Politecnico di Milano

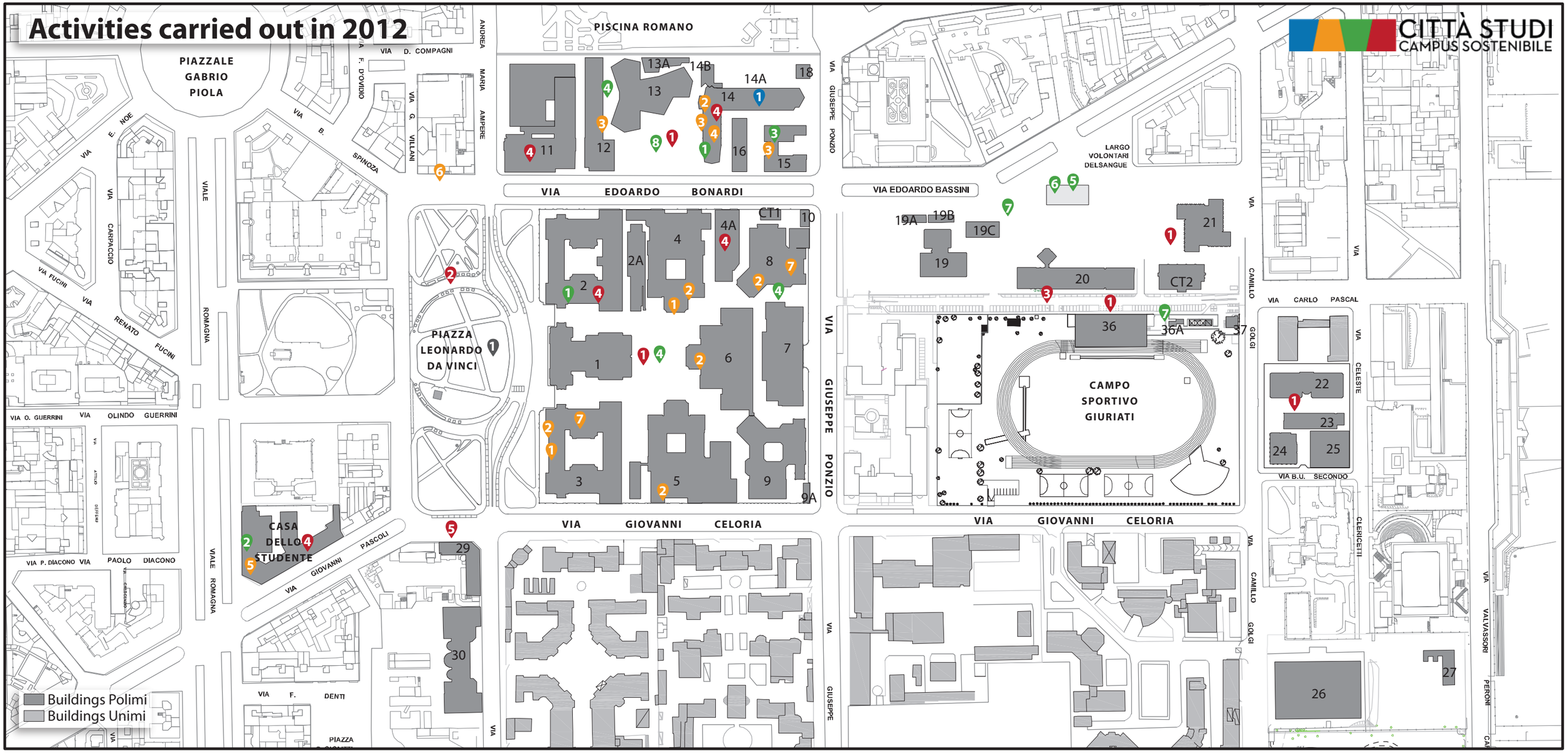
www.campus-sostenibile.polimi.it

ISCN-GULF Sustainable Campus Charter Report 2012

Milano, 15 April 2013

Activities carried out in 2012

CITTÀ STUDI
CAMPUS SOSTENIBILE



PEOPLE

1. Smart campus EU project - reducing energy consumption by acting on lifestyle
2. New release of the Web portal: *www.campus-sostenibile.polimi.it*
3. Event "Giornate della Sostenibilita" – seminars and initiatives (12 - 13 October 2012)
4. Activating the "Code for sustainable behavior"
5. &CO service
6. TOCTOC movement
7. "Polinclusive" initiative
8. Smart plan project

ENERGY

1. New thermal insulation
2. New windows / Thermal windows with double glazing
3. Energy surveys on buildings (thermal images)
4. Photovoltaic Test Facility
5. PV modules installed on roofs
6. Electric car charging station by Comune di Milano
7. New inverters for the air climatization of rooms
8. Collecting data on electricity and natural gas of buildings
9. Reduction of artificial lighting policies
10. Consolidation and improvement of the Energy monitoring system of the campus buildings

ENVIRONMENT

1. Environmental surveys on buildings
2. Improved waste management
3. Green roofs and hydroponic walls
4. New urban outdoor furniture
5. Ecological garbage collection area renovated
6. New waste compactors
7. New weather- and environmental and stations
8. Students' competition for redesigning an open space on campus
9. Separated waste collection in outdoor spaces
10. Seminars and initiatives for green procedures
11. Instructions for trash collection
12. PIC pilot project – smart waste collection
13. CO_2 assessment – campus scale
14. Green areas surveys and mapping
15. Collecting data on water consumption

ACCESSIBILITY

1. 150 new bicycle parking arches
2. Bike-sharing station (by BikeMI Comune di Milano)
3. Green move – electric car sharing
4. New accessible elevetors
5. Carsharing by GuidaMI Comune di Milano
6. Refurbishment buildings program - accessibility to people with disabilities
7. Carpooling website

CITY

1. Meetings and discussions on the renewal of piazza Leonardo da Vinci

Contents

1. INTRODUCTION

The project

Città Studi Campus Sostenibile is a project promoted by the Politecnico di Milano (POLIMI) and Università degli Studi di Milano (UNIMI). The project aims at transforming the whole campus neighborhood into an urban area which can serve as an urban model in Milan with respect to life quality and environmental sustainability. The project is open to the participation and support of researchers, students and all campus citizens.

The goals of the project are the following: to test innovations developed by scientific research; to promote life style transformation and more livable spaces; to become a positive example for the entire city; to cope with the international network of sustainable campuses.

More on the Politecnico di Milano

POLIMI plays a significant international role in the field of engineering and technology as well as in architecture and design. Established in 1863, the school moved to the current site of Città Studi in 1927. The sustainable campus project concerns the 'Leonardo Campus', which is the main campus of the seven of our institution distributed around the Lombardia region. Today, the 'Leonardo Campus' occupies a surface of 186,613 m^2 and 17,605 students are enrolled in the different programs offered by the university during this academic year (2011/2012) on our campus. In addition, 1,736 staff members (professors and personnel) work every day on the campus.

A short history of the project

Year 1

- *January 2011* / Creation of the launch team of the project.
- *March 7 2011* / Launch of the project during the inauguration speech of the new Rector of POLIMI, Professor Giovanni Azzone.
- *Since March 2011* / Construction of the process and the on-line platform of the initiative.
- *June 9 2011*: Participation of POLIMI at the ISCN conference in Gothenburg. POLIMI joins the ISCN network and commits to the sustainability principles of the ISCN Charter.
- *June 16 2011* / Internal launch of the project. The two Rectors of POLIMI and UNIMI commit for a shared sustainability program that involves the whole district of Città Studi. The POLIMI and UNIMI communities are invited to join the project.

- *Since June 2011* / Launch of the “Thematic Tables” where researchers and technical staff present their ideas and project proposals and define targets and strategies for a more sustainable campus.
- *September 21 2011* / Press conference: Official launch of the project, commitment by the presidents of POLIMI and UNIMI. Confrontation with the municipality. Strong coverage by local and national newspapers.
- *End of September 2011* / Opening of the first release of the dedicated web-platform *www.campus-sostenibile.polimi.it.*
- *December 16 2011* / Presentation of the first works by the Thematic Tables, in which every working group reports on the discussed initiatives and strategies.

Year 2

- *Since March 2012* / Opening to the local community with the launch of the new “Table City” with events and workshops.
- *Since March 2012* / Reinforcement of human resources dedicated to the project, by the introduction of the new institutional members as part of the management system.
- *Spring 2012* / Implementation of research projects (among others TOC-TOC, &CO, GRU project)
- *June 2012* / Launch of the second release of the web-platform, allowing citizens to be active participants and richer in functions and services.
- *Since June 2012 I* Effective actions for the renewal of open spaces such as the introduction of the separated waste collection in the outdoor spaces of the campus, the installation of benches and tables and bike parking.
- *September 2012* / Establishment of the Energy Board.
- *October 2012* / Sustainable campus days “Giornate della Sostenibilità”.
- *Since Fall 2012* / Initiatives for a stronger participation of students in the project: involvement of students’ representatives in the board, launch of a student competition for redesigning sustainable open spaces on campus.

