POLITECNICO MILANO 1863

SBE19 - Resilient Built Environment for Sustainable Mediterranean Countries

SBE SERIES

Co-promoters:

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UN environment
United Nations Environment Programme

Supporters:

AiCARR
Cultura e Tecnica per Energia Uomo e Ambiente

ENEA

ICMQ

Rete Italiana LCA

RUS
Rete delle Università per lo Sviluppo sostenibile

CITTA STUDI
CAMPUS SOSTENIBILE

SUSTAINABILITY AT POLITECNICO DI MILANO

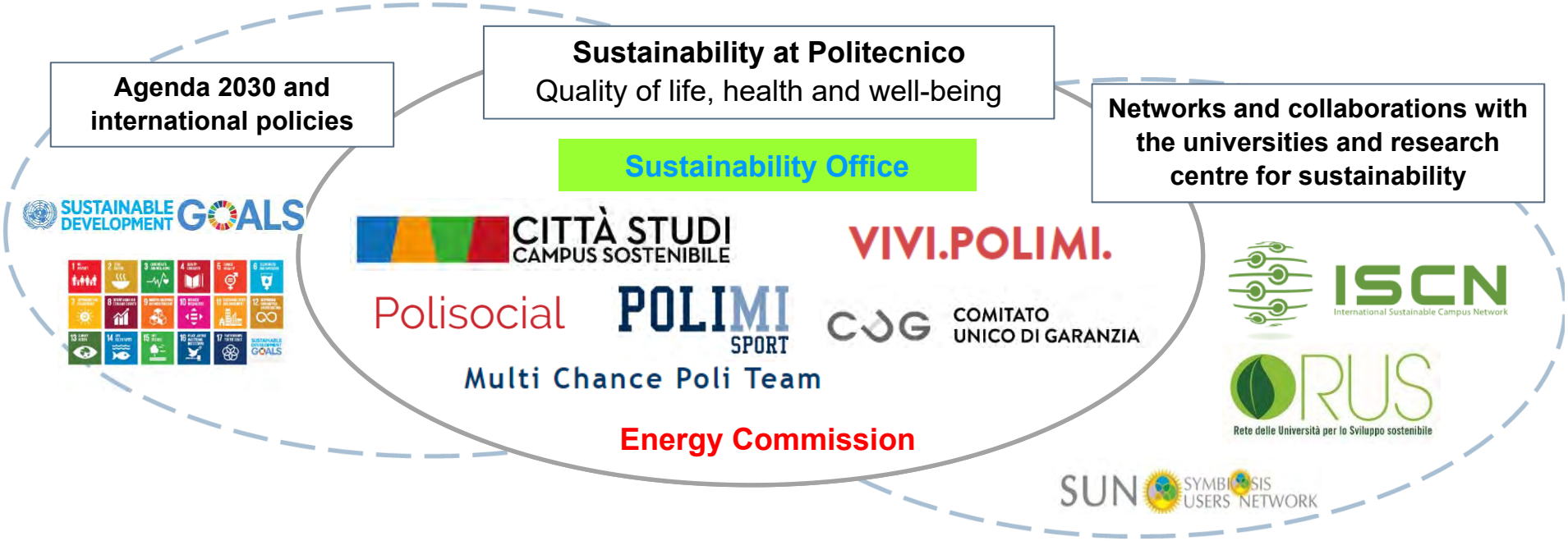
Eleonora Perotto, *Eugenio Morello*

POLITECNICO STRATEGY

Sostenibilità@Polimi

Reorganization of the sustainability strategy at university:

→ **towards an holistic view of the commitment to our community and our campuses, facing new challenges in the quality of life, health and well-being.**



The context has changed

2019 is the «sustainability year» for Italian Universities:

Recent measures:

- Conference of Rectors of Italian University (CRUI) **campaign on «Plastic Free University»**;
- letter by the **Ministry of Education** sent to all university presidents to **promote a culture of sustainability in universities**;
- development of **many activities and projects** promoted by working groups of the Italian Network of Universities for Sustainable Development – **RUS (strong commitment!);**
- **MANIFESTO CRUI 2019 «From "The Universities for Sustainability" to "Sustainability in the Universities"».**

The contest has changed

30 MAY 2019 - MANIFESTO CRUI 2019

«From “The Universities for Sustainability” to “Sustainability in the Universities”»

"This document recognizes the fundamental role that Universities play in the implementation of the UN 2030 Sustainable Development Goals. In particular, the Manifesto suggests the realization of concrete actions, according to different lines of action".

https://www.crui.it/archivio-notizie/le-universit%C3%A0-per-la-sostenibilit%C3%A0-2.html

STRATEGIC OBJECTIVES

O1
COMMUNICATING SUSTAINABILITY @ POLIMI
THE STORYTELLING

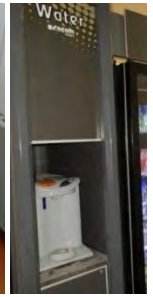
O2
ENGAGING OUR COMMUNITY
CAMPUS SOSTENIBILE

