



POLITECNICO
DI TORINO

Honors thesis

ARCHITECTURE CONSTRUCTION CITY

Abstract

**PoliGround. The ecological footprint and scenarios for a
post-carbon campus**

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by

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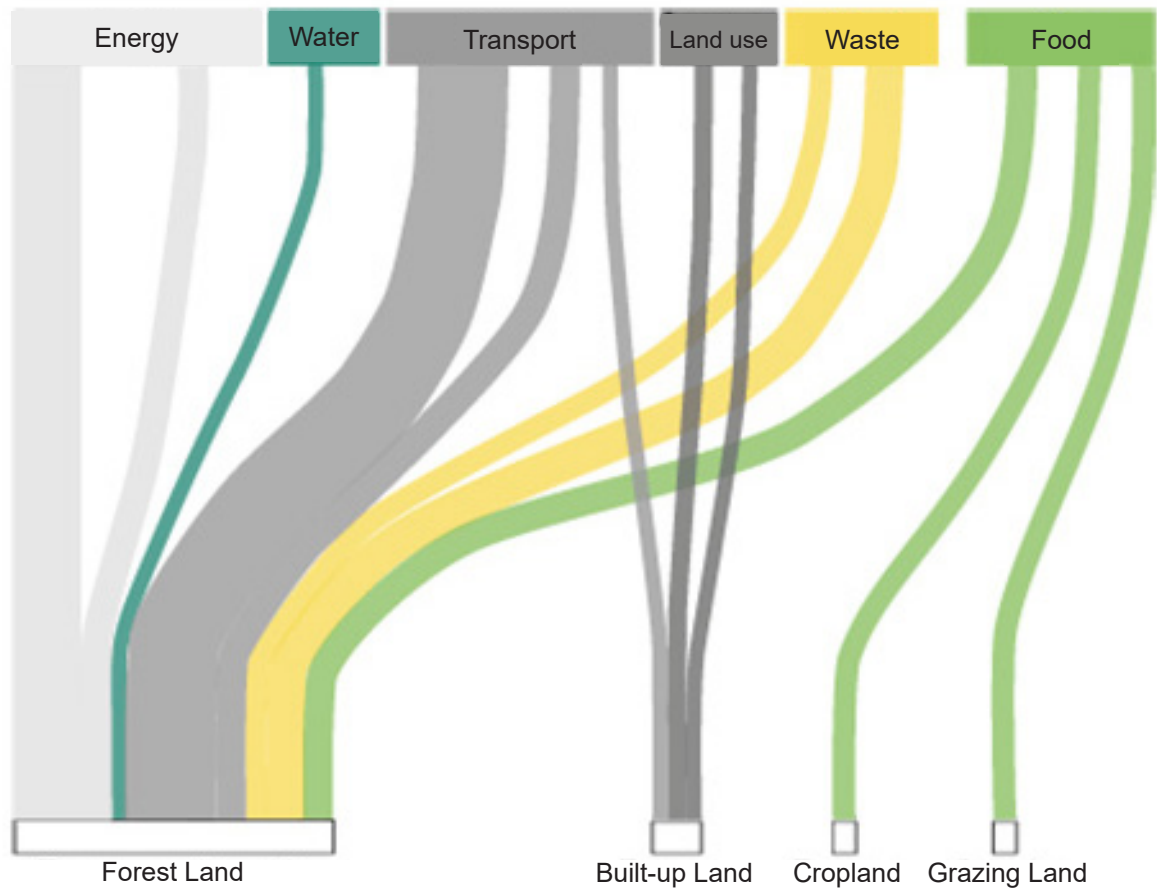
Over the last century the world has been rapidly urbanized: today over the half of the global population lives in cities and it is predicted that in 2030 it will be the 60%. Recent studies have shown that cities, taking up less than 10% of the Earth's surface, consume 75% of the natural resources and between 67-76% of the energy, becoming one of the main responsible of climate change. This raises questions about how the contemporary cities could react, respond and adapt to these changes, transforming themselves into a resilient ecosystem, of which it becomes necessary to study the metabolism. Researches on urban metabolism, that is the material and intangible flows in the city, but also its vulnerability and adaptability are the basis for a post-carbon city. If nowadays steps toward an application of renewable energies and the reduction of greenhouse gas emissions starts to be visible, the actions towards a full-ranging sustainable scenario are still a lot.

In this transition, the university campus, a public and educational structure, and with a strong impact on the territory, becomes an important driver for a sustainable development of the city. It must be considered not as a hermetic system but as a living lab in which innovation and a participatory approach are possible.

The research finds application in the Politecnico di Torino, a campus spread within the urban area and in expectation of enlargement. We evaluated the ecological footprint of the activities of the campus, identifying the surface needed for its sustenance and the absorption of the CO₂ emissions produced by itself. Among the advantages of this complex indicator, there is the possibility of a simple comparison and a greater communicability even to a non-expert public. Furthermore, while it is not possible to directly transpose the results of the ecological footprint into concrete actions, it can be a support in creating emission reduction strategies.

