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Valuation supports green university: case action at *Mediterranea* campus in Reggio Calabria

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Abstract

Civil society, economies, governments are asking to Universities to find a solution for Global Warming problems. Since they are mainly due to human settlement and continuous development and construction, research strategy has singled out Architecture Passivation or Building Greening as a first solution; thereby establishing as its main goal the start-up of real world prototype works, experimental *chantiers* or building sites, as well as their implementations and monitoring. Geomatic Valuation University Laboratory (GeVaUL) is carrying out a direct experience in real-world implementation of sustainability, designing a strategy for the *Mediterranea* University campus greening and "passivation" (= energy efficiency). It is done through careful climatic calculation of academic building thermal behavior, and the consequent economic and physical cost-effectiveness valuation of interventions for passivation, *i.e.* for radical enhancement of energy efficiency. Knowledge of cost-effectiveness valuation has been applied to architectures *i.e.* buildings or facilities of University Campus in Reggio Calabria. GeVaUL designed greening and building insulation obtained by using ecological cork and bio-ecological lime plaster with impressive well-being regulatory power. Technical Bodies of Central State (Ministry of Industry) and Regional Governments found this approach innovative and appropriate. They are investing in passivation of some University buildings using bio-ecological cork and natural lime plaster, and providing investment capital. Furthermore real world bio - ecological sustainable retrofitting sites have been set up for selected University buildings. Evidence gained thanks to the above experimentation has been applied to simulate passivation of the entire Latin Quarter area (surrounding the University), producing relevant impact with potential influence on local and regional economy.

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Introduction

Sustainability is the current frontier of our societies. Enabling us to meet our current needs while still allowing future generations to meet theirs seems the holy grail of a post-industrialist world (ISCN Report, 2014). Campus sustainability has become an issue of global concern for university policy makers and planners as result of the awareness of the impact that University activities have on the environment. Several universities, through signed commitments or voluntary decisions, have embarked projects and initiatives aimed at incorporating sustainability into their systems. Currently, there is a real and constant need for a professional and systematic environmental management approach in order to reduce the consumption of resources and the negative impacts on the environment by promoting campus sustainability. Unfortunately, there is no globally shared approach and achieving sustainability in university campuses is, in any cases, not easy. It is important to understand the meaning of "sustainability" when applied to the university campus context. A definition of "Sustainable university" is given by Velazquez et al. (2006) ''A higher educational institution, as a whole or as a part, that addresses, involves and promotes, on a regional or a global level, the minimization of negative environmental, economic, societal, and health effects generated in the use of their resources in order to fulfill its functions of teaching, research, outreach and partnership, and stewardship in ways to help society make the transition to sustainable lifestyles''. Given the large scale of potential impacts, the heterogeneous nature of university campuses, the different land uses and activities on campus and the fact that universities have the responsibility to train and educate society, environmental management and sustainability at university level require a holistic approach similar to the one applied at the towns scale. Universities have been, in fact, conceptualized as 'small cities' in their quest to attain sustainability due to their size and their impacts on the environment and society (Alshuwaikhat & Abubakar, 2008). The assessment of sustainability in universities has been examined in a number of critical reviews and meta-analyses on the use of various assessment tools. Boer (2013) evaluates a number of valuation frameworks, such as STARS, AISHE 2012 (Auditing Instrument for Sustainability in Higher Education), ARISE (Assessing Responsibility In Sustainable Education), together with the Audit and certification method which reflects ISO methods. Some studies provide innovative ways to develop appraisal or assessment systems which can achieve societal goals.

1. Strategic Plan for Sustainability at Mediterranea University

Mediterranea University is located in the North of the rebuilt town of Reggio Calabria. As Polytechnic for the Environment, degree programs, academic courses and single subjects are devoted to implement Sustainability, relating themes of sustainable architecture, landscape, urbanism, and infrastructure foster-up environment treasuring and protection, and green economy development. Mediterranea University, as other Universities worldwide, has embraced the imperative mission to reduce energy over consumption and consequent CO_2 emissions. To implement it, a <Strategic Plan for Sustainability at Mediterranea University> has been draw-up by GeVaUL. The main goal is to identify programs, measures, actions, procedures, interventions, and real works to promote a 'Rational Use of Energy' and reduce energy over consumption and CO_2 emissions. The Plan sets in place the University's target reductions in carbon dioxide (CO_2) emissions, according to the European Union and World 2020 strategies, and identifies a framework of actions, over the next years, to get energy and CO_2 savings and to meet international University targets set by International Green University Network. IGUN requires a new post-carbon investment programme to be implemented. Green University foresees an average target of 33% energy saving compared to the conventionally (un-sustainable) designed University.

Typical energy performance enhancements include:

- More efficient lighting;
- Greater use of day-lighting and sensors;