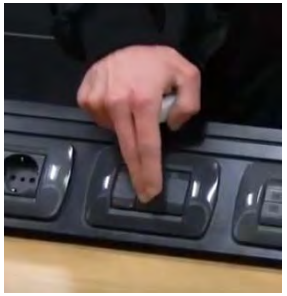
O3
DEFINING & COMMUNICATING
THE CO_2 EMISSIONS REDUCTION TARGETS

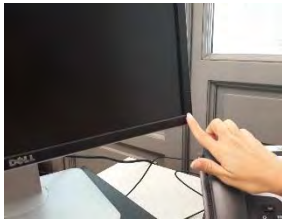
O4
DEFINING & COMMUNICATING TARGETS TO PROMOTE
SUSTAINABLE MOBILITY

O5
DEFINING & COMMUNICATING TARGETS FOR
SUSTAINABLE WASTE MANAGEMENT AND CIRCULAR ECONOMY

O6
DEFINING & COMMUNICATING TARGETS FOR
ENERGY EFFICIENCY





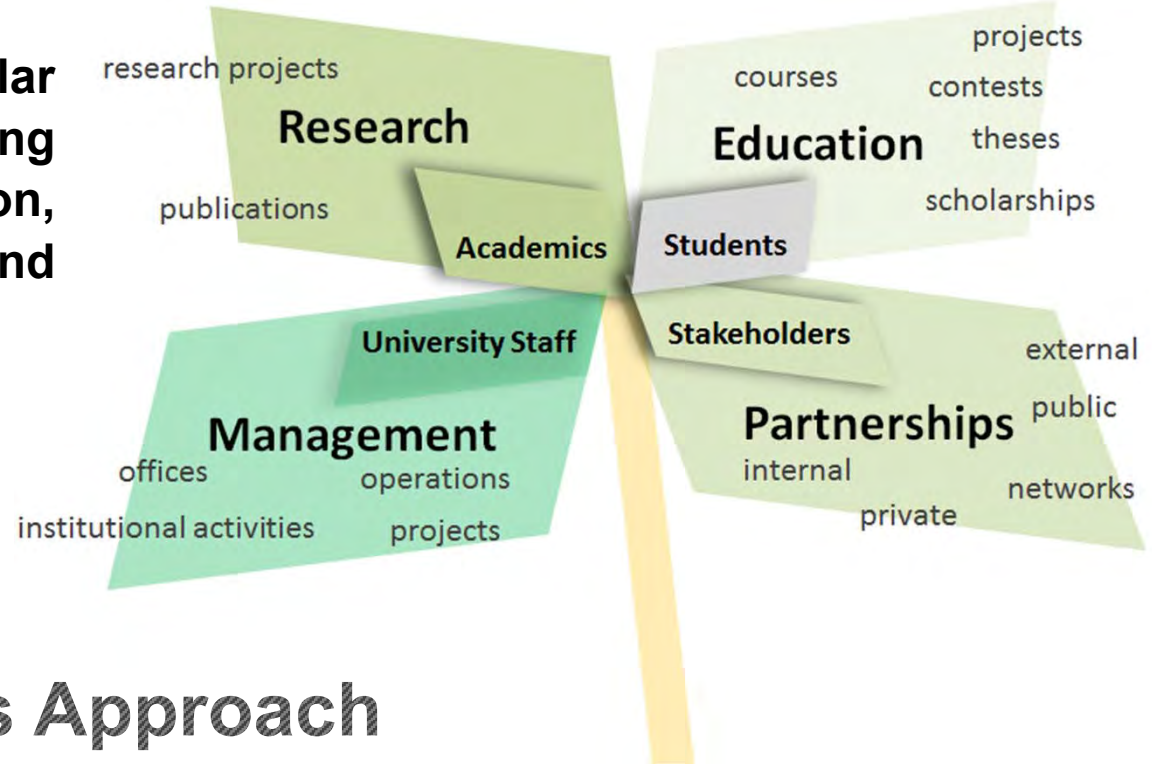


STRATEGIC OBJECTIVES

O1 \ COMMUNICATING SUSTAINABILITY @ POLIMI - THE STORYTELLING

SUSTAINABILITY PERMEATING ALL THE ACTIVITIES OF OUR INSTITUTION

Sustainability becomes a pillar at our institution, permeating all the activities in education, research, management and partnerships.



SDGs Approach

STRATEGIC OBJECTIVES

O1 \ COMMUNICATING SUSTAINABILITY @ POLIMI - THE STORYTELLING

MAPPING SUSTAINABILITY AT OUR INSTITUTION

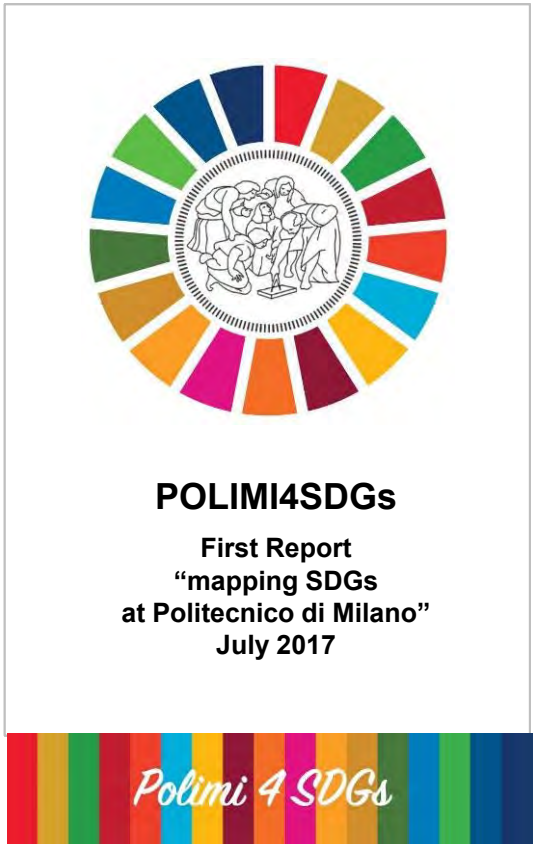
SUSTAINABLE DEVELOPMENT GOALS

POLIMI4SDGS 2017

In 2017 we launched an initiative for «**self-mapping**» our committment to the Sustainbale Development Goals (SDGs) through an online survey open to our community.

Facts from the survey:

- 201 adhesions by our community
- 119 courses mapped
- 160 research projects and activities mapped
- 18 institutional activities mapped



STRATEGIC OBJECTIVES

O1 \ COMMUNICATING SUSTAINABILITY @ POLIMI - THE STORYTELLING

IDENTIFYING THE DIMENSIONS OF SUSTAINABILITY IN HIGHER EDUCATION AND RESEARCH

Our community committed to diffuse values and bring the topic of **sustainability into research** and cooperation projects

Politecnico for Sustainability
Research, cooperation, teaching, networking

SUSTAINABLE DEVELOPMENT SOLUTIONS NETWORK
A GLOBAL INITIATIVE FOR THE UNITED NATIONS
UN-GGIM ACADEMIC NETWORK
UNESCO
uniTwin
POLITECNICO DI MILANO
SUSTAINABLE DEVELOPMENT GOALS
ISCN International Sustainable Campus Network
ORUS Rete delle Università per lo Sviluppo sostenibile
Polisocial

COMITATO **SBE 2019**

Sustainability at Politecnico
Quality of life, health and well-being

CITTÀ STUDI CAMPUS SOSTENIBILE
VIVI.POLIMI.
Servizio Sostenibilità di Ateneo
POLIMI SPORT
Comitato Unico di Garanzia
Multi Chance Poli Team

Testing the outcomes of research on our campus according to the **living lab approach**

STRATEGIC OBJECTIVES

O1 \ COMMUNICATING SUSTAINABILITY @ POLIMI - THE STORYTELLING

MAPPING SUSTAINABILITY AT OUR INSTITUTION

Example

HONOURS PROGRAMME
"ENGINEERING FOR SUSTAINABLE DEVELOPMENT"

ENG4SD

The Honours Programme is a parallel training programme offered to Masters of Science students.