2. “CITTA STUDI CAMPUS SOSTENIBILE": THE CONSTRUCTION OF A PROCESS TOWARDS SUSTAINABILITY

The campus as a living lab: A bottom-up approach

The campus is here intended as the place where knowledge and practice can meet. The initiative is based on a strong bottom-up approach in which everyone can collaborate and propose ideas. The prerequisite for the success of the initiative is the creation of a strong awareness on the topic of sustainability within the community. For instance, this project is supported by the collaborative work of many components of both the POLIMI and UNIMI communities. The involvement is purely on a voluntary basis: for instance, people propose and share ideas, but no dedicated funding was initially provided by the institution, with the exception of the launch team.

Starting from the implementation of a web platform where opportunities and problems become visible and proposals are collected and shared, the campus as a living lab is slowly been achieved by carrying out a number of co-design activities aiming at driving transformations within the campus environment as based on collaborative experimentation and test thus feeding collective learning and awareness. This Living Lab driven approach is showing large potentials in (re)framing the governance of the campus development and transformation. The most significant results in terms of the campus governance are related to the rooting of the bottom-up approach as referred not simply to the participatory approach of the whole initiative but rather as attaining at the willingness to be active part of the campus transformation by sharing scientific and educational resources, knowledge and efforts. This “sharing” from individuals and research work groups towards the wide campus community is evident in the functioning of the web platform and represents a significant challenge to the traditional academic work which is mainly competitive and bounded by disciplines and competences.

Funding

As a public institution, Politecnico di Milano is under the authority of the Italian Republic and mainly financed by the Ministry of Education, Universities and Research (MIUR), its tuition fees from students attendance and by research and consultancy contracts. The primary governance body is the Administration Board (Consiglio d’Amministrazione), which has regulatory functions, and it is responsible for guiding and controlling the administrative, economic and patrimonial management. The Board carries out its functions according to the policy choices and resource utilization criteria established by the Academic Senate, which directs the development program of the University, with particular emphasis on teaching and research.

2011

As we stated above, the initiative started with very little funding, and the latter was used to cover the expenses sustained by the launch team. The voluntary work by the research community built up the first initiatives through the website and the thematic tables. Later on, the Campus Sostenibile initiative adhered at the Periphèria CIP European Project (CIP ICT PSP Programme; Grant Agreement number 271015) and could benefit from it in terms of the ICT support (mainly by Archeometra srl Periphèria partner) and the Living Lab approach. Moreover, funding from taxpayers that decided to allocate a share of five per thousand taxes on personal income to POLIMI was dedicated in part to support projects on the sustainable campus topic for a total amount of 304,000 Euro.

2012

In the near future, we expect to raise funds from private sponsors, particularly the ones interested in testing innovative solutions and supporting research for onsite sustainability projects. For this reason, two main areas of intervention were pursued: firstly, the fund raising through research projects, through the participation to calls and projects; secondly, we devoted special effort for the establishment of a “Protocol for Partnerships”, which defines the types of involvement of private stakeholders in the project (the work is currently under construction).

Governance and Management

The Politecnico di Milano Rector, prof. Giovanni Azzone, is the promoter of the initiative. The board that launched the initiative is composed by institutional representatives from POLIMI and UNIMI communities. In particular, project leaders on POLIMI side are Alessandro Balducci (Vice Rector) and Manuela Grecchi (Rector’s Delegate for Building and Properties), and Dario Casati (Vice Rector) and Alessandro Toccolini (Head of the Department) on the UNIMI side. They identified a launch team and a support structure (credits below). The management group was kept quite small in order to be as flexible as possible, and it covers interdisciplinary competences. People from the academic staff were involved part-time on the project with the objective of designing the governance and the timetable of the entire process. For the moment, we decided to not have a dedicated technical office on sustainability.

After the launch of the website and the involvement of more participants from the scientific community, we started to organize technical meetings (thematic tables); we immediately understood that a strong collaboration between innovative research expertise and technical and administrative offices was the basis for action, in accordance with the idea of experimenting our research outcomes directly on our campus. In fact, the academic community is very interested in involving the technical offices, because they are perfectly knowledgeable about campus management and the reasons for certain existing inefficiencies; on the other side, the technical staff is enthusiastic about the possibility to collaborate with academics and acquire a research perspective for the project. For instance, students, academics and technical staff sit

together at the different tables and share ideas and proposals to improve our common good. Hence, we learn by doing and we redefine the management of the initiative at every step of the process while trying to keep the principles of the initiative in mind.

Project management team

Project leaders Politecnico di Milano (POLIMI):
Alessandro Balducci, Vice Rector
Manuela Grecchi, Rector's Delegate for Building and Properties.

Partners from the Università degli Studi di Milano (UNIMI):
Dario Casati, Vice Rector
Alessandro Toccolini, Head of the Dept. of Agricultural Engineering.

Program Manager of Città Studi Campus Sostenibile (POLIMI): Eleonora Perotto
Program Manager – Research and fundraising (POLIMI): Chiara Montanari
Support Structure (POLIMI): Laboratorio di Simulazione Urbana «Fausto Curti» (Eugenio Morello, Barbara Piga, Valerio Signorelli)

Board:
Paola Baglione, Mirja Calgaro, Grazia Concilio, Fabrizio Delfini, Riccardo Guidetti, Antonio Longo, Fabio Manfredini, Chiara Montanari, Eugenio Morello, Eleonora Perotto, Barbara Piga, Paola Pucci, Francesca Rizzo, Luca Studer

Thematic Tables facilitators in 2011 and 2012:
Grazia Concilio, Manuela Grecchi, Antonio Longo, Eugenio Morello, Paola Pucci, Francesca Rizzo, Luca Studer

Web-platform:
Concept and Web design: Andrea Manciaracina (Design, POLIMI)
Technical concept and developer of release 1: Archeometra srl
Developer of release 2: METID, POLIMI
Manager: METID, POLIMI
Contents: Servizio ACRE

Supporting technical and administrative offices:
Servizio Area Comunicazione e Relazioni Esterne (ACRE, POLIMI)
Servizio Area Gestione Infrastrutture e Servizi (AGIS, POLIMI)
Area Tecnico Edilizia (ATE, POLIMI)
Centro Metodi e Tecnologie Innovative per la Didattica (METID, POLIMI)
Multi Chance Poli Team - Servizio per studenti con disabilità (POLIMI)

About 200 people participating to the activities at the thematic tables and the online platform as of December 2012.

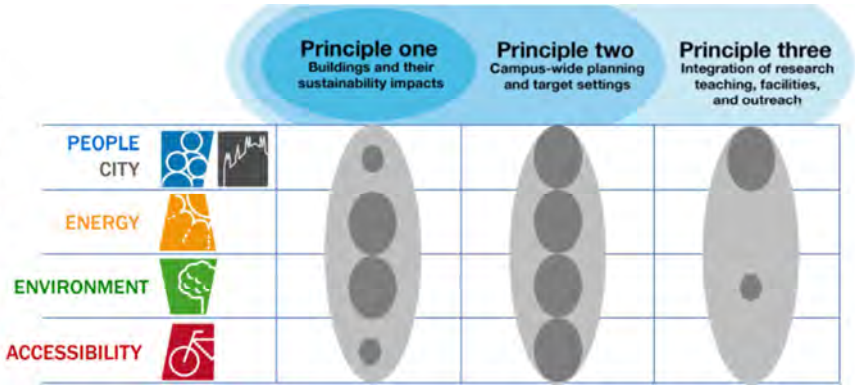
Four + one themes for sustainability

The “Città Studi Campus Sostenibile” project is structured into **four main themes** or areas of interest, namely People, Energy, Environment and Accessibility. The themes are identified in order to cluster the received project proposals and initiate thematic working groups, which are called the **Thematic Tables**. They are deliberately broad in order to encourage an interdisciplinary approach, in addition to being interrelated; they may overlap and can be understood as an opportunity for interaction between working groups. The four working groups and the way the themes will evolve will structure the whole project and encourage a convergent vision for the sustainable campus. The four themes are briefly introduced below.

In 2012 the new **Table City** was launched as an additional table derived from the work carried out within the activities of the Table People. For instance, this initiative was taken aiming at giving more relevance and visibility to citizens’ participation in the project. In fact, citizens registered at the Table City have open access to all the functionalities provided by the online web-platform.

Pictures taken during a participatory event organized by the Table City with the local community in Piazza Leonardo da Vinci.

The four themes overlap with the ISCN-Charter principles and helped in organizing the management of the whole process and structuring the ISCN-report. The scheme shows the distribution of the projects so far.