Elaborating a transformation scenario, we worked on the open spaces of the university because they are spaces of interaction with the city, they are performing and educational at the same time, theater of the individual daily activities and of the collective events. We integrated the calculation of the ecological footprint with analysis on the material composition of these spaces and their user's perception.

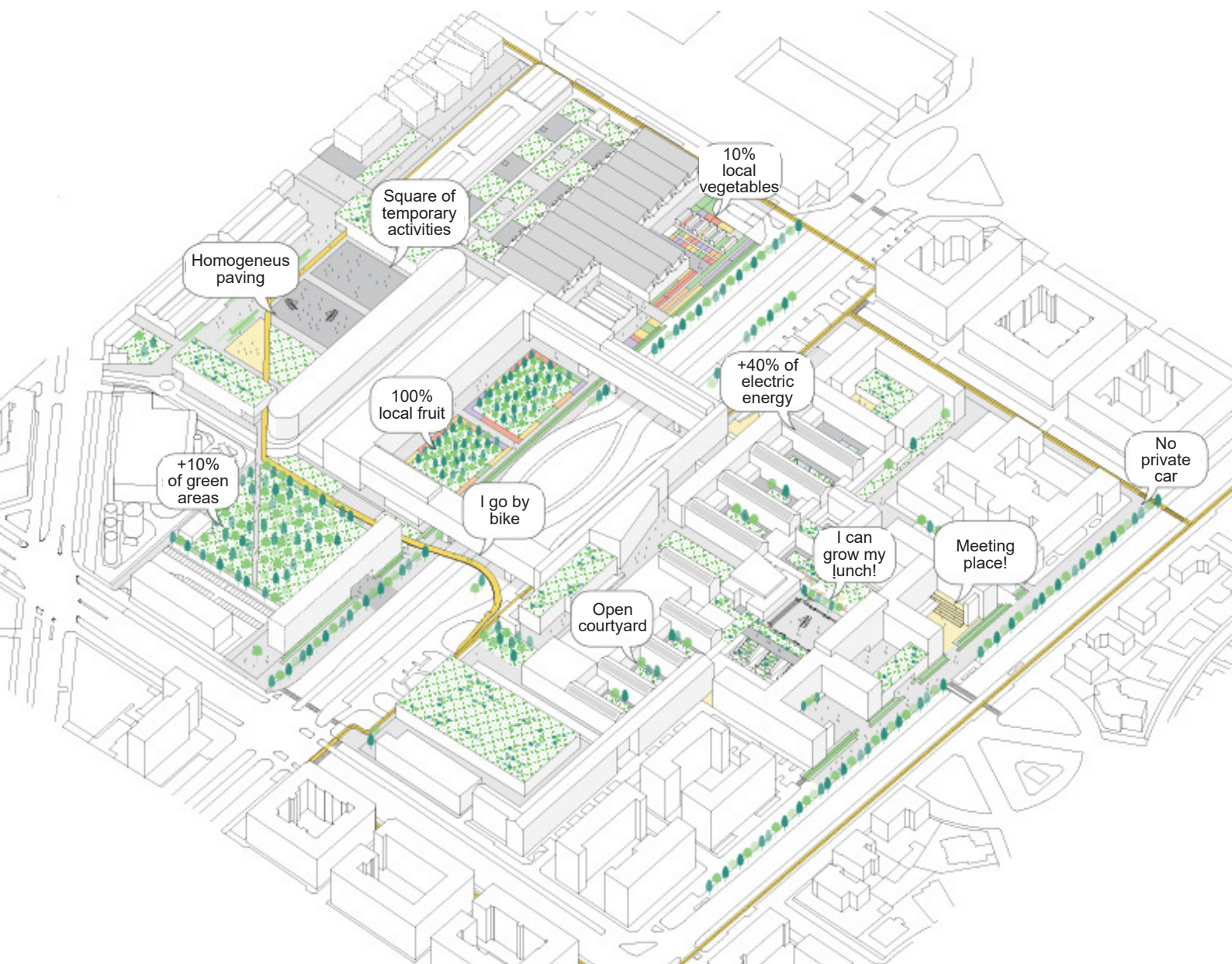
We proposed a catalogue of interventions, which is possible to read whether as single elements or as an overall picture. The actions, which start from the existing situation, aim to reduce the environmental impact and to improve the well-being of the students. The project can be read through different layers coming from the ecological footprint - energy, water, mobility, waste, land use, food – and the importance to create qualified spaces. With the proposal we demonstrate as through a re-design of the public spaces is possible to enhance the sustainability of the campus.



Consumption categories of the ecological footprint analysis



View of the new bicycle lane in Corso Castelfidardo



View of transformation scenario

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