The aim is to enhance and develop the systemic and cross-discipline skills of future engineers, helping them understand and evaluate global challenges so that they may operate effectively in the field of sustainable development, deploying both theoretical and practical technical skills.

https://www.polimi.it/corsi/percorsi-di-alta-formazione/honours-programme-engineering-for-sustainable-development/

STRATEGIC OBJECTIVES

O2 \ ENGAGING OUR COMMUNITY

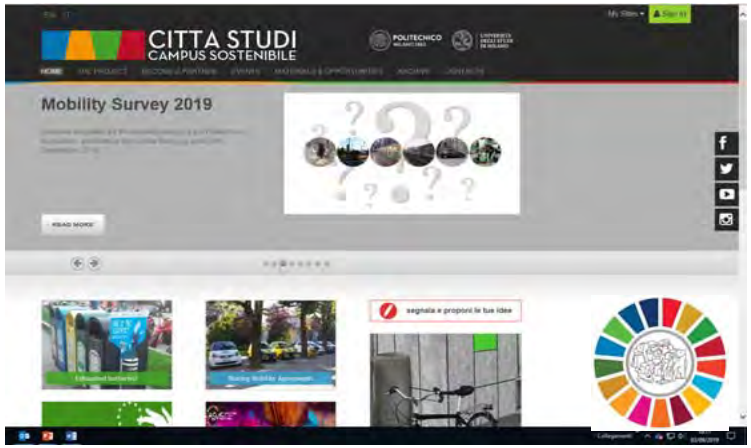
THE SUSTAINABLE CAMPUS INITIATIVE

CITTÀ STUDI CAMPUS SOSTENIBILE
project launched in 2011 by Politecnico di Milano (POLIMI) and Università degli Studi di Milano (UNIMI).

The project aims at transforming ***the whole campus neighborhood into an urban model, in Milan, with respect to life quality and environmental sustainability.***

The goals of the project are:
- to **test innovations** developed by scientific research;
- to **promote lifestyle transformation** and more liveable spaces → **VIVIPOLIMI Project (2017)**
- to become a **positive example for the entire city**;
- to cope with the **international network of sustainable campuses**.

The campus as a living lab: a bottom-up approach
The campus can be seen as a meeting point for **knowledge and practice**.
The initiative is based on a strong bottom-up approach, where everyone can contribute and propose ideas → **WIKI CODE**
This project is supported by the collaborative work of many components of both the POLIMI and UNIMI communities.



http://www.campus-sostenibile.polimi.it/home

STRATEGIC OBJECTIVES

CITTÀ STUDI CAMPUS SOSTENIBILE

O2 \ ENGAGING OUR COMMUNITY

Example

THE SUSTAINABLE CAMPUS INITIATIVE

«Reconquering» Piazza Leonardo da Vinci: from an informal parking lot …to a pedestrian public space

STRATEGIC OBJECTIVES

CITTÀ STUDI
CAMPUS SOSTENIBILE

O2 \ ENGAGING OUR COMMUNITY

THE SUSTAINABLE CAMPUS INITIATIVE

Example

«Reconquering» Piazza Leonardo da Vinci: from an informal parking lot …to a pedestrian public space

Today

STRATEGIC OBJECTIVES

O2 \ ENGAGING OUR COMMUNITY

EDUCATION AND ENGAGEMENT ACTIVITIES

Education for sustainability to be achieved in different ways:

- Since 2012, Organization of many **lectures,** seminars and **events (first of all – Sustainability DAYS)**, especially during:
  - «**Sustainable Development Festival**» every year in May-June since 2017
  - «**European Mobility Week**» every year in September
  - «**European Week for Waste Reduction**» every year in November
- **Competitions**, workshops, contests, …
- **Videos** dedicated to sustainability issues;
- **Reports:** ISCN, …
- **MOOC** HE4SDGs (from october 2019);
- **Training** and service activities at our facilities, voluntary work, …

STRATEGIC OBJECTIVES

O3 \ DEFINING & COMMUNICATING CO_2 EMISSIONS REDUCTION TARGETS

SETTING THE BASELINE AND THE GOALS

STARTING POINT:

- **CO_2 emissions inventory** (updated annually):
  - 2014, 2015 and 2016 inventories finalized
  - 2017 and 2018 inventory in progress
- **Implemented calculation tool** (CO_2 Poli Oracle database)
- **Defined CO_2 baseline** (2015) and drawn up **annual reporting**
- **Development of CO_2 Emission Factor Guidelines and University emissions inventory Guidelines** (RUS working Group «Climate Change»)
- **Approved CO_2 Mitigation Plan** of PoliMI by the University Senate (February 2019)
- **Commitments, CO_2 emission reduction targets**
  - *minus 25% in 2025 (compared to 2015)*
  - *minus 35% in 2030 (compared to 2015)*

Communication

- Work in progress:
  - investigation through technical and economic feasibility studies and implementation timings
  - definition of priority activities and set-up of working tables for implementation of measures to be adopted