People: users, participation and identity

- active participation of all campus users (students, researchers and administrative staff) in every situation of dis/abilities
- fostering education and lifestyle towards more sustainable behaviors
- construction of a dedicated web platform for e-participation
- creation of collective spaces being comfortable and livable for all
- creation of new accessible services for students, workers and residents (residences, sports, event locations) including web services
- strengthening of campus identity as an open but unitary place

Energy: energy efficiency and renewable energies

- implementation of innovative systems for monitoring energy consumption
- development of new procedures to increment energy savings
- use of renewable sources for covering part of the energy requirements

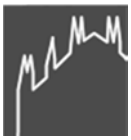
Environment: environmental quality

- enhancement of the wellbeing of people by improving the environmental quality of indoor and outdoor spaces
- improvement of the waste management increasing reuse, recycle and waste separation
- application of procedures for reducing emissions
- increase water saving, management of wastewater and storm water runoff from roofs and yards
- application of procedures for reducing emissions
- improvement of the activities for protecting soil
- upgrading of green areas and creation of ecological networks in the urban context

Accessibility: Transport terms accessibility and sustainable mobility

- promotion of the quality, safety and recognition of cycling and pedestrian routes
- promotion of sustainable mobility
- introduction of mobility credits
- reconnection and accessibility of campus spaces with the city
- regulation of car and motorcycle parking

City: Transferring research from labs into urban life



- experimenting sustainability at the urban level
- putting research at service of urban life
- experimenting new partnerships for and in research
- widening the effectiveness of the project at the urban scale
- testing the masterplan of the sustainable campus as an artificial planning context managed with specific alignment tools
- producing public results in the public space of the neighborhood characterized by a strong effectiveness

The main goals and topics of interests of the thematic tables.

3. IMPLEMENTATION

Phase 0 Mobilization of interests (as of February 2011)

Call for participation and expressions of interest, mapping of (un)sustainability on campus, collection of documentation and information, contacts with potential donors. Reconstruction of the cartography and digital model of the campus under development.

Phase 1 Design and implementations (as of April 2011)

Launch of the thematic tables, design and development of the dedicated web platform, establishment of collaborations with other institutions and private partners, the physical transformation of some areas in a sustainable manner.

Phase 2 Design and implementations (as of September 2011)

Launch of the dedicated web platform, organized collection of project proposals, advancement of the thematic tables, development of ongoing projects and launch of new research projects.

Phase 3 Design and implementations (as of January 2012)

Definition of the baseline: quantifications and initial analysis on the actual situation. Setting up of project proposals for catching and redirecting the programmed refurbishments promoted by the technical offices.

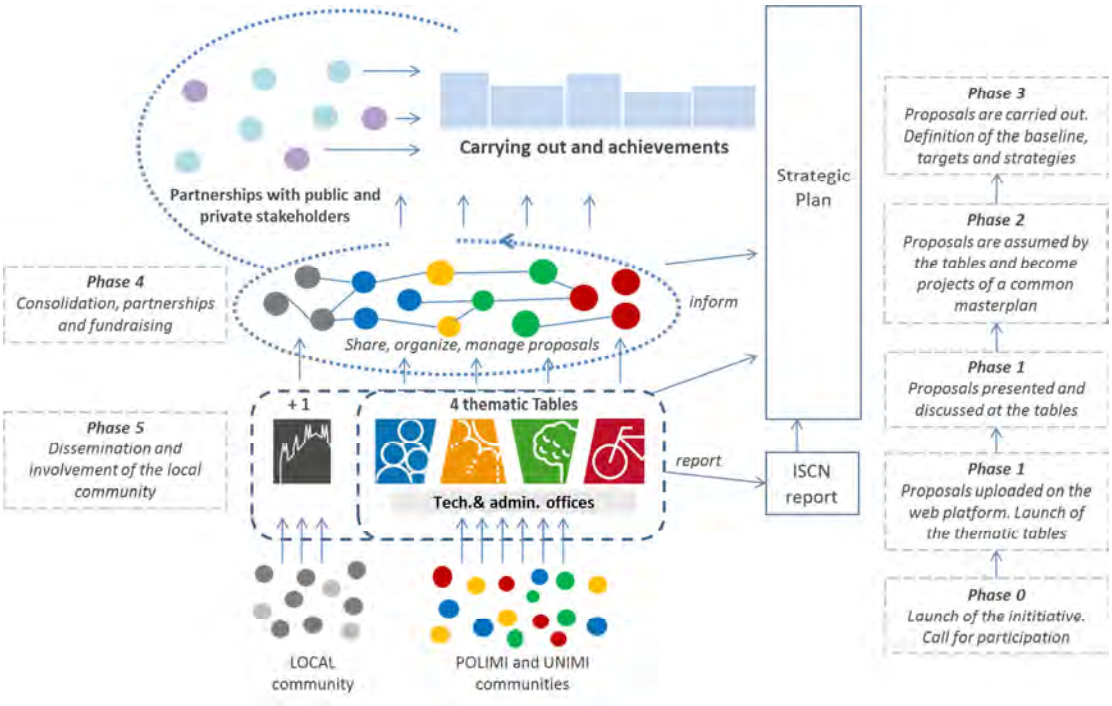
Phase 4 Consolidation, partnerships and fundraising (as of April 2012)

The reinforcement of the partnerships with public and private stakeholders, and the implementation of dedicated policies for fundraising through the participation to calls of research proposals. Launch of meetings with public authorities in order to share our programs.

Phase 5 Dissemination and involvement of the local community (as of June 2012)

The revision of the first year of work leading to the launch of the new release of the web-platform, and the launch of the Table City with workshops, and the launch of the “Giornate della Sostenibilità”, a two days events of seminars and demonstrations on sustainability on campus. Moreover, launch of a design competition open to students, was an additional attempt to involve the community.

The involvement of the community through the Table City and the activated partnership with the local public institution (the municipality and the district) is producing its first results, through the participation of all the stakeholders to a common initiative for the renewal of Piazza Leonardo, the main public square and park in front of the campus.



Structure and management of the initiative: how proposals and ideas are shared, discussed and implemented by the POLIMI, UNIMI and local communities.

A picture taken during the seminar "Giornate della Sostenibilità" on October 12 2012.

4. ONGOING RESULTS

Main initiatives of the project in 2012

According to the targets of the phases 4 and 5 of the project, the project worked mainly on the **communication and dissemination** of the project, both within the community and outside towards the city, a series of **tangible actions and initiatives**, and the improvement of the **management and organization** of the sustainable campus initiative. Among others:

Communication and dissemination:

- The new release of the web-portal *www.campus-sostenibile.polimi.it*, which includes new functionalities and applications.
- The organization of the event "Giornate della Sostenibilità" (October 12 and 13, 2012): sustainable campus days with seminars and initiatives and demonstrations on campus.
- The diffusion of the initiative through the participation to external fairs, seminars and festivals (among others: Ecomondo, Go Slow Social Festival).
- The launch of the Table City for a direct involvement of the citizens in the project.
- The exhibition of the theses for a Sustainable Campus during the Giornate della Sostenibilità (October 12 and 13, 2012).
- The launch of a design competition for students aiming at directly involving students in the redesign of an open space on campus (November 2012). The design schemes will be offered to the technical offices to be considered in the retrofitting of the space.
- The launch of research projects that directly involve students (among others: GRU,TOCTOC, &Co)

Tangible actions and initiatives:

- The implementation of physical actions to improve the quality and livability of open spaces; among others: new outdoor furniture such as benches and tables for the community, bike stations, trees and green areas.
- The introduction of the separated waste collection in outdoor spaces.

Improvement of the organization and management of the project:

- The introduction of the institutional position of the Manager of the Sustainabile Campus Project.
- The direct involvement of the students in the board (since December 2012).
- The establishment of the Energy Board, in charge of defining the strategies of the Politecnico in terms of energy policies.
- The consolidation and improvement of the energy monitoring system named Energy Sentinel Web, which now accounts for the consumption of all buildings and in some cases even parts of buildings.

Fund raising with research projects

A significant boost was given to the promotion of the initiative as a possible framework and case-study for research projects proposal. Below, some successful proposals that got funded or joined the sustainable campus project:

- Currently, the sustainable campus project is partially funded by the European Commission under the CIP ICT PSP Programme (**Periphèria Project**: Grant Agreement number 271015).
- **Smart Campus: Building-User Learning Interaction for Energy Efficiency**. CIP: Competitiveness and Innovation Framework Program 2007-2013 – Pilot Action (start date: August 2012). This project aims at reducing energy consumption in the buildings of the campus enabling users' engagement towards more sustainable behaviors (see http://greensmartcampus.eu).
- Two projects launched with funding from taxpayers that decided to allocate a share of five per thousand taxes on personal income to POLIMI in 2011 were dedicated to the sustainable campus project, namely:
  - **Open innovation in urban discovery and planning for the Città Studi Campus Sostenibile project**: from master plan as alignment environment to urban digital footprints.
  - **Progettare e realizzare una macchina eolica adatta all'ambiente urbano e di facile installazione**: Microgenerazione eolica diffusa per il Campus Sostenibile
- The Project **PRIN-SENSE** (Smart building ENvelope for Sustainable urban Environment) will investigate the relation between microclimate and built environment and install a weather station on campus.
- **The GRU 2012 project** (management and reduction of waste within the University), funded by the Italian Ministry for the Environment, Land and Sea. The initiative works on setting up of message boards dedicated to the Sustainable Campus project and several activities for the promotion of correct waste reduction policies within the POLIMI community.
- The project "**La smart region tra Torino e Milano. I servizi mobili come driver di innovazione**" funded by Telecom Italia and POLIMI DiAP is investigating the use of ICT for providing an integrated system of services on the case-study area of the campus and the emerging collective behaviors and feedback on the territory.
- **VELUXlab**, the construction of the prototype for the "near-zero energy" buildings, represents the result of the synergistic work of VELUX with three departments of POLIMI (DEI, BEST, Energia).

