SDGs@Polimi
2021

POLITECNICO
MILANO 1863

SDGs@Polimi 2021

FOREWORD

Politecnico di Milano's commitment to sustainable development

Politecnico promotes the culture of sustainable development in all its institutional activities, in teaching and research. Working in partnership with society and helping it to achieve Sustainable Development Goals at global, national and local levels is an integral component of the University's mission, firmly embedded in both the relevant community context and the international academic setting.

At Politecnico we face the challenge of sustainable development, strengthened by our identity and values as a polytechnic school. Indeed, we believe in the value and effectiveness of the contribution that the design and creative culture as well as the problem-solving ability, typical of a polytechnic approach, can give to the urgent and global challenges posed by the United Nations 2030 Agenda.

We have been doing this with growing commitment for many years on at least four fronts: environmental sustainability, promotion of responsible research, international cooperation and equal opportunities. This is evidenced by the policies that have been developed over time.

Nevertheless, we believe that the efforts made over the last ten years must be further consolidated. Politecnico wishes to take responsibility for new projects and new investments. Global challenges are increasingly urgent and sometimes, as has been the case in the last two years, unpredictable. In this evolving context, the role and responsibility of higher education and scientific research are crucial, as they are capable of generating high-level innovation and knowledge that can be used to support both immediate decisions and longer-term policies and strategies. These considerations highlight the importance of our contribution as a university, as a place of research and teaching, a campus, a place of work and study; and the call for a joint, collaborative effort by the entire Politecnico community to direct our work and research towards a fairer society is ever clearer.

Our commitment to sustainable development is not a mere administrative act or the response to a passing trend. We believe it to be our duty. We are fully aware that pursuing Sustainable Development Goals within the university entails a high cost in terms of economic resources, work and energy; but only by staking on research and education can this cost become an investment for the future of the society we are called upon to build and to which we belong.

Ferruccio Resta
Rector

Donatella Sciuto
Vice Rector

Emilio Faroldi
Vice Rector

SUSTAINABLE
DEVELOPMENT

save

METHODOLOGICAL NOTE

The publication of the SDGs@POLIMI Report has the primary objective of collecting and organising in a systematic way the actions carried out by Politecnico di Milano in recent years aimed at supporting the achievement of the 17 Sustainable Development Goals (SDGs). The preparation of summary sheets for each objective provides evidence of, and gives visibility to the projects that are being developed and all the initiatives that have been carried out by the University. At the same time, this process has allowed to identify the points on which further work is needed, in terms of defining tangible policies or actions, in order to direct future measures effectively and establish Politecnico as a model of sustainability in institutional, teaching and research activities.

This document was drafted by a dedicated working group, with the involvement of the Heads of Administration, who provided a preliminary reading of the University's policies and actions within the SDGs framework and the Rector's Delegates who provided policy insight. In addition, valuable support came from other working groups set up within Politecnico, such as the Energy Commission and the Gender Budget Working Group. The experience gained by these groups, and in particular by the delegates, is also collected in a series of publications that were the basis and fundamental reference for the drafting of this report. These include:

- The yearly **Gender Budget**, published by the working group of the same name led by the Executive Vice Rector, Prof. Donatella Sciuto, now in its third edition in 2021, which presents an update, conducted from a gender perspective, of the main data relating to the student component, faculty and technical-administrative staff of the University. It explores a number of strategic areas for the definition of gender mainstreaming policies at POLIMI, such as the international student component and the younger members of the faculty.

- The **University Environmental Sustainability Report**, drafted by the Delegate for Environmental Sustainability of the University, Prof. Eugenio Morello, and first published in 2021, which aims to assess the current environmental performance, the risks (understood as threats but also opportunities), the resources available for their improvement and the limitations encountered, the trends of the processes taking place in the University and in society to provide a sound basis for planning and future decisions.

- The **University Energy Balance (BEA),** drawn up by the University Energy Commission headed by Prof. Mario Motta, in its first edition in 2021, was created with the aim of accurately identifying the University's energy needs by detailing the location of demand, the energy vectors used and the conversion technologies. The BEA, drawn up each year, will make it possible to highlight the university's progress in terms of limiting consumption (energy efficiency) and integrating renewable energy sources, and to assess the effectiveness of strategic choices in managing the university's energy system.

- **Polisocial Award, Responsible Research Experiences**, published in 2018 and aimed at recounting the experience of the University's programme for funding responsible research.

- **Stories of Cooperation at Polimi**, written by the Delegate for Cooperation and Development, Prof. Emanuela Colombo and published in its second edition in 2021, which summarises the evolution of the vision of cooperation and the potential role for Politecnico in development, and presents the research, training activities and international collaborations in the form of cooperative projects in which Politecnico as an institution has been involved.

- **Third Mission and Public Engagement: Framework and development prospects at Politecnico di Milano**. A report, to be produced in 2021, drafted by a team led by the Civic Engagement and Social Responsibility Delegate Prof. Francesca Cognetti, which aims to consolidate the strategic vision of Politecnico di Milano on the issues of Third Mission and Social Responsibility, starting from existing practices and polytechnic specificities, identifying future directions of development for the University.

This reconnaissance activity has made it possible to identify the "core SDGs" to which the University is strongly committed and which primarily characterise its activities for the benefit of its students and Politecnico community, the local context in which it is immersed, national and international institutions, and as a partner of private stakeholders. This commitment is explicitly expressed in the definition of the University's Strategic Programmes, such as the Sustainable Campus, ViviPolimi, Polisocial and Polytechnic Equal Opportunities (POP) projects.

Within the Strategic Programmes and in line with them, the various Structures of Politecnico implement initiatives and projects which aim to achieve the goals of the SDGs. The following summary sheets provide a broad though non-exhaustive overview of the actions carried out in recent years.

The five SDGs for which the mapping process of strategic projects did not provide "strong" evidence (SDG1 - No poverty; SDG2 - Zero hunger; SDG3 - Good health and wellbeing; SDG14 - Life below water; SDG15 - Life on land) are presented in this document by means of summary sheets, which allow to gather current teaching activities and research experiences, as well as the development of individual initiatives, which provide a starting point and the expression of an interest that will hopefully result in greater relevance in the future.

For the classification of teaching and research activities, the results of the voluntary self-mapping activity proposed to lecturers and researchers in 2017 and 2020 as part of the POLIMI4SDGs project were collected.

Additionally, in order to obtain a more complete vision of teaching activities, a keyword search methodology was developed for the teaching programmes and learning objectives defined for the Bachelor's and Master's degree courses offered by the university in the academic year 2020/21: starting from the search strings defined by Elsevier/SciVal to identify the publications related to the SDGs, a set of keywords was defined in Italian and English and were used to select from the database of programmes the courses that touch on issues related to the SDGs. The methodology was preliminarily tested on five SDGs (SDG1, SDG3, SDG6, SDG7, SDG15) and was used to identify teaching activities related to the Goals not mapped in POLIMI4SDGs.

THE CORE SDGs AT POLITECNICO DI MILANO

SDG4

QUALITY EDUCATION

Strategic programmes

As a higher education institution, Politecnico di Milano plays a crucial educational role not only for its own enrolled students, but also for the wider community that revolves around it. In its efforts to reach the objectives of SDG4, Politecnico has established strategic programmes aiming to guarantee lifelong learning opportunities for all, provide methodological support for primary and secondary schools, and support first-generation students. Additionally, an experimental programme of non-curricular teaching activities has also been designed for students.

LIFELONG LEARNING AND POLIMI OPEN KNOWLEDGE

As per its 2021-2023 Strategic Plan, Politecnico di Milano is committed to the creation of a new Lifelong Learning programme which, starting with the Polimi Open Knowledge project, aims to bring together and boost all the initiatives that Politecnico is already undertaking to this end.

- **POK:** In 2014, Politecnico di Milano launched POK - Polimi Open Knowledge, the MOOC (Massive Open Online Course) portal. All the courses are free of charge and open to all, with a certificate of participation issued at the end. The philosophy of the portal is "using MOOCs to bridge the gaps". The project has strategic value and has therefore been promoted and funded by the governance of the university. Initially, the portal was designed to support students through key transitions: from secondary school to university, from bachelor's to master's, from university to the world of work. Based on the results of the entrance tests, the initial need was mainly to reinforce the entry skills required for the three-year degree (mathematics, physics, history of architecture) and the master's degree for those coming from different curricular paths. Thanks to a survey undertaken with a panel of companies, the transversal skills necessary for job placement were then identified, resulting in the decision to launch the MOOCs dedicated to soft skills as some of the first courses, given that they are of greatest interest within the business world. Once launched, the portal quickly catalysed other initiatives promoted by the university, which needed to have an effective and sustainable tool to support high-impact training actions which would be able to reach a significant number of users from outside the university or not otherwise involved. Based on the experience of Polimi Open Knowledge, Politecnico is developing a new portal, due to open to the public in autumn 2021, which will provide upskilling and reskilling opportunities for professionals in new high-tech domains, such as data science, smart mobility etc., all relevant for professional development from a perspective of Lifelong Learning.

- **Enter a Classroom:** Politecnico has uploaded more than 20 lessons onto its YouTube channel so as to make them widely available on demand for dissemination purposes. With a total of almost 5 milions views, this playlist presents an interesting insight into teaching at Politecnico and touches upon a wide variety of topics connected to the core subjects taught at the university, namely architecture, engineering and design.

POLIMI4SCHOOL

Politecnico's commitment to primary and secondary schools has increased considerably over the course of the COVID-19 pandemic. The support of the entire educational chain from a university like Politecnico is pivotal to enhancing digitalisation and tackling the new challenges arising from the pandemic. At this time of crisis, which is affecting the entire Italian education system, Politecnico di Milano is offering its experience to help with the planning and implementation of remote teaching in the most effective way possible. Based on the many activities developed and carried out by the departments of our university with and for the Italian education system on the subjects of digital innovation in education and in institutions, some specific initiatives have been put in place:

- **PoliCollege:** PoliCollege is a teaching innovation project inspired by the American college model, which offers talented and enthusiastic secondary school students the opportunity for advanced training in technical-scientific subjects through on-line courses taught by Politecnico di Milano professors. Each course is divided into 4 teaching modules and has a total workload of approximately 25 hours; the duration of the course is typically 2 or 4 weeks, with each virtual class consisting of 30 students. At the end of the course, students receive a certificate and a digital badge to attach to their CV.

- **#DOL - E-collaboration at school and outside:** An open online course organised by the DOL specialising master's course (for experts in the use of teaching technologies, offered by the Department of Electronics, Information and Bioengineering), with a community of more than 3,660 enrolled teachers: a place designed to promote learning in general, but specifically offering discussions with those who have tested and are testing out innovative teaching methods. Ultimately, the "mission" of the DOL course is to enable teachers to carry out their activities by making the best and most informed use of the opportunities offered by information technology. The educational mix of the DOL course (theoretical lessons, methodologies, in-depth studies, laboratories and experiments, debates and videoconferences) provides a solid and secure foundation upon which to build a modern, effective and engaging education.

- **POK - Polimi Open Knowledge:** The platform of MOOCs from Politecnico di Milano is also open to teachers and students engaged in the final year of secondary schools, with a selection of courses that can help with the preparatory process as they approach the end of the school year, such as Introduction to Experimental Physics: Mechanics, Thermodynamics.

- **PoliTeaching: teacher to teacher!:** PoliTeaching is a repository of teaching ideas conceived and managed by HOC-LAB at Politecnico di Milano: a blog of simple but useful tips for remote teaching, with videos of 'how-to' testimonials, constantly expanding thanks to comments and contributions from readers.

- **Ebook "Voices from Italian schools in the time of COVID-19":** An eBook that brings together the experiences of teachers (from kindergarten to upper secondary school) who provided distance learning during the course of the health crisis. It is interesting and, at times, even entertaining and moving. A picture of the Italian school system that ensured continuity of service throughout, helpfully provided free of charge in both Italian and English. These testimonials from Italian teachers were collected as part of a free MOOC made by HOC-LAB. The MOOC was opened in March 2020 to help deal with the health crisis. More than 3000 teachers took part.

- **#MIP4SCHOOL - How to manage digital education:** Videos and resources about e-learning management from the MIDIS specialising master's course (digital innovation at school, provided by MIP – Politecnico Graduate School of Business); in addition, regular webinars with experts on the problems that schools are facing at the moment are planned. MIP is an opportunity for everyone to stay informed and updated on the topic of digitalisation in schools by sharing some brief tips and tricks on how best to adopt a smart learning approach, and above all by offering the opportunity to participate in a webinar on the subject, where questions and doubts can be aired and answered.

Other actions

- **First-Generation Students@Polimi:** A scholarship programme designed for students whose parents do not have a higher education diploma and who, for economic or cultural reasons, might refrain from starting a university career. The first students will be enrolled in A.Y. 22/23.

- **Passion in Action:** "Passion in Action" is a catalogue of open participation teaching activities that Politecnico offers to students to support the development of transversal, soft and social skills. This opportunity is open to everyone. Students may choose from a range of subjects, depending on their own interests and personal aptitudes. Students taking part in "Passion in Action" can register for any of the activities in the catalogue, regardless of whether they are related to the programme in which they are enrolled (subject to any prerequisites for access to individual initiatives). Any skills acquired will be accredited on their Diploma Supplement. Some Passion in Action courses focus on sustainable development to improve students' knowledge of these issues. Some highlights include "Passion for Sustainable Development", "Mobiance 4" and "Cumulus Green 2020: for a new circular economy".
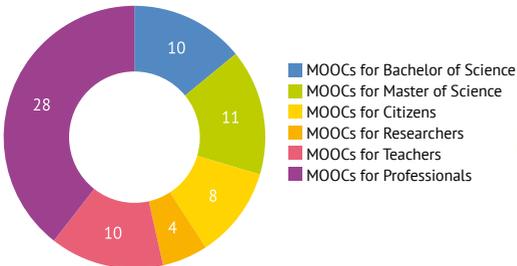
Data

POK

In 2020 POK has counted 71 active MOOCs, 56 provided in English Language and 15 in Italian, 133,000 customers and 200,000 enrollments in courses. MOOCs are also used in Politecnico didactics, with more than 100 internal professors that have used them in their curricular teaching.

NUMBER OF MOOCs

10
28
11
10
4
8

- MOOCs for Bachelor of Science
- MOOCs for Master of Science
- MOOCs for Citizens
- MOOCs for Researchers
- MOOCs for Teachers
- MOOCs for Professionals

POLIMI / NON-POLIMI USERS

38%
62%

- Non-Polimi user 87600
- Polimi user 140300
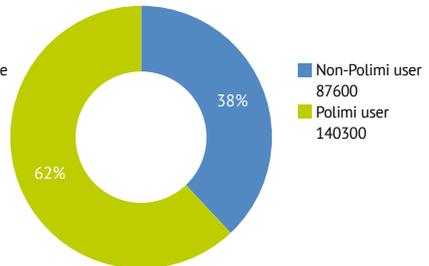
Passion in Action

Since the launch of the Passion in Action educational programme in October 2018, a grand total of 222 teaching activities have been offered, for which more than 16,000 attendance requests have been made, with over 10,000 of these granted. Below is a visualisation of the data split into pre-COVID and COVID periods.

PASSION IN ACTION:
ACTIVITIES OCTOBER 2018 - FEBRUARY 2020

9,623
enrollment requests

6,853
attendances confirmed

152
ACTIVATES COURSES

5,370
validated activities

PASSION IN ACTION:
ACTIVITIES MARCH 2020 - MARCH 2021

6,456
enrollment requests

3,900
attendances confirmed

70
ACTIVATES COURSES

1,756
validated activities

Public engagement events as educational outreach

EVENTS ORGANISED BY THE DEPARTMENTS OF POLITECNICO DI MILANO AS EDUCATIONAL OUTREACH IN 2020	
DEPARTMENT	**NUMBER OF EVENTS**
Aerospace Science and Technology	8
Architecture and Urban Studies	3
Architecture, Built Environment and Construction Engineering	26
Chemistry, Materials and Chemical Engineering "Giulio Natta"	24
Civil and Environmental Engineering	12
Design	26
Electronics, Information and Bioengineering	18
Energy	19
Management, Economics and Industrial Engineering	17
Mathematics "Francesco Brioschi"	6
Mechanical Engineering	2
Physics	3
Total	**164**

Educational outreach activities organized by Politecnico di Milano – either as sole organizer or in collaboration with other entities – in 2020 were developed as multi-day events (MeetMeTonight, MantovArchitettura, Milano Arch Week) or as series of events (conferences, lessons, virtual tours…); in-person attendance was limited due to the COVID-19 emergency, and only remote attendance was allowed for the 2020 edition of MantovArchitettura.

EVENTS ORGANISED AT POLITECNICO DI MILANO AS EDUCATIONAL OUTREACH IN 2020		
TITLE OF SERIES OF EVENTS	**PARTICIPANTS**	**YOUTUBE VIEWS**
Meet Me Tonight 2020	33427	10723
Polimi For Kids	8587	16646
Polimi Virtual Tour	7613	11485
Milano Arch Week 2020	13000	/
Lezioni in Biblioteca	4350	7586
Lezioni al Politecnico	1128	4819
MantovArchitettura	/	5274
Polimi Tribute	2080	3109
Poli-Tech Stories	1628	1902
PolimiOpenLabs Virtual Tour	1054	1361
Total	**72867**	**62905**

Teaching and research

The activity of mapping out teaching activities onto the SDGs highlighted three course units which deal with themes linked to SDG4, all offered by the School of Architecture, Urban Planning and Construction Engineering. They all address the issue of designing innovative, inclusive education facilities which can offer benefits to both students and the surrounding community, with particular attention to fragile contexts and environments.

In parallel to this, the self-mapping initiative POLIMI4SDGs shows that since 2016, twelve research projects developed at the departments of Politecnico di Milano have addressed the topics of SDG4, including:

- **Fashion SEEDS – Fashion Societal, Economic & Environmental Design-led Sustainability (2018-2021):** developed at the Department of Design, this project aims to provide guidelines and material for the implementation/development of the BA/MA curricula in Sustainable Fashion Design, aligning them with the sustainable skills in demand in the sector as well as the employment prospects of the global industry. The aim is to shift the focus from fashion's simple contribution to the economy, to a broader perspective that also examines its contributions to society, culture and the environment.

- **Capacity building for safeguarding Asmara's historic urban environment (2017-2020):** this project, carried out at the Department of Architecture and Urban Studies, has the objective of improving the capabilities of local workers (engineers, architects, geologists, surveyors, archaeologists, etc.) through advanced training courses on the conservation of the architectural heritage of the 20th century in Asmara and its local area. The training programme aims to establish a new common, shared and widespread attitude towards monuments, historical buildings, the urban context and the local area, strengthening and reinforcing local skills with regard to the design of plans and interventions.

- **Measuring the impact of activities aimed at combating child educational poverty:** the Tiresia research group, established at the Department of Management, Economics and Industrial Engineering, has built up a significant body of knowledge and experience in providing strategic advice to social innovators and entrepreneurs; this experience has been applied to an impact evaluation of projects by Con i bambini and Cometa.

Through international cooperation and research projects, Politecnico di Milano has been supporting the achievement of the objectives of SDG4, mainly in African countries:

ACRONYM AND TITLE	GEOGRAPHICAL CONTEXT	DURATION	LEAD DEPARTMENT
UNS3 - Italian support for university education in Somalia 2017-2018	Somalia	2020 - 2022	Architecture, Built Environment and Construction Engineering
UNS4 Infrastructural and strategic consolidation of Somali National University	Somalia	2020 - 2022	Architecture, Built Environment and Construction Engineering
PFK - Partnership for Knowledge // Platform 3 Energy	Africa, Europe	2019 - 2021	University
ExiST: Excellence in Science & Technology (KFW Project no. 51235)	Ethiopia	2018 - 2020	Chemistry, Materials and Chemical Engineering "Giulio Natta"
ISSES – INFORMATION SECURITY SERVICES EDUCATION IN SERBIA	Serbia	2017 - 2020	Electronics, Information and Bioengineering
AID_12079_AICS Convention on Tourism and Technical Assistance to support the identification of human resources required to promote the development of tourism in Jordan	Jordan	2020 - 2022	Design
Development of an Interactive Building Energy Design Software Tool	Africa	2017 - 2018	Architecture, Built Environment and Construction Engineering

Administrative units and supporting bodies

- **METID - Learning Innovation:** METID is Politecnico di Milano task force dedicated to developing innovative teaching methodologies and supporting the teaching staff in the implementation of innovative and interactive learning activities. Over the course of the COVID-19 pandemic, it has played a crucial role in the development and training of remote working and teaching tools for students, researchers, teaching staff and technical-administrative staff, ultimately managing to allow for the uninterrupted continuation of working and teaching activities, all whilst protecting and maintaining the safety and wellbeing of the entire university population.

