

Case studies on financing Green Roofs

The IGNITION project



GREATER MANCHESTER
DOING THINGS DIFFERENTLY



European Union
European Regional Development Fund

What is a green roof?

Green roofs, and blue-green roofs, are designed to increase biodiversity on an underutilised area of our urban environment. Green roofs also hold significant capacity to store and filter rainfall – acting as a sustainable drainage system (SuDS) – whereas a generic hard-infrastructure roof channels rainfall quickly off the building. This extra green layer on a roof can also increase thermal insulation and prolong roof lifespan by protecting the roof from the elements. When accessible, green roofs in dense urban spaces can provide a unique leisure space for residential or commercial purposes, therefore increasing property value.



The IGNITION Nature-Based Solutions Evidence Base

The IGNITION project collated over 1,000 evidence items on nature-based solutions (NBS) over 12 benefit areas. This research found that green roofs can provide on average:



6%
energy saving through thermal insulation



75%
captured rainfall



7%
increase in property value for accessible green roof

How are green roofs traditionally financed?

Green roofs provide significant benefits to a building and its surrounding community and whilst they may cost more than a traditional roof upfront, over their lifetime they can deliver a payback on this investment through their benefits. Currently, most green roofs are funded via the property owners without these returns or savings considered. The case studies below show how this can be changed.

Building the business case for a new blue-green roof – A case study from Stockport

Interchange

Current concept stage: Design and analysis



IMAGE: The Stockport Interchange design

A new two-acre town centre accessible blue-green roof or 'podium park' is being planned for Stockport Bus Interchange in Greater Manchester. It is part of a £120 million opportunity to replace, redevelop and regenerate the town's current dated bus station into a transformational new hub. The project is hoped to be completed in 2023. The planning and design preparation for this build provides an interesting insight into the future of financing NBS by recognising and accounting for the full range of benefits they deliver.

Quantifying and collating the benefits

City of Trees, through the Natural Course programme, identified the potential for the blue-green roof and succeeded in receiving the Environment Agency's Water Environment Improvement Fund (WEIF) support to appoint consultants to undertake a cost-benefit analysis.

The research found that a self-irrigating blue-green roof system could deliver capital cost savings compared to storm attenuation tanks without compromising surface water storage capacity while also providing sustainable means for maintaining green infrastructure. The possible reduction in surface water treatment charges could also help to offset the maintenance costs for new green infrastructure.

The £116,000 capital cost savings could be achieved from the attenuating blue-green roof system by avoiding the need for deep digging in contaminated soil and rock to install a storm attenuation tank. Stockport Metropolitan Borough Council and Transport for Greater Manchester have shown interest in using this NBS and it is hoped that the main contractor will engage with the consultants to develop these designs. The Environment Agency is exploring the potential to provide grant support towards the capital costs for the blue-green roof system.

Savings from [reducing waste-water banding charge](#): £14,100 per annum

Capital cost saving for utilising nature-based solutions: £116,000



Assessing impact of retrofit green roof – A case study from Unicorn Grocery

Current concept stage:

Retrospective analysis



IMAGE: Google Earth image of Unicorn roof area

Investors: Unicorn Grocery, SITA grant

Managed by: Unicorn Grocery

Unicorn Grocery is a medium-sized co-operative in Chorlton. The co-op has operated in Chorlton since the 1990 and invested in a green roof, plus solar panels, on its owner-occupied building in 2008. For the Unicorn co-operative, the decision to invest in a green roof was primarily driven by the need to insulate the roof. **Costs for standard insulation were expected to cost between £40-47,000, so the green roof provides insulation for the same price plus the valuable benefits of water retention, biodiversity, carbon capture and the creation of a green rooftop recreational space.**



Unicorn Grocery is an owner-occupied building where the bill payer and building owner are the same. The building and organisation were ideal candidates for investing in a green roof, as this was an environmentally conscious organisation with an existing poorly insulated owner-occupied building. They were already planning to insulate their roof and therefore much of the budget for the green roof was already planned to be spent.

Translating the figures into 2020 prices shows that if the Unicorn Grocery invested now they would make a return on investment.

Standard insulation cost estimate:

£40,000-47,000 (No additional benefits in 2008 prices)

Green roof capital cost:

£41,000 (in 2008 prices)

£55,000 (£125 m²) (Adjusted to 2020 prices)

Maintenance:

Minimal – 4 days labour per year maintenance plus approximately £100-200 every 4 years on a planting refresh, approximate £1 m² yr.



Assessing impact of retrofit green roof – A case study from Unicorn Grocery

Quantifying and collating the benefits



Extended roof longevity

“We tended to re-tarmac the bare roof every 10 years, for about £10-20K each time. The green roof should easily pay for itself by extending the life of our asphalt roof from 10 years to over 50 years, by protecting it from the elements”

(Unicorn co-operative member)

By protecting it from the elements, the extended roof longevity reduced the need for replacement of the existing roof and provided an additional cost-saving for the co-op, which was another incentive to invest.

Annualised **green roof replacement** costs: Av. **£2.11 m²/yr** over 20 years compared to annualised **brown roof replacement** costs on avg. **2.55 m²/yr** over 20 years

Estimated property value uplift

The mean value for non-accessible green roofs 2.9% was used to provide a conservative estimate of the uplift in property asset value that the Unicorn co-operative may have experienced from investing in an accessible green roof.

Estimated energy savings, based on average energy intensity, from increased insulation



- **13,700 kwh/yr** for the 440m² area covered by the green roof.
- **Approximately £1,070** (£2.40 m²/yr) annual saving
- **Avoiding 3120kg of equivalent carbon dioxide** emissions per year and sequestering approximately 560kg carbon dioxide per year



Waste-water banding charge discount

- **£1,237** per year