Involvement of the community

At this time (as of December 2012) we collected 33 proposals and suggestions on the web-platform. We registered 129 participants at the Thematic Tables (about doubled in comparison to last year) and a mailing list of about 200 followers of the initiative (as of December 2012; details in the table below). For instance, the number of participants

increased right after the opening of the new version of the website in Summer 2012; the new launch of the platform and the Sustainable Campus Days in October highly contributed in diffusing the initiative among the students.

	participants registered on website		participants registered on the mailing lists		uploaded projects on the web-platform		activities conducted by the talbe		uploaded reports on the web-platform	
	as of APR 2012	as of DEC 2012	as of APR 2012	as of DEC 2012	as of APR 2012	as of DEC 2012	as of APR 2012	as of DEC 2012	as of APR 2012	as of DEC 2012
PEOPLE	n.a.	44	62	68	11	10	5	9	n.a.	9
CITY	146	n.a.	n.a.	n.a.	n.a.	n.a.	6	18	n.a.	1
ENERGY	n.a.	22	26	27	5	5	3	2	n.a.	2
ENVIRONMENT	n.a.	33	79	83	11	13	7	2	n.a.	14
ACCESSIBILITY	n.a.	30	20	34	4	5	12	2	n.a.	10
	n.a.	**129**	**187**	**212**	**31**	**33**	**33**	**33**	**0**	**36**

Some facts about the Thematic Tables: participants, projects presented and discussed as of December 2012. Please, consider that some participants are registered to more than one table, hence the effective number of followers is slightly lower than the same indicated here.

Strengthening of internal collaborations

Since the beginning, this project revealed itself to be a great opportunity for strengthening collaborations and interdisciplinary research inside our scientific community. The trans-disciplinary work promoted through the launch of the Thematic Tables was already a significant achievement: building bridges between different competencies and departments and working together from different perspectives towards the common goal of sustainability enabled a great exchange of knowledge, allowing us to discover more about ongoing research and available skills at our institution. In particular, it is the first time that the collaboration of complementary knowhow from POLIMI and UNIMI were made possible under the umbrella of an official and joint initiative. Few more national and international project proposals were submitted and we awaiting for grant decisions.

Allocated Human Resources

A number of staff members dedicated to the project from the technical staff (ACRE, ATE, AGIS, Multi Chance Poli Team) were involved since the beginning of the process. In 2012, the institutional position of the Manager of the Sustainabile Campus Project was officially introduced and another Manager dedicated to Research and Fundraising was hired. Moreover, the initiative reached a larger number of community members, such as the Amministrazione Centrale and Fondazione Politecnico with their competences in fundraising. The Energy Board composed by POLIMI professors was also established.

Construction of the baseline: measurements to monitor our actions

Creating awareness on the topic of sustainability among the technical and administrative offices of our institution was an opportunity to start feeling the need for a more efficient management of resources. In particular, construction of the baseline as a reference starting point was the crucial step for consolidating the analysis on the topic of sustainability and to measure the effects of our actions. In fact, we have promoted a series of activities and produced the following results:

- We have been working on the reconstruction of a digital campus model, which will serve as the support center where we will collect incoming data and the basis for the new masterplan.
- Studies conducted on measurements and surveys and acquired new technical equipment for monitoring energy consumption and environmental comfort (indoor and outdoor) through pilot projects on campus.
- We have reconstructed historical energy consumptions in collaboration with the energy provider. Now, we can make use of a digital online interface to monitor energy consumptions of the building stock.
- We are now investigating a possible way in order to harmonize and integrate the indicators proposed by the ISCN Charter to with EU standards and other metrics that best express our targets towards sustainability.

Pictures from recent initiatives: on the left, the exhibition of Master theses for a Sustainable Campus; on the right, the exhibition of an architectural design studio working on the renewal of the campus.

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PRINCIPLE 1 - SUSTAINABILITY PERFORMANCE OF BUILDINGS ON CAMPUS

Principle 1: To demonstrate respect for nature and society, sustainability considerations should be an integral part of planning, construction, renovation, and operation of buildings on campus.

A sustainable campus infrastructure is governed by respect for natural resources and social responsibility, and embraces the principle of a low carbon economy. Concrete goals embodied in individual buildings can include minimizing environmental impacts (such as energy and water consumption or waste), furthering equal access (such as nondiscrimination of the disabled), and optimizing the integration of the built and natural environments. To ensure buildings on campus can meet these goals in the long term, and in a flexible manner, useful processes include participatory planning (integrating end-users such as faculty, staff, and students) and life-cycle costing (taking into account future cost-savings from sustainable construction).

Management Approach to Principle 1 Topics

The majority of buildings are owned by the institution and only few are rented. In any case, all the buildings and open areas on campus are managed and maintained by the institution. The initiatives promoted in the Thematic Tables aim at overlapping with the maintenance work plan and potentially redirecting and improving design choices. The initial stage of the work was mostly dedicated to create a baseline for measurements and the quantification of indicators. A list of objectives is shown below.

- The first challenge is a strong **commitment to reduce the energy consumption of buildings**. For instance, the campus is composed of old buildings (most of them are from the 20ies of the last century, some of the 60ies and only few were constructed in recent years); we are undergoing the **refurbishment** of our real estate and this should happen in the respect of the historical and architectural value of the buildings (some of them represent significant samples of the Italian modern architecture, designed by well-known architects).
  How: from now on, the **refurbishment program should be implemented with the contribution of academic expertise**; this might be the occasion to experiment innovative solutions or to propose a more conscious, environmental-friendly and inclusive design: the campus is intended as **the place where we can test our research ideas and products**, and offer them to the district and the city.
- A second aim is to improve the **energy efficiency** of the campus. The **first operation involves measuring** the performance of buildings in order to better understand and evaluate the livability and efficiency of our buildings. It will be

crucial to identify the campus areas with low performance, i.e. higher consumptions, through the implementation of a monitoring system.
- A third scope will consider the potential production of energy on site through **renewables**.

Main initiatives and results

Energy

New in 2012

- The online application of the **monitoring system** of energy resources consumption was implemented and refined. A dedicated person responsible for the monitoring of the use of resources will be activated soon.
- The **Energy Board** with professors experts in energy was established to envision future innovative strategies aiming at the reduction of consumption.
- **Retrofitting of buildings**: new thermal insulation and new windows were installed and will improve the overall performance of Building 3 (Aule Sud) and Building 4 ; thermal broken windows with double glazing have been installed in Buildings 4, 5, 6, 6 and 14 (Nave).
- **Surveys on buildings** (mainly thermal imagery) have been conducted on pilot buildings (Buildings 12, 14 and 15) in order to program future intervention on the exterior walls. Two master theses have been completed on this topic.
- The **Photovoltaic Test Facility** (PVTF) on the roof of Building 14 (Nave) was installed, aiming at testing and comparing the performance of different modules provided by producers.
- A **solar system** with the Dessicant Evaporativy Cooling (DEC) technology was installed on the roof of the dormitory Casa dello Studente for the climatization of the building both during the summer and the winter (extension of the modules150 m^2, production of about 60.000 thermal kWh).
- The installation of **new inverter air conditioning systems** were installed in Building 8 and in the conference Room De Donato (Building 3).

Still running or completed

- **Data on Electricity, Natural Gas** were collected, then made visible on a map at the POLIMI campus level and organized in an online application, so that researchers and the technical staff can monitor the trends of consumption. The latter application revealed itself to be very useful in detecting anomalies and unexpected peaks of consumptions. The data is aggregated into buildings and parts of buildings, according to the installed counters, after the refinement and infilling of the monitoring system on campus completed in 2012.
- A **survey about the main characteristics of the 3700 building spaces** was conducted in 2007. The resulting database contains more than 100 fields for each zone, describing main characteristics of orientation, lighting layout and activation,

heating and cooling devices, windows, shading devices, etc. A queries system has been implemented using MS-Excel macros for evaluating scenarios on the adoption of different control systems to zones, in order to easily find the most promising interventions, in terms of retrofit and building automation, for reducing wastes of energy. A proposal for the improvement of the existing dynamic-database will enable to preview the reduction of energy wastes deriving from the adoption of different control devices.

- Policies for the **reduction of artificial lighting** were already implemented in the past: photocells were installed in the restrooms, passages, corridors and common areas (indoors and outdoors), and currently most of them are covered by this control system. This technology is used for all new or retrofitting interventions on campus.
- The introduction of **environmental and energy criteria for directing retrofitting interventions**, which take into account the different building typologies and ages of our real estate were proposed.
- Increase of energy production through **renewables** is under investigation. A PV plant on the roof of the main building of our Architecture School is already in place since more than a decade, and the use of more roof surfaces might increase our productivity.