- **HOC-LAB:** HOC-LAB is an interdisciplinary research laboratory at Politecnico di Milano (Department of Electronics, Information and Bioengineering) which is active in the field of multimedia communication and technology-supported teaching. The work done by HOC-LAB involves the creation of technological tools to support new educational and teaching formats, the development of design methodologies, the analysis of teaching experiences, and the provision of e-Learning services. HOC-LAB has provided services in 18 European countries (in addition to Israel and the USA), involving more than 5,000 teachers and 100,000 students overall.

- **Public Engagement and Communication Division:** this unit is in charge of the organisation and management of public engagement activities at Politecnico di Milano, largely consisting of designing, promoting, organising and measuring the impact of cultural and scientific exhibitions, events and initiatives.

Regulatory framework

Politecnico di Milano ensures that all teaching and education activities organised at the university are offered to their intended audiences (internal and/or external) in fair and equitable ways, with no discrimination based on economic status, gender, ethnicity, disability or religious beliefs:

- The Statute of Politecnico di Milano states that the university recognises the dignity of every single person engaged in work and/or study, ensuring and promoting equal treatment as well as promoting initiatives aimed at removing discrimination in training, access to work, guidance and career progression.

- The Regulation for Lifelong Learning Courses contains the guidelines for the design and implementation of lifelong learning activities; it states that beneficiaries of such activities may be students, secondary school/university graduates, professionals, workers or unemployed people, and that for some activities no educational qualifications may be required.

SDG5
GENDER EQUALITY

Strategic programme

GENDER POP

Within the framework of the POP strategic programme, Gender POP is the line of action specifically geared towards improving gender equality and female empowerment. Its activities aim to attract young women to STEM subject in order to ultimately encourage more women to study at Politecnico, providing students with a welcoming environment that supports them throughout their studies, accompanying PhD students and researchers in their professional careers with support and training so that they can also become role models for future students, and opening up a space for sharing and dialogue with stakeholders to improve equal opportunities both within the university and beyond.

- **Childcare facilities**
  The Polimi has a crèche at the Leonardo Campus (with capacity for 25 children aged 6 to 36 months) and a micro-crèche at the Bovisa Campus (with capacity for 10 children aged 6 to 36 months). Moreover, since 2014, the agreement with a private crèche at the Lecco Campus has continued. During 2020, the number of places available in the crèches for employees and students of Politecnico was further increased through agreements with private facilities, which allowed 5 children to be placed in the "Il Bello dei Bimbi" facility, a private crèche located near the Leonardo Campus, starting from September 2020, under the same financial terms as the crèches managed by the University.
  During the summer and Easter school holidays, a hospitality service is organised for employees' children aged 4 years (first year of nursery school) to 13 years (final year of lower secondary school). The service is currently being restructured for the start of new activities at the Bovisa and Leonardo campuses. On the Leonardo campus, the new summer/easter centres will involve dedicated motor activities at the Giuriati sports facility, which was recently renovated by the University.

- **Maternity and paternity policies: post-natal financial support and 'Parents at the Poli'.**
  As part of the actions of the POP strategic plan, financial support for Associate Professors and Untenured Researchers when resuming their professional activity after maternity leave has been provided since 2018. Specifically, this measure provides for the allocation of a personal research budget of €15,000 upon return from leave, automatically allocated to all eligible women. Two grants were awarded during 2020.
  The University also covers the fees for the Polimi crèches for students, PhD students and research assistants who become mothers. In the 2019-2020 academic year, 11 eligible persons benefited from the measure.
  In 2020, the Human Resources and Organisation Area created the **"Parents at the Poli"** project for all parents, providing a listening space focused on work-life balance issues and on raising awareness of the skills acquired by parents. During the months of closures due to the health emergency, the project was transformed: it used the online interview method to detect difficulties and support colleagues in their dual role as workers and parents; hence the new name "Genitori Polimi #io resto a casa".

- **EnginHERing Polimi**
  The initiative aims to steer female students towards STEM subjects, and in particular towards courses at Politecnico with a low female participation. The orientation project is dedicated to female high school students and involves the creation of a new narrative of certain degree courses (such as Mechanical or Aerospace Engineering) that are still characterised by a high level of gender 'segregation'. Through the experiences of female students enrolled in courses, researchers and alumnae, a narrative pathway is proposed to secondary school pupils that aims to overcome gender stereotypes and bring an ever-increasing number of girls and young women to these degree courses. Approaching STEM subjects through

new models and narratives was one of the objectives of the 2020 publication 'Alumnae: Engineers and Technologies", a book dedicated to former Polimi students, which gathers the experience of 67 female engineering graduates between 1990 and 2014 with the aim of disseminating to the general public the example of many women who have a passion for technology and who work as engineers in a variety of fields and sectors, with great success and satisfaction.

- **Scholarships: Girls@Polimi:** this new scholarship programme, funded by Politecnico di Milano and co-funded by private companies, is designed for female students who enrol in engineering courses where they constitute a significantly underrepresented group (i.e. where female participation is lower than 35%).

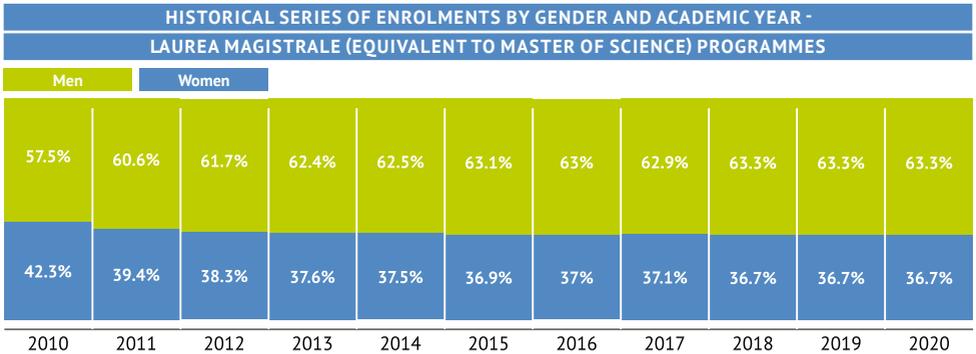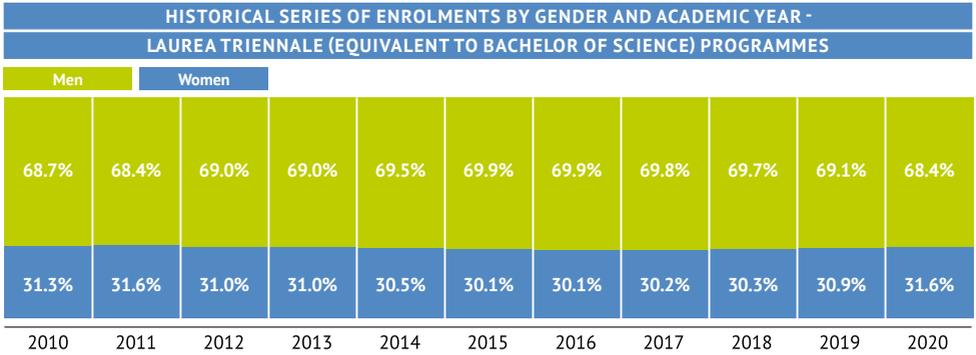## Affiliations and sponsorships

Over the years, our university has initiated many collaborations with, for example, the following:

- the **Women's Forum for the Economy & Society**, a leading European association representing the voices of women on major social and economic issues worldwide. In October 2021, Politecnico will host the Forum's annual event.

- the **Inter-university Research Centre on Gender Cultures**, set up with the aim of promoting studies, research and positive action on gender cultures and thus contributing to the growth and dissemination of respect for the dignity and skills of women. The Centre promotes and coordinates research programmes on the subject, in conjunction with other national and international academic and governmental institutions.

- **ValoreD**, an association of companies and institutions committed to gender balance and an inclusive culture in organisations, using an integrated approach that provides participants with tools and opportunities for discussion between organisations and with institutions. During 2020, Politecnico's partnership with ValoreD was consolidated, particularly in the **ValoreD4STEM** area.

- **Parks - Liberi e Uguali** [Parks - Free and Equal], a non-profit association created to help member companies understand and fulfil the business potential of developing diversity-friendly strategies and best practices. The association focuses on the dissemination of Diversity Management specifically related to sexual orientation, gender identity and LGBTQ+ issues. To date, Polimi is the only Italian university to be a partner of Parks.

- The **CRUI Working Group on Gender-related themes** and the round table conferences on the guiding themes identified within it (language and gender; female representation in STEM careers; gender balance; gender in education).

- the **National Conference of Equality Bodies of Italian Universities**, which brings together in a network the representatives of the CUGs, in order to build inter-university collaborative relationships on areas of competence. During 2020, the Polimi hosted the annual conference organised by the Conference, on the theme 'Smart Academia: evaluation, work, well-being and equity in the changing university'. Politecnico's CUG is also a member of the Network of CUGs in Lombardy.
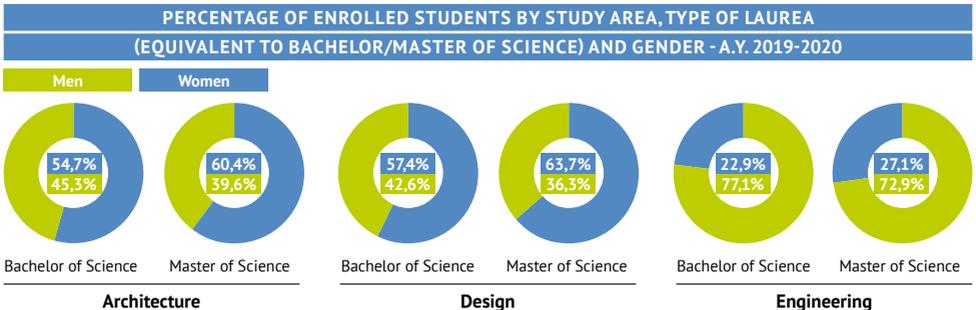
Data

The data presented here is part of the third edition of Politecnico di Milano Gender Balance, 2021 edition. The gender balance sheet analyses the University's population from a gender perspective, breaking it down into its three main components: students, teaching staff and technical-administrative staff. In general, the dimensions and phenomena analysed show positive trends in the gender distribution of the Polimi population, in all three of its components. In particular, the overall University data shows that the proportion of women in the student population is around 1/3, consistent over the ten years covered by the analyses shown in this chapter, with a higher female proportion (around 37%) in the Laurea Magistrale (equivalent to Master of Science).

HISTORICAL SERIES OF ENROLMENTS BY GENDER AND ACADEMIC YEAR - LAUREA TRIENNALE (EQUIVALENT TO BACHELOR OF SCIENCE) PROGRAMMES										

Men | **Women**

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
68.7%	68.4%	69.0%	69.0%	69.5%	69.9%	69.9%	69.8%	69.7%	69.1%	68.4%
31.3%	31.6%	31.0%	31.0%	30.5%	30.1%	30.1%	30.2%	30.3%	30.9%	31.6%

HISTORICAL SERIES OF ENROLMENTS BY GENDER AND ACADEMIC YEAR - LAUREA MAGISTRALE (EQUIVALENT TO MASTER OF SCIENCE) PROGRAMMES										

Men | **Women**

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
57.5%	60.6%	61.7%	62.4%	62.5%	63.1%	63%	62.9%	63.3%	63.3%	63.3%
42.3%	39.4%	38.3%	37.6%	37.5%	36.9%	37%	37.1%	36.7%	36.7%	36.7%

This pattern of an increase in the number of women attending the Laurea Magistrale (equivalent to Master of Science) compared to the Laurea Triennale (equivalent to Bachelor of Science) is consistent across the three areas of the University, with Architecture and Design having a female majority at both levels, and Engineering having around 23% of women enrolled in the Laurea Triennale and 27% in the Laurea Magistrale.

PERCENTAGE OF ENROLLED STUDENTS BY STUDY AREA, TYPE OF LAUREA (EQUIVALENT TO BACHELOR/MASTER OF SCIENCE) AND GENDER - A.Y. 2019-2020					

Men | **Women**

Architecture		Design		Engineering	
Bachelor of Science	Master of Science	Bachelor of Science	Master of Science	Bachelor of Science	Master of Science
54,7% / 45,3%	60,4% / 39,6%	57,4% / 42,6%	63,7% / 36,3%	22,9% / 77,1%	27,1% / 72,9%

When analysing the university careers of male and female students, an interesting fact comes to light. When comparing enrolled students and graduates, the female ratio grows consistently in all three areas of the University, with particularly significant differences at the Laurea Magistrale (equivalent to Master of Science) in Engineering (around 6%) and Architecture (around 17%). This testifies to the excellent ability of the students to complete their studies.
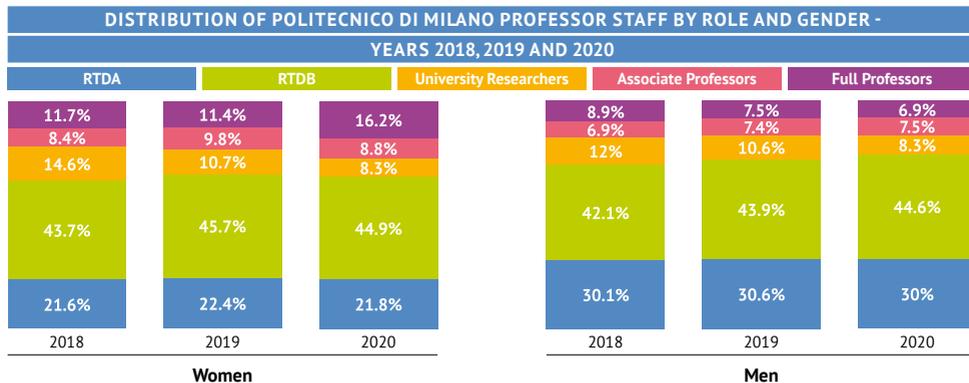
Analyses monitoring entry into the job market, which refer to data collected five years after graduation, confirm that the gender pay gap is still present in all three study areas (particularly in Architecture), starting with graduates of the Laurea Triennale (equivalent to Bachelor of Science), moving on to those qualified with a Laurea Magistrale (equivalent to Master of Science) and ending with PhDs, albeit with varying percentages between the three levels. By contrast, employment rates are very high and comparable between genders in all three study areas for Laurea Triennale graduates, Laurea Magistrale graduates and PhDs.
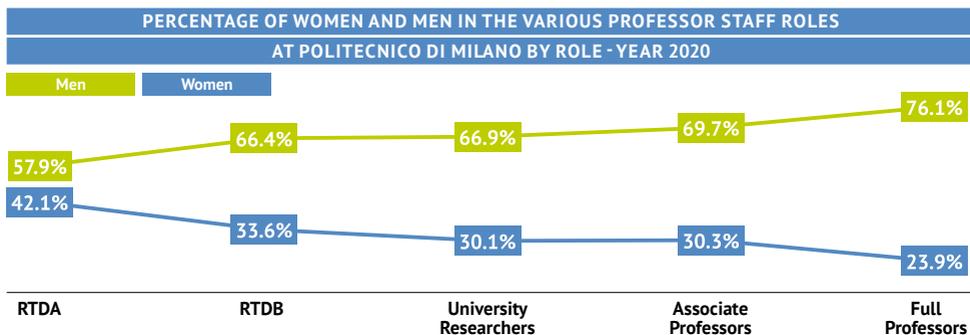
ITALIAN LAUREA TRIENNALE GRADUATES 2015, FIVE YEARS AFTER GRADUATION						
2015 GRADUATES OF THE LAUREA (EQUIVALENT TO BACHELOR OF SCIENCE) COURSE (5-YEAR SURVEY)						
	ARCHITECTURE		DESIGN		ENGINEERING	
	Women	Men	Women	Men	Women	Men
Employment rate	94%	96%	94%	96%	100%	99%
Permanent contracts	75%	83%	79%	81%	92%	93%
Average net salary	1.470 €	1.849 €	1.544 €	1.602 €	1.919 €	2.070 €

EMPLOYMENT DATA OF 2015 ITALIAN LAUREA MAGISTRALE GRADUATES, FIVE YEARS AFTER GRADUATION						
2015 GRADUATES OF THE LAUREA MAGISTRALE (EQUIVALENT TO MASTER OF SCIENCE) COURSE (5-YEAR SURVEY)						
	ARCHITECTURE		DESIGN		ENGINEERING	
	Women	Men	Women	Men	Women	Men
Employment rate	96%	98%	96%	99%	99%	99%
Permanent contracts	73%	81%	87%	92%	92%	92%
Average net salary	1.652 €	1.883 €	1.754 €	2.020 €	2.037 €	2.237 €

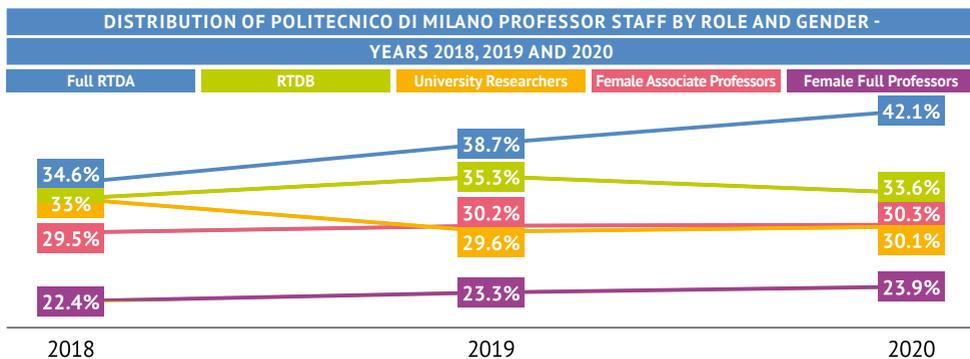| EMPLOYMENT DATA OF PHDS FOUR AND FIVE YEARS AFTER GRADUATION						
PhDs 4-5 YEARS AFTER QUALIFICATION (ITALIAN + FOREIGN LAUREA MAGISTRALE GRADUATES 2015_2016)						
	ARCHITECTURE		DESIGN		ENGINEERING	
	Women	Men	Women	Men	Women	Men
Employment rate	89%	94%	100%	100%	93%	96%
Permanent contracts	52%	67%	55%	50%	67%	70%
Average net salary	1.673 €	2.052 €	1.950 €	1.850 €	2.124 €	2.374 €

Analyses of the professors in the three-year period 2018-2020 show a very encouraging figure regarding the presence of women in the first stage of their academic career, the RTDA [untenured assistant professor] position.
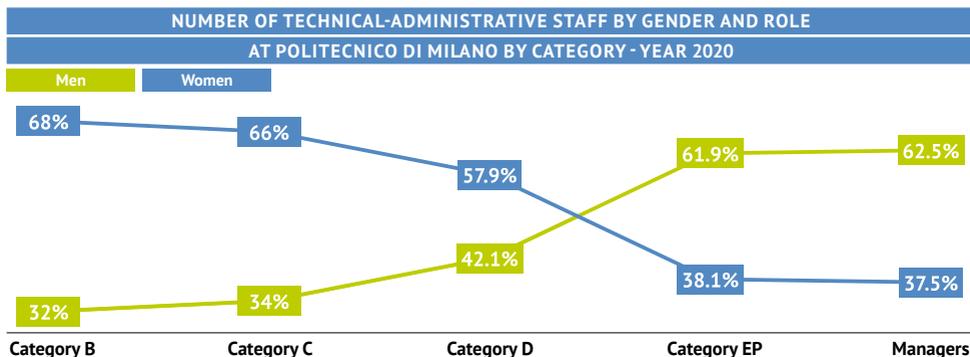

DISTRIBUTION OF POLITECNICO DI MILANO PROFESSOR STAFF BY ROLE AND GENDER - YEARS 2018, 2019 AND 2020

RTDA | RTDB | University Researchers | Associate Professors | Full Professors

Women

	2018	2019	2020
Full Professors	11.7%	11.4%	16.2%
Associate Professors	8.4%	9.8%	8.8%
University Researchers	14.6%	10.7%	8.3%
RTDB	43.7%	45.7%	44.9%
RTDA	21.6%	22.4%	21.8%

Men

	2018	2019	2020
Full Professors	8.9%	7.5%	6.9%
Associate Professors	6.9%	7.4%	7.5%
University Researchers	12%	10.6%	8.3%
RTDB	42.1%	43.9%	44.6%
RTDA	30.1%	30.6%	30%

PERCENTAGE OF WOMEN AND MEN IN THE VARIOUS PROFESSOR STAFF ROLES

AT POLITECNICO DI MILANO BY ROLE - YEAR 2020

Men — Women

	RTDA	RTDB	University Researchers	Associate Professors	Full Professors
Men	57.9%	66.4%	66.9%	69.7%	76.1%
Women	42.1%	33.6%	30.1%	30.3%	23.9%

The percentage of women in this role increased by more than 7 percentage points, from 34.6% in 2018 to 42.1% in 2020. This illustrates the University's support for promoting the careers of young academics in general, and a drive towards gender balance.

