





## Strategic programmes

### POLITECNICO DI MILANO CO<sub>2</sub> MITIGATION PLAN

The Mitigation Plan of Politecnico di Milano outlines the methodological framework for the definition and subsequent verification of the University's CO<sub>2</sub> emission reduction commitments, and constitutes the necessary knowledge base for the acceptance of formal emission reduction commitments. The Plan, for which it was necessary to make an inventory of the University's CO<sub>2</sub> emissions in advance, illustrates an initial assessment of the reduction effect of these emissions resulting from ten types of interventions in the strategic sectors of energy and transport. The document therefore proposes commitments to reduce the University's CO<sub>2</sub> emissions, compared to the reference year 2015, for the years 2025 (-25%) and 2030 (-35%). The Plan has been approved as a policy guideline and contains a preliminary assessment of the University's CO<sub>2</sub> reduction potential resulting from ten types of measures in the energy, building and transport sectors:

- Optimisation of the trigenerator for the Milan Città Studi site (Leonardo-Bonardi-Bassini complex);
- Implementation of a trigenerator for the Milan Bovisa site (via La Masa Campus);
- Replacement of light fittings;
- Increased photovoltaic energy production;
- Work on refrigeration machines;
- Work on opaque and transparent surfaces of buildings;
- Optimisation of plant regulation;
- Commitment to sustainable mobility;
- Reduction of emission factors from electricity consumption;
- Reduction of vehicle emission factors.

Changes in the emission factors do not depend directly on the Politecnico di Milano. However, the University is active in an attempt to encourage them. In fact, projects aimed at installing photovoltaic panels and using as much electricity originating from renewable sources as possible have been implemented to promote a reduction in the emission factor linked to electricity consumption. On the other hand, projects and activities aimed at installing an increasing number of charging points for electric vehicles and raising awareness about the environmental benefits deriving from the use of electric vehicles have been approved to promote the reduction of the emission factor of vehicles.

**ViviPolimi:** Actions within the ViviPolimi project focused on the implementation of green and blue technical solutions in the regeneration of open spaces. In compliance with the regional law on hydraulic invariance, 4 dispersing wells were drilled in 2019 and 6 dispersing wells in 2020, in order to increase the draining surfaces, and permeable soils were increased in the renovation works of the Leonardo Gardens in the headquarters of Piazza Leonardo da Vinci 32.

Within and alongside the two strategic programmes, climate action activities at Politecnico di Milano can be divided into two main categories: raising awareness and adaptation interventions.

## ACTIVITIES FOR RAISING AWARENESS

- **Greenhouse gas emission inventories in Italian universities:** The first national meeting of the RUS Climate Change Working Group, organised at the D'Annunzio University of Chieti-Pescara (Ud'A) - had the aim of illustrating both the activities carried out by the Working Group and the experiences gained at a number of RUS member universities for the creation of their greenhouse gas inventory, highlighting the methodological and practical aspects and the criticalities encountered. The objective is to analyse and share strengths and weaknesses in order to increase capacity and effectiveness in designing and implementing GHG emission inventories, on a university scale, with consistent operational methods across the territory. The aim is therefore to achieve a reliable estimate of the emissions of Italian universities in the future, as a necessary basis for formal commitments to reduce them.
- **Climbing for Climate:** high altitude seminars at the Rifugio Alpino Monza-Bogani (LC) – 19 november 2020. The Network of Universities for Sustainable Development (RUS), in collaboration with the Club Alpino Italiano [Italian Alpine Club] (CAI), organised the second edition of the “Climbing for Climate” initiative, in which the Politecnico di Milano also participated. The day included an excursion to the Rifugio Alpino Monza-Bogani, Esino Lario (LC), where an in-depth seminar on climate change was held, coordinated by two experts from the Department of Civil and Environmental Engineering of the Politecnico.