Environment

New in 2012

- Preparation of **guidelines for waste collection** were introduced in the student residences. A correct collection is still one of the main issues among students with very different cultural habits.
- A series of seminars and initiatives towards the **EU green procurements** were carried out during the year 2012. For instance, green procurements are already mandatory for the acquisition of materials and products. In particular, the environmental product certification (ISO 14020, Ecolabel) and environmental management system (ISO 14001, EMAS) are preferential prerequisites for procurements. The seminars are listed below:
    - Seminar on eProcurements with the title "La domanda pubblica come fattore di stimolo all'innovazione regionale: il Pre-Commercial Procurement" (May 28). Relator: Francesco Molinari, coordinator of the WG Stato Regioni on "Bandi multistadio e Public Procurement" for the “Agenzia per l'Innovazione” and the Dept. for Development and Cohesion Policies of the Italian Ministry of Economic Development.
    - Seminar on eProcurement with the title “Gestire in maniera innovativa gli acquisti della Pubblica Amministrazione: l’eProcurement e le opportunità per il Sistema Paese”. Relator: Giovanni Calabria, Osservatori ICT & Management, School of Management POLIMI.
- The census of 26 counters of water was carried out in order to start collecting data on **water consumption**.

Still running or completed

- The surveys on Building 14 (Nave) and Building 2 (Aule Nord) were completed and helped in the reconstruction of the overall **performance (heating and cooling demand) and environmental comfort of the indoor spaces**. In particular, a BIM model and environmental simulations along with comfort surveys in the summer and winter, and the monitoring of consumption data are used to inform the design of innovative solutions.
- **Differentiated waste collection** of paper and plastics is already in place in the classrooms and common spaces, as well in all the departments and offices. An overall reorganization of the waste management is under development. Hazardous waste collection in departments working with chemical products is mandatory (managed by the Office “Servizio Prevenzione e Protezione” together with the responsible for the waste management).
- In order to reach a right differentiated waste collection in the different buildings and departments, a series of **instructions** (posters) have been prepared to be put on the white garbage collectors for paper and on the green ones for the glass collection.
- A **census of the differentiated waste collection** was conducted in order to evaluate the status of the as-is (how many garbage collectors are new, how many are to be changed etc.) and to evaluate if the number of waste collectors are enough to sustain the current garbage production for each single building and if they are compatible with the frequency of the garbage collection carried out by the municipal waste management provider (AMSA).
- A **pilot university residence** was chosen for introducing an improved waste management, in particular waste and water management, oil collection, increasing recycling with specific containers, along with awareness and training of the users. The pilot project was completed and now its application is waiting for the go-ahead by the by the managers of the students residences.
- The experimentation of **green roofs and hydroponic walls** technologies are under evaluation through the installation of sample solutions on selected campus buildings (Building 15).

Accessibility

Still running or completed

- Quite all the buildings and rooms are already **accessible to people with disabilities** (the accessibility audit of the paths through all the buildings was verified). From 2004 the **refurbishment program** has to develop inclusive design approach and the Multi Chance Poli Team provided to special needs of accessibility personalization. From now on, **refurbishment buildings program** has to develop accessibility customization of different locations, services and activities.

- New elevators and entrances accessible to people with disabilities were installed in Buildings 2,4A, 11 and 14 and Casa dello Studente.

People

New in 2012

The following initiatives refer to the potential reduction of energy consumption by acting on behavioral change and habits of the community in general. In particular:

- In order to make sustainable rules to be shared by all the actors the collective writing of a "**Code for sustainable behavior**" has been activated. A preliminary draft was posted on a **Wiki space** of the platform prepared with the support of other table members. The Wiki space will allow collaborative discussions and writings to be monitored and recorded as shared behavioral rules.
- Two services, related to the Behave! challenge have been co-designed and developed by the Alta Scuola Politecnica (ASP) students:
    - **&CO**. Starting from the need of the ARCHIMODEL Lab in the Campus where much residual materials are produced, the &CO services has been co-designed with students, citizens and other potential users. &CO is a web based Solidarity Purchasing Group focused on the **reuse and the collective buying of reusable materials**. This service grounds on the idea to elongate materials' life cycles and responds to two different needs: 1) remove residual materials from production space; 2) reduce the cost of acquiring new materials. In order to respond to these needs a network among groups and associations already working in this field has been activated. This collaborative service was launched during the "two days for sustainability" event and a dedicated web page is under development using facebook and twitter as clustering drivers.
    - **TOCTOC Movement**. The main goal of this service is to **reduce waste** and help to build a local community from which all citizens can take profit. Toc Toc actually comes from the sound (knock, knock) that represents the action on knocking on neighbor's door, this is the help that each and every one of us is willing to give in order to live in a sharing community. Therefore TocToc is a platform where every user can offer his/her possessions that he/she does no longer need and obtain in return something else, or simply avoid that used objects being in good conditions, being still useful, finish on the dumpster. TocToc is a service web application. By logging in with e-mail, or the credential of another social network, it is possible to enter and be part of the community, create your profile, see the others next to you on a map or do a research by subject; you can upload and geo-locate your own offers, propose an object exchange to other users, send private messages or comment on other's offers.

- The **Smart Campus project** has been proposed to European funding call and financed. Started on August 2012 it aims at improving energy efficiency in public building (as most of the campus buildings are) by changing users behavior.

Still running or completed

- In order to crowd source activities and commitment towards Campus Sostenibile goals, Challenges have been identified starting from themes having a wider collective value. Among these challenges one is named "**polinclusive**"; it aims at collecting ideas or project proposals on possible transformations or services to be carried out or supplied in order to guarantee a comprehensive human approach to people, considering their different disabilities and abilities to access the campus life.

Principle 1 Targets for 2013

- Working on a more comprehensive **monitoring of energy consumption**
- Working on **guidelines with environmental and energy criteria** for the retrofitting of buildings and open areas.
- Introducing the **separated collection of glass** in the buildings

Overview of Organization's Principle1 Goals

Theme	Topics	Related Indicators	Goals and Initiatives	
	Priority Topics		**Objectives and Targets**	**Key Initiatives**
The themes identified by the Città Studi Campus Sostenibile project		GRI and STARS indicators, indicators proposed by POLIMI	for reporting year, for the following year, and/or beyond	in reporting year, and /or planned for the following and beyond
Principle 1	***To demonstrate respect for nature and society, sustainability considerations should be an integral part of planning, construction, renovation, and operation of buildings on campus.***			
	Resource use			
ENERGY	Energy use | direct energy consumption	kWh/y (EE) -- kWh/building m3/y (CH4)	Monitoring and reducing consumption	Installing new sensors for monitoring buildings' performances and for building automation
ENE / ENV	Water use	m3/y	Reducing consumption	Collection of data about water consumption on campus (26 counters)
ENVIRONMENT	Wastewater	n° of maintanance interventions/year	Residences: Reducing interventions on the	Handbook of good practices for students living in the dormitories and for the community of Campus
ENE / ENV	Periodic maintenance on the building	n° of maintanance interventions/n° of program maintanance interventions	Energy saving , waste reduction and non-compliance management	Creation of control registers in use of S.P.P. for the ordinary monitoring;in case of emergency a specialized company will be called
ENERGY	Energy and water costs, and savings achieved	euro/y	Reducing consumption and investing the savings	Working on light solution (first), i.e. lifestyle
ENVIRONMENT	Overall purchased products/materials (Auto emissions and green cleaning product requirements)	N° green product/tot	Improving the amount and the environmetnal quality of purchased products on campus	EU green procurements are mandatory for the acquisition of materials and products
	Waste, recycling, local emissions, and non-compliance			
ENVIRONMENT	Solid waste	- tonn/y	Monitoring and management of differentiated waste collection in the buildings/departments	- Census and posters - Census of garbage quantity produced at POLIMI (indoor and outdoor) - Re-organization of the ecological garbage collection area and optimization of the right waste collection and disposal
ENV / PEO	Recycling	of different types of waste collected on campus For residences: - For all the categories of solid waste: number of containers/retire; - For oils: liters/y; liters/y/student. - To monitor the progresses of the collection of oils and organic waste: number of interventions on the kitchen sinks/y	Already in place in the buildings, needs to be improved	Collective writing of the "Guidelines for Sustainable Behavior"
ENVIRONMENT	Re-use		Increasing the life cycle of materials by re-using waste materials	Study for the reuse of materials from construction or waste for the making of new products
ENVIRONMENT	Waste costs, and savings achieved	For residences: number of fines/y --- euro/y	Improving the education and commitment for waste collection in the community	Handbook of good practices for students living in the dormitories
ENE / ENV	Emissions contributing to local air pollution	CO2/y --- CO2/student	Reducing the sources of emissions at local level	The feasibility study for replacing the existing thermal plant with a new one was conducted

	Users			
ACCESSIBILITY	Handicap access	n° Hp access/tot access		
PEOPLE	Stakeholder participation in planning (integrated design)	- Number of external stakeholders - Number of additional meetings - Number of shared initiatives	To engage stakeholders out of the standard academic life in the envisioning and co-design activities	Activating a fifth non-academic work table
ENVIRONMENT	How present conditions affect users' behaviour	Monitoring users' behaviour / built environment performances according to established Post Occupancy Evaluation (POE) criteria	Defining users' behaviour / built environment relationship patterns in order to support rehabilitation design strategies	Post Occupancy Evaluation (POE) techniques
	Indoor Environmental Quality			
ENVIRONMENT	Indoor Air quality	Temp, Humidity, air velocity	To reach high IAQ levels	1. Adopt an IAQ management policy 2. Improve IAQ by considering it in design, operations and maintenance policies 3.Introduce a mechanism for occupants to register complaints
ENVIRONMENT	Indoor Air quality	legionella, nr. of bacteria/cm2, …	No biological agents or mould	clean and maintenance of pipes of air conditioning

Legend:

POLIMI Proposed topics beyond ISCN
Topics not discussed yet, but to be included as future work

PRINCIPLE 2 – CAMPUS WIDE MASTER PLANNING AND TARGET SETTING

Principle 2: To ensure long-term sustainable campus development, campus-wide master planning and target-setting should include environmental and social goals.