The figure below shows the change over time of the female population of professors by position in the period from 2018 to 2020.

DISTRIBUTION OF POLITECNICO DI MILANO PROFESSOR STAFF BY ROLE AND GENDER –

YEARS 2018, 2019 AND 2020

Full RTDA — RTDB — University Researchers — Female Associate Professors — Female Full Professors

	2018	2019	2020
Full RTDA	34.6%	38.7%	42.1%
RTDB	33%	35.3%	33.6%
Female Associate Professors	29.5%	30.2%	30.3%
University Researchers	33%	29.6%	30.1%
Female Full Professors	22.4%	23.3%	23.9%

As can be seen, the percentage of female full professors out of the total number of full professors has (slightly) increased over the three-year period, from 22.4% in 2018 to 23.9% in 2020.

NUMBER OF TECHNICAL-ADMINISTRATIVE STAFF BY GENDER AND ROLE

AT POLITECNICO DI MILANO BY CATEGORY - YEAR 2020

Men — Women

	Category B	Category C	Category D	Category EP	Managers
Men	68%	66%	57.9%	61.9%	62.5%
Women	32%	34%	42.1%	38.1%	37.5%

The population of technical-administrative staff remains predominantly female, with more than 60% being women. Again, however, the presence of women becomes less prominent at higher career levels, falling to 37.5% among managers. There was also a slight loss of female representation over the three-year period 2018-2020 at EP level, where women fell from 41% in 2018 to 38% in 2020.

In the pandemic context of 2020, the importance of the flexible working opportunities that Polimi has long put in place for its technical-administrative staff became apparent. Remote working projects, which can be implemented due to particular needs of a personal or family nature, were taken up by 90.9% women, while the smart working project had a growing base compared to the previous year, with women accounting for 64.7%. These results suggest that the ways in which women organise their work are often linked to their greater family responsibilities, but show that smart working is also a popular solution for men.

Teaching and research

Teaching activities

Assessing Cognitive Biases and Affective States through Data Analytics: module on gender bias issues.

Communication Design and Gender Cultures. The Laurea Triennale (equivalent to Bachelor of Science) course aims to develop and foster integration between the fields of Visual Cultures and Gender Studies. It aims to highlight the designer's joint responsibilities in producing images and image-objects that define our daily routine, with special reference to the theme of a non-stereotypical gender representation.

Politecnico di Milano is a partner of **FOSTWOM: Fostering Women to STEM MOOCs**, an **Erasmus+** project that harnesses the potential of MOOCs to bring STEM subjects to girls without gender bias and prejudice, with the ultimate aim of increasing the number of female students in technical and scientific subjects.

The University has also extended its participation in orientation events in collaboration with institutional and private partners, proposing the **TechCamp@POLIMI** digital training offers again in 2020 and through **Coding Girls**, tutoring activities on IT-related subjects, provided by students from the University to high school classes.

Research activities

The **DCxCG group - Communication Design for Gender Cultures**, made up of communication theorists and designers, media semiologists and sociologists of the Department of Design at Politecnico, organises research and teaching projects to promote the social responsibility of Communication Design regarding Gender Cultures. Its activity focuses on designing awareness-raising actions, information and training to define the company's vision, contributing towards the development of communication projects that rethink Gender Oriented communication formats and rules.

The transdisciplinary research unit **Promoting Diversity and Gender Equality in Education, Science, and in Society as a Whole: a Multi-disciplinary Approach** which involves six departments of the University, aims to develop tools to detect, characterise and quantify gender biases (both conscious and unconscious) and to identify their short- and long-term consequences, in order to plan actions to mitigate and eventually avoid them. The core group also intends to provide suggestions for designing policies to foster inclusiveness in businesses and organisations.

The **WiTECH project** (2019-2022), within the framework of the **Erasmus+ platform**, aims to promote female entrepreneurship, particularly in the STEM sector, by creating a blended learning course aimed at female students of Laurea Magistrale programmes in ICT subjects. Politecnico di Milano is coordinator of the project in which the Department of Management Engineering and the Department of Electronics, Information and Bioengineering, as well as the METID centre, are participating.

Administrative units and supporting bodies

The various actions are carried out by different facilities and services, all committed to the achievement of equal opportunities, in particular those for gender equality.

- **Equal Opportunities Unit:** A unit established within the Campus Life Division that is responsible for organising activities and initiatives aimed at promoting a culture of equity, transparency and appreciation of diversity amongst the various components of the community.

- **Human Resources and Organisational Development Division:** it is the Division in charge of ensuring the

recruitment, selection and development of qualified human resources, promoting a productive working environment with a good organisational climate. Within gender equality programmes, they ensure appropriate maternity and childcare policies for employees of Politecnico di Milano. They organize dedicate interview upon re-entry from maternity leave to ensure a smooth transition and cater at best to the mother's needs.

- **Career Service Unit:** A unit established within the Research, Innovation and Corporate Relations Division; with regard to gender equality actions, it manages the Girls@Polimi scholarship programme.

- **Guarantee Committee (CUG):** The Guarantee Committee (CUG) collaborates with other university services dedicated to the wellbeing and protection of students and employees of Politecnico di Milano. Its main objectives are: to promote equality in work and study between men and women and to prevent work-related conditions of distress or discomfort; to propose and organise scientific and cultural activities along with informational and training activities related to issues such as equal opportunities and occupational wellbeing; to spread knowledge and monitor observance of the University Code of Ethics and Conduct; to formulate opinions concerning staff reorganisation projects and training, staff evaluation criteria, flexible working (working hours, part-time work, remote work); to verify the results of positive actions, projects and beneficial practices promoted in order to offer equal opportunities as well as to prevent and counteract conditions of distress or discomfort in working and educational environments.

Regulatory framework

Politecnico di Milano's commitment to achieving the objective of SDG5 is embodied in its core values of Respect and Fairness. Politecnico rejects all forms of discrimination, specifically those based on gender, and recognises merit and the importance of fairness in evaluations and decisions; it promotes equal opportunities in all areas of academic life and guarantees fairness of access to the opportunities on offer for everybody.

The university regulations on non-discrimination and the promotion of equal opportunities are firmly established in the Statute, the Code of Ethics and Conduct, and the Code for the Safeguarding of Personal Dignity:

- The Statute of Politecnico di Milano affirms the dignity of every single person engaged in work and/or study, guaranteeing equal treatment as well as promoting initiatives aimed at removing discrimination in training, access to work, guidance and career progression.

- The Code of Ethics and Conduct affirms the university's founding values, requiring every single member of the community to refrain from discriminatory behaviour towards other members and to respect everyone without distinctions of gender, ethnic origin, nationality, sexual orientation, religion or belief, personal or political convictions, ability or social circumstances.

- The Code for the Safeguarding of Personal Dignity emphasises the importance of preventing and combating discrimination on the grounds of gender, ethnic and national origin, sexual orientation, religion or belief, personal or political convictions, ability, social circumstances and age. Moreover, harassment and sexual harassment are specifically considered to be forms of discrimination. It also establishes the role of the Confidential Counsellor, providing organisational and financial support for their activities, constantly refining the procedures for the protection of whistleblowers, and introducing the duty of cooperation with and dissemination of the Code by all those to whom it is addressed.

SDG6

CLEAN WATER AND SANITATION


6 CLEAN WATER AND SANITATION

Strategic programme

SUSTAINABLE CAMPUS - ENVIRONMENT

Within the "Environment" line of action, the University's Sustainable Campus Project, with particular reference to drinking water, contributes to SDG6 through the following main actions:

- Interventions on the water infrastructure in the toilets of the campuses, in order to ensure a conservation of the resource: Politecnico has been installing for years water saving devices, such as photocells on water taps, aerator nozzles and dual flush toilets.
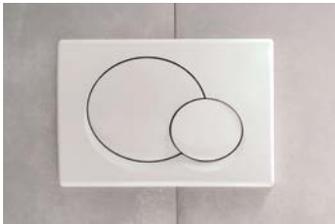
- Installation of drinking water dispensers on campuses in order to make the resource accessible to all and reduce the production of plastic waste.

  - **Drinking water dispensers:** since 2016, Politecnico has invested in the installation of drinking water points and water coolers inside the campuses. They are located in the buildings, housing and teaching facilities, to provide free access to water for our students and reduce the consumption of disposable plastic. A map of all the water points can be found here: www.campus-sostenibile. polimi.it/progetto-asap

  - **Casa dell'Acqua Campus Bassini:** the "Casa dell'Acqua" [Water House] was inaugurated on World Water Day 2018 in the presence of the city authorities, MM Spa and the Politecnico di Milano. The new Water House, located in the playground in Via Pascal 6, is equipped with real-time water quality analysis instruments and is used by teachers and researchers of the Civil and Environmental Engineering Department for study/research activities, while doubling as an information point for the city of Milan, thanks to the information boards on Municipal water.

- **AcquaPoint at Cremona campus:** AcquaPoint was installed in 2019 inside the Cremona campus thanks to Padania Acque, sole manager of the integrated water service in the Province of Cremona. Refrigerated, plastic-free natural water has been provided since then for both students and staff and, to mark the inauguration of this service, around 200 "Goccia" water bottles were distributed to Polimi members.

- **Installation of water fountains at the new Leonardo Gardens:** the ViviPolimi Project addresses the issue of water supply by providing the community with fountains installed at the new outdoors study and rest areas.

- Awareness-raising during sustainability events and initiatives, and through the suggestions in the "Code of Conduct for a Sustainable Campus", a document resulting from a collaborative discussion of Politecnico community in 2011, which has since been updated.

  - **Water bottle distribution:** the University has been carrying out awareness-raising activities on the issue of tap water quality for years, combined with the distribution, free of charge, of water bottles bearing the Sustainable Campus logo to members of our community, activity carried out by the Sustainability Unit during some of its events; To mark the start of the new 2019-2020 academic year, the Piacenza Regional Campus welcomed first-year students on the Mechanical Engineering and Architectural Design courses by giving new students a personalised Polimi water bottle to discourage the use of plastic water bottles.

  - **What kind of water do we drink?** A seminar focusing on the underground journey of Lombardy's water from the glaciers to the plains" organised by Padania Acque in collaboration with the Cremona Water Hub and Water Alliance, at the Palazzo Comunale in Cremona. The event was organised as part of the MEET ME TONIGHT (Researchers' Night) initiatives.

- Launch of specific projects, in some cases working together with external partners (e.g. ASAP, BeviMi).

  - **ASAP! Acqua Sostenibile al Politecnico** [Sustainable Water at the Politecnico]: The ASAP! project is the result of a collaboration between Eliante and the Politecnico di Milano (DAStU - Architecture and Urban Studies Department, DICA - Civil and Environmental Engineering Department and Area Campus Life - Sustainability Unit) with the support of Fondazione Cariplo. The ASAP! project aims at teaching people that the Municipal water is safe and constantly under sanitary control. To do this it explores new ways of providing drinkable water, changing the experience and the perception linked to using Municipal water instead of water bottled in single use plastic containers. This will bring a significant reduction of waste produced due to such packaging, as part of a circular economy.

- **BeviMI:** The BeviMI Project - Mayor's Water and Responsible Consumption, was conceived and proposed by the Italian Committee for the World Water Contract (CICMA) and co-funded by Fondazione Cariplo within the framework of the "Plastic Challenge - Challenging disposable plastics". It involves three Milanese universities: Politecnico di Milano (Civil and Environmental Engineering Department, in collaboration with the Sustainability Unit), University of Milan, and University of Milano-Bicocca. The BeviMi project, which targets around 150,000 people (students, professors and university staff), is part of a series of initiatives and actions on sustainability to which the three universities - members of the RUS_Rete delle Università per lo Sviluppo Sostenibile [Network of Universities for Sustainable Development] - have been committed for some time (waste, mobility, lifestyles and water).

Data

83	2	512,389 m³
water dispensers in the Campuses (2020)	water stations installed, open to citizens and students (2019)	drinking water consumed annually (2019)

Teaching and research

The self-mapping initiative POLIMI4SDGs yielded 2 teaching activities linked to SDG6, with only one **(Supply water treatment)** explicitly referring to the SDGs in the course programme; the testing of the keywords-based mapping methodology also yielded the course "Supply water treatment", and identified 13 additional course units focused on SDG6; the pertinence appears to be high for the majority of them, suggesting that the keywords choice was appropriate, although these activities were not captured by the self-mapping initiative. The overarching topic of water resources management is mainly relevant within the School of Industrial and Information Engineering (7) and the School of Civil, Environmental and Land Management Engineering (6).

The self-mapping initiative also resulted in the identification of 14 research activities linked to the topics of SDG6, mainly carried out at the Department of Civil and Environmental Engineering. Among these 6 PhD theses which have been developed/are under development are fully focused on water management, pollutant removal, wastewater treatment and drinking water upgrade. Other research activities deal with irrigation systems, water quality monitoring and sludge treatment. Finally, the international cooperation project **Dafne: Decision-Analytic Framework**, carried out at the Department of Electronics, Information and Bioengineering in 2016-2020, deals with water management issues in Africa.

Administrative units

- **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 manages relations between the Politecnico and the local community in terms of environmental sustainability issues; it organises internal and external dissemination initiatives; it manages the experimental activities and projects related to reducing water consumption.

- **Housing & Dining Unit:** with respect to drinking water consumption in the University campuses, this Unit manages the installation and maintenance of drinking water dispensers.

- **Supplies, Building Management & Logistic Division:** reading water quality and supply at Politecnico, this Division manages maintenance and upgrading of water supply systems of university buildings, laboratories and water fountains in outdoor areas, including the installation of water saving devices.

SDG7

AFFORDABLE AND CLEAN ENERGY

Strategic programme

ENERGY PROJECT

This includes all the activities carried out by the Energy Commission, established at Politecnico di Milano in 2012, with the aim of meeting the university's targets for economic savings, the conservation and conscious use of energy, and ensuring that the actions taken comply with current regulations in the field.

- **Energy saving and low energy buildings**
  Politecnico invests in building quality, focusing on the energy efficiency upgrading of existing buildings and the highest standards of performance and sustainability for new constructions. A pioneer in energy-efficient buildings thanks to the VELUXlab at Bovisa, Politecnico continues to invest in buildings that meet the most advanced energy efficiency criteria, becoming Nearly-Zero Energy Buildings (NZEB).

- **Smart Building**
  Following a long-running process of technological adaptation, a continuous monitoring system of many buildings is now in place:

  - the installation at Città Studi and Bovisa (La Masa Campus) of Smart Meters and their online monitoring

  - a thermal energy monitoring system for each building and a heating plan for Città Studi and Bovisa Campus (La Masa Campus)

  - installation of advanced automation systems in a number of buildings in order to test, for example, smoke detectors (Città Studi, building 25)

  - installation in Città Studi of a system (micro-grid) for the management of electricity production and consumption in island mode (underway)

  - optimisation of the district heating network in Città Studi: temperature verification to avoid network losses

- **Development of ETNA**
  ETNA is an innovative IT platform for the collection and analysis of energy data at Politecnico di Milano. ETNA collects data from the various monitoring systems located within the University and it is interconnected both with the BMS systems that control the thermal and electrical plants at Politecnico and with the smart meters deployed within the campuses. The platform also keeps a model of the campuses (buildings, thermal, and electrical plants) to associate data with the measured entities.

  The goals of the platform are:

  - to collect and process data from different sources developed by different private companies

  - to post-process the data, calculating key performance figures at different levels, from single machines that build the thermal and electrical system to buildings and campuses

  - to provide access simply and quickly to all of the University's energy data

  The awareness of actual energy performance of buildings is essential both for those who build new plants or renovate them, to identify the most energy-consuming areas and focus on them the improvement works, and for those who perform buildings facility management, who can use the data of the platform to optimize the management of plants.
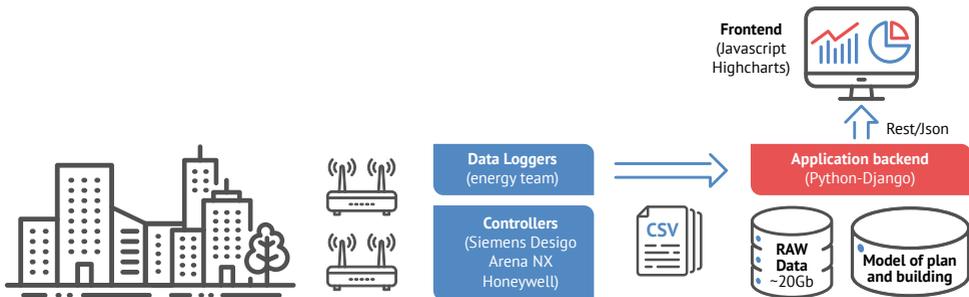
- **Efficient energy production**
  The university is equipped with two types of electricity generation: trigeneration and photovoltaic solar energy. Several buildings also have geothermal systems (heat pumps). The main source of energy production in Città Studi comes from a trigeneration plant, i.e. a combined cooling, heating and power (CCHP) system. The unit is located on the Leonardo Campus and meets the electricity, heat and partial cooling needs of the Campus. The plant's electricity production is monitored through the Campus online metering system. The second trigeneration plant at the Bovisa Campus, with the same electrical power (2MW), is in the design phase and is scheduled to be installed in 2021.

Data

	2017	2018	2019	2020
Total area of the campuses (land area, m²)	352,234	342,582	357,831	357,831
Electricity produced by renewable sources (kWh)	9,550,000	11,100,000	11,250,000	11,000,000

Teaching and research

The self-mapping initiative POLIMI4SDGs linked 8 teaching activities to SDG7 objectives, 5 out of this bunch appeared also as a result of the testing of the keywords-based mapping methodology. This latter process identified 74 additional course units equally divided into the School of Industrial and Information Engineering (34) and the School of Architecture, Urban Planning and Construction Engineering (37). Although minor, there is also a response in the School of Design (1) and in the School of Civil, Environmental and Land Management Engineering (2). A pivotal role in the breakdown of this SDG, both in the self-mapping and in keywords-based one, is played by the Energy Engineering degree programme; however, SDG7-related courses are widely disseminated throughout the whole University's teaching schedules.

Here is a brief summary list of the most representative teaching courses from SDG7 perspective:

- **Engineering and Cooperation for Development:** this course gives an overview on cooperation history and energy context in less developed countries, particularly in Africa. Throughout the course, energy access and related issues are addressed detailing some of the main functional solutions.

- **Smart Grids and Regulation for Renewable Energy Sources:** the course focuses on studying the evolution of electricity systems needed to enable a significant supply from Renewable Energy Sources (RES) and Distributed Energy Resources (DERs).

- **Energy Management Lab:** This course is designed to provide students with the concepts and instruments necessary for assessing from an economic perspective the adoption of technologies in the renewable energy, energy efficiency and digital domains, understanding the impact of emerging societal, technological, economic and regulatory-political trends on the business models of companies in the energy value chain and understanding industrial practices in terms of their energy performance, identifying the potential of energy-efficient technologies and services within the energy value chain.