STRATEGIC OBJECTIVES

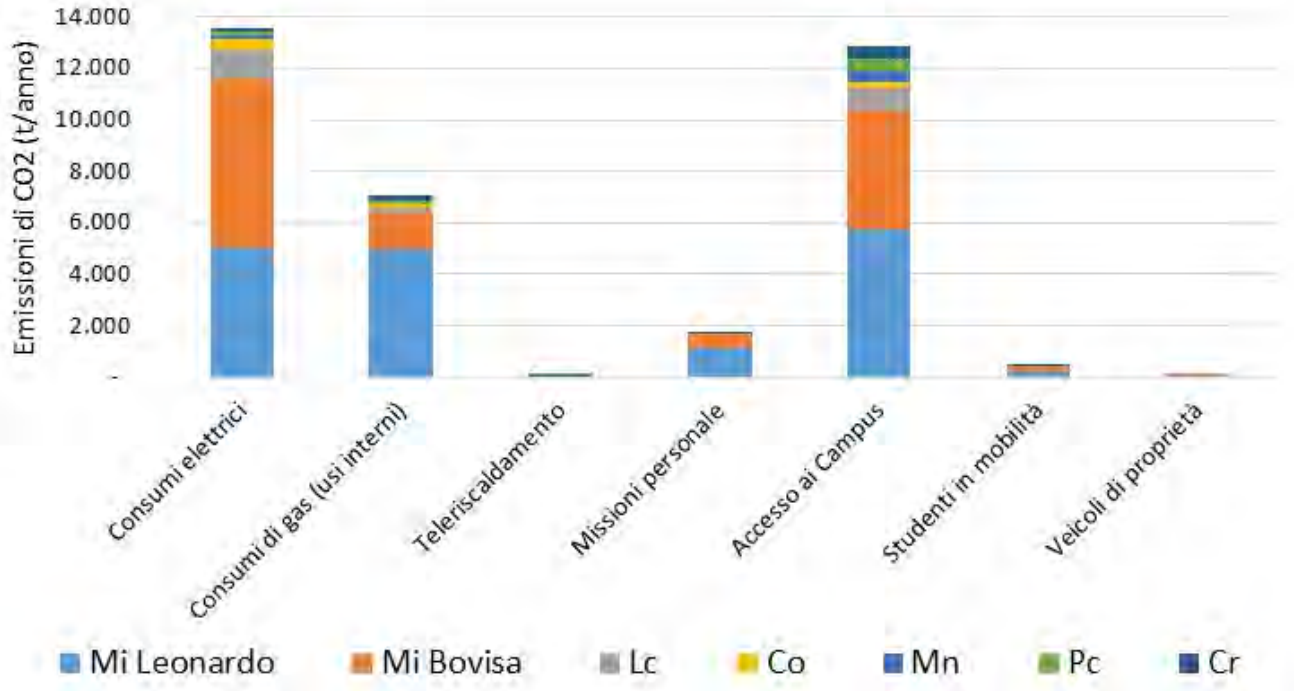
O3 \ DEFINING & COMMUNICATING CO_2 EMISSIONS REDUCTION TARGETS

OVERVIEW OF THE POLITECNICO DI MILANO'S CO_2 EMISSIONS IN 2016

Total University emissions

35.9 $ktCO_2$/year

0.82 tCO_2/year/person



STRATEGIC OBJECTIVES

O3 \ DEFINING & COMMUNICATING CO_2 EMISSIONS REDUCTION TARGETS

MITIGATION PLAN: 10 MAIN ACTIONS FOR REDUCING EMISSIONS

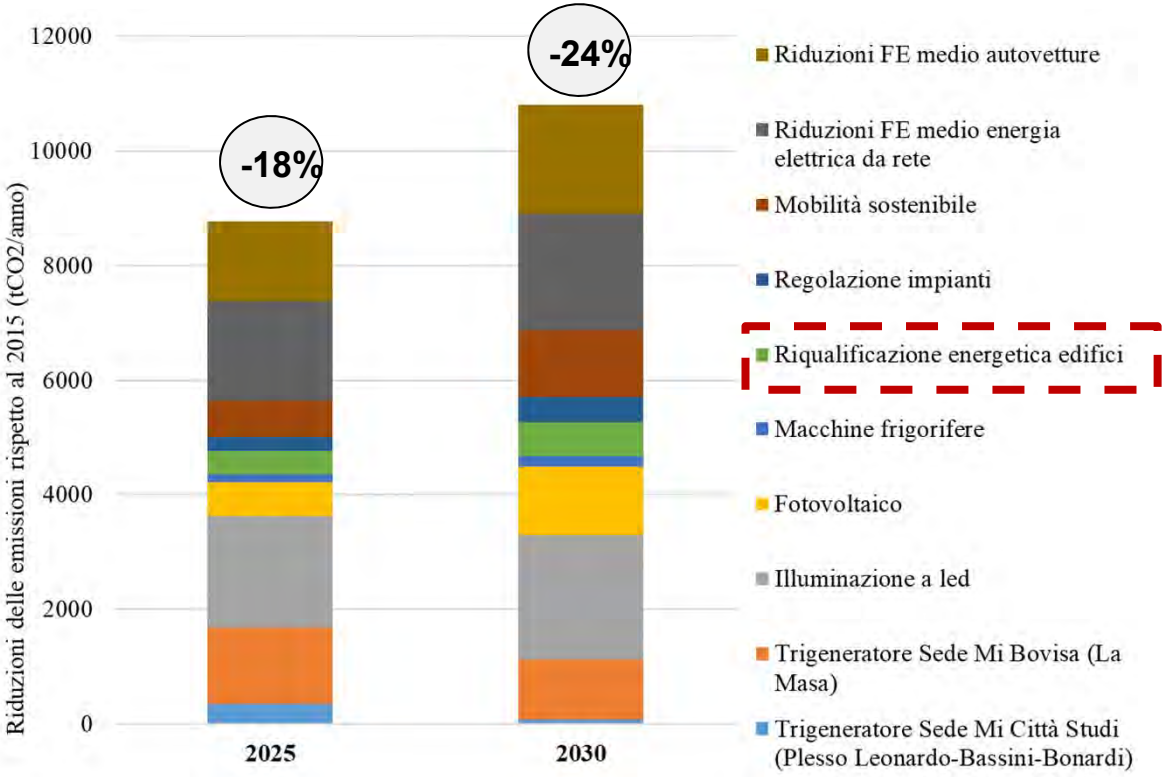
01	Optimisation of the Trigenerator plants of the main campus in Città Studi (Leonardo)
02	Installation of new Trigenerator for the Bovisa Campus (Via La Masa)
03	Replacement and optimisation of lighting bulbs with LED technology
04	Production of Photovoltaic energy
05	Renewal of cooling machines
06	Retrofitting of existing buildings for increasing energy efficiency
07	Regulation of heating and cooling systems
08	Promotion of sustainable mobility, through infrastructural measures and incentives
09	Reduction of CO_2 emission factor of power generation (external measure)
10	Reduction of CO_2 emission factor of cars (external measure)

*Reductions also possible through **other interventions***

STRATEGIC OBJECTIVES

O3 \ DEFINING & COMMUNICATING CO_2 EMISSIONS REDUCTION TARGETS

MITIGATION PLAN: OVERVIEW OF POTENTIAL CO_2 EMISSIONS REDUCTION



Retrofitting of existing buildings for upgrading energy efficiency

STRATEGIC OBJECTIVES

O3 \ DEFINING & COMMUNICATING CO_2 EMISSIONS REDUCTION TARGETS

MITIGATION PLAN: ENERGY RETROFITTING OF BUILDINGS

Data source

Studies conducted on several sample buildings and examination of interventions in progress or already approved, in collaboration with Prof. Bruno Daniotti and Conservation and Building Services (ATE)

Targets

Reduction in consumption equal to:

in **2025**: **10%** of winter heating consumption
5% of summer air-con. consumption

in **2030**: **15%** of winter heating consumption
7.5% of summer air-con. Consumption