Sustainable campus development needs to rely on forward-looking planning processes that consider the campus as a whole, and not just individual buildings. These processes can include comprehensive master planning with goals for impact management (for example, limiting use of land and other natural resources and protecting ecosystems), responsible operation (for example encouraging environmentally compatible transport modes and efficiently managing urban flows), and social integration (ensuring user diversity, creating indoor and outdoor spaces for social exchange and shared learning, and supporting ease of access to commerce and services). Such integrated planning can profit from including users and neighbors, and can be strengthened by organization-wide target setting (for example greenhouse gas emission goals). Existing low-carbon lifestyles and practices within individual campuses that foster sustainability, such as easy access for pedestrians, grey water recycling and low levels of resource use and waste generation, need to be identified, expanded and disseminated widely.

Management Approach to Principle 2 Topics

The scale of the campus is the one that best leads to the aggregation and alignment of all the proposed initiatives. It is also the dimension that best embraces all the competencies activated in the Thematic Tables, thereby representing the contact point, in many cases, between the tables.

For instance, the projects uploaded on the web-platform together with the proposals discussed at the Thematic Tables are the raw materials for the design of the whole **Campus Masterplan**. The main goal is to make all the projects overlap and converge in a unique, comprehensive and coherent scheme. Energy and environmental aspects, together with social and cultural issues have to find a common ground and agreement through the physical design of the masterplan.

We focus significantly on the **environmental quality and accessibility of open spaces**. In fact, open areas are crucial for the overall usability and image of the campus, but are underestimated and underused by the POLIMI community. Hence, the sustainable campus project is a great opportunity to redesign outdoor spaces.

Main initiatives and results

Energy

New in 2012

- Proposal for an **electric car charging station with cogeneration**. The project, totally financed and implemented, consists in a container for the cogeneration and storage of electricity and two charging columns.

Still running or completed

- A **survey** that photographs the today's condition and the last four years in terms of energy, water and gas consumption.
- The replacement of the centralized heating system with an innovative **co/trigeneration plant** with high efficiency and low emissions was proposed. Investment costs are quite high, but the payback makes the proposal practicable. From the feasibility study of the project conducted in 2012 the following conclusions emerged: the existing building can host the new plant, and the existing distribution infrastructure can be reused with little intervention.

Environment

New in 2012

- **The PIC project (Platforms for Intelligent Containers)**, aiming at introducing an innovative system for the management of waste collection (in terms of monitoring, quantification of production and optimization of collection) completed the pilot phase on campus (application on the ecological platform and in sample areas) in 2012 and is looking for funding opportunities.
- **Permeability and drainage** of large parts of the campus was mapped and possible solutions for a more rational and **sustainable water management** will be presented as part of a master thesis.
- A first and comprehensive **CO_2 assessment at the campus scale** was produced and presented as part of a master thesis discussed in December 2012. This work will contribute to the definition of more informed sustainability scenarios for the near future.
- The introduction of **waste management outdoors** was completed on campus.
- The installation of **new urban outdoor furniture**, mainly benches and tables, was initiated in order to provide places for the campus community to study, meet and socialize.

Still running or completed

- **Increasing outdoor thermal comfort**: Following the general goal to improve livability conditions at the Campus Leonardo, a methodology has been proposed which begins with environmental analysis of the open spaces and aims to provide design specifications and strategies to improve microclimate and comfort conditions. First of all, a study for the definition of the **protocol for comfort measurements and surveys** was carried out in 2011 in order to map the occurrence of critical situations. Secondly, and at the same time, thermal perception of users were collected through a questionnaire and answers were compared with the "answers" of the instruments thus aiming at defining a new score scale to "calibrate" the measurements with the people of our community. Thirdly, open space users' behaviors were observed in order to understand critical elements as well as the capability of specific spaces.
- **Green areas**. Surveys and mapping of the vegetation on the POLIMI and UNIMI campuses (what we call the Green Cadaster) was conducted aiming at delivering a tool that can be applied for the management and design of new green spaces (we will propose the municipality to adopt this tool) and for the following issue.
- **Waste management outdoors**. A more efficient management of waste collection in the open spaces was investigated in 2011 and enabled the introduction of differentiated waste collection outdoors in 2012**.** The activities included the following ones:
    - A **census of garbage quantity** (volume) produced on campus (indoor and outdoor) started in 2011 was completed. The data collected in the census derive either from the number of garbage bags that have been counted during the academic year or from statistical data that represent the garbage production per capita. This investigation should help in the reorganization for a more rational waste collection.
    - Moreover, **new compactors** for the reduction of waste volumes (dry waste, paper and cartons) were rented.
    - The monitoring of plastic consumption was scheduled in the near future.
    - The re-organization of the **ecological garbage collection area** was carried out in 2011. In particular: the overall layout has been changed and new containers, front loaders etc. have been introduced; a map has been designed with present, past and future layout, procedures, rules and registers have been introduced for the area management; adequate posters have been introduced to simplify the correct waste collection management.
- Re-organization of **green areas equipped for students' life**: after having mapped and proposed a new design and arrangement of garbage bins, benches, tables, Wi-Fi access in 2011, the installation of furniture started in 2012 and will completed in 2013.
- Maps of the network and the services regarding the **wastewater and rainwater management** were prepared in order to define strategies to decrease of the rate of rainwater collection into sewer and the improvement of soil permeability.

- A **new weather station** as part of the PRIN SENSE project was installed on campus and will be used to increase the sensor network on campus.

Accessibility

New in 2012

- The analysis and construction of **scenarios for the regulation of parking spaces** on campus were proposed. The aim is to gradually reduce the offer of parking spots for vehicles and promote other transportation modalities.
- **Survey and installation of bicycle parking**. For instance, 150 arch bicycle parking stands were installed on campus.
- Launch of a **technic table with the municipality** (Comune di Milano) **and the mobility agency** (AMAT), together with the Tables City and People, aiming at coordinating the different interventions for the renewal of open spaces, road system and mobility in the district of Città Studi. For instance, the table is currently working on the following initiatives:
    - Reducing the space for the car-parking lots in Piazza Leonardo da Vinci in front of the main and historical entrance of the Politecnico. At the same time, promoting new ways of use of former parking lots as a reconquered public space through the management of temporary and experimental public concerts, sports, markets with the engagement of the local community and citizens associations. The project was presented to the local public authorities and is going to be adopted soon.
    - Securing the pedestrian crossing of via Ponzio is under investigation; a street dividing two parts of the POLIMI campus, which is currently crossed by a multitude of people in unsafe conditions.
    - Installation of new BikeMI bike-sharing stations in Piazza Leonardo da Vinci and in front of Lambrate railway station (installed by BikeMI company and the Municipality of Milan with the support of Campus Sostenibile).
- Feasibility study of the **Polibikes Project** with the objective to establish a **bike repair shop** (linked to the existing shop at UNIMI) that repairs abandoned bikes donated from the Municipality of Milan and to set up a bike sharing system for students, employees and teaching personnel.
- Feasibility study of a project aiming at **monitoring bike journeys** of the students' community with mobile applications. The analysis of the overall routes enable to define the most used roads or bike lanes of the students in the neighborhood of POLIMI, the origins and destinations of these trips, the time schedules and other special requests and needs (mobility profiles). The results will support the definition of better and more user-focused measures towards sustainable mobility. Possible participation at the European bike challenge.
- New definition and **re-launch of the Carpooling Project** of POLIMI and UNIMI for students and employees and teaching personnel is under study due to the lack of participation to the previous initiative.

- Feasibility study of a project for the design and application of **mobility (or sustainability) credits** aiming at the delivery of a tool able to promote and reward sustainable behaviors.
- Beyond the boundaries of Città Studi, the Sustainable Campus Project is starting to involve the **other campuses of POLIMI**, thus initiating a series of activities with local municipalities, such as:
    - The launch of a **technic table with the municipality** (Comune di Milano) **for the requalification of the Bovisa area** where the Campus Bovisa of POLIMI is located. Main aim of the table is the reorganization of the viability of the area with special focus on POLIMI community needs, in particular the definition of sustainable mobility measures, walking and cycling itineraries and green areas.
    - The launch of a **technic table** for the requalification of the POLIMI **Campus in Lecco** in collaboration with the local municipality (Comune di Lecco).
- **GHG emissions and Transportation.** If the GHG emissions are calculated (organization-wide), it is possible to fix which is the best target of emission reduction compared to the baseline, that can be applied to decrease the environmental impact .The GHG emissions can be let down by replacing traditional vehicles, powered by fossil fuel, with green transportation. Many different projects are being studied to join this objective such as: the “Green move project” and the “bike sharing”. Encouraging the staff to use public transport is another way to reduce pollution. A ticket discount has already been applied in some public transports, but only for few passenger classes. The aim will be to extend it to every kind of categories and type of public transport. Improving system efficiency and using renewable energy (for example photovoltaic), will reduce total account of greenhouse gas emissions.