VELUXlab Zero-Impact Laboratory

Conceived as an experimental module, VELUXlab is a building that achieves high levels of energy efficiency. The shape and orientation of the building, combined with its bioclimatic architecture and innovative building shell, allow optimal use of solar energy as well as natural lighting and ventilation to ensure comfortable interiors without any energy consumption.

As an active laboratory of Politecnico di Milano, VELUXlab is a true living lab, whose mere presence raises awareness and educates Politecnico community. Indeed, the building is subject to continuous experiments, the last of which, completed in August 2019, led to it becoming one of the first buildings with a green roof in Milan.

Supporting bodies

- **Energy Commission:** the Energy Commission (EC) is principally tasked with defining the university's energy strategies, supporting the Directorate General in achieving the objectives of economic savings and the conservation and conscious use of energy. The EC is involved in the design and management of energy systems and provides its opinion on contracts for the provision of energy-related services. The EC ensures the proper management and maintenance of the systems, liaising with the Administration Areas in charge of this, and is tasked with monitoring and controlling the consumption of energy and drinking water for all the university's sites, as well as drawing up the final and forecast energy statements.

- **Energy manager:** a fundamental role in achieving SDG7 is also played by the energy manager. This figure mainly deals with the analysis, monitoring and optimization of the energy use of the University. All this is done in order to allow economic, energy and environmental benefits as well as benefits related to the production of goods and services.

SDG8

DECENT WORK AND ECONOMIC GROWTH
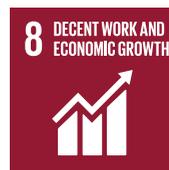
Strategic programmes

Politecnico di Milano has established various strategic programmes to offer support to the staff it employs, monitor and steadily improve working conditions, and boost the working opportunities available to graduates.

RETHINKING POLIMI FOR A POST-COVID WORLD

Since the start of the pandemic, the university has made a huge effort - in terms of training, new technological equipment and revision of organisational procedures - to provide its staff with an effective model for remote working and its faculties with new teaching tools and skills in an attempt to avoid disrupting academic activities. With this in mind, the Rethinking Polimi for a Post-COVID World project aims to understand the new challenges that the higher education system is facing, as well as how best to address them. The conflicting threats of "going back to normal without learning from the experience" and drastically curbing students' mobility and exchange of ideas have been identified. In order to avoid these, the university as a place of work and study must be reimagined, with digitalisation also pursued and encouraged in parallel as a means of improving the performance of those working and studying.

- **Flexible and remote working**
  In 2019, Politecnico di Milano undertook a pilot project to understand the challenges and opportunities of flexible working and working from home. Flexible working is considered an opportunity to promote a culture of working towards clearly identified results instead of working a determined number of hours, whilst working from home allows for a healthier work-life balance. 67 employees took part in the flexible working project; as of 31/12/2020, 217 employees are authorised to work from home. In parallel to this, protocols for "simplified flexible working" were introduced at the national level due to the pandemic, which made it possible for 94% of all Politecnico di Milano employees to benefit from flexible working options. In 2021, a new plan will be developed to build a protocol that meets the expectations of expanding flexible working arrangements beyond the period of the health crisis. To this end, Politecnico di Milano participates in the POLA (Piano Organizzativo del Lavoro Agile - Organisational Plan for Agile Working), which promotes flexible working in public administrations.

- **Innovative teaching and workspace management**
  Within the framework of the post-COVID plan, a new approach will be followed for the design and rethinking of spaces for work and study: future classrooms at Politecnico should have a flexible and modular layout, allowing them to respond to the new teaching methods designed to improve the quality of the classroom experience. With regard to study spaces, teamwork rooms will be set up, i.e. small, flexible spaces distributed throughout the university to manage group work, partly remotely, and for small groups to participate in online lessons. Finally, a major investment will also be made in creating new spaces for staff wellbeing and socialisation, both fundamental for increasing quality of life on campus.

THE INDIVIDUAL: A PILLAR OF THE STRATEGIC PLAN

Politecnico di Milano promotes the individual by doing its utmost to favour policies that improve enrolment and recruitment standards for students and professors, by increasing opportunities for growth within the university. It considers and implements actions designed to cultivate and enhance the value of Politecnico di Milano community.

- **Commitment to European Charter for Researchers**
  The university's commitment to the Charter for Researchers is embodied in four main actions, including the improvement of working conditions - achieved by stimulating mobility, increasing the number of spaces for collaborative working and knowledge sharing, and deploying a welfare plan - and a focus on training and development, with particular care devoted to professional development in the early stages of young researchers' career paths.

- **Professional development and training**
  Politecnico di Milano ensures the promotion and development of skills and expertise within the university by organising and managing training processes and professional development for teaching, administrative and technical staff. Particular care is devoted to the early and final stages of the professional career: on the one hand, vocational training for technical-administrative staff who are approaching retirement, helping them to develop and update skills and abilities that can be applied in contexts beyond the sphere of employment (Talete Project). Politecnico di Milano employees can also benefit from lifelong learning courses organised by the university, which are open to students, graduates and professionals.

- **Welfare and personal care plan**
  Politecnico di Milano supports the academic and technical-administrative staff and promotes work-life balance initiatives by means of a welfare plan which encompasses mobility, a health insurance plan, subsidies, childcare facilities and summer camps for employees' children.

- **Survey of work climate and wellbeing**
  The University detects the organizational climate through a structured survey which, generally, has a response rate between 50 and 60% of the administrative and technical staff. It is an internal monitoring tool that allows to put in place positive actions to improve the quality of relationships and the working environment, and the positive actions implemented following the three surveys of 2015, 2016, 2019 include results dissemination, group training and panel discussions on personal and organizational well-being, projects for specific recipients (managers, outgoing staff and new hires). The fourth edition of the survey, scheduled for 2021, will focus on the perception of the aspects concerning remote work and the impact of the pandemic.

POP PROGRAMME

Pari Opportunità Politecniche (Polytechnic Equal Opportunities) is the strategic programme at Politecnico di Milano that aims to guarantee a work and study environment that respects differences in gender identity, disability, culture and background. The POP programme is structured around five strategic lines of action: gender identity, culture, nationality and religion, sexual orientation, disability and psychological wellbeing. For each of the five lines of action, the university engages in promoting and organising a range of training initiatives and services (guidance, listening and support, etc.) aimed at creating an inclusive environment that allows students, researchers and staff to pursue their careers successfully, both within the university and beyond its confines.

- **Multicultural POP**
  Within the POP strategic programme, Multicultural POP is the line of action dedicated to promoting the integration of different cultures, countries and religions, offering a dedicated support service for foreigners working and studying at Politecnico di Milano. Within the initiative, specific attention is devoted to welcoming and supporting visiting professors from all over the world, who offer a unique opportunity to enrich and diversify the teaching offered by the university, as well as broadening the scope of research activities and networks.

- **Wellbeing POP and PoliPsi**
  Wellbeing is the strategic line that collects the actions in favour of the psychological well-being of students and employees of Politecnico. Among these, PoliPsi is the free counselling and psychological-psychotherapeutic support service for students and for PhD candidates at Politecnico di Milano, involving psychologists and psychotherapists who are experts in relational dynamics and in learning processes. The service offers a place to face problems and to receive support when going through periods of distress, uncertainty or difficulty related to studies or to personal events. As a consequence of the COVID-19 pandemic, a specific counselling for sanitary emergency related issues has also been established and is offered to Politecnico di Milano community by the PoliPsi service.

CAREER GUIDANCE AND DEVELOPMENT AT POLITECNICO DI MILANO

Politecnico di Milano is committed to providing high-quality placement and career guidance services for its students, with a constant focus on the skills and abilities required by companies, which are continuously adapting to innovations in entrepreneurship and production systems. Improving the employability of its students is one of the core vocations of Politecnico di Milano, representing a strategic way of combating unemployment in the younger population and improving the quality of job placements taken by Italian graduates.

- **Job Fairs**
  The Career Service organises three job fairs every year, each featuring a specific focus: Career Day is the largest one, where Politecnico di Milano students who are approaching graduation have the opportunity to meet both Italian and international recruiters, as well as to gain first-hand experience of the requirements and expectations of the job market; SME Day is focused on connecting students with small and medium-sized enterprises, offering them a significant opportunity to showcase what they have to offer; finally, the International Job Fair is aimed at students and graduates who are interested in pursuing a career outside Italy.

- **Individual career support**
  Career advisors are available to support Politecnico di Milano students in writing CVs and cover letters, to practice interviews, and to offer expert advice on the job market, with insights into skills and abilities that recruiters are currently looking for.

POLITECNICO DI MILANO ALUMNI

This is the project dedicated to the development of a strong community of Politecnico di Milano alumni at all levels (graduates, Master's graduates, PhDs). It is rooted in the belief that creating a large network of skilled engineers, architects and designers is the key to providing high-quality job opportunities to students at our university, as well as networking opportunities with the wider community.

- **Alumni Convention**
  The Convention is the annual meeting of Politecnico di Milano and its alumni. Through the wide-ranging expertise offered by its notable alumni, Politecnico opens up a space for discussion of innovation and strategies for facing the new challenges of the world that the university and its graduates are going to experience.

- **Alumni Digital Talks**
  These digital talks are a series of web conferences in which Politecnico di Milano alumni and notable professionals from all over the world discuss technical research, innovation, human capital, entrepreneurship and societal challenges, in a continuous exchange of knowledge and experiences. The talks are divided into four threads: Unconventional Alumni, Progress in Research, International Alumni, and Alumni.

Data

To fulfil its duties of research, teaching and outreach, Politecnico di Milano employs a large and thriving professional community of workers, teachers and researchers. As of December 2020, the university employs 1475 teaching staff and 1236 technical-administrative staff; research and teaching activities are also supported by 760 temporary research fellows and 963 part-time contract teaching staff.

Politecnico di Milano has implemented a number of welfare and personal care programmes as well as vocational training initiatives in order to support and offer valuable opportunities to its staff.

Teaching staff

The teaching staff are organised into the twelve departments of Politecnico di Milano and three main disciplinary areas (engineering, architecture, design). According to Italian legislation, teaching staff are divided into three categories: Professore Associato (Associate Professor), Professore Ordinario (Full Professor) and Ricercatore a tempo determinato (Untenured Researcher). A fourth contract category,

Ricercatore Universitario (University Researcher), is still present, though this has not been applicable to new employment contracts since 2005.

As of December 2020, the distribution of teaching staff across the departments is as shown below, with a fairly consistent distribution of around 45% associate professors, 28% full professors and 32% researchers.

DEPARTMENTS	ASSOCIATE PROFESSORS	FULL PROFESSORS	RESEARCHERS	TOTAL
Architecture and Urban Studies	74	39	56	**169**
Architecture, Built Environment and Construction Engineering	79	37	38	**154**
Chemistry, Materials and Chemical Engineering "Giulio Natta"	57	35	31	**123**
Design	52	23	38	**113**
Electronics, Information and Bioengineering	118	72	47	**237**
Energy	55	33	40	**128**
Physics	30	18	17	**65**
Civil and Environmental Engineering	48	33	27	**108**
Management, Economics and Industrial Engineering	32	41	34	**107**
Mathematics "Francesco Brioschi"	50	25	29	**104**
Mechanical Engineering	46	36	38	**120**
Aerospace Science and Technology	18	14	15	**47**
Total	**659**	**406**	**410**	**1,475**

Classification by disciplinary area shows that the Engineering faculty is significantly larger than that of both Architecture and Design, although this is in line with the distribution of students over the three areas (75% Engineering, 15% Architecture, 10% Design). The students/teacher ratio is therefore consistent across the three disciplinary areas.

DISCIPLINARY AREA	UNTENURED RESEARCHERS	TOTAL	% OF UNTENURED RESEARCHERS ON TOTAL
Architecture	63	323	20%
Engineering	203	1,039	20%
Design	21	113	19%
Total	**287**	**1,475**	**19%**

Technical-administrative staff

The university's technical-administrative staff manage and support its activities as a whole, within both the academic departments and the administrative offices of Politecnico di Milano's campuses, located in Milan and outside the city. Some of the technical staff are responsible for the operation of the university's many laboratories.

Since 2018, the University has been running an experimental Smart Working project, which was further developed in 2019. In 2020, the majority of staff benefitted from an extraordinary smart and remote working scheme to guarantee work continuity during the COVID-19 emergency.

	2017	2018	2019	2020
Smart working	0	37	61	102
Remote working	53	73	105	111
Flexible working during the emergency phase	-	-	-	936

Almost all of Politecnico di Milano's technical-administrative staff are employed on secure contracts, demonstrating the university's commitment to combating the casual employment of the workforce.

POST-GRADUATE PROGRAMS	2016	2017	2018	2019	2020
Contract Staff	94	102	97	96	119
Permanent Staff	1,109	1,102	1,140	1,136	1,117
% Contract on Permanent	8%	9%	9%	8%	11%

Below are some data that demonstrate the quality of the employment relationship that Politecnico di Milano undertakes to offer to its collaborators. In particular: the data show the very low number of termination of the employment relationship due to voluntary resignations; as well as the longevity of working relationships (reference year 2020).

VOLUNTARY RESIGNATIONS					
	2016	2017	2018	2019	2020
Total technical-administrative staff (TIND)	1,109	1,103	1,138	1,136	1,119
Voluntary resignation	2	2	5	5	8

DURATION OF EMPLOYMENT RELATIONSHIP - REFERENCE YEAR 2020	
YEARS OF EMPLOYMENT RELATIONSHIPS	N. OF EMPLOYEES
<10	60
11-15	306
16-20	135
21-25	172
26-30	102
>30	160
Total	**1,119**

With reference to dedicated support to the early and final stages of the staff professional career, the following tables summarize the activities undertaken at Politecnico di Milano in recent years, involving:

- Check of length of service in order to indicate the maturity date of right to pension, with possible continuation of service beyond legally established limit.
- Preparation of possible scenarios, allowing staff member to make a decision.
- Remote support in completing pension claim.
- Sorting out insurance position with PassWeb application (INPS database), including writing to other administrations if necessary.
- Checking the necessary documentation and contacting INPS if necessary to establish applications for assessment of periods of services not yet worked.
- Support in dealings with INPS, even after the date of termination.

NO. INSTANCES OF RETIREMENT SUPPORT					
	2016	2017	2018	2019	2020
Staff	17	20	17	37	18
Faculty	32	21	22	25	25

NEW STAFF WELCOME ACTIVITIES			
	INTERVIEWS WITH NEW HIRES	INTERVIEWS WITH MANAGERS OF NEW HIRES	WELCOME/INFO INITIATIVES FOR NEW HIRES
2016	10	10	not planned
2017	20	12	not planned
2018	66	51	not planned
2019	37	20	not planned
2020	11	8	2 termly sessions on performance cycle

Internships

Politecnico di Milano also hosts many interns, both as curricular and extracurricular schemes with respect to their study curricula. The internship is considered a training tool as well as an active labour-market measure. It helps younger people in career choices by learning a specific professional field, and it allows them to acquire the necessary skills for labour market integration.

The internship is a precious resource for Politecnico di Milano too, as it enables to meet talented young people willing to learn; moreover, the internship often represents the starting point for more solid and lasting work relationships. As shown in the following table, the number of internships offered at Politecnico has been constantly growing from 2016 (with a slight decrease in 2020 caused by COVID-19 pandemic).

	2016	2017	2018	2019	2020	2021
Interns	**82**	**103**	**126**	**166**	**114**	**139**
Graduates	66	91	111	136	88	117
Students	16	12	15	30	26	22

Other staff

Other staff types include part-time contract teaching staff, temporary research fellows and doctoral researchers.

	2016	2017	2018	2019	2020
Part-time contract teaching staff	1098	1019	1004	1042	997
Temporary research fellows	614	723	718	785	760
Doctoral researchers	1121	1067	1096	1156	1375

Students

As a university with a strong technical vocation, temporary job placements and internships for students are considered an important part of the study curriculum, especially with regard to architecture and design degrees. Architecture and engineering courses show a largely even distribution of internships - both mandatory and elective - between bachelor's and master's degrees, whilst design courses show a marked increase in job placements at the master's level.

		2017/18	2018/19	2019/20	OVERALL TOTAL
Architecture	Curricular - Elective	99	174	103	**423**
	Curricular - Mandatory	1346	1900	1436	**4920**
	Erasmus+Traineeship		2	5	**7**
	Extracurricular	1	1	6	**8**
Design	Curricular - Elective	198	241	159	**640**
	Curricular - Mandatory	292	496	427	**1243**
	Erasmus+Traineeship		3	2	**5**
	Extracurricular	3	1	9	**18**
Engineering	Curricular - Elective	1212	1362	759	**3592**
	Curricular - Mandatory	1165	1176	806	**3345**
	Erasmus+Traineeship		1	8	**9**
	Extracurricular	81	40	53	**234**
	Overall total	**4397**	**5397**	**3773**	**14444**

Postgraduate and specialising courses aim to create professional profiles with highly specialised skills and abilities, making them better suited to highly qualified positions and capable of offering innovation and growth to the economic sectors in which they operate. Since 2015, more than 2000 people have taken part in these courses at Politecnico di Milano every academic year.

	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020
Specializing Master	2039	2186	2162	2364	2452
Post Graduate Programs	19	26	38	31	19
Specialisation courses	254	199	231	247	281

Career Service activities for Politecnico di Milano students

		2016	2017	2018	2019	2020
Events	no. participants in orientation events with companies	5855	5021	7925	7328	10532
	no. participants in Career Day	4500	5000	5000	5500	3829
	no. participants in International Career Day	2000	3000	3000	5000	1780
	no. participants in SME Career Day	1500	2000	3000	4300	400
Assessments	unique visitors to Assessment Centre for mock interviews	ND	511	582	763	732
	unique visitors to Assessment Centre for career guidance	ND	1461	1663	2596	3117
Website	company logins to site/month	1870	2037	2203	2233	1565
	student logins to site/month	9881	10061	10754	10609	10392
	CVs visible to companies on site/month	4657	4686	4881	4988	4933
Placements	placement adverts on site	13020	15784	15153	15664	9792
	job interviews	942	1359	1033	1185	308

Teaching and research

The self-mapping initiative POLIMI4SDGs resulted in the identification of 3 course units linked to SDG8, with 2 reporting that the topics are discussed for a significant part of the course curriculum **(Macroeconomics of finance and Business and industrial economics).**

Two recent research activities are also focused on the themes of SDG8:

- The projects **Survey on company and territorial participatory models for health and safety in the workplace: the role of Workers' Safety Representatives and interactions with prevention actors** and **Methodologies and tools for a sample survey on the role of Workers' Safety Representatives at company, territorial and production site level**, developed at the Department of Economics, Management and Industrial Engineering.

- **Modern Artisan:** a social innovation project supported by Yoox Net-a-Porter Group (YNAP), carried out at the Department of Design. The aim was to bridge the skills gap in the British textile industry by training the next generation of artisans and providing education and employment for the local community. The project promoted the importance of the role of education, the rediscovery and protection of handicrafts and cultural exchange between different experiences.

One of the many research activities performed within the international cooperation projects, the **Tambali Fii** project (2017-2019), focused on the creation of a technological and social innovation cluster for the development of the shipping and fishing industry in Senegal.

Administrative units and supporting bodies

- **Professional Development Unit:** a unit established within the Human Resources and Organisational Development Division with the aim of providing training and development initiatives for teaching and technical-administrative staff. Through the identification of skill development needs, the unit offers professional development programmes dedicated to specific working categories and even individual key roles. It was the unit that was largely responsible for the remote working revolution of last year.

- **Rewarding, Performance Management and Welfare Unit:** a unit established within the Human Resources and Organisational Development Division with the aim of designing, implementing and managing welfare and personal care projects.

- **Equal Opportunities Unit:** a unit established within the Campus Life Division that is responsible for organising activities and initiatives aimed at promoting a culture of equity, transparency and appreciation of diversity amongst the various components of the community. In particular, the Equal Opportunities Unit manages services for students with permanent or temporary disabilities; counselling for students (meetings on study methods, workshops on anxiety management, motivation, self-esteem); organisational, administrative and accounting support for the Guarantee Committee, the Confidential Counsellor and the counselling desk on work-related distress or discomfort; coordination between the managers/users/administration of the childcare facilities at Politecnico di Milano.