## ADAPTATION INTERVENTIONS

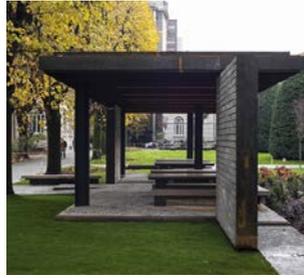
The University has developed several projects for the redevelopment of the external areas. These are aimed at mitigating climatic stress in extreme summer temperatures (i.e. provision of new drinking water supply points on campuses, and creation of new shaded areas).

The two main projects are presented below.

**ViviPolimi@Green:** the project, launched in 2019, aims to improve the environmental quality of our university by creating a campus that is resilient to climate and environmental challenges. To slow down runoff water and support sustainable rainwater drainage, it is essential to increase soil permeability and drainage and provide infrastructure to maximise hydraulic invariance. To mitigate urban temperatures, it is important to increase tree and shrub vegetation to promote evapotranspiration and shading. The use of clear surfaces with high solar reflectance will reduce heat build-up in the built environment.

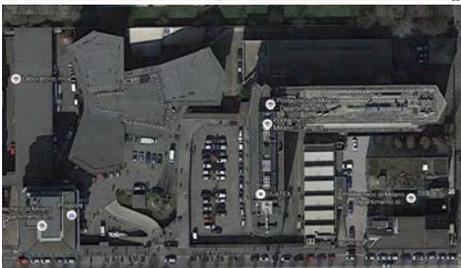
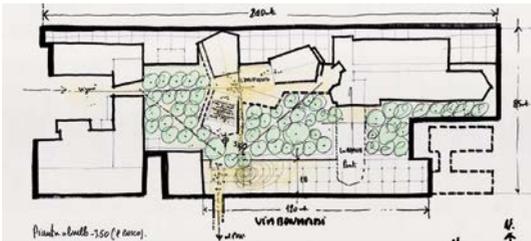
ViviPolimi@Green promotes environmental quality to improve life quality, focusing on the well-being of people who will use the spaces with positive psycho-physiological impacts (@Health).

The first project that has been completed is the one concerning the renewal of the Leonardo Gardens in the headquarters of Piazza Leonardo da Vinci 32: in compliance with the regional law on hydraulic invariance, 4 dispersing wells were drilled in 2019 and 6 dispersing wells in 2020, in order to increase the draining surfaces, and permeable soils.



**Renzo Piano's project for the regeneration of the Bonardi Campus:** the new Bonardi University Campus is the result of an idea by Renzo Piano presented to the Politecnico di Milano and the enhancement and development of the original idea by ODB-OTTAVIO DI BLASI & Partners. The project proposes a thorough rethinking of the Campus' spaces (8,000 m<sup>2</sup>), modelled primarily on the needs of the students, making it open, international and avant-garde, and centred around three key points:

- Greenery: the new campus will feature a large number of trees and green spaces.
- The relationship with the historic buildings, which will be respected, while restoring their original appearance
- Useable terraces: the roofs of low buildings will be used for outdoor activities and events



## Data

### Reducing emissions

**-25% and -35%**

the university's carbon emissions reduction goals for 2025 and 2030, respectively

