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2.4. Energy and CO_2 emissions savings from reduced volume of water entering sewers

Project Name: URBAN GreenUP (Grant Agreement no. 730426)

Author/s and affiliations: Paul Nolan[1], Clare Olver[1], Raúl Sánchez[2], Jose Fermoso[2], Silvia Gómez, María González[2], Jose María Sanz[2], Esther San José[2]

[1] *The Mersey Forest Offices, Risley Moss, Ordnance Avenue, Birchwood, Warrington, WA3 6QX*

[2] *CARTIF Foundation. Parque Tecnológico de Boecillo, 205, 47151, Boecillo, Valladolid, Spain*

Recommended citation: The Mersey Forest, Natural Economy Northwest, CABE, Natural England, Yorkshire Forward, The Northern Way, Design for London, Defra, Tees Valley Unlimited, Pleasington Consulting Ltd, and Genecon LLP (2010). GI-Val: the green infrastructure valuation toolkit. Version 1.6 (updated in 2018). https://bit.ly/givaluationtoolkit

Estimated energy and CO_2 emissions savings from reduction in the volume of water entering combined sewers	**Climate Resilience** **New Economic Opportunities and Green Jobs**
Description and justification	GI-Val is The Mersey Forest's green infrastructure valuation toolkit. The current prototype is free and open source, and can be downloaded under a Creative Commons License from: https://www.merseyforest.org.uk/services/gi-val/. It takes the form of a spreadsheet calculator and a user manual. Drainage of stormwater run-off into combined municipal sewers results in a proportionate level of energy use and CO_2 emissions associated with stormwater transport and

	treatment. GI-Val Tool 2.1 estimates the energy savings (in kW hr/y) associated with the impact of vegetation on reducing the amount of stormwater entering combined sewers, along with the equivalent carbon emissions savings (in tonnes CO_2e/year). The tool further estimates the economic values of carbon and energy savings. An independent assessment of GI Val by the Ecosystems Knowledge Network is available from this link, along with links to other tools: https://ecosystemsknowledge.net/green-infrastructure-valuation-toolkit-gi-val
Definition	The estimated decrease in energy use and associated CO_2e emissions due to implementation of NBS (increase in land surface vegetation).
Strengths and weaknesses	- Tool developed using English data. - The toolkit remains a prototype and this means there are some green infrastructure benefits for which it cannot calculate a direct financial value. While there is a rich body of evidence that illustrates and demonstrates the different types of benefits deriving from quality green infrastructure, robust valuation techniques do not yet exist for all benefits. Therefore some valuations come with detailed caveats as they are based on limited evidence at this stage. - The toolkit's calculation is designed to be useful for initial, indicative project appraisal, providing a range of figures indicating the potential impact of a green infrastructure intervention or the value of an existing green infrastructure asset. The toolkit does not assess the quality of the design or detailed management requirements of green infrastructure. It does not replace a full cost benefit analysis, but it provides a basic valuation at a much lower cost. - Valuations such those made with a toolkit or cost benefit analysis also need to be seen as part of a much bigger picture. The valuation should not replace community engagement and local dialogue about what is valued about a place. Calculating economic value of green assets will always be a controversial technique and financial value should only be seen as one factor in decision-making. - The reported GVA values include transfers from one organisation to another, which means that although GVA increases for the beneficiaries, it may not increase for the study area as a whole.

Measurement procedure and tool	The toolkit provides a set of calculator tools to help assess an existing green asset or proposed green investment. Tool 2.1 uses Forestry Commission data about water use by trees and other types of land cover to estimate the reduction in runoff to sewers. Input data for estimation of energy and carbon emissions savings as a result of decreased stormwater inflow to combined sewers include: • Land use, including surface cover characteristics • Average local rainfall • Water treatment costs (energy and other inputs) The toolkit uses standard valuation techniques to assess the potential benefits provided by green infrastructure within a defined project area. These benefits are assessed in terms of the functions that the green infrastructure may perform, support or encourage, depending upon the type of project. Once data is entered into the toolkit, it generates financial values for many of the green infrastructure benefits, included the improvement in air quality. The toolkit identifies the marginal benefit, the additional value of the green infrastructure, and also tries to ensure that there is no 'double counting' of value.
Scale of measurement	Street to district scale
Data source	
Required data	Land use and land surface cover characteristics for the area under examination; local rainfall data (yearly mean rainfall); water treatment unit costs, including energy use.
Data input type	Numeric data.
Data collection frequency	Individual assessments
Level of expertise required	Technical / Expert
Synergies with other indicators	
Connection with SDGs	SDG3 / SDG11
Opportunities for participatory data collection	Developing the toolkit's next iteration will require wide and sustained collaboration. To facilitate this process, interested parties are invited to pass the toolkit to others who might be able to incorporate it into their work and to provide feedback on their experience in using the toolkit, good and bad! Sources of improved evidence Suggestions

	for improving the tools Ideas for new tools The consortium who led the development of this toolkit has handed over the responsibilities for co-ordinating future work to the Green Infrastructure Value Network (GIVaN). Further information on the network can be found at: www.bit.ly/givaluationtoolkit
Additional information	
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2.5. Soil Temperature

Project Name: OPERANDUM (Grant Agreement no. 776848)

Author/s and affiliations: Slobodan B. Mickovski[1], Alejandro Gonzalez-Ollauri[1], Karen Munro[1]

[1] *Built Environment Asset Management Centre, Glasgow Caledonian University, Glasgow, Scotland, UK*

Soil temperature	**Climate Resilience** **Natural and Climate Hazards** **Green Space Management**
Description and justification	Soil temperature is intrinsically related to soil microbial activity and to biogeochemical and hydrological fluxes in the soil. Different soil temperatures would be preferred by