- **METID – Learning Innovation:** METID is Politecnico di Milano task force dedicated to developing innovative teaching methodologies and supporting the teaching staff in the implementation of innovative and interactive learning activities. Over the course of the COVID-19 pandemic, it has played a crucial role in the development and training of remote working and teaching tools for students, researchers, teaching staff and technical-administrative staff, ultimately managing to allow for the uninterrupted continuation of working and teaching activities, all whilst protecting and maintaining the safety and wellbeing of the entire university population.

- **Career Service Unit:** established within the Research, Innovation and Corporate Relations Divison, this unit is dedicated to boosting students' employability by organising events, offering a career guidance service, and managing national and international corporate relations, all to ensure constant adaptation to the evolution of professional profiles. Its four main activities are: managing students' internships and work placements; corporate relations; organising events; job market data centre. The unit also manages an online platform where employers can advertise job openings for students and graduates to apply to;

students and graduates can manage their personal page and CV on the platform, meaning that employers are also able to get in touch with promising profiles directly.

- **Fundraising and Alumni Unit:** established within the Research, Innovation and Corporate Relations Division, this unit has a dual role: on the one hand, it develops and coordinates networking activities with and between Politecnico di Milano alumni, with the aim of creating an engaging community of professionals who can offer their innovation, ideas and expertise to Politecnico di Milano and the entire community. On the other hand, it is responsible for fundraising campaigns targeting individuals and companies, with a view to sponsoring scholarships as well as supporting research activities, the construction of new facilities, alumni association activities and other projects.

- **Guarantee Committee (CUG):** the Guarantee Committee (CUG) collaborates with other university services dedicated to the wellbeing and protection of all employees of Politecnico di Milano. It publishes an annual report which tracks the equity and fairness of employment distribution and pay scales.

Regulatory framework

As a workplace, Politecnico di Milano strives to build an equitable, respectful and inclusive working environment, expressing this inclination via the core regulations adopted at the university:

- The Code of Ethics and Conduct affirms the university's founding values, requiring every single member of the community to refrain from discriminatory behaviour towards other members and to respect everyone without distinctions of gender, ethnic origin, nationality, sexual orientation, religion or belief, personal or political convictions, ability or social circumstances.

- The Code for the Safeguarding of Personal Dignity emphasises the importance of preventing and combating discrimination on the grounds of gender, ethnic and national origin, sexual orientation, religion or belief, personal or political convictions, ability, social circumstances and age. Moreover, harassment and sexual harassment are specifically considered to be forms of discrimination.

Politecnico di Milano complies with nationally agreed-upon contracts for the retribution of technical-administrative staff and directives from the Ministry of University and Research for the retribution of academic staff. The university staff are represented at the university and national levels by recognised labour unions (CGIL, CISL, UIL).

As a public administration, Politecnico di Milano also pursues values of fairness, equity and transparency in all its processes of human resources recruitment and outsourcing of services. Public announcements are made to provide information about requirements, specifications and application processes in accordance with Italian law. The assessment of applications and appointment of the winning party is done in compliance with transparency requirements established by both Italian law and university regulations.

SDG9

INDUSTRY, INNOVATION AND INFRASTRUCTURE

Strategic programmes

POLITECNICO DI MILANO'S NETWORK OF LABORATORIES

The network of laboratories is made up of four Large Infrastructures serving research and business, 246 Research Labs and 32 Joint Labs. 2020 marked the launch of a new investment plan, partly supported by companies, which will lead to the creation of new research laboratories in the fields of aerospace, the circular economy, mobility and energy transition. Two of these are supported by the Lombardy Regional Government, namely "POLIQI - POLItecnico Quantum Infrastructure", an infrastructure for distributing quantum keys in urban areas, and "Advanced and sustainable materials and manufacturing for life sciences and energy transition".

- **GVPM Wind Tunnel:** GVPM is a special closed-circuit wind tunnel arranged in a vertical layout, with two test rooms located on opposite sides of the loop. The first of these (4x4 m) is located in the lower part of the loop and is suitable for low-turbulence tests. The second (14x4 m) is located in the upper part of the loop and is intended for civil engineering testing (the Boundary Layer Test Section). Due to this unique feature, GVPM offers the widest possible range of testing arrangements and options.

- **PoliFAB:** PoliFAB, the university's infrastructure for micro- and nano-manufacturing, offers a single platform to integrate all of the Key Enabling Technologies in innovative devices and microsystems. PoliFAB also makes it possible to quickly produce prototypes and create pre-series products of commercial interest. Work is carried out in 430m2 cleanroom set up for creating device prototypes which integrate a range of technologies (photonics, micro and nanoelectronics, spintronics, micromechanics/fluidics, biotechnologies). Available processes: microfabrication on 6" (photolithography, dry and wet etching, plasma-enhanced chemical vapour depositions, sputtering, evaporation, back-end) and nanofabrication (electronic lithography, nano-imprinting, AFM nanolithography).

- **Polifactory:** Polifactory is an interdepartmental research laboratory that explores the relationship between design and new digital manufacturing processes, promoting a new culture of making. A place for users to investigate the possible future scenarios of advanced manufacturing: from distributed production to open hardware, all the way to high-interactivity product-service design. Polifactory is a container for services and activities designed to develop young people's multidisciplinary talents and their ability to craft innovative product-service solutions that integrate design and technology. It is a cutting-edge service offered by Politecnico in terms of experimental training, research and consultancy for firms.

- **Material Testing Laboratory - LPM:** The LPM performs tests on materials and structures for research and teaching purposes, as well as on behalf of third parties. The lab is equipped with testing apparatus and measuring instruments for mechanical testing with forces from 0.01 N to 5000 kN. Its activities include the testing of structures and structural elements, as well as the chemical-physical and mechanical testing of building materials. The lab is accredited as an official laboratory according to the Italian law relating to the certification of testing on construction products. It is a notified body according to Regulation (EU) no. 305/2011 for the CE marking of construction products. It is also accredited by national accreditation body Accredia for tests on polymer matrix composite materials, fibre-reinforced cementitious matrix materials, railway materials and components and for the calibration of force.

- **JRC:** a Joint Research Centre (JRC) is a medium/long-term strategic partnership between a company and Politecnico aimed at developing advanced joint research programmes, creating observatories on technological advancements, sharing research instruments, laboratories and infrastructures and investing in the growth of highly skilled human resources. 61 JRCs are in place today.

- **Fondazione Politecnico di Milano:** the Fondazione Politecnico di Milano was established in 2003 at the behest of Politecnico di Milano in conjunction with our city's main institutions, the Lombardy Regional Government, and the support of several important businesses. The foundation is actively engaged in enhancing the university's development path for accessible innovation and sharing the many strengths that define its research in the fields of engineering, architecture and industrial design alongside manufacturing companies and the local community, driving progress in order to build the future.

  - **THEOREM:** THEOREM is the intellectual property awareness and education programme for students, researchers and young entrepreneurs of creative and high-tech startups who are interested in protecting and developing their ideas. The project consists of six meetings, each one dedicated to a different topic or aspect of intellectual property. Each meeting includes: a basic training/information session delivered by experts in the field; a discussion and debate session, with talks and participation from university experts, online influencers, scientific disseminators, companies and startups; the production of a video summary of the meeting.

  - **IP-EXPERIENCE:** IP-EXPERIENCE aims to raise awareness and empower secondary school and university students with regard to the strategic value that intellectual property rights can bring to their future business and professional activities, through a programme of workshops and events. The project targets young people, differentiating between secondary school students aged 15 to 18 and university students aged 19 to 24, with a focus on students in technical/scientific faculties (engineering, architecture, design). In addition, the project will promote content that is of interest to young researchers, PhD students, students in general, young future entrepreneurs and startuppers.

- **PoliHub:** PoliHub's mission is to support the development of deep tech startups that will generate value for society and the economy, moving towards a model of sustainable progress thanks to science, technology, and leveraging Politecnico di Milano ecosystem. It is a certified startup incubator ranked amongst the top five university incubators in the world, according to the University Business Incubators Index rankings for 2019/2020.

  - **Switch2Product - Innovation Challenge:** Switch2Product is run by PoliHub, the Technology Transfer Office at Politecnico di Milano, and Officine Innovazione at Deloitte. Switch2Product supports innovation by bringing out the most revolutionary and innovative scientific and technological solutions, as well as the most promising business ideas, that emerge from the research and entrepreneurial mindset of students, researchers, PhD students, teachers and alumni at Politecnico di Milano.

  - **South Up!:** South Up! is a Call4Startup conceived and supported by Eni through Joule, Eni's free school for entrepreneurship, in collaboration with the Fondazione Politecnico di Milano, PoliHub and ALSIA. The call was created with the aim of identifying a successful model for the entrepreneurial ecosystem of southern Italy, providing innovative projects in the agritech and agroenergy fields with an acceleration programme for territorial development, with the contribution and involvement of Basilicata's agricultural businesses. The initiative is aimed at promoting innovative and technological solutions in the agricultural sector, with a focus on both social and environmental sustainability, making full use of the circular economy as a lever.

  - **Entrepreneurship Lab:** The Entrepreneurship Lab is an experiential course that involves participants transferring the dynamics, language and methodologies of startups to their activities. In a ten-week journey, participants work side by side with startups, engaging in the research and validation of their business models. Through a weekly interaction with their direct involvement, the future Startup Experts of PoliHub have the opportunity to apply the methodologies - both basic and advanced - learnt over the initial two days of training, with the support of a senior expert from Eptagon Lab who accompanies the participants through the subsequent nine weeks of work and interaction with the startups selected by PoliHub.

- **Affamati di Futuro:** Affamati di Futuro (Hungry for the Future) is the format produced by PoliHub, in collaboration with Deloitte Italia, aimed at the online community of innovators, startuppers, technology enthusiasts and the curious. A series of meetings livestreamed on YouTube, LinkedIn and Facebook, led by Gabriella Greison - a physicist, writer, journalist, theatre actress, scholar and artist - and Enrico Deluchi, General Manager of PoliHub, with speakers from key areas such as universities, venture capital firms, startups, companies, organisations and institutions making for a multi-voice dialogue providing a collaborative exploration of what the future of technology will be.

- **MADE:** MADE is part of the Industry 4.0 Italian ecosystem created by the Competence Centres and Digital Innovation Hubs, and its Digital and Sustainable Factory supports enterprises in their path of digital transformation towards Industry 4.0. MADE provides a wide range of knowledge, methodologies, and digital tools that encompass the entire product lifecycle: from design to engineering, production management to delivery to the customer, all the way to the end of the product lifecycle.

- **EIT KICS@POLIMI** Knowledge and Innovation Communities (KICs) are the main operational tool used by the European Institute of Innovation and Technology (EIT), an EU body and integral part of Horizon 2020 created in 2008 to increase Europe's ability to innovate. With more than 1000 partners, the EIT is Europe's largest innovation network. It encompasses the 'knowledge triangle' integrating the industrial world, education and research in order to find solutions to pressing global challenges. In this sense, the KICs act as catalysts for innovation, performing activities throughout the entire value chain, from training and instructional programmes to innovative projects and support for business incubators and accelerators. Each KIC represents an independent legal entity equipped with its own physical infrastructure and financial resources. Politecnico di Milano is part of 5 of the 8 KICs active in the EIT: Urban Mobility, Manufacturing, Climate-KIC, Digital and Raw Materials.

The Digital Innovation Observatories of the School of Management were founded in 1999 with the aim of creating and disseminating knowledge in all major areas of digital innovation. Today, more than 35 Observatories are operational and involve many different companies: their mission is to create, disseminate and provide access to authentic knowledge on digital innovation to promote its development and its effective and conscious use for the sustainable progress of society.

The Technology Foresight Centre is intended to be a tool with which Politecnico di Milano brings together the expertise of its network of national and international academic and industrial experts to produce forecasts for technological development. The aim is to provide key decision-makers with selected information and critical input on possible future impacts.

Data

JRCs

61	1.138.096 €	5
total number of active partners	average value per project	partners who have joint laboratory infrastructures with Politecnico

ECONOMIC MACRO SECTOR (ATECO 2007)	NUMBER OF ACTIVE PARTNERS
Financial activities	1
Public administration	2
Arts and entertainment	2
Manufacturing	31
Professional and scientific activities	2
Wholesale	3
Construction	7
Water and waste management	1
Electricity and gas supply	4
Business support	1
ICT	3
Transport	4
Total	**61**

Research labs network

The research labs network at Politecnico di Milano encompasses 4 Large Infrastructures, 32 Joint Labs and 246 Research Labs.

Spin-offs

As of December 2020, there are 67 active spin-offs at Politecnico di Milano, more than half of which have been activated in the last 3 years:

SPIN-OFFS ACTIVATED IN 2018-2020		
2018	2019	2020
14	13	9

Each spin-off is managed by the department from which it originates, with the Department of Electronics, Information and Bioengineering holding the largest share, followed by the Department of Mechanical Engineering and the Department of Chemistry, Materials and Chemical Engineering. The subject areas most commonly researched and developed within Politecnico's spin-offs are Health & Bioengineering, Industry 4.0, and Green & Energy.

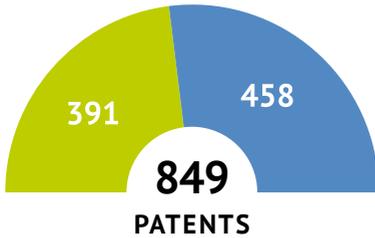SPIN-OFFS ACTIVE FROM 2000 TO 2020 BY DEPARTMENT

DEIB 38, DFIS 6, DICA 5, DMEC 12, DIG 6, DENG 4, DMAT 2, DABC 3, DAER 4, DCMC 12, DESIGN 4, 2 DIP 4
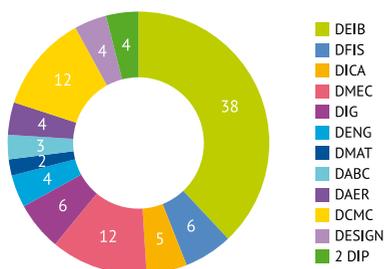
SPIN-OFFS ACTIVE FROM 2000 TO 2020 BY SUBJECT AREA

4.0 38, Health & BIO 6, Laser/Sensori 5, Telecom 12, Green & Energy 6, Finanza & Analytics 4, Mobilità/Automotive 2
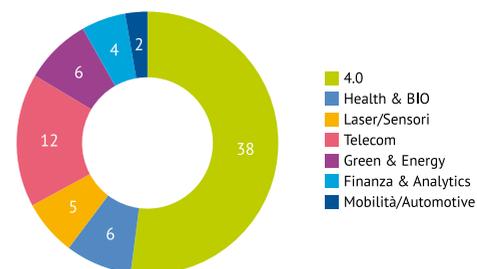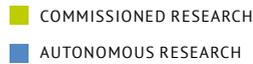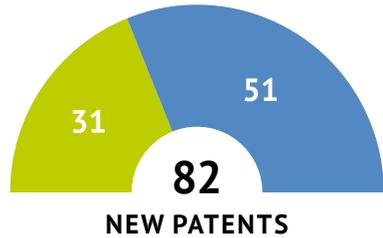
Patents

The patents registered by Politecnico di Milano belong to 849 patent families, with a grand total of 2324 individual patents. The majority of these are held by the Departments of Chemistry, Electronics, Information and Bioengineering, and Mechanical Engineering.
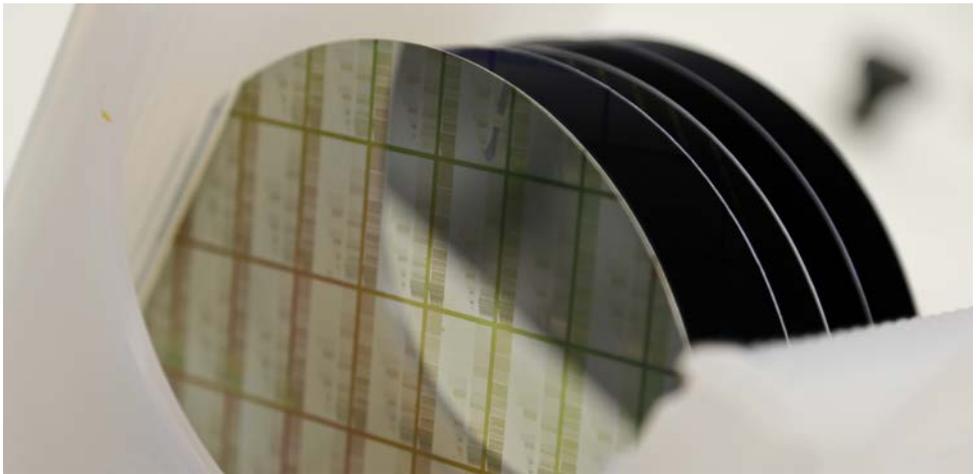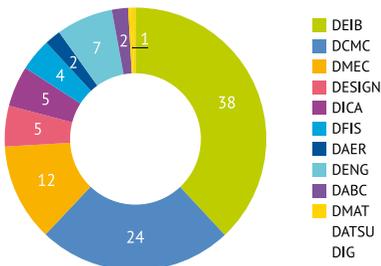
391   458

849
PATENTS

- COMMISSIONED RESEARCH
- AUTONOMOUS RESEARCH

31   51

82
NEW PATENTS

- COMMISSIONED RESEARCH
- AUTONOMOUS RESEARCH

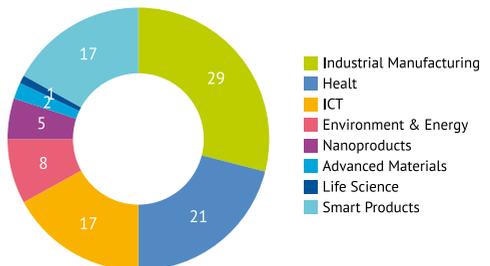*All patents in portfolio excluding those abandoned or rejected from 2000 to 2020. 849 patent families, EXCLUDING REJECTED ones

38
24
12
5
5
4
2
7
2
1

- DEIB
- DCMC
- DMEC
- DESIGN
- DICA
- DFIS
- DAER
- DENG
- DABC
- DMAT
  DATSU
  DIG

29
21
17
17
8
5
2

- Industrial Manufacturing
- Healt
- ICT
- Environment & Energy
- Nanoproducts
- Advanced Materials
- Life Science
- Smart Products

* Based on 475 recent patents labelled on 849 patent families

Teaching and research

The activity of mapping teaching activities on the SDGs identified 10 course units which deal with themes linked to SDG9; among these, 3 make explicit reference to the SDGs in the course programme, and 2 state that the entirety of the curriculum is focused on Sustainable Development: the laboratory **Business in transformation** and the laboratory of **Construction Architecture**.

The themes of SDG9 are even more relevant in the research activity at Politecnico di Milano, with 32 recent research projects focusing on them, confirming the university's strong vocation for innovation and technology. This is also reflected in international cooperation projects, which aim at supporting global effort towards the achievement of SDG9 by addressing issues related to mobility, cultural heritage and the spread of innovation towards developing countries:

ACRONYM AND TITLE	GEOGRAPHICAL CONTEXT	DURATION	LEAD DEPARTMENT
EMotion - Eritrea Mobility and cultural heritage: new frontiers of the Horn of Africa	Eritrea	2019 - 2020	Department of Mechanical Engineering
AILs - Emerging Africa Innovation Leaders	Ethiopia, Kenya, Mozambique, Niger, Nigeria, Tunisia	2018 - 2019	Department of Energy
Convention Museums-Program for the definition of a strategic plan for the improvement and enhancement of the museum folklore, the museum of popular traditions and the site of the Roman theatre of Amma	Jordan	2020 - 2023	Department of Design

Administrative units

The Research, Innovation and Corporate Relations Division (ARES) is the administrative division principally involved in SDG9. Its staff supports Politecnico di Milano by promoting strategic agreements with national and international companies and institutions, fostering the alumni network, and supporting faculty in obtaining research funding.

- **Research Office Unit:** the Research Office (RO) provides specialist support to researchers and staff during all stages of the research project lifecycle. The office gives information and advice in scouting, training, preparing proposals and grant management for national, European and international projects. Special focus is given to the Horizon - the EU Framework Programme for Research & Innovation. The Research Office has expertise in strategic planning, the writing and evaluation of research proposals, and career development, as well as an in-depth knowledge of funding programmes and links to universities across the world. The RO organises training workshops and funding information days for the research community.