Still running or completed

- **Surveys on mobility and mobility services** were conducted in October 2010 and concerned 2,624 workers and 12,919 students of POLIMI and UNIMI. The surveys were finalized to implement the commuting plan (home/work) needed to improve and to support sustainable mobility practices.
- **Cycling**: survey on the bicycles available for departments and administrative staff to improve the organization and to increase the use of bicycles to move inside and outside the campus; mapping of bicycles paths and “friendly roads” to identify a networks for cycling on a urban scale; offer of an itinerant bike-repair shop service (from October 2009 to March 2011, funded by the Cariplo Foundation).
- **Parking**: Survey on the time and the use of parking lots inside the campus and proposal of scenarios finalized to reorganize the internal parking lots to create new public spaces. The goal is to open a web-debate on the re-use of parking lots through a comparison of different scenarios and an assessment of the satisfactoriness.
- **Carpooling**: construction of the web portal www.carpooling.polimi.it where it is possible to enter travel requests. The software, according to the user preferences,

automatically creates the crews. The goal is to improve the university accessibility through the provision of a car pooling service available to students, professors and administrative staff of POLIMI and UNIMI.

- **Electric Car Sharing**; Green Move project (www.greenmove.polimi.it): Proposal for a ZEV vehicle-sharing system based on an open and dynamic logic. The goal is to provide access within the service, both as consumers and as sharers of vehicles. Funded by the Regione Lombardia, involving eight departments and research centers of the POLIMI, has developed analysis of existing literature and best international practices; definition of parameters describing a system of sharing vehicles; organization of several workshops; identifying the most appropriate vehicles for experimentations. The project includes: design and implementation of service management platform; design of the device using the service; testing of a field test involving also the "Città Studi" area; estimated demand and potential supply; analysis of all the main stakeholders potentially affected by the service.
- **Usability of the offered services**: studies about the orientation and signposting design for an easier use of the main services on campus, also by the inhabitants of the neighborhood.

People

New in 2012

- The **Smart Plan project** has been started aiming at experimenting new for of master plan as environment for aligning resources and activities towards sustainable transformation. This project, in coherence with the Periphèria project aims at experimenting the effectiveness of open innovation in driving complex systems (as a university campus is) onto a common path towards sustainability without having the ambition to guide rather supporting synergizing and collaboration.

Still running or completed

- With the same goal described in the previous paragraph, another target has been identified: it is named "urban experiments" and aims at collecting and acquiring ideas to use the **Campus as an urban experimentation lab** to test sustainable, creative and innovative urban solutions, modes, lifestyles. The main goal of this challenge is to transform the urban area around the campus, and the campus itself, **into an integrated urban space**. The main results on this challenge are related to the activities carried out through the Table City in collaboration with the Smart Plan project. The conjunction of these two initiatives gave birth to the idea of RiconquistaMI, a collaborative services that helps citizens to re-conquest public spaces through the development of a collaborative calendar of activities (called "palinsesto") using and filling the public spaces. For this service a dedicated app has been developed, "Stick around" that will be tested during the early public events taking places in Piazza Leonardo da Vinci.

- Several services are under development to increase **accessibility for people with disabilities** (among others: multi-modal communication for internal and external users, design for everyone and multisensory design of open and indoor spaces; accessibility and customizability of services and places).

Principle 2 Targets for 2013

- Focusing on **mobility or sustainability credits policies**
- Finalizing the **CO2 accounting of the campus**
- Improving the **environmental data collection** (mainly water and waste consumption)
- Completing the **database of the campus green areas**
- Installation on campus of the POLIMI **electric car charging station**
- Widening the sustainable campus initiative to the other satellite campuses of POLIMI (in particular Bovisa and Lecco)

Overview of Organization's Principle 2 Goals

Theme	Topics	Related Indicators	Goals and Initiatives	
	Priority Topics		**Objectives and Targets**	**Key Initiatives**
The themes identified by the Città Studi Campus Sostenibile project		GRI and STARS indicators, indicators proposed by POLIMI	for reporting year, for the following year, and/or beyond	in reporting year, and /or planned for the following and beyond
Principle 2	***To ensure long-term sustainable campus development, campus-wide master planning and target-setting should include environmental and social goals.***			
	Institution-wide carbon targets and related achievements			
ENVIRONMENT	Carbon emissions (organization-wide)	emission CO2/y or emission CO2/student	Measuring CO2 emissions on campus	A master thesis was conducted on the topic of CO2 emissions accounting
	Master planning			
ALL	Coverage of campus area by masterplanning initiatives	Coverage of campus area by masterplanning initiatives/Tot area Campus	Reporting local initiatives at the campus level	The smart-plan project is mapping and reporting initiatives and transformation at the campus level
	Transportation			
ACCESSIBILITY	Frequency of traffic surveys	Traffic survay/y	Understanding and implementing strategies for sustainable mobility	2010, 2007, 2001. The survey is finalized to implement the commuting plan (home/work)
ACCESSIBILITY	bicycle/ebike and pedestrian access	n° available campus bicycle n° bike rack	Identifying a networks for cycling on a urban scale; offer of a mobile byke-repair shop service , improve the bicycle fleet available to departments and administrative staff	- Mapping of bicycles paths and "friendly roads" - Survey on the bicycles available to departments and administrative staff
ACCESSIBILITY	Estimated commute distance or commute energy use per person	Average travel time		
ACCESSIBILITY	Internal parking lots	tot n° parking n° parking/n° of student n° parking/n° of campus staff	Reorganizing the internal parking lots in order to create new public spaces	Surveys on the time and the usage of parking spaces inside the campus and proposal of transformation scenarios
ACCESSIBILITY	Facilities and promotions in favour of public transport	n° facilities vs sustainable mobility	Increasing the use of public transport by the community on campus	
ACCESSIBILITY	Mobility Management	n° initiatives sustainable mobility/y	- Management of the main mobility projects and programs - Commuting plan (home/work) useful to improve and support sustainable mobility practices	Activities promoted at the Table concerning the discussion of plans, programs and scenarios
ACCESSIBILITY	Rehabilitation of traffic system and paths within the district of Città Studi		Improving the overall accessibility to the campus from an urban design perspective	Preliminary masterplan to reorganize the road system in the district of Città Studi (with traffic calming measures, securing the crossroads, new pedestrian and byke paths)
ACCESSIBILITY	Urban mobility | Electric car sharing	n° of users/y	Implementing an efficient and environmental-friendly urban mobility	Proposal for a ZEV vehicle-sharing system based on an open and dynamic logic.
ACCESSIBILITY	Urban mobility | Car pooling	n° of users/y	Implementing an efficient and environmental-friendly urban mobility	Online service (carpooling.polimi.it) where it is possible enter travel requests to automatically generate the crews

	Social Inclusion and protection			
PEOPLE	Diversity (faculty, staff, and students)	- % of faculty members/staff/students on the total number of involved people - % of gender participation	To keep the kind of participants at an appropriate mixed level	
PEOPLE	Incidents of discrimination	n° claim/y		Policies already in place by the institution beyond the sustainable campus initiative
PEOPLE	Access to education (in case of substantial fees)	n° claim/y		Policies already in place by the institution beyond the sustainable campus initiative
PEOPLE	Open access spaces for interaction	n° initiatives/y		Policies already in place by the institution beyond the sustainable campus initiative
ACCESSIBILITY	Access to services and commerce	n° services		
PEOPLE	Participative campus planning integrating users and neighbors	- number of co-design workshops - percentage of external participants on the total	To activate a wide external (non-academic) participation	Co-design Workshops and participation meetings
	Land use and biodiversity			
ENVIRONMENT	Garbage area collection optimization	n° maintenance intervention/y n° different waste bin	Improvement of garbage collection	Changing layout, introducing procedures, rules, registers and posters
ENVIRONMENT	Increment of green areas	m2/y	Reorganization of green areas by including facilities for the POLIMI community	
	Outdoor Environmental Quality			
ENVIRONMENT	Outdoor Air quality	[pollutant]	Monitoring air quality	Regional Agency for Environmental Protection (ARPA) contributor and collaboration for air control through central measurement station
ENVIRONMENT	Outdoor Thermal Comfort	temp, humidity, air speed	Establishing a methodology to evaluate outdoor thermal comfort and conducting on field surveys (both microclimatic measurements and people interviews) in order to get a sensation map. The goal for the next year is to conclude the field survey with new microclimatic instruments and realize some sensation maps of some significants areas	- Acquisition of equipment for measurements - The proposed methodology to evaluate outdoor comfort was established and tested. Some critical elements were pointed out. The aim for the next year is to solve the critical issues and complete the field survey in 4-6 areas of the Campus in two different seasons (spring and summer)

Legend:

POLIMI Proposed topics beyond ISCN
Topics not discussed yet, but to be included as future work

PRINCIPLE 3 – INTEGRATION OF FACILITIES, RESEARCH, AND EDUCATION

Principle 3: To align the organization's core mission with sustainable development, facilities, research, and education should be linked to create a "living laboratory" for sustainability.

