USAGE project: how to link urban Data Space and Local Green Deals with data

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Abstract Through the Green Deal, the European Commission has set the ambitious target of making Europe the first climate-neutral continent by 2050 and the key to this commitment is represented by cities implementing Local Green Deals.

This is exactly the process that the Horizon Europe project "USAGE" (www.usage-project.eu) has been supporting for the past years in 4 pilot cities (Ferrara, Graz, Leuven, Zaragoza), working to overcome legal and technical barriers to share and exploit urban data among public bodies, private organisations and civil society, with the aim of developing actionable data-driven tools to directly support decision makers and environmental local policies.

Main outcomes are:

- involvement of civil society in citizen science initiatives for collecting and analysing data about urban heat islands, flash floods, biodiversity and other topics

- creation of data governance frameworks for cities (local data spaces)

- deployment of software solutions for data-sharing and their exploitation

- improvement of availability, quality and interoperability of data for Local Green Deals

On top of spatial data (LiDAR point clouds, hyperspectral and thermal data from airborne sensors, multispectral data captured from satellite, citizen-sourced data from apps and mobile sensors, ...), USAGE developed algorithms and data services that transform input data into value-added products (Decision Ready Information), leveraging on ML and DL algorithms.

Some of the most relevant results are:

- hyperspectral image analysis to automatically derive tree canopies and species estimation;

- classification of roof material type, road pavement type, level of soil imperviousness, all based on hyperspectral images;

- implementation of an indicator measuring which buildings satisfy the "3-30-300 rule, to identify the areas that are most lacking also in relation to Urban Heat Islands hot-spots;

- solar potential estimation in public areas and buildings roofs, to identify available spaces to develop community solar projects.

USAGE was deeply based on the FAIR principles: both input (raw) and derived datasets (DRI) are discoverable via public catalogues (usage.geocat.live/catalogue and local ones) and accessible through OGC interoperable standard protocols and formats; likewise, algorithms and tools are described and published on the project GitHub (github.com/USAGEHub).

The talk presents workflows and resulting DRI for decision makers, technicians and citizens. Indeed, some of data-elaboration pipelines have been developed using AI techniques and their result is specifically oriented to provide actionable decision-making tools for city administrators.

Lastly, the talk describes how the issues of data governance, management and use were handled within the project, together with practical lessons learnt on data constraints and involvement of civil society (e.g. www.citizenscienceferrara.org).