- **Technology Transfer Office:** the Technology Transfer Office (TTO) of Politecnico di Milano is one of the first to have been established in Italy and is amongst the founders of Netval (TTO Network of Italian Universities). Over the years, it has achieved significant results in terms of both intellectual property management and spin-off generation, with a portfolio of more than 1600 patents, half of which are already in use at an industrial and commercial level. The TTO's mission is to support Politecnico's researchers, staff and students in leveraging their research activity and bringing it to market, in order to develop products or services capable of improving everyday life, create further innovation, and generate returns to be reinvested in academic research activities. They provide researchers with the professional support needed at every stage of the technology transfer process, as well as interfacing with industries to find possible routes for exploitation and collaboration.

SDG10

REDUCED INEQUALITIES

Strategic programmes

Two main strategic programmes aim to guarantee equal opportunities for all those working and studying at Politecnico di Milano.

POP PROGRAMME

Pari Opportunità Politecniche (Polytechnic Equal Opportunities) is the strategic programme that aims to guarantee a work and study environment that respects differences in gender identity, disability, culture and background. The POP programme is structured around five strategic lines of action: gender identity (Gender POP), culture, nationality and religion (Multicultural POP), LGBTI+ support (Pride POP), disability (Multichance POP) and psychological wellbeing (Wellbeing POP). For each of the five lines of action, the university engages in promoting and organising a range of initiatives and services (guidance, listening and support, etc.) aimed at creating an inclusive environment that allows students, researchers and staff to pursue their careers successfully, both within the university and beyond its borders.

- **Italian courses for foreign students and visiting staff:** as part of the "Multicultural POP" line of action, highly affordable Italian language courses are available to the international community of Politecnico di Milano. Different course levels are offered, from Beginner to Advanced, in order to cater for the specific needs of each person. All course levels are organised and offered each term, with a view to meeting the particular needs of exchange students who might attend Politecnico di Milano classes and experience life in Milan for just a single term.

- **Non-discriminatory admissions test:** enrolment at Politecnico di Milano is open to all, with no discrimination on the grounds of gender, ethnic and national origin, sexual orientation, religion or belief, personal or political convictions, ability, social circumstances or age; the only requirement for admission is to pass the admissions test. Prospective students who require accommodations for learning disabilities or other impairments can access sessions of the admissions specifically tailored to their needs, upon presentation of medical documentation.

- **Accessible facilities:** Politecnico di Milano is committed to eliminating barriers to access for people with limited mobility. The university is currently engaged in a plan for the removal of architectural barriers (Piano di Eliminazione Barriere Architettoniche, PEBA). Two online resources are available for disability access information: **interactive maps** (PoliMaps), which have the option of showing wheelchair-friendly routes, and the **classroom search** tool, which shows the number of ergonomic seats for disabled students per room.

- **Accommodation for students with disabilities:** every year, Politecnico di Milano announces a competition for the allocation of accommodation spots for all enrolled students. Priority is given to students with a disability rating of 66% or higher. The accommodation available to students with disabilities is in Milan at the following residences: Casa dello Studente, Galileo Galilei, Campus Rubattino, Campus Certosa and Campus Martinitt. Additional accessible accommodation is available at some of the university residences that have an agreement with the Como, Lecco, Piacenza campuses.

- **Tuition fee exemption for students with severe disabilities:** students who have a disability rating of 66% or higher are exempted from paying university tuition fees.

- '**Alias' identity:** since 2017, Politecnico di Milano has had a protocol in place that allows students who are undertaking gender transitioning to activate a provisional identity - an 'alias' with respect to their identity in the registry - which is recognised by Politecnico for all intents and purposes of their university career.

Several scholarship programmes are available at Politecnico di Milano to guarantee equal rights to education for all, as well as promote enrolment amongst underrepresented groups. Scholarships awarded as financial aid are mainly funded by the Diritto allo Studio Universitario (DSU) Fund, which is financed by the Lombardy Regional Government as per Italian law, but to which the university contributes with its own financial resources to ensure that all eligible students can receive the scholarship. In so doing, Politecnico di Milano moves to eliminate the economic obstacles that would prevent deserving students without sufficient means from successfully completing their studies, ultimately helping to mitigate a major loss of human capital.

- **Diritto allo Studio (DSU):** these scholarships are assigned based on merit and family income; they include financial aid in terms of money and services (such as catering); eligible students who live far from Milan can also access university accommodation at a discounted price.

- **Extraordinary Grants:** financial aid for students who are experiencing serious events that affect their ability to continue with their studies, such as major economic problems, serious illnesses or natural disasters.

- **Merit Project Fund:** these additional scholarships, financed by Polimi at the request of student representatives, support the following initiatives: the supplementation of Erasmus scholarships, the extension of merit-based exemptions to first-year master's degree students, contributions to international competitions, prizes for the best students, scholarships for particularly deserving students considered 'away from home', sports scholarships.

- **Girls@Polimi:** this new scholarship programme is co-funded by private companies and designed for female students who enrol in engineering courses where they constitute a significantly underrepresented group (i.e., where female participation is lower than 35%).

- **First-Generation Students@Polimi:** this new programme is designed for students whose parents do not have a higher education diploma and who, for economic or cultural reasons, might refrain from starting a university career.

Affiliations and sponsorships

- Collaboration with **Parks Liberi e Uguali association**

- Annual sponsorship of **Milano Pride**, in synergy with the **PoliEdro** students' association (committed to raising awareness and supporting the LGBTI+ community). Responsible for organising events such as the 2020 Polimi Pride Week.

Data

This section presents quantitative data regarding Politecnico di Milano population, tracking the university's performance in terms of equal opportunities.
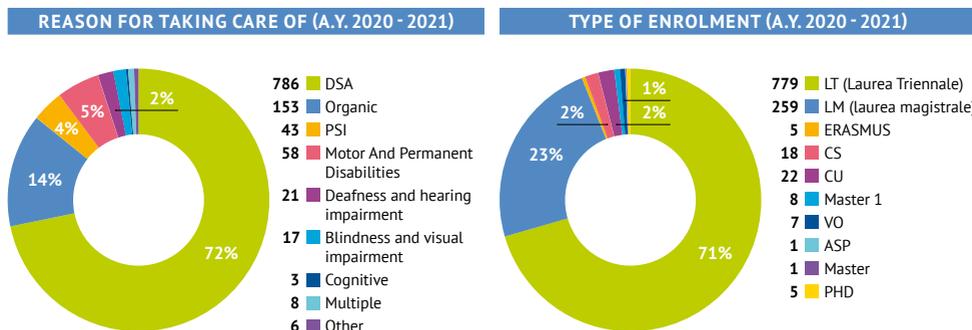
Students

The table shows the percentage of first-generation graduates from Politecnico, i.e. students whose parents do not hold an academic degree. Most first-generation graduates have at least one parent who has obtained a high school diploma.

FIRST-GENERATION GRADUATES												
GRADUATION YEAR	2015			2016			2017			2018		
	MSc	BSc	Total	MSc	BSc	Total	MSc	BSc	Total	MSc	BSc	Total
Students with no graduate parents	54%	68%	**58%**	51%	63%	**55%**	49%	62%	**52%**	51%	59%	**53%**
of which high school diploma	87%	83%	**85%**	89%	87%	**88%**	87%	86%	**87%**	89%	88%	**89%**
of which middle school diploma	12%	16%	**13%**	10%	13%	**11%**	10%	13%	**11%**	10%	11%	**10%**
of which elementary school diploma or no qualification	1%	1%	**1%**	1%	0%	**1%**	2%	1%	**2%**	2%	1%	**1%**

INTERNATIONAL STUDENTS FROM DEVELOPING COUNTRIES															
	2015-16			2016-17			2017-18			2018-19			2019-20		
	BSc	MSc	Total	BSc	MSc	Total	BSc	MSc	Total	BSc	MSc	Total	BSc	MSc	Total
Low-Income Economies	13	28	41	16	37	53	12	50	62	10	67	77	10	84	94
Lower-Middle-Income Economies	250	693	943	244	969	1213	231	1246	1477	222	1249	1471	200	1274	1474
Total number of students	**26426**	**14775**	**41201**	**26555**	**16059**	**42614**	**26394**	**17571**	**43965**	**26983**	**18076**	**45059**	**26797**	**18713**	**45510**

	2015-16			2016-17			2017-18			2018-19			2019-20		
	BSc	MSc	Total	BSc	MSc	Total	BSc	MSc	Total	BSc	MSc	Total	BSc	MSc	Total
Proportion of students from Low and Lower-Middle Income Countries	1.0%	4.9%	2.4%	1.0%	6.3%	3.0%	0.9%	7.4%	3.5%	0.9%	7.3%	3.4%	0.8%	7.3%	3.4%

Students supported by the Equal Opportunities Unit (students with disabilities and learning disabilities)

REASON FOR TAKING CARE OF (A.Y. 2020 - 2021)

- 786 DSA
- 153 Organic
- 43 PSI
- 58 Motor And Permanent Disabilities
- 21 Deafness and hearing impairment
- 17 Blindness and visual impairment
- 3 Cognitive
- 8 Multiple
- 6 Other

TYPE OF ENROLMENT (A.Y. 2020 - 2021)

- 779 LT (Laurea Triennale)
- 259 LM (laurea magistrale)
- 5 ERASMUS
- 18 CS
- 22 CU
- 8 Master 1
- 7 VO
- 1 ASP
- 1 Master
- 5 PHD

Scholarships and financial aid

- University Financial Aid (Diritto allo Studio Universitario - DSU)

ACADEMIC YEAR	ELIGIBLE STUDENTS
2015-2016	3055
2016-2017	3940
2017-2018	5074
2018-2019	5977
2019-2020	6489
2020-2021	6823

- Extraordinary grants: each year, a budget of €50,000 is allocated to cover Extraordinary Grants for students who are experiencing serious events that affect their ability to continue with their studies; in consideration of the COVID-19 emergency, in the last Academic Year an additional budget of €80,000 was allocated to mitigate extraordinary circumstances that students might be facing.

- Girls@Polimi scholarships: since the launch of the programme in 2019, 15 Girls@Polimi scolarships have been awarded to female students of Politecnico (2 in the A.Y. 2019/2020, 13 in the A.Y. 2020/2021).

- Accommodation: Politecnico di Milano reserves a significant portion of the students' accommodation facilities to DSU students.

ACADEMIC YEAR	TOTAL ACCOMMODATION AVAILABLE	ACCOMMODATION RESERVED FOR DSU STUDENTS
2015-2016	1888	720
2016-2017	2044	950
2017-2018	2068	950
2018-2019	1790	1045
2019-2020	1699	991
2020-2021	1699	991

Staff

TECHNICAL-ADMINISTRATIVE STAFF WITH DISABILITIES: CHARTS 2016-2020			
YEAR	TOTAL STAFF	PROTECTED CATEGORIES	OF WHICH LEGAL DISABILITIES
2017	1193	78	68
2018	1201	84	72
2019	1226	81	69
2020	1212	79	67
2021	1232	78	67

Teaching and research

In line with the POP Programme, Politecnico di Milano offers the PhD module **Discrimination and New Technologies: Risks and Opportunities**, aimed at providing tools to prevent and combat discrimination, also including cyber risks, as well as stimulating research on the sustainable deployment of new technologies to support the categories most at risk of fragility due to age, disability, gender or nationality. The module is open to PhD candidates of all programmes.

Additionally, a transdisciplinary research group for the promotion of inclusive policies - **Promoting Diversity and Gender Equality in Education, Science, and in Society as a whole: a Multi-disciplinary Approach** - has been established and spans six of the university's twelve departments.

Administrative units and supporting bodies

Various university bodies are involved in supporting and managing the activities of the strategic programmes.

- **Equal Opportunities Unit:** a unit established within the Campus Life Division that is responsible for organising activities and initiatives aimed at promoting a culture of equity, transparency and appreciation of diversity amongst the various components of the community. In particular, the Equal Opportunities Unit manages services for students with permanent or temporary disabilities; counselling for students (meetings on study methods, workshops on anxiety management, motivation, self-esteem); organisational, administrative and accounting support for the Guarantee Committee, the Confidential Counsellor and the counselling desk on work-related distress or discomfort; coordination between the managers/users/administration of the childcare facilities at Politecnico di Milano.

- **Multi Chance Poli Team:** this is a service for students with disabilities and learning disabilities. A variety of skilled consultants can provide services to ensure the right to education, as well as guaranteeing proper involvement and a significant level of autonomy to students with all disabilities, be they congenital or acquired, permanent or temporary. The services provided through the Multi Chance Poli Team include: counselling for students, technological aids for attending classes and exams, administrative assistance, dedicated financial aid, mobility assistance both within the university and between the university and the nearest public transport, dedicated tutoring and job placement support. The Multi Chance Poli Team is also integrated into the POP Programme with the "Multichance" line of action.

- **Financial Aid Unit:** this is the unit fully dedicated to the management of funds for Diritto allo Studio (scholarships, catering, accommodation) and for students' temporary collaborations. It also deals with student loans and grants as well as international thesis scholarships.

- **Guarantee Committee (CUG):** the Guarantee Committee (CUG) collaborates with other university services dedicated to the wellbeing and protection of students and employees of Politecnico di Milano. Its main objectives are: to promote equality in work and study between men and women and to prevent work-related conditions of distress or discomfort; to propose and organise scientific and cultural activities along with informational and training activities related to issues such as equal opportunities and occupational wellbeing; to spread knowledge and monitor observance of the University Code of Ethics and Conduct; to formulate opinions concerning staff reorganisation projects and training, staff evaluation criteria, flexible working (working hours, part-time work, remote work); to verify the results of positive actions, projects and beneficial practices promoted in order to offer equal opportunities as well as to prevent and counteract conditions of distress or discomfort in working and educational environments.

- **Confidential Counsellor:** the Confidential Counsellor provides advice and assistance to anyone claiming to have been a victim of discrimination, bullying, or sexual, moral or psychological harassment. They are a professional figure external to the university who acts in full autonomy, performing functions such as prevention, informing and training to promote a suitable organisational climate that ensures equal dignity and freedom for professors, technical-administrative staff and students within the university. They operate scrupulously, earnestly and with the utmost confidentiality with regard to the individual cases submitted to their attention.

- **Student Ombudsman:** the role of the Student Ombudsman, as per art. 15 of the University Statute, is to receive reports on problems and restrictions affecting the rights of students. It is an independent body which ensures compliance with current regulations. Students can contact the Ombudsman to report or complain about behaviour that violates university regulations and the rights and duties of students of Politecnico di Milano. The Student Ombudsman carries out an adequate investigation into the matter and tries to solve it, whilst also protecting the student against any retaliation.

Regulatory framework

Politecnico di Milano's commitment to achieving the objective of SDG10 is made explicit first and foremost in its core values of Respect and Fairness. Politecnico respects everybody's personal freedom, dignity and inviolability, promoting the value of diversity and multiculturalism; it recognises merit and the importance of fairness in evaluations and decisions; it promotes equal opportunities in all areas of academic life and guarantees fairness of access to the opportunities on offer for everybody.

The university regulations on non-discrimination and the promotion of equal opportunities are firmly established in the Statute, the Code of Ethics and Conduct, and the Code for the Safeguarding of Personal Dignity:

- The Statute of Politecnico di Milano affirms the dignity of every single person engaged in work and/or study, guaranteeing equal treatment as well as promoting initiatives aimed at removing discrimination in training, access to work, guidance and career progression.

- The Code of Ethics and Conduct affirms the university's founding values, requiring every single member of the community to refrain from discriminatory behaviour towards other members and to respect everyone without distinctions of gender, ethnic origin, nationality, sexual orientation, religion or belief, personal or political convictions, ability or social circumstances.

- The Code for the Safeguarding of Personal Dignity emphasises the importance of preventing and combating discrimination on the grounds of gender, ethnic and national origin, sexual orientation, religion or belief, personal or political convictions, ability, social circumstances and age. Moreover, harassment and sexual harassment are specifically considered to be forms of discrimination.

The regulation on financial aid for students relies on Regional Law no. 33 of 13/12/2004, under which universities are entrusted with the management of the measures for the right to study. In Lombardy, unlike in other regions, an innovative experiment is currently underway with the aim of evaluating and developing student merit (protocol of 19/07/2010 signed with the Ministry for Universities and Research). Each year in June, a call for applications is published, clarifying the type of support offered, who can apply, access requirements and evaluation criteria.

SDG11

SUSTAINABLE CITIES AND COMMUNITIES
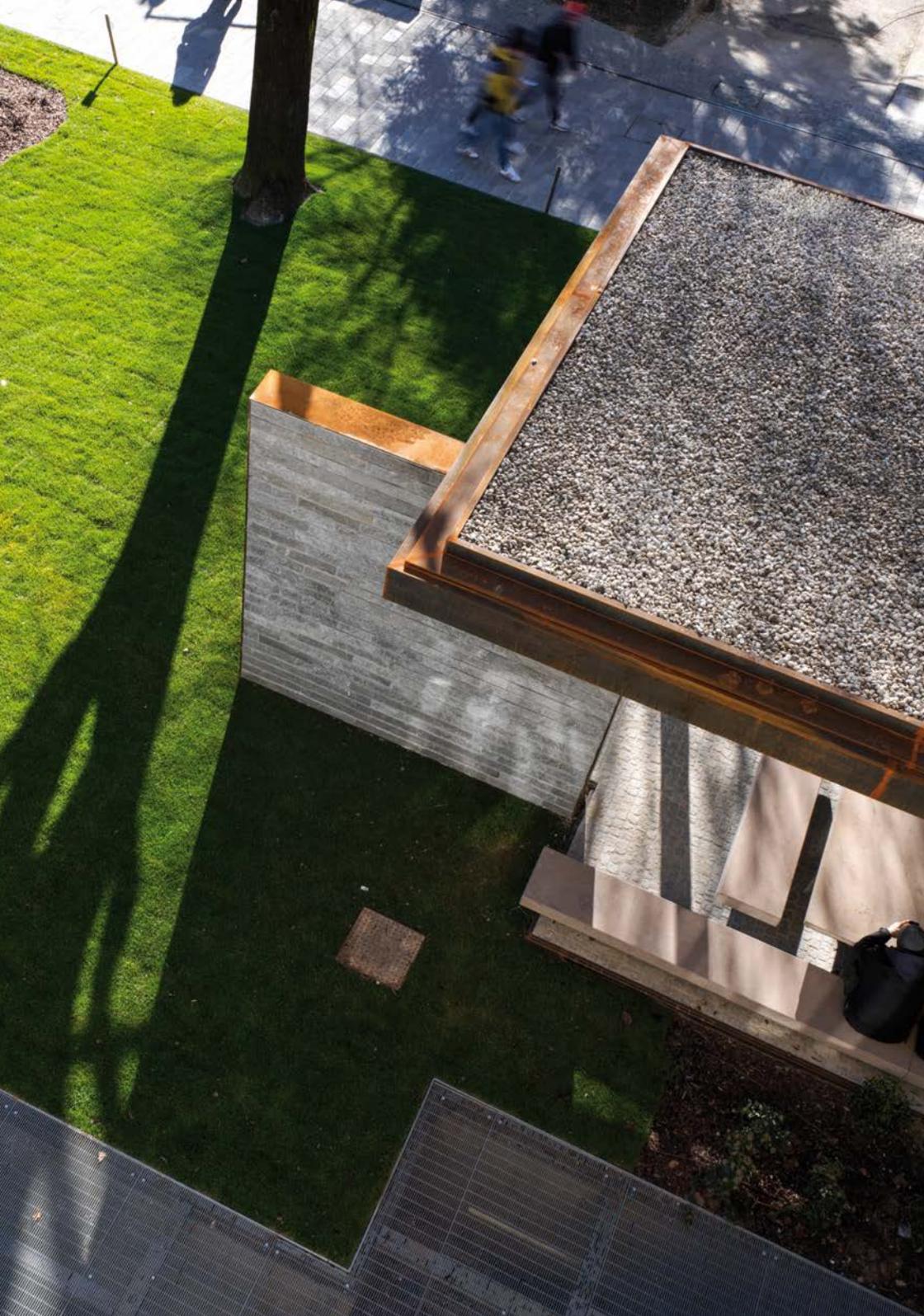
Strategic programmes

Politecnico di Milano has launched four strategic projects linked to SDG11, in line with its dual vocation of offering innovative and green spaces for studying, working and gathering, and of being a catalyst for open and accessible culture, with a view to the development and sustainability of the community in which it is located.