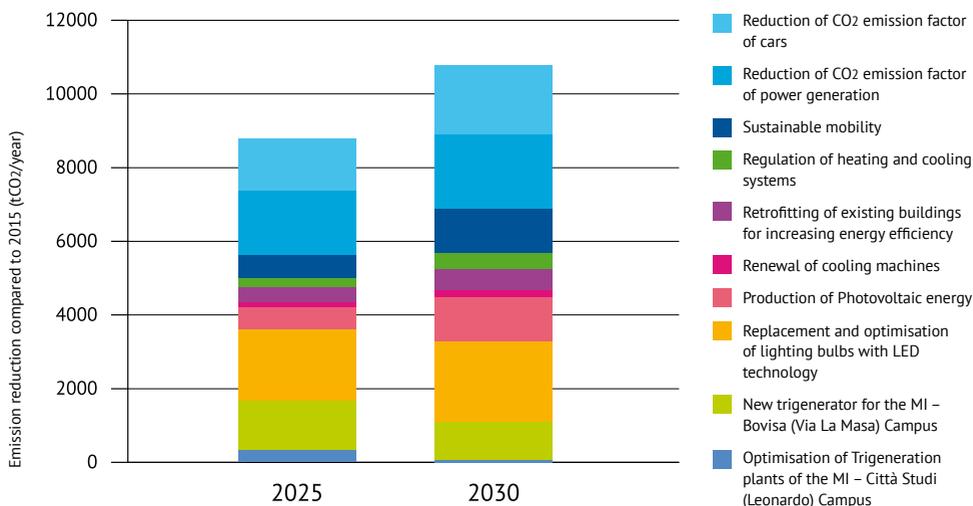
**€ 1 mln**

to replace the refrigeration units with new, high-performance ecogas units (2019)

**€ 4.8 mln**

investment funds already earmarked and planned for trigeneration facilities on the Città Studi and Bovisa Campuses (2019)

## THE POTENTIAL REDUCTIONS IN EMISSIONS (tCO<sub>2</sub>/YEAR) BY 2025 AND 2030



## Adaptation to climate change

+920 m<sup>2</sup>

surface area of land depaved and converted to green spaces in the main campus under the Vivipolimi project in the new Giardini di Leonardo

+8,000 m<sup>2</sup>

surface area of shaded pedestrianised areas created in the new Bonardi Campus (designed 2016 - completed 2020)

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rainwater collection system, with water reused for irrigation of the gardens in the Leonardo Campus (2019)

## Affiliations and partnerships

**RUS** - The Politecnico di Milano is an active member of the Rete delle Università per lo Sviluppo sostenibile (RUS, "Network of Universities for Sustainable Development"), a coordination initiative between Italian universities aimed at promoting sustainability in all university missions. Within this network, the University coordinates the "Climate Change" Working Group. The goal of this working group is to guide the commitment of universities towards actions to combat climate change by sharing information, materials and methods aimed at defining common metrics, knowledge, skills and best practices. The activities of the WG concern:

- the support for the creation of inventories of the CO<sub>2</sub> emissions of universities;
- the promotion of mitigation and adaptation plans;
- support for the undertaking of formal commitments to contain emissions;
- communication and training on the subject.

## Teaching and research

The self-mapping process of teaching activities at Politecnico di Milano identified 7 course units strictly related to SDG13 objectives. Three of them belong to the School of Architecture, Urban Planning and Construction Engineering, other three to the School of Industrial and Information Engineering and the remaining one is delivered within the School of Civil, Environmental and Land Management Engineering. Climate action is particularly at the core of the following Politecnico courses:

- **Climate Change Mitigation:** The course deals with the different aspects of the global climate change problem, with the aim of providing the necessary elements for the design and evaluation of mitigation policies. To achieve this goal, the phenomenological bases of the problem are deepened, showing the origin and magnitude of the different anthropogenic forcings, as well as the expected short and long term impacts on the different environmental compartments.
- **Climate and Global Changes in the Age of Sustainable Development:** Aim of the course is to discuss from the perspective of sustainable development the great environmental, economic and social challenges that humanity is facing in the contemporary era. Each and all of the problems are treated up to a global scale and over long temporal scales. Particular attention is given to climate change and its consequences along many directions claiming for sustainable solutions, from agricultural and ecological dynamics to human and Earth health.

## Administrative units and supporting bodies

- **Sustainability Unit:** the unit in charge of the operational management of environmental sustainability in the university, from the design to the implementation of institutional policies and initiatives; it organises internal and external dissemination initiatives; it manages the activities related to the CO<sub>2</sub> Mitigation Plan.
- **Energy Commission and the Energy Manager:** as part of their institutional mission, they analyse and propose structural interventions for the reduction of energy consumption (efficient and renewable energy production, installation of energy saving devices).
- **Mobility Manager:** they promote sustainable, shared a low-impact mobility, with the aim of reducing the environmental footprint and greenhouse gases emissions of the commuting activities of the entire Politecnico population.