

POLITECNICO DI TORINO

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**Assessment of University Campus Sustainability Through  
Environmental Indicators and their Efficacy**



Supervisors:  
Prof. Patrizia Lombardi  
Dr. Eleonora Perotto

Candidate:  
Heghine Pilosyan

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## Abstract

In the contemporary world the exploitation of the term “sustainability” and “sustainable” tends to become rather overwhelming and unjustified, which somehow reduces its relevance. As numerous researches are being conducted, various approaches and definitions emerge, which, however fair and realistic they be, are always a matter of competences and views of each researcher, the time in which the research was conducted, and the place. The first major question emerging is: how to understand whether the given object can be labeled as sustainable or not? The obvious answer is the search of a system of common evaluation criteria. These searches led to the creation of sustainability development assessment frameworks, consisted of indicators and indexes. And of course the quality of assessment depends on the quality of indicators. But not only the selection of indicators is a challenge, but also the issues linked to their weighting and aggregation, which is a mathematical process that considerably influences the final results.

Every intended use of structure has its own requirements and peculiarities, specific to the function it performs. Naturally, the criteria of “good” and “bad” among two different uses may be opposite one another. Hence, the very first thing to take into consideration when assessing any structure is its function. That is why it is vital to establish unambiguous and representative definition of sustainability for every single intended use and every single field involved in the operation of that specific use. One of such uses is the university campus. Being a relatively young field of sustainable development studies, the reports are quite recent and new tools of assessment are being actively elaborated.

As the universities become larger, occupying a vaster area, the impact they have on the sustainable performance of the city in whole increases. Thus certain restrictions and rules should be set. It is clear that the major sense of assessment process is not the mere collection of data regarding the performance of any given university. And although, the selection of criteria is mainly a matter of location and time, again, certain common requirements can be set.

As in every assessment process the sustainability in higher educational institutions has to permit a temporal and inter-university (or, on a smaller scale, inter-campus) comparisons, to track the performance alterations, in order to establish realistic targets and consistent policies. As it has been lately evidenced by the almost failed experience of the target referred to as “20-20-20” (Lombardi and Trossero, 2013) the adopted policies are not always feasible and the expectations are often overestimated.

The task becomes even more responsible due to the fact that as a higher educational institution the university is the core of formation of the future society. It is the place where future professionals are being shaped as a member of the society, which has to be conscious about sustainable way of

development. Since, the classical definition of sustainability is being based on “three pillars” - environmental, economical and social - a system of trade-offs among these three fields should be elaborated to meet the requirements for the development of each of them.

The major question set by the author at the initial phase of this thesis was: what can I do as a present and future architect?

Taking into consideration the competences gained during the years of studies, the personal experience as of a full-time student spending hours inside the university campus and the researches already conducted, the answer is: to study and to implement the environmental elements of assessment frameworks with the aim of understanding of major policies and their future implementation in the improvement of campuses' performance.

This in-depth analyses will be accomplished through the case study in the section 3 conducted for Politecnico di Torino and Politecnico di Milano, implementing the UNI-metrics system, which stands for Value Metrics and Policies for a Sustainable University Campus. It is a Eli project financed by the European Commission under the 7th Framework Program within the Marie Curie Actions IRSES-International Research Staff Exchange Scheme (Grant agreement number PIRSES-GA-2010-269161) and coordinated by the Politecnico di Torino. The other three higher education institutions participating in this project are Cambridge University, Free University in Amsterdam and Hokkaido University. In this way the cooperation of four institutions, which share the common concept of sustainable development, will lead to a more sustainable university community through the metric-based assessment with cross-institutional experience exchange and policy development for more efficient performance