VIVIPOLIMI

Ongoing since 2019, ViviPolimi is a strategic project aimed at upgrading the quality of work, research and teaching spaces at Politecnico di Milano, bringing them into line with international standards and creating more interconnections between the university and the city. Within the programme, particular attention has been given to the renovation of green spaces and the integration of green areas into the development of new university facilities.

- **ViviPolimi@Green** and **ViviPolimi@Health** are the two main lines of action, aiming to transform spaces in terms of environmental quality and mental and physical wellbeing, with a view to planning, monitoring and developing a user-friendly way of changing and improving the spaces we live in. Architecture, the use of resources, investment plans, the orientation of technological developments and institutional changes are all incorporated into a synergistic system to improve the spaces in Politecnico di Milano dedicated to work, research, teaching and socialising, through a lens of respecting and improving the environment, the landscape, and the places we experienced in our everyday lives. In this framework, the continuous conversion of outdoor spaces into green and pedestrian areas is one of the main objectives of the plan.

CAMPUS SOSTENIBILE

A project that has been ongoing since 2011, aimed at redesigning the university campuses in a sustainable way and proposing a sustainable model for the whole local community. To this end, they coordinate projects for the sustainability of the university and the city through the creation of joint working groups (students, lecturers, researchers, technical-administrative staff) which incorporate and initiate collaborations with local stakeholders; they also organise public engagement and dissemination initiatives to spread a culture of sustainability throughout the whole local community.

Through the implementation of concrete, concerted and participatory interventions, which have restored livability and safety to neighborhoods where the University is located (as well as within it), Campus Sostenibile project has then achieved results in terms of: greater recognition of the value of the green in improving the quality of air and spaces also in terms of increasing resilience to extreme weather events (correlation with climate change topic); an increase in the adoption of "circular thinking", aimed at promoting the choice of "eco-sustainable" materials, even when not required, and at promoting the reuse of resources; a greater possibility of moving in a sustainable way thanks to the presence of suitable infrastructures for parking bicycles and scooters.

- **Sustainable mobility** Low-impact and electric mobility are incentivised through **infrastructural interventions** (campuses renewal and redesign, including the installation of renovated bike shelters), **awareness campaigns** (e.g. seminars, test drives, experimentations, citizen science projects, ...) with many different partners in order to raise awareness on the topic and takes part in the activities organized each year for the European Mobility Week; **facilitations and agreements**, providing funds

for staff subscriptions to public transport, giving them the opportunity to purchase public transport passes with dedicated accessibility schemes, and signed agreements for discounts on shared mobility services (car sharing, moped sharing, bike rental, bus/shuttle services, carpooling) and **networking activities** in working groups at local (together with the Municipality of Milan, Metropolitan City of Milan, Lombardy Region, various association and stakeholders related to mobility), national (RUS) and international level (e.g. the European Commission's U-MOB LIFE project).

- **Festival dello Sviluppo Sostenibile (Sustainable Development Festival)** The Politecnico di Milano has been taking part in this event since its first launch in 2017, which is organised every year by the ASviS – Associazione Italiana per lo Sviluppo Sostenibile, as a way of marking European Sustainanble Development Week. ASviS is a partner of the Italian University Network for Sustainable Development (RUS), network which includes our university. During the Festival, the Politecnico di Milano organises a rich programme of events which are open and freely accessible to the general public.

- **Milano Bike Challenge** Politecnico di Milano takes part to the Milano Bike Challenge, a friendly competition between companies aiming at increasing the number of workers going to work by bicycle, since 2015. In 2019 the Politecnico Personnel Team managed to win the competition, while the years before had taken the second place. In the last edition of the Bika Challenge, the 121 participants from Politecnico cycled for more than 28,000 km, resulting in the avoidance of approximately 3tonnes of CO_2.

CULTURE@POLIMI

Thanks to a close-knit and fruitful network of relationships and strategic alliances with cultural bodies and institutions both national and international, Politecnico di Milano is able to organise various cycles of cultural events that are open to the city, enhancing the university's role as a catalyst of free culture available to all. Shows, concerts, meetings, book presentations, conferences, exhibitions, guided tours and film discussion groups, with topics ranging from science to technology, architecture to design and art, all make for a rich programme of events that spans the entire course of the year.

- **MEETmeTONIGHT** Every year, Politecnico di Milano, together with four other Italian universities, organises a two-day local public event to correspond with European Researchers' Night. The main objective of MEETmeTONIGHT is to foster a greater degree of interaction between citizens and the world of science. All its activities aim to promote researchers and their profession, with a special focus on both the younger generations and the recognition of the role played by Europe. The intention is to show how research has an impact on our lives, how fundamental it is, how present it is in the technologies and tools that we use every day, as well as to demonstrate that science is not the preserve of a restricted élite, but rather something for everyone to engage with.

- **Polimifest** Launched in 2015, this is the summer cultural programme at Politecnico di Milano, offering open-air shows, film screenings, concerts and conferences open to the local population.

- **Art and Science** Launched in 2017, "Art and Science" is a cycle of events offering a series of meetings in which figures from the worlds of culture, fashion, politics, entertainment, sports and philosophy dialogue with the professors of Politecnico di Milano. The aim is to highlight the close relationship between art and science, creativity and technology.

The social engagement and responsibility programme at Politecnico di Milano. Polisocial promotes and encourages new multidisciplinary approaches with a particular focus on human and social development, expanding the training opportunities and chances for discussion and research offered to students, researchers and the university's teaching and technical-administrative staff. The goal is to foster a responsible attitude and to develop skills, expertise and new values in future generations of professionals and citizens, who are becoming increasingly aware and better prepared to handle ethical challenges and contribute to the development and wellbeing of their communities. Each year, Polisocial holds a "Polisocial Award" call for applications, which rewards Politecnico's best research projects with social objectives. Two editions of the Award specifically dealt with themes linked to SDG11: in 2017, the call for projects was oriented towards **Urban Peripheries**, whilst in 2018, the focus of the call was on **Africa: Smart Cities and Communities**.

• **Off Campus** is an initiative promoted by Polisocial with the aim of bolstering the presence of Politecnico di Milano within the city of Milan, following the principle of a university that is more responsible, open and aware of social challenges, as well as closer to the community that it is part of. The initiative was launched in 2018, with the first Off Campus space opening in the San Siro district in April 2019, whilst the second space - located in Milan's NoLo neighbourhood - was opened in September 2020. The Off Campus sites provide spaces for teachers, researchers and students to develop innovative teaching activities, with a particular focus on the development of new skills, acquired through working in real contexts; responsible research, with a view to the development of inclusive knowledge production processes; co-designing with local businesses to carry out operations capable of making a positive impact on the community. Off Campus San Siro also includes a Neighbourhood Archive, which collects various texts and materials - including some obtained from local residents' personal archives - in order to preserve a valuable heritage for the neighbourhood and the city.

Affiliations and partnerships

• **Festival dello Sviluppo Sostenibile (Sustainable Development Festival)**
Since 2017, Politecnico di Milano has been taking part in this event organised by the ASviS – Associazione Italiana per lo Sviluppo Sostenibile, as a way of marking European Sustainanble Development Week. During the Festival, Politecnico di Milano organises a rich programme of events which are open and freely accessible to the general public.

• **Festival dell'Energia (Energy Festival)**
The Energy Festival, the main national event in the sector, was launched in 2008 with the aim of creating an opportunity for networking and dialogue at the highest institutional and market levels, whilst at the same time offering the laymen of the general public an opportunity to learn more about a subject that concerns us all, in all areas of our everyday lives. Politecnico di Milano has been one of the main partners of the event since 2014.

Data

Sustainability in buildings

357.831 m^2	11.121.000 kWh	12,60 m^2	3.698 m^2
total area of the campuses (2019)	**electricity produced by renewable sources** (2019)	**of open space per person** (2019)	**of surface area covered by smart buildings** (2019)

Mobility

The number of agreements with mobility sharing services increased between 2017 and 2019; the subsequent reduction in 2020 is due to the COVID-19 situation, which strongly impacted the number of new users too.

AGREEMENTS				
	2017	2018	2019	2020
Sharing agreements	6	16	16	7
Users of sharing services	1500	5300	5400	650

Public transport is the main means of transport used by Politecnico di Milano students (54%) and staff (47%). To incentivise the continuous growth of the number of public transport users amongst university staff, Politecnico di Milano offers a discount on local (Milan area) and regional transport passes, which a significant portion of the eligible population take advantage of.

PUBLIC TRANSPORT				
	2017	2018	2019	2020
Total public transport passes	1077	1187	1090	858
ATM passes purchased through the University	677	727	686	617
TRENORD subscriptions purchased through the University	400	460	404	241
Employees (eligible) benefiting from the mobility grant	58%	62%	63%	46%
Discount on subscription cost	35%	35%	35%	35%

CHARGING STATIONS						
	2017	2018	2019	2020	PLANNED BY 2021	PLANNED BY 2025
Active charging stations	0	4	4	4	14	24

Politecnico di Milano offers a wide range of bike parking spots inside its campus, from traditional bike racks to covered bike shelters. Recently, a new bike station has been created inside the Leonardo campus, which is a protected space accessible only to those owning a Polimi card or badge and equipped with the necessary tools for little maintenance work. The overall number of bike parking spots dropped in 2020 because of the many building sites active in most campuses, which made some of the parking spots unavailable.

BIKE PARKING SPOTS				
	2017	2018	2019	2020
Available bike parking spots	1437	1504	-	1231

HISTORY OF PARTICIPATION IN THE BIKE CHALLENGE		
YEAR	POLITECNICO TEAM FINAL STANDING	PARTICIPANTS
2017	2°	158
2018	2°	110
2019	1°	121

Cultural activities

All cultural and public engagement activities organised at Politecnico di Milano and open to the general public saw significant reductions in both number and participation in 2020 due to the COVID-19 health crisis. All activities which could be enjoyed remotely were offered as online streams, with significant participation on the whole; activities which could only be carried out in person (e.g. access to archives and libraries), however, were significantly impacted.

CULTURAL ACTIVITIES: SERIES OF EVENTS ORGANISED AT POLITECNICO DI MILANO IN 2020	
TITLE OF SERIES OF EVENTS	IN-PERSON/ONLINE PARTICIPANTS AND YOUTUBE VIEWS
Polimifest 2020	5500
Incontro con l'Autore	1960
Arte e Scienza	1820
Alfred Hitchcock	40° dalla morte	186

EXHIBITIONS ORGANISED AT POLITECNICO DI MILANO 2016-2020		
YEAR	NUMBER OF EXHIBITIONS	NUMBER OF VISITORS
2016	3	1029
2017	3	1010
2018	3	1650
2019	5	1465
2020	2	188

NUMBER OF ENTRIES TO THE ARCHIVES OF POLITECNICO DI MILANO 2016-2020	
YEAR	NUMBER OF ENTRIES
2016	559
2017	231
2018	270
2019	211
2020	71

LIBRARY MEMBERSHIPS ACQUIRED BY LOCAL CITIZENS (NOT PART OF POLITECNICO COMMUNITY) 2016-2020	
YEAR	NUMBER OF MEMBERSHIPS
2016	108
2017	113
2018	118
2019	131
2020	85

Polisocial – Off Campus

Two Off Campus initiatives are active at Politecnico di Milano: Off Campus San Siro opened in April 2019, while Off Campus Nolo is ongoing since September 2020. Cumulative data are presented here, encompassing the entire lifetime of the two projects.

RESPONSIBLE RESEARCH DATA		
	NOLO	SAN SIRO
Involved faculty	9	16
Publications	7	8
Research partneships	0	2

INNOVATIVE TEACHING DATA		
	NOLO	SAN SIRO
Teaching activities	0	7
Involved students	0	291
Developed theses	2	0
Internships	4	3
Students involved in volunteering activities	0	12

CO-DESIGN AND DEVELOPMENT ACTIVITIES DATA		
	NOLO	SAN SIRO
Initiatives	3	4
Partnerships on individual initiatives	0	4
Institutional agreements	1	3

SERVICES TO THE COMMUNITIES AND CULTURAL ACTIVITIES FOR THE GENERAL PUBLIC		
	NOLO	SAN SIRO
Active services	3	4
Services users	134	*
Public cultural events	2	7
Participants to public cultural events	150	400

*Services active within the Off Campus San Siro include information and advice desks for legal and residential consultancy ("Clinica Legale" and "Touch Point – Milano 2035"), which cater to approximately 10 and 3 (respectively) users each day. In addition, the "Neighbourhood Archive" handled 50 materials and documents loans requests in 2020, and approximately 30 local entities (associations, cooperatives, committees) benefitted from training, coordination and capacity building activities organized by "Rete Sansheros".

Teaching and research

The mapping of teaching and research activities linked to SDG11 at Politecnico di Milano identified 41 course units, the majority of which are offered by the School of Architecture, Urban Planning and Construction Engineering, and 56 recent research projects; this is in line with the vocation of the School, and of the University in general, to further develop and explore the themes of green buildings, sustainable urban planning and smart cities, and in general to integrate sustainability in all teaching activities linked to architectural and urban planning, to spread the culture of sustainable cities and settlements among tomorrow's architects, designers and engineers.

The same interest can be found in the large number of research projects undertaken in the framework of International Cooperation and the Polisocial Award, both of which have been launched since 2016. The majority of these have been developed in African countries (Somalia, Mozambique, Kenya, Uganda), contributing to the alleviation of urban issues related to informal settlements, mobility and waste management.

ACRONYM AND TITLE	GEOGRAPHICAL CONTEXT	DURATION	LEAD DEPARTMENT
BECOMe - Business ECOsystem Design f or Sustainable Settlements in Mogadishu	Somalia	2019 - 2020	Architecture, Built Environment and Construction Engineering
POLIMI PARA ROCINHA - Environmental performances and social inclusion: a project for the Rocinha Favela in Rio de Janeiro, based on IMM methodology	Brazil	2016 - 2018	Architecture, Built Environment and Construction Engineering
Boa_Ma_Nhã, Maputo! A study for the integrated development of the region Boane, Moamba, Namaacha (Mozambique)	Mozambique	2019 - 2020	Architecture and Urban Studies
safari Njema - From paratransit mobility to mobility policies through big data analysis	Mozambique	2019 - 2021	Mathematics Francesco Brioschi
waste Management Africa - Comprehensive feasibility study for the closure of the informal dumpsite and construction of an integrated solid waste management facility in Ngong Town, Kenya - UN-Habitat	Kenya	2017 - 2018	Architecture, built environment and construction engineering
west Nile Regional Profile – Supporting multi-scale integrated planning in the Nebbi – Koboko corridor, Uganda	Uganda	2018 - 2019	Architecture and Urban Studies
iNTERIOS - Integrated management of natural resources in the Tiro Municipality (Gestione Integrata delle Risorse Naturali nell'Unione delle Municipalità di Tiro)	Lebanon	2019 - 2020	Civil and Environmental Engineering
VITAE - Sustainable Valorisation of the ErITreAn HEritage Adulis Archaeological Site Project	Eritrea	2020 - 2023	Mechanical Engineering

Administrative units and supporting bodies

The aim of creating a sustainable and engaging community within and around Politecnico di Milano is one pursued by the university as a whole, with each administrative division, campus and department playing its fundamental role in helping to fulfil this truly crucial objective. The following organisations are most closely and extensively engaged in pursuing this goal:

- **Campus Life Division:** the Central Administration unit with the highest degree of involvement in developing a lively, sustainable and engaging community experience for Politecnico di Milano population, as well as for local citizens. Multiple units within the division work towards this goal:

- 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 manages relations between Politecnico and the local community in terms of environmental sustainability issues; it organises internal and external dissemination initiatives; it monitors and coordinates the activities of the university's "Campus Sostenibile" project.

- Community Life Unit: the unit responsible for the organisation of integratory activities for Politecnico di Milano community, particularly recreational and cultural opportunities, language courses, the integration of international students, and relationships with students' associations.

- Librarian Services and Archives Unit: management of the University Archives, which are open to the local community with free access for all. Material collected in the archives can be freely reproduced by visitors with their own means. The Historical Archives of Politecnico di Milano are a valuable resource for the community of the Milan area, as they document the activities of important figures in engineering, architecture and design which are often interwoven with the history of the university.

- Museum Activities Unit: Politecnico di Milano manages an exhibition space ("Made in Polimi") and art collections owned by the university, celebrating the work of Italian artists (Arnaldo Pomodoro, Salvatore Sebaste). All exhibition spaces are freely accessible to the public.

- Sport Unit: in charge of organising sporting events and activities at Politecnico di Milano, aimed both at the university population (inter-university tournaments) and at the local community (PolimiRun). Management of sports facilities: 2021 marked the completion of renovation works on the Giuriati Sports Centre, which is now ready to become a place of sharing, participation and integration for students, the wider Politecnico community, and all citizens of Milan. The new facilities are built according to modern standards of technological innovation and energy sustainability, making for one of the most comprehensive sports facilities in the city.

- Housing and Dining Unit: in collaboration with the Financial Aid Unit, this unit provides affordable accommodation to students, PhD candidates and visiting professors.

- **Public Engagement and Communication Division:** the organisation and management of public engagement activities at Politecnico di Milano, largely consisting of designing, promoting, organising and measuring the impact of cultural and scientific exhibitions, events and initiatives. Organisational support for Polisocial, the university's social responsibility programme.

- **Real Estate, Construction and Development Division:** the planning and construction of buildings according to principles of environmental sustainability and reduced energy consumption. Recent construction and planning activities have been located in disused industrial areas (Bovisa Campus) and brownfield land (the "Goccia" area). The latest building standards have been applied in the planning of a new student accommodation facility near Bovisa Campus (the Gianluca Spina Residence). Other works have targeted areas accessible to vehicular traffic, renovating them and transforming them into pedestrian zones (Bonardi Campus).

- **Mobility manager:** the responsibility of the mobility manager it is to define the actions and practices implemented to promote sustainable mobility (final scope: to reduce the use of private cars and improve the organisation of working hours to limit traffic jams). The appointed Mobility Manager oversees the process and publishes a Sustainable Mobility Plan (SMP) to define actions and set targets for sustainable commuting. The role is specifically dedicated to managing demand and promoting sustainable mobility for employees and students to travel from home to work.

- **Waste manager:** a fundamental role in achieving SDG 11 (and SDG 12) is also played by the waste manager. This figure is responsible for implementing all activities related to the management of university waste, with the exception of radioactive and asbestos-containing waste (and it does so in compliance with current legislation).

Regulatory framework

In the framework of the commitment to being a university which offers hospitable spaces for its own population and the surrounding community, Politecnico di Milano has a specific policy on the general accessibility and temporary concession of its facilities: the free and open accessibility of Politecnico di Milano's spaces (both indoor and outdoor) is enshrined in the Regulations for the Concession and Temporary Use of the Spaces of Politecnico di Milano. These regulations also dictate the guidelines for the free/paid concession of university spaces for cultural, scientific and educational events to people who are part of the institution (e.g. staff, students' associations) and to external organisations.

The sustainable mobility and commuting of university staff and students is supported by the formal appointment of a **Mobility Manager**, whose responsibility it is to define the actions and practices implemented to promote sustainable mobility.

In parallel to the organisation of institutional events dedicated to culture and science, Politecnico di Milano also promotes and encourages the organisation of cultural, social, recreational and sporting activities by students of the university. To this end, the Regulations for the Constitution of the Register of University Student Associations and for the Funding of the Cultural and Social Initiatives of Politecnico di Milano Students lays out the process of requesting funding for sporting and cultural activities, as well as for educational trips and tours. Funding can be requested by students' associations and by groups of at least fifty students who have formally come together to organise an activity.

Finally, the university's commitment to having a positive impact on the surrounding community, which is supported at the governance level with the appointment of a Delegate for Civic Engagement and Social Responsibility, has led Politecnico di Milano to develop a specific policy to deal with facilities which have become obsolete and/or no longer suitable for use in activities within the university, considering the issues of environmental sustainability, responsible consumption, and addressing particular needs that are present in the community in which the university is located. The Guidelines for the Disposal, Transferral or Donation of Moveable Property therefore dictate that zero-value goods which are suitable to be sent to local waste management operations according to university and local law can also be donated to humanitarian or non-profit organisations, voluntary organisations, educational institutions and any other public or private non-profit organisations interested in acquiring them, thus having a positive impact on their activities whilst at the same time helping to reduce the avoidable production of waste.