Potential CO_2 emission reduction by 2025

408 tCO_2/year

Potential CO_2 emission reduction by 2030

596 tCO_2/year

STRATEGIC OBJECTIVES

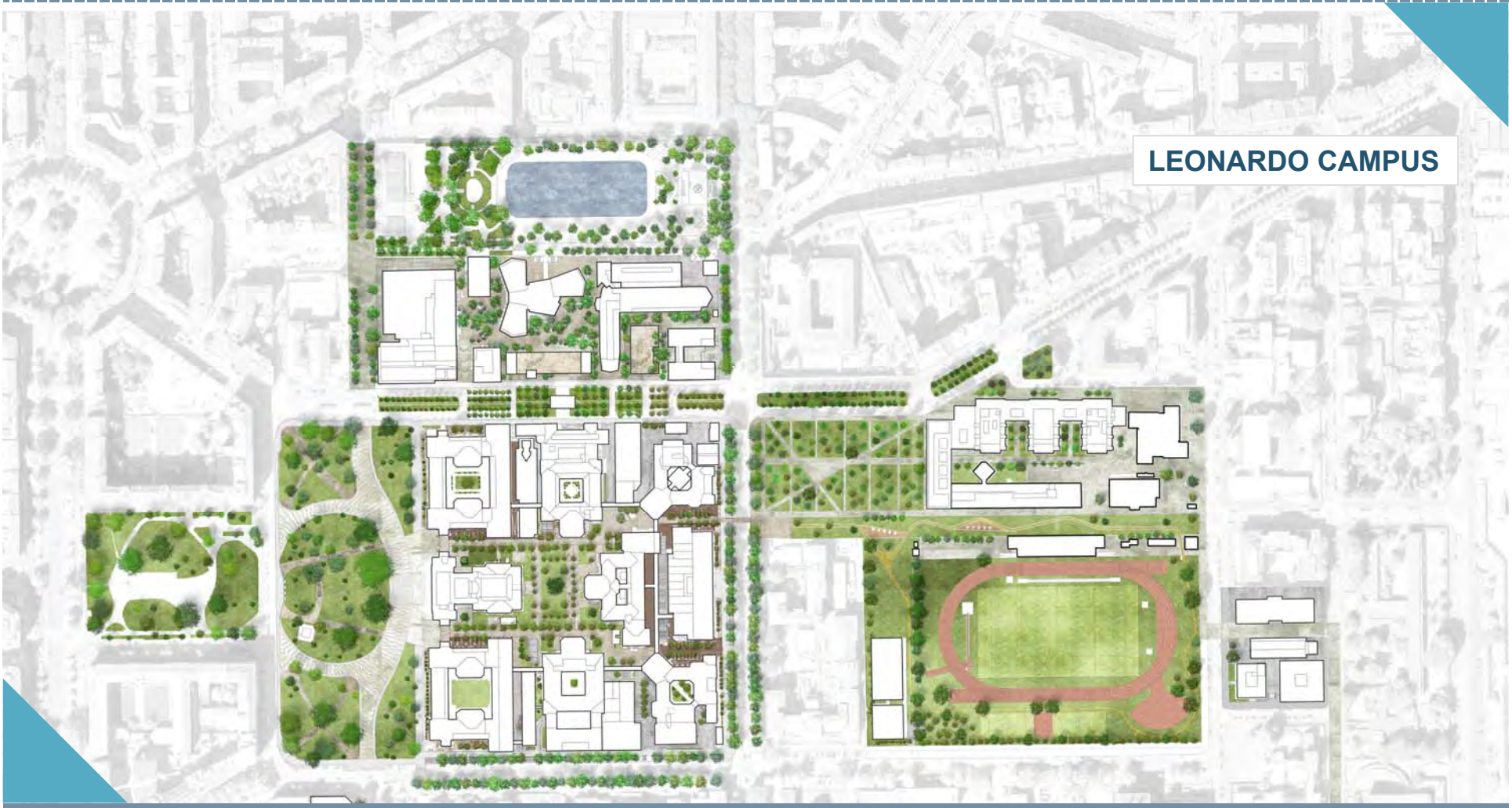
CAMPUS RETROFITTING INITIATIVES: VIVIPOLIMI

- **IMPROVE life on campus**
- **ADAPT our campuses to international standards**
- **VALORIZE the existing campus spaces**
- **PROMOTE healthy habits, a culture of well-being and correct lifestyles**
- **CLOSELY LINKED to the issue of sustainable mobility**

STRATEGIC OBJECTIVES

Campus retrofitting initiatives: VIVIPOLIMI

Example



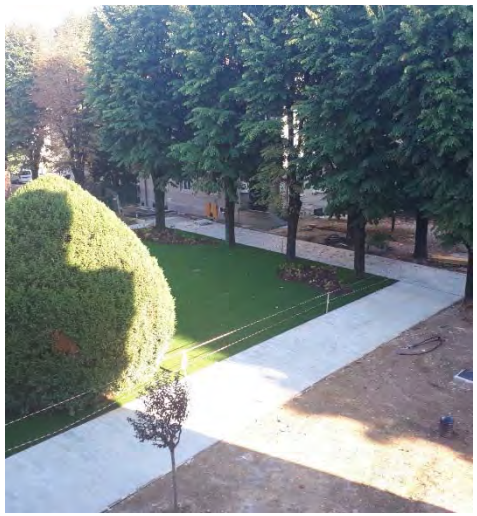
STRATEGIC OBJECTIVES

Yesterday

LEONARDO CAMPUS

SBE 19 - Resilient Built Environment for Sustainable Mediterranean Countries, Milan

