peaks in the drain-water system following rainfall. The water stored in the roof is released slowly, reducing the chance of street-level flooding. The number of downpours of 60 - 120 mm/hour is increasing due to climate change.
- ▶ Easing peaks in the drain-water system also reduces the chance of sewer overflow. This, in turn, helps to keep surface water cleaner, which is healthier for plants, animals and people, and saves money. Without green roofs, 5.5% of the annual amount of rainfall ends up mixing with surface water due to overflows. Green roofs can reduce this up to 2.2% of the annual amount of rainfall.

The extent to which green roofs retain water, enable evaporation and reduce drain water depends on their design. The depth of the substrate layer, the planting and whether there is an extra water drainage layer with or without a water management system are all factors that play a role.



# Costs and water savings for 4 types of green roofs

## SEDUM ROOF

Great aesthetics, some water retention and evaporation, can be smartly combined with solar panels

Substrate layer	40 - 80 mm
Plants	succulents, drought-resistant herbs, grasses and perennials
Weight	40 - 80 kg/m <sup>2</sup>
Maintenance	1 - 2 times a year
Costs (including VAT)	€ 35 - € 80/m <sup>2</sup>
Water retention	15 - 24 l/m <sup>2</sup>
Water evaporation	45%

## NATURAL ROOF

Preserve, strengthen and increase local biodiversity, called 'biosolar roofs' when combined with solar

Substrate layer	80 - 200 mm, height and composition can vary
Plants	trees, bushes, herbs, grasses and perennials, preferably native varieties
Weight	100 - 300 kg/m <sup>2</sup>
Maintenance	1 - 3 times a year
Costs (including VAT)	€ 50 - € 100/m <sup>2</sup>
Water retention	20 - 50 l/m <sup>2</sup>
Water evaporation	50 - 60%

## GARDEN ROOF

A pleasant place to spend time

Plants	grass, perennials, shrubs and trees
Substrate layer	150 - 400 mm
Weight	200 - 600 kg/m <sup>2</sup>
Maintenance	4 - 10 times a year
Costs (including VAT)	€ 80 - € 250/m <sup>2</sup>
Water retention	30 - 90 l/m <sup>2</sup>
Water evaporation	55 - 65%

## BLUE-GREEN ROOF

Water management for extra water retention, buffering, deceleration, evaporation, cooling and reuse, can be combined with solar

Plants	combines water layer with sedum, nature and/or garden roof
Construction height	30 - 100 mm extra*
Weight	25 - 100 kg extra* per m <sup>2</sup>
Maintenance	approx. 3 times a year (drain rainwater)
Costs (including VAT)	€ 15 - € 60/m <sup>2</sup> extra*
Water retention	60 - 150 l/m <sup>2</sup>
Water evaporation	70%

\* The height, weight and/or costs listed should be added to the substrate layer for the sedum, natural or garden roof which is placed on top of the water layer

# The Green Deal on Green Roofs

The Green Deal on Green Roofs brings together companies, local government, water boards, finance providers and knowledge institutions to make the most of the sustainability benefits that green roofs provide. The partners are developing effective methods for roll-out and scale-up, including tax advantages, better building labels and a discount on mortgage interest. In the spring of 2019, we aim to start work as an independent national platform for multifunctional roofs.

This fact sheet has been compiled by the Green Deal on Green Roofs partners: the City of Rotterdam, Nelen & Schuurmans, Van der Tol and Vereniging Bouwwerkgroen, in collaboration with STOWA/COP Green-Blue Roofs Measurement and Monitoring. This English version is supported by the European Federation of Green Roof Associations.

## More information

Join us and make the most of your buildings roof space:  
[www.greendealgroenedaken.nl](http://www.greendealgroenedaken.nl), [www.efb-greenroof.eu](http://www.efb-greenroof.eu),  
[www.livingroofs.org](http://www.livingroofs.org)

Find out more about how to increase the value of your roof:  
[www.multifunctioneledaken.nl](http://www.multifunctioneledaken.nl) (in Dutch)

All the sources for these Facts & Values:  
[www.greendealgroenedaken.nl/en-facts-values](http://www.greendealgroenedaken.nl/en-facts-values) (in English)