On a sustainable campus, the built environment, operational systems, research, scholarship, and education are linked as a "living laboratory" for sustainability. Users (such as students, faculty, and staff) have access to research, teaching, and learning opportunities on connections between environmental, social, and economic issues. Campus sustainability programs have concrete goals and can bring together campus residents with external partners, such as industry, government, or organized civil society. Beyond exploring a sustainable future in general, such programs can address issues pertinent to research and higher education (such as environmental impacts of research facilities, participatory teaching, or research that transcends disciplines). Institutional commitments (such as a sustainability policy) and dedicated resources (such as a person or team in the administration focused on this task) contribute to success.

Management Approach to Principle 3 Topics

The whole People strategy has been developed within a **Living Lab approach** also in coherence with the Periphèria European Project; i.e. it is aimed at looking at the Campus as an open innovation environment where collaborative design learning and assessment are fed by scientific knowledge rooted in the campus activities. One of the main characters of a living lab approach is the creation of **private-public-people (PPP) partnerships** that can guarantee diverse knowledge be involved, diverse interests, diverse approaches to collaboration and innovation.

This approach was possible thanks to the implementation of the **web platform**, which helped in creating awareness of the initiative and enabled the management of a large number of people in the initiative. For the moment, the portal is open to the POLIMI and UNIMI communities, and whose members can propose ideas and projects; nevertheless, everyone can visualize the uploaded comments and proposals. We are confident to open the portal to everyone (in particular citizens) soon, due to the new release of the website.

In addition to the above, surveys to map the **sustainability curriculum** of our university were started. In particular, we focused our attention on the following aspects of our green curriculum:

- mapping the **education curriculum for sustainability** (programmes, courses, workshops, etc.) offered to students. The intention is to map the future evolution of green classes offered by the school. In the year 2010/11, 126 classes – out of a total offer of 3117 activated courses at the POLIMI – are specifically related to sustainability and we are currently investigating the possibility of a labeling procedure (**green cv**).
- Monitoring of **projects started by classes and courses specifically dedicated on the Sustainable Campus project** since fall 2011. For now, about six classes in the Architectural Design programmes used the campus as the design area.
- **Mapping research groups on sustainability** and attempting to involve them to be part of the initiative.

Main initiatives and results

All

- **Dissemination** of the project through a series of main initiatives, in particular:
  - The two days long event **"Giornate della Sostenibilità"** with seminars and activities related to sustainability.
  - **Presentation of the project outside POLIMI, among others**: official presentation at the Comune di Milano (June 2012), Go Slow Social Festival (September 2012, Milan)
  - **Exhibition of the Theses for a Sustainable Campus** (October 2012)

Energy

New in 2012

- The introduction of a **carbon footprint calculator** on the web-platform is currently under investigation, and was proposed as a way to involve students and the community in general in a deeper understanding of the impact of our daily actions.

People

New in 2012

- Collaboration to the implementation of the **second release of the web-platform**
- The implementation of a **new app** as part of the Periphèria CIP European Project and directly connected to the website is under implementation and will be delivered in 2013.
- **Launch of the "Table City"** (see below the initiatives that were activated)

- Two courses (in the first semester of 2012-13), one of the School of Architecture, one of the School of Design and directly connected to Campus Sostenibile involved up to 100 students; about 30 new proposals have been developed by students and are being up-loaded on the Campus Sostenibile site.

City

New in 2012

- Open participation and discussion about the **renewal of Piazza Leonardo da Vinci**, through:
    - Dedicated meetings and workshops with the local community members
    - Activation of meetings with the municipality (Comune di Milano), the district for a shared redesign of the space
    - Preparation of POLIMI and UNIMI proposals as an integration to the project proposed by the municipal technical offices.

Still running or completed

- Design, implementation and launch of the first release of the **web-platform** www.campus-sostenibile.polimi.it in 2011.
- **Activation of initial partnerships**: with UNIMI and with the City of Milano. Both institutions where presenting the Campus Sostenibile Initiative together with POLIMI when it was launched at a Press Conference in September 2011. Memoranda of understanding have already been signed with these two institutions.
- Launch of **challenges**. Challenges (two of which are described above) have two main goals: 1) to crowd source initiatives, ideas, perspectives and projects towards the sustainability perspective of the campus; 2) to activate PPP partnerships while specifying into a project and rooting some of the emerged ideas/solutions within the campus initiatives. They are considered powerful socio-relational activation means, characterized by widely shared goals and loose-coupled design perspectives.
- **Opening of the initiative to civil society** and to the district community with the aim of sharing our projects; in fact, citizens are interested in knowing more about our initiatives and could give us some positive feedback and suggestions. We launched regular meetings with the representatives of the municipality as well as the citizens of the district and the city. In 2011 three meetings have already been carried out involving local inhabitants and public agencies. This activity conducted to the establishment of the Table City in 2012.

Environment

New in 2012

- Launch of the **design competition for POLIMI and UNIMI students** (November 2012) titled «*Riqualificazione degli spazi aperti del Campus Bonardi*» for the redevelopment of the open spaces of the Bonardi Campus. The goal is a new arrangement of spaces based on multiple uses and according to the requirements of livability. The competition was considered an effective way in order to involve the students in the process.

Still running or completed

- In collaboration with the Table People a **Wiki** for the collaborative implementation of **guidelines for sustainable behavior** was proposed in 2011 and launched in 2012 (see above). The guidelines are going to be offered to the community (both students and staff) in order to promote the spread of more environmental-friendly actions on campus (under development).

Accessibility

Still running or completed

- **Opening of a web debate on the re-use of car-parking areas** inside the campus through a comparison of different scenarios and the assessment of acceptability. A first open discussion was activated during the Campus Days in October 2012.

Principle 3 Targets for 2013

- New commitment between POLIMI and UNIMI boards to strengthen common initiatives.
- Organizing the second edition of the **Sustainable Campus Days for 2013**
- Finalizing the work on the **green cv** in order to recognize the sustainability path of students
- **Re-launch of the website** with new contents and features.
- Diffusing the initiative through the **participation to conferences, seminars and fairs.**

Overview of Organization's Principle 3 Goals

Theme	Topics	Related Indicators	Goals and Initiatives	
	Priority Topics		**Objectives and Targets**	**Key Initiatives**
The themes identified by the Città Studi Campus Sostenibile project		GRI and STARS indicators, indicators proposed by POLIMI	for reporting year, for the following year, and/or beyond	in reporting year, and /or planned for the following and beyond
Principle 3	***To align the organization's core mission with sustainable development, facilities, research, and education should be linked to create a "living laboratory" for sustainability.***			
	Topical integration			
PEOPLE	Programs and projects that connect facilities, research, and education	N° of projects or programs/y	Improving the integration between academic research and students	Possibilities for students to do an internal intership in collaboration with the university research laboratories on the topic of sustainability
PEOPLE	Labeling and number of courses that have an integrated perspective on sustainability as a key component	N° of green courses/tot	Increasing the number of courses that deal with the theme of sustainability	A census of the green courses started
PEOPLE	Courses and/or research that transcends disciplines	N° of cross curricular courses/tot		
	Social integration			
PEOPLE	Programs and projects that connect campus users with industry, government, and/or civil society	N° of projects or programs/y	Have a deeper influence and integration of the university reseach on sustainability and the society	Agreement of the initiative with different POLIMI offices devoted to enhance the connection between the campus and the external resources: Fondazione Politecnico, Career Service, the Press Office
PEOPLE	Programs to further student interaction and social cohesion on campus	N° of projects, theses by students involved in the project	To involve more students on the activated Sustainable Campus initiatives	A number of theses and projects that have the Sustainable Campus as topic were proposed; some are already concluded and inform the discussion at the tables.
PEOPLE	Courses that use participatory and project based teaching	N° of courses officially active on the Campus Sostenibile initiative	To enlarge the number of courses having practical involvement in the Campus Sostenibile initiative	Diffusing the initiative among the staff through the Thematic Tables
PEO / ENV	Behavioral programs aiming at more sustainable actions by students, staff, or external community members	- Number of people involved in the writing of the Sustainable Behaviour Guidelines - Number of uploads in response to the challenge	To engage people in developing sustainable behavioural rules and in behaviours transformation	- Collective writing of the "Guidelines for Sustainable Behavior" - Launch of the Behave!Challenge
	Research and education projects on laboratory/IT facilities and sustainability			
PEOPLE	Research and education on mitigating energy use in laboratories/IT facilities	N° initatives/y		
PEOPLE	Research and education on mitigating hazardous waste from research/IT facilities	N° initatives/y		
	Commitments and resources for campus sustainability			
PEOPLE	Existence of an organization-wide sustainability policy that integrates academic with operational issues?			
PEOPLE	Commitment to external sustainability principles and initiatives (this Charter and other)		External commitment to sustainability of our University	- ISCN reporting - Green Ranking
PEOPLE	Dedicated resources (processes, human and financial resources) for campus sustainability	-Number of people involved -Number of activated/funded projects -External money raised	Incremental increase of the dedicated resources for campus sustainability	- Dedicated research funds for projects on the campus (304,000 Euro from taxpayers donations) - Establishment of the sustainability manager position

Legend:

POLIMI Proposed topics beyond ISCN
Topics not discussed yet, but to be included as future work

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