STRATEGIC OBJECTIVES



LEONARDO CAMPUS

Today

STRATEGIC OBJECTIVES

LEONARDO CAMPUS

STRATEGIC OBJECTIVES

Campus retrofitting initiatives: VIVIPOLIMI

Example

STRATEGIC OBJECTIVES

Today

LA MASA CAMPUS

STRATEGIC OBJECTIVES

LA MASA CAMPUS

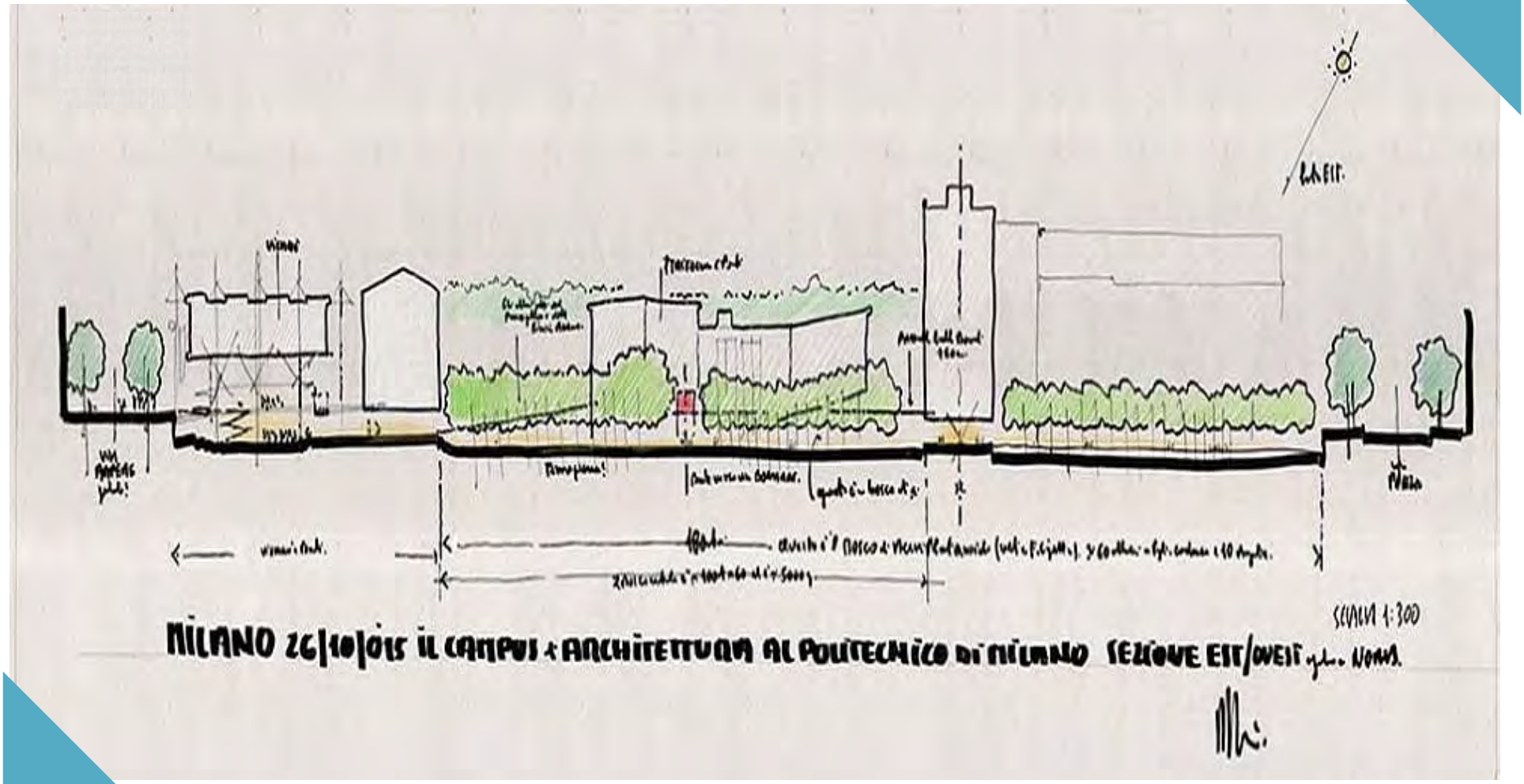
VIVI MI POLI

SBE 19 - Resilient Built Environment for Sustainable Mediterranean Countries, Milan

STRATEGIC OBJECTIVES

Campus retrofitting initiatives: Bonardi Campus

Example



STRATEGIC OBJECTIVES

BONARDI CAMPUS

Yesterday

STRATEGIC OBJECTIVES

BONARDI CAMPUS

Today

STRATEGIC OBJECTIVES

BONARDI CAMPUS

UN NUOVO CAMPUS
PER MILANO.

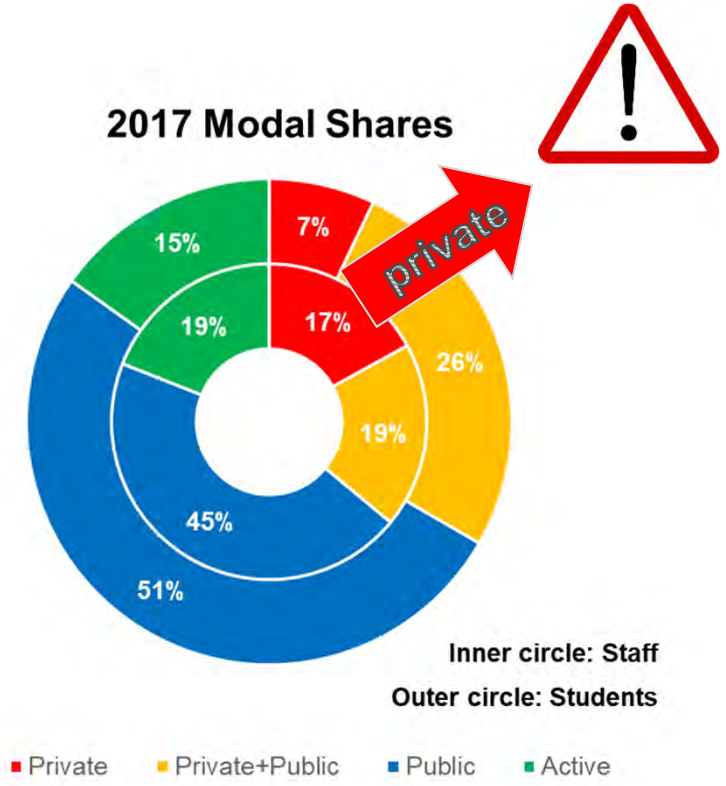
Tomorrow

STRATEGIC OBJECTIVES

O4 \ DEFINING & COMMUNICATING TARGETS FOR SUSTAINABLE MOBILITY

STARTING POINT:

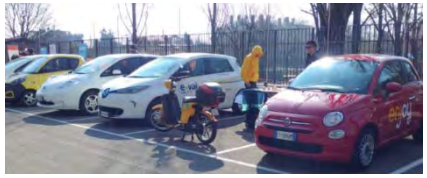
- **presence of a Mobility manager**
- **actions coordinated with other projects (e.g VIVI.POLIMI and CO_2 Emission Mitigation Plan)**
- **results of the 2015 and 2017 mobility survey (2019 ongoing)**:
  - widely used public transport, both alone or with private transport;
  - private vehicles mostly used by staff;
  - high share of active mobility.



STRATEGIC OBJECTIVES

O4 \ DEFINING & COMMUNICATING TARGETS FOR SUSTAINABLE MOBILITY

- **Mobility survey** every two years for monitoring the progress of our actions
- Promotion of **sustainable mobility** through:
  - ✓ Bike parking policies;
  - ✓ Discounts for Public Transportation;
  - ✓ Improving and facilitating pedestrian mobility on campus and planned reduction in parking lots in historic campuses (e.g. **VIVI.POLIMI project**);
  - ✓ **Shared mobility agreements** for discounted prices and promotion of behavioral change;
  - ✓ **Electric mobilty** (charging stations);
  - ✓ **Organization of events, competitions**, workshops, contest, …
  - ✓ Agreement with providers of **electric cars and scooters** for internal usage (in the future)
  - ✓ ….



STRATEGIC OBJECTIVES

Example

O4 \ DEFINING & COMMUNICATING TARGETS FOR SUSTAINABLE MOBILITY

SHARED MOBILITY AGREEMENTS

The project started in 2017 with agreements with 6 societies and more than 5.000 registrations in one year.
In 2018, 16 agreements have been signed with car, bike, scooter and bus sharing societies.
Events, held 2 times a year in our campuses, but also open to citizens, are organized to illustrate the opportunities offered by shared mobility.

https://www.youtube.com/watch?v=7Rn8kMk019s&feature=youtu.be

STRATEGIC OBJECTIVES

Example

O4 \ DEFINING & COMMUNICATING TARGETS FOR SUSTAINABLE MOBILITY

MILANO BIKE CHALLENGE

Once a year since 2015, Politecnico takes part in the MILANO BIKE CHALLENGE, fostering the whole university community to use their bikes when travelling towards the campuses or in their leisure time, for the whole duration of the challenge.

In 2017 and in 2018 Politecnico won the 2nd prize at regional and national level.

POLIMI Cyclist Ambassador

STRATEGIC OBJECTIVES

Example

O4 \ DEFINING & COMMUNICATING TARGETS FOR SUSTAINABLE MOBILITY

AL POLI SENZA AUTO

Initiative: “To university without your car”

Starting from 2016, a campaign has been organized during the **European Mobility Week**, to promote best mobility practices and behaviours among PoliMI professors, administrative staff, and PhDs.

The winners of each edition are awarded with the title of ***«Politecnico Sustainable Mobility Ambassador»*** for one year.

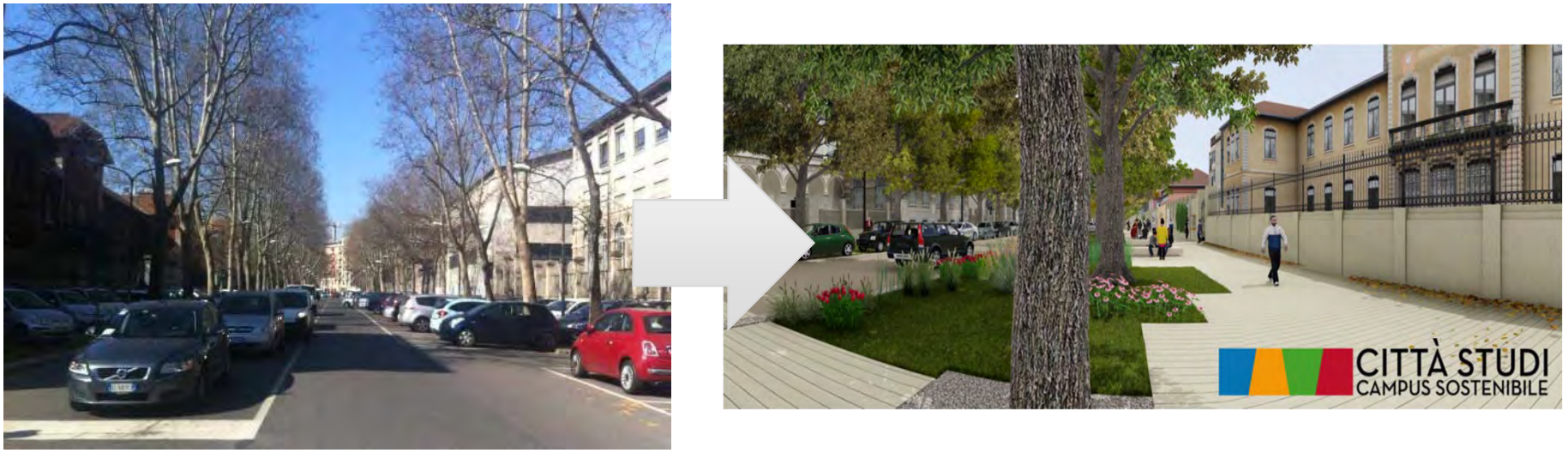
STRATEGIC OBJECTIVES

Example

O4 \ DEFINING & COMMUNICATING TARGETS FOR SUSTAINABLE MOBILITY

DESIGN CONTESTS AND WORKSHOPS

Designing with students original solutions for promoting slow-mobility on campus and in public spaces close to campuses, prioritizing a pedestrian and bicycle-friendly environment.



STRATEGIC OBJECTIVES

Example

O4 \ DEFINING & COMMUNICATING TARGETS FOR SUSTAINABLE MOBILITY

- **POLICICLO → Repairing initiatives** (from 2014).

- Run by students
- Place where you can find all the tools to repair a bike and where you can learn to take care of your vehicle.
- Increases awareness and knowledge of the bicycling world

(http://www.policiclo.it/)

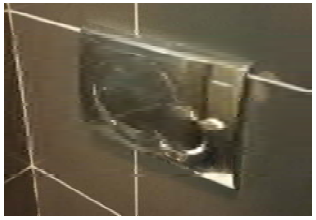
AMBIVALENT PROJECT

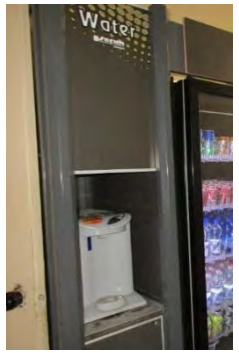
O5 \ DEFINING & COMMUNICATING TARGETS FOR CIRCULAR ECONOMY

STRATEGIC OBJECTIVES

O5 \ DEFINING & COMMUNICATING TARGETS FOR SUSTAINABLE WASTE MANAGEMENT AND CIRCULAR ECONOMY

- **Separate Waste collection** on campus and numerous **reycling projects** and campaigns;
- Reduction of plastic use and water conservation (installation of **water houses** and **water fountains or dispenser** on campus);
- **Repairing initiatives (Policiclo);**
- **Water conservation**: raingarden;
- **Retrofitting of toilets (**push systems, air mixers and dual flush toilets for water saving**)**;
- **Organization of events, competitions**, workshops, contest, …
- …





STRATEGIC OBJECTIVES

Example

O5 \ DEFINING & COMMUNICATING TARGETS FOR SUSTAINABLE WASTE MANAGEMENT AND CIRCULAR ECONOMY

METROPOLITANA MILANESE (MM) WATER HOUSE

- The inauguration of the Water House on campus by MM, the local water utility, was held on the World Water Day, the 22th of March 2018.
- Available both for the University community and for all citizens
- supplies fresh, still or sparkling water
- Educational purpose and sustainable path
- Case study → research project
- Aluminium bottles have been distributed for free to the attendees, aiming at sensitizing our community towards a wiser use of resources.

STRATEGIC OBJECTIVES

Example

O5 \ DEFINING & COMMUNICATING TARGETS FOR SUSTAINABLE WASTE MANAGEMENT AND CIRCULAR ECONOMY

FLASHMOB ***POLIMI PLASTIC FREE***

CITTÀ STUDI CAMPUS SOSTENIBILE

LEGAMBIENTE

12 CONSUMO E PRODUZIONE RESPONSABILI

RUS Rete delle Università per lo Sviluppo sostenibile

http://www.campus-sostenibile.polimi.it/-/serr-2018-il-politecnico-ha-partecipato-con-un-flashmob --
https://www.youtube.com/watch?v=ZkGYp0YMBfg&feature=youtu.be

RUS Rete delle Università per lo Sviluppo sostenibile Rifiuti

STRATEGIC OBJECTIVES

Example

O5 \ DEFINING & COMMUNICATING TARGETS FOR SUSTAINABLE WASTE MANAGEMENT AND CIRCULAR ECONOMY

Initiative: PULIAMO IL MONDO

Let's clean up the world!

Promoting the separate waste collection, the recycling and reuse with dedicated projects, such as the participation in the campaign Puliamo il Mondo, Let's clean up the world, promoted in Italy by Legambiente NGO.

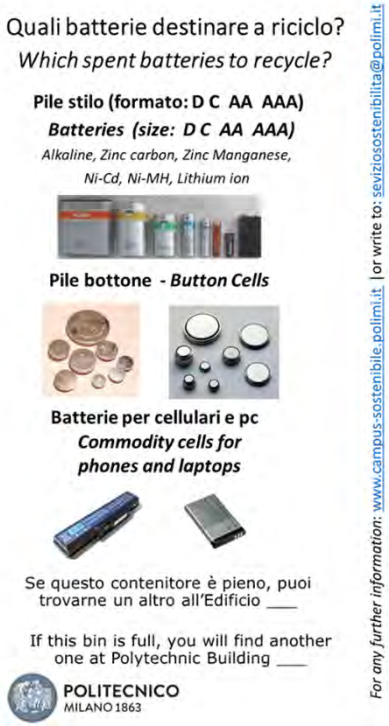
STRATEGIC OBJECTIVES

Example

O5 \ DEFINING & COMMUNICATING TARGETS FOR SUSTAINABLE WASTE MANAGEMENT AND CIRCULAR ECONOMY

BATTERIES PROJECT

Promoting separate collection, recycling and reuse with specific campaigns involving participation in the collection and recycling of exhausted batteries.



STRATEGIC OBJECTIVES

Example

O5 \ DEFINING & COMMUNICATING TARGETS FOR SUSTAINABLE WASTE MANAGEMENT AND CIRCULAR ECONOMY

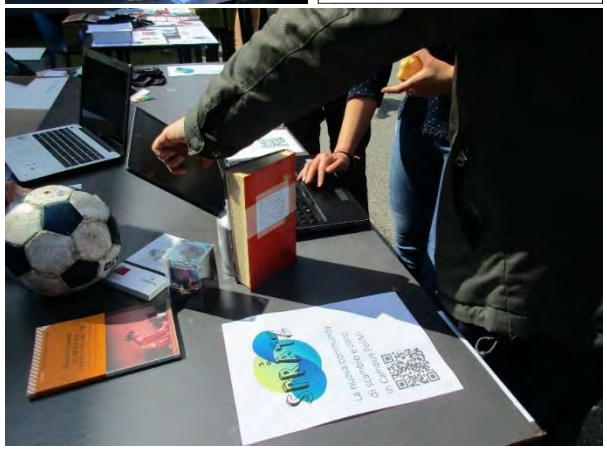
"the best waste is the one not produced"

SPRATZ

Experimental platform for free exchange of goods and materials (DASTU Project in collaboration with SSA)

Based on nearness and a shared denominator; place for transaction is the university campus.

Spratz stands for Supporting Practices of Reuse, which are particularly active in Territorial Zones (of the university). What is useless for one, can be useful for another.



https://www.facebook.com/groups/spratz/

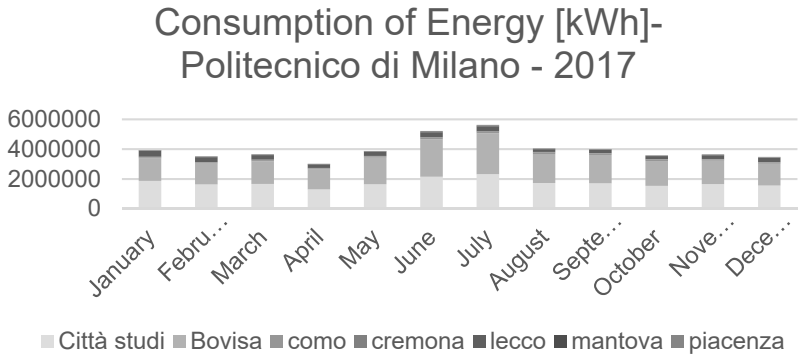
STRATEGIC OBJECTIVES

O6 \ DEFINING & COMMUNICATING TARGETS FOR ENERGY EFFICIENCY

SETTING THE BASELINE, MONITORING AND DEFINING THE GOALS

The energy management is carried out by the **Energy Commission (and by energy manager of POLIMI)** through different activities:

- Realization of the first **energy balance** at university in 2018;
- Installation of **sensors and smart meters** on campus to map the performance of buildings;
- **Promotion of measures for energy efficiency in buildings** (insulation);
- Large investments in the renovation of power plants in the last three years; in particular the new **combined cooling heating and power (Trigenerator/CCHP) plant** for the Leonardo Campus and the second one for the Bovisa Campus (under construction)
- **Expansion of Renewable energy sources** (geothermal and PV)



STRATEGIC OBJECTIVES

O6 \ DEFINING & COMMUNICATING TARGETS FOR ENERGY EFFICIENCY

Initiative «M'ILLUMINO DI MENO»

Less light!

Participation to different campaigns with the scientific coordination of the Energy Commission.

Among these, we take part to "M'illumino di meno" since 2016.

In february 2018, in collaboration with RUS – Universities Network for Sustainable Development, a flashmob "Caccia al kWh" (Hunt for the KWh reduction) has been promoted.

RUS Rete delle Università per lo Sviluppo sostenibile — Energia

La RUS aderisce a "M'illumino di Meno 2018 – Con i piedi per terra" con

"Caccia al kWh"

Vademecum per la partecipazione degli atenei

VIDEO

https://www.youtube.com/watch?v=h8OotvRw714

STRATEGIC OBJECTIV

O6 \ DEFINING & COMMUNICATING TARGETS FOR ENERGY EFFICIENCY

In 2012, VELUXlab has been installed on the Bovisa Campus (La Masa): first italian building NZEB (Nearly Zero Energy Building) on a university area.

Smart Building

VIDEO
https://www.youtube.com/watch?v=tXUAuuTwh5U

Foto: SSA

The realization of a new building "ZEN", for the Energy Department laboratories and offices, is ongoing on Bovisa Campus.
The building will be used as a research laboratory for the development of renewable sources; it will be implemented through the use of renewable energy sources in order to be eco-sustainable.

Thank you for your attention!

And remember…

https://www.un.org/sustainabledevelopment/be-the-change/

Or…if you prefer……

"Be the change that you wish to see in the world."

Mahatma Gandhi

- **Eugenio Morello**

University Environmental Sustainability Project Rector's delegate

- **Eleonora Perotto**

Mobility Manager and Head of Sustainability Office

Contacts

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