SDG12

RESPONSIBLE CONSUMPTION AND PRODUCTION

Strategic programme

CAMPUS SOSTENIBILE - ENVIRONMENT

Within the 'Environment' line of action, the Campus Sostenibile project aims to improve the management of resources and waste, encouraging practices such as reuse, recycling and waste separation. These activities can be broadly divided into resource management and waste management.

Resource management

The various activities carried out in order to enhance the resource management at Politecnico can be classified in 5 main groups:

1 Services	**2** Projects	**3** Departmental activities	**4** Awareness raising campaign	**5** RUS
such as the installation of water fountains and sustainable vending machines	such as the one activated with Cingomma (or the Bevimi and ASAP projects, already presented while discussing SDG6)	such as the DICA project, developed to avoid wasting reagents	with activities as Avanzimania, detailed below	Participation to the RUS network and coordination of the Resources and Waste Working Group

Key actions in the area of sustainable resource management include:

- **Cingomma project:** The project consists in **collecting inner tubes and tyres** from different areas of the University (identifiable through an interactive map), which are used to make belts and other items (by an external partner) and then sold through Politecnico Official Merchandise channel. The experimental project also aims to help **disseminate the principles of the circular economy**, raising awareness among Politecnico community and the general public on the increasingly important issue of waste prevention. Politecnico makes some of its spaces available to enable the **implementation**

of experimental projects for the collection, reuse and recycling of materials. The University has also launched a **new Green Collection** as part of its merchandising activities to help promote a culture of sustainability. The creations made by Cingomma as part of this initiative, for example certain models of belts, are available in the Official Merchandise catalogue of Politecnico.

- Offer catering services in the University with a low environmental impact, catering suppliers have proposed actions and projects to reduce "food waste":

  - Use of hybrid material for cups in vending machines

  - Use of one's own cup at vending machines

  - Use of compostable material instead of plastic in bars and self-service restaurants

  - Inclusion of the option to buy water in organic bottles

  - Compass box: sale of leftover food at a reduced price at the end of the day

  - Agreements with food bank to recover surplus food from canteens and catering services

- **Sustainable vending machines:** In 2020 Politecnico installed in its campuses new vending machines, adding the possibility to order a drink without the plastic cup, which is meant to allow the use of personal cup that can be washed and reused, instead of producing single use plastic waste.

- **Avanzimania:** Avanzimania is a collection of recipes, created by the University Sustainability Unit (Campus Life Division), to raise awareness about a particular type of "hidden" waste: our food leftovers. The recipes to combat food waste, all proposed solely by Politecnico community, are posted on the CSCS social channels, on the website and YouTube, via videos, stories and photos.

- Development of the **"NO PAPER"** project: digitisation and de-materialisation of administrative processes, both in the teaching context and in the areas of accounting, personnel management, research and, more generally, document management.

- Promoting the activities of the **PoliCiclo** University cycle workshop : Policiclo is an association of student volunteers who manage a cycle workshop within Politecnico di Milano, located at the Bovisa Candiani campus. Thanks to the new materials donated by the Sustainability Department, Policiclo will be able to continue to contribute to sustainable mobility and the enhancement of the circular economy by reusing and repairing what is already there.

Waste management

Politecnico's aim is to improve efficiency in the waste management and collection system.

In order to achieve this result, the University has for some time been equipped with suitable infrastructures for the recycling of all types of waste produced, and has subsequently launched an intensive systematic awareness and information campaign.

- **Enhancement project:** Internal policies to raise awareness of recycling and to initiate, with specialised companies, the recycling of certain types of materials to make them useful again (e.g. paper. end-of-life equipment and metals such as iron, steel and aluminium).

- **Constant renewal, adaptation and integration of the infrastructure** for the collection of the four standard types of waste at the campuses (paper, plastic and aluminium, glass and general waste), adopting bilingual signs and container colours in accordance with UNI 11686.

- Presence of compactors/shredders in some refreshment areas (corner vending machines).

- Presence of Temporary Storage Facilities, organised in areas within the University, differentiated by size and by type of waste collected to accommodate different types of waste mainly from office, teaching, laboratory and research activities. Some waste (paper, plastic/metal, glass/metal and general waste) is handled by the public collection service and delivered to the large-volume containers located in specific areas of the University (ecological islands) where bulky waste, WEEE and toners are also handled and collected. Other special waste from laboratory and research activities is handled in areas directly identified and managed by the individual production facilities (facility depots). Overall, Politecnico has 3 ecological islands and 57 facility depots.

- **Containers, Project PILE [batteries]:** 25 specific containers of batteries and accumulators have been placed in different buildings on the Campus (identifiable through an interactive map). A specially designed label has been placed on the containers to improve the recycling of batteries and accumulators. Collecting exhausted batteries is really important because it allows to recover a lot of valuable resources like metals and rare chemical substances.

- **Material containers for architecture models:** Experimentation with students' re-use of material used or left over from modelling activities in the architecture workshops.

- **Containers, Project ZeroZeroToner:** The project involves the total recycling of spent printer cartridges, which are completely converted into raw and secondary materials, and participation in the Print Releaf programme, which allows the University to take part in one of the global reforestation projects in operation.

- **Second Life Arredo Project:** An in-house reuse system for furniture that is no longer useful has made it possible to survey more than 1,200 items and relocate 33% of them, thus avoiding disposal. The furniture is mapped by defining its main properties (e.g. size, material, state of repair) and the mapping is forwarded to the facilities that can show their interest in reusing the material.

- **Umido Project:** At Politecnico, experimentation with the collection of the organic waste fraction, which until now was only present in the University's canteens and cafeterias, was introduced with the aim of promoting and increasing user awareness of separate waste collection. The experimental phase of the project consists of the placement of 26 proprietary containers, widely distributed throughout the two Milan campuses (9 at the Città Studi site and 17 at the Milan Bovisa site) which are easily identifiable and marked with special signs informing and educating users about proper disposal.

Affiliations and partnerships

- **RUS** - 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 "Resources and waste" Working Group. The WG R&W works on the management (collection, temporary storage, transport and treatment) of all types of waste produced by the universities, in implementation of legislative and technical standards. It collects and disseminates, also from the perspective of the "circular economy", practices aimed at raising awareness on the issue of proper waste management and to address behaviors to prevent waste production from its origin: from the non-use or limited/shared use of certain objects or substances to the virtuous management of goods and materials in order to extend their useful life as much as possible.

- **SUN** - The University's participation in national networks on the subject, such as the Italian Network of Industrial Symbiosis (SUN - Symbiosis Users Network), promoted by ENEA. It represents the first Italian network on industrial symbiosis and as of now has 39 partners, among which there are universities, political institutions, research bodies, private companies, technology networks and local authorities. The SUN network objective is to be the reference point at which Italian companies can look when choosing to apply industrial symbiosis. Together with ENEA and CNR, Politecnico di Milano coordinates the 4th WG "Accreditation and standard for industrial symbiosis", which aims at publishing a support manual for identifying useful standards in the different phases of implementing the industrial symbiosis process.

- **CIRS** - Participation in CIRS (Comitato Interdisciplinare Rifiuti e Salute - Interdisciplinary Committee on Waste and Health) with various representatives, some of them even holding coordinating functions. CIRS carries out intense activity splitting them in 9 different thematic groups: Prevention, Landfills, Thermal
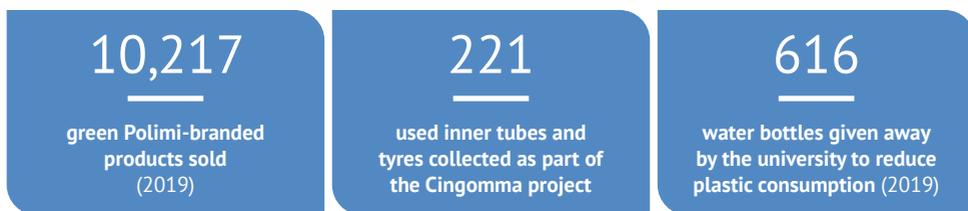
treatments, Reuse and recycling, Management of biomass from wastes, Special wastes, Environment and health, Communication, Territory and community: risks of not doing. Last May the first mid report was published and a webinar called "Strategies for an effective communication on waste management and health impacts", co-organized by Politecnico, was held.

- **MitE (Ministero della Transizione Ecologica – ex Ministero dell'Ambiente)** - Politecnico participated to the round table of the MiTe, representing the Resources and Waste Working Group of the RUS [Network of Universities for Sustainable Development] as coordinator of the WG. The round table was held to draft the document on "Minimum Environmental Criteria" for i) restaurant services through the installation of vending machines for food and water; ii) restaurant services; iii) services for the making and catering of sandwiches, iv) supply, installation and management of water houses and the distribution of Municipal water both indoors and outdoors.

- **Legambiente** - Politecnico di Milano cooperates with Legambiente, environmental association, on many projects, such as for the "Innovation prize" or the "Clean the world" initiative.

Data

Resource management

10,217	221	616
green Polimi-branded products sold (2019)	used inner tubes and tyres collected as part of the Cingomma project	water bottles given away by the university to reduce plastic consumption (2019)

Waste management

	2017	2018	2019	2020
Number of WIFs (Waste identification forms) managed annually	554	482	479	543
kg of batteries collected	556	691	296	1.132
EWCs managed annually	65	56	60	75

Teaching and research

The self-mapping process of teaching activities at Politecnico di Milano identified 12 course units related to SDG12 objectives. The most represented School is the Industrial and Information Engineering one, delivering 5 courses, followed by the School of Design (4). This widespread dissemination serves as a validating proof of the heterogeneity of the possible approaches to the circular economy and, more broadly, to SDG12 objectives.

Administrative units

The following administrative units are most closely and extensively engaged in pursuing this SDG:

- **Campus Life Division:** Multiple Units within this division are involved in the University commitment to SDG12: the Sustainability Unit organises internal and external dissemination initiatives and manages the experimental activities and projects related to circular economy; the Housing & Dining Unit is

active in making the university food and beverage supply as sustainable as possible (dining services with reduced waste, water dispenser, sustainable vending machines); the Community Life and Merchandising Unit manages the sale of green Polimi-branded merchandise.

- **Supplies & Facility Management Division:** with reference to resource and waste management, this Division manages waste collection at Politecnico and organizes testing of new waste collection initiatives (bike tires, organic waste, batteries) and circular economy interventions (reuse of office furniture).

- **Waste manager:** a fundamental role in achieving SDG 12 (and SDG 11) is also played by the waste manager. This figure is responsible for implementing all activities related to the management of University waste, with the exception of radioactive and asbestos-containing waste (and it does so in compliance with current legislation). In this regard, it is important to point out that, in 2019, the CRUI (Conference of Rectors of Italian universities), with the manifesto "Universities for sustainability, Sustainability is in the University" promotes the figure of the "resources and waste manager" at the University. This figure differs from the waste manager for a greater attention to the issues of circularity and the reuse of resources.

Regulatory framework

The overarching regulatory framework concerning responsible consumption and production, as well as the themes of circular economy is contained in the 2015 Action Plan for the circular economy of the European Union, further redefined in 2020. In addition, another fundamental directive is the Single Use Plastics Directive, dedicated to reducing the incidence of certain plastic products on the environment.

Considering this context, Politecnico di Milano included the circular economy in the university's Strategic Plan, as one of the great challenges on which Politecnico will focus in the coming years, alongside sustainability and climate change.

In order to implement the circular economy paradigm, Politecnico has issued a Waste Management Regulation, to clearly and univocally determine tasks and responsibilities in the tracking and disposal of all categories of waste produced within the University.

In addition, other internal directives relating to the circular economy, such as Second Life Arredo and the collection of reusable material for architectural models have been issued on campus and will be developed in the near future.

SDG13

CLIMATE ACTION

13 CLIMATE ACTION

Strategic programmes

POLITECNICO DI MILANO CO$_2$ MITIGATION PLAN

The Mitigation Plan of Politecnico di Milano outlines the methodological framework for the definition and subsequent verification of the University's CO$_2$ 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$_2$ 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$_2$ 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$_2$ 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.

VIVIPOLIMI@GREEN

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 m²), 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
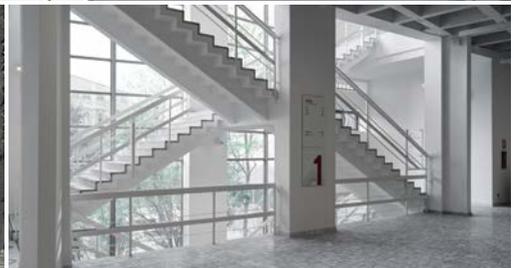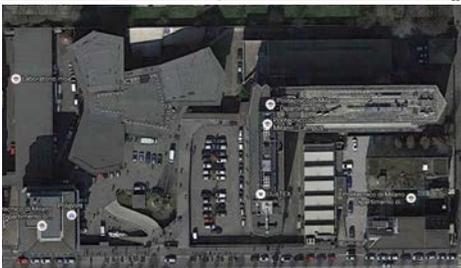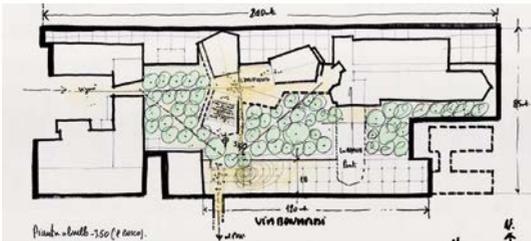
Data

Reducing emissions

-25% and -35%	€ 1 mln	€ 4.8 mln
the university's carbon emissions reduction goals for 2025 and 2030, respectively	to replace the refrigeration units with new, high-performance ecogas units (2019)	investment funds already earmarked and planned for trigeneration facilities on the Città Studi and Bovisa Campuses (2019)

Legend:
- Reduction of CO_2 emission factor of cars
- Reduction of CO_2 emission factor of power generation
- Sustainable mobility
- Regulation of heating and cooling systems
- Retrofitting of existing buildings for increasing energy efficiency
- Renewal of cooling machines
- Production of Photovoltaic energy
- Replacement and optimisation of lighting bulbs with LED technology
- New trigenerator for the MI – Bovisa (Via La Masa) Campus
- Optimisation of Trigeneration plants of the MI – Città Studi (Leonardo) Campus

Adaptation to climate change

+920 m²

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 m²

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

1

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_2 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_2 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.

SDG16

PEACE, JUSTICE AND STRONG INSTITUTIONS

Actions

Politecnico di Milano expresses its commitment to fulfilling SDG16 by acting as:

- A university which encourages and respects the participation of students, faculty and staff in decision-making processes through elected representation. All components of Politecnico population are included in university bodies, with representatives given the opportunity to make their voices heard at all levels of governance

- A university and public administration that values transparency, making its internal regulations open and freely accessible through a dedicated portal, committing to transparent and equitable selection processes, and publishing financial data and documentation

- A university that operates in close contact with and provides impartial expert technical support to local and national governments, as well as to all public administrations who rely on our expertise and advice.

ELECTED REPRESENTATION AND STUDENTS' UNIONS

All components of the university population (faculty, students, technical-administrative staff, researchers, PhD students) are guaranteed fair and full representation in Politecnico di Milano's governance structure. The Statute of Politecnico di Milano defines the governing bodies of the university, describing their responsibilities and indicating which components are represented in each of them:

- Faculty elect 16 representatives in the Academic Senate, 4 representatives in the Board of Governors. All faculty of each department are part of the Departmental Council.

- Students elect 4 representatives in the Academic Senate, 2 representatives in the Board of Governors and several representatives in the committees, boards and councils of the individual schools.

- Technical-administrative staff elect 2 representatives in the Academic Senate, 1 representative in the Board of Governors, and 2 representatives in each Departmental Council.

- Temporary research staff elect 2 elected representatives in each Departmental Council.

- PhD Students elect at least 1 representative in each Departmental Council and 4 representatives in the PhD School Board.

The **Student Council** is an advisory body which makes proposals and provides advice to the university's governing bodies on issues under discussion in the Academic Senate and the Board of Governors. It is composed of the student representatives in the Academic Senate, the Board of Governors, and the Joint Committees of the schools of Politecnico di Milano.

Politecnico di Milano encourages and promotes the establishment of **students' associations** with cultural, social, recreational or scientific aims. At present, 25 students' associations are active at the university; additionally, in June 2017, these associations inaugurated an informal round table in which each association is represented by one member. This round table, which meets monthly, also involves the participation of student representatives, who liaise between the associations and Politecnico. Any students who wish to form an association must follow the procedure illustrated in the Regulations for the Constitution of the Register of University Student Associations and for the Funding of the Cultural and Social Initiatives of Politecnico di Milano Students.

TRANSPARENCY

Transparency at Politecnico di Milano is one of the core values established in the Code of Ethics and Conduct: "Politecnico di Milano promotes the dissemination of the information necessary to guarantee the traceability and transparency of administrative processes, and the correct balance between transparency and privacy protection. The community is committed to being fair in decisions, to ensure transparency in decision-making and in evaluation processes, and to promote clear communication. The constant search for dialogue and open discussion is also expressed in the explanation of the motivations and decisions taken."

Administrative transparency is pursued following the guidelines laid out in the Regulations on Administration, Finance and Accounting. The Transparency page of the website allows a comprehensive view of the main administrative acts of Politecnico di Milano.

- **Three-year plan against corruption and for transparency**

  Politecnico di Milano receives financial contributions from the state and region, as well as from students, businesses, alumni and donors. As such, it is responsible to the entire community for the transparency and fairness of its actions. The Plan, which includes a risk analysis and a map of the critical issues related to corruption and transparency, aims to:

  - strengthen the oversight on high-risk processes by establishing an internal auditing unit that carries out the activity in full autonomy;

  - increase the involvement of managerial staff by setting specific individual objectives included in the performance assessment plan.

  Politecnico di Milano will organise training related to the Plan and the content of the Code of Ethics and Conduct for all technical-administrative staff, and will also establish a working group on conflicts of interest.

- **Polimi for COVID-19 and the Premio Rosa Camuna**

  During the COVID-19 pandemic, Politecnico di Milano set in motion a series of research projects to support national and international efforts to tackle the pandemic within its area of expertise. These projects aim to analyse the mechanisms behind the spread of the virus, help to monitor the evolution of the pandemic, propose innovative technologies for laboratory analyses and treatments, and design pathways to mitigate the effects of the crisis and assist recovery. This significant effort was recognised by the Lombardy Regional Government, the president of which awarded the Rosa Camuna prize to Politecnico di Milano in May 2021.

- **Polimi for the City of Milan**

  Politecnico di Milano has established a long and fruitful relationship with the City of Milan, characterised by a deep connection between the university and the surrounding community, for which Politecnico aims to serve not only as a higher education institution, but also as an open and accessible space for socialisation, an institution which is active in preserving the local heritage, and a strong promoter of innovation in the city of Milan. Some prime examples of this relationship include the agreement for the urban redevelopment project of the Bovisa-Goccia area, with the Garden of Arts and Science, a new sports centre (Fabbrica dello Sport) and an innovation district to create an ecosystem of innovation with those who wish to develop business projects and startups together with Politecnico; the collaboration for the Off Campus projects in the San Siro and NoLo neighbourhoods, an example of co-design in conjunction with local companies to carry out interventions capable of producing a positive impact in the community; the university's commitment to donate tablets and PCs and to establish Internet connections in public schools in the city, as well as to promote digitalisation and technology training throughout the curriculum in order to educate young citizens.

- **Polimi for the Lombardy Regional Government**

  In 2018, the Lombardy Regional Government and Politecnico di Milano established a collaboration agreement with a view to improving the maintenance and management of the regional roadway infrastructures. Several joint activities were included in the agreement, specifically:

  - the development of guidelines for the classification, description, diagnosis, monitoring, lifecycle analysis and drafting of maintenance plans for the critical elements of the regional transportation network, e.g. bridges, viaducts and flyovers;

  - the development of criteria for the identification of priorities, accounting for indirect consequences related to downtime during maintenance operations;

  - the development of decision support tools for the management of bridges in both ordinary and emergency situations;

  - the application of the criteria developed to major pilot bridges;

  - the establishment of a monitoring network for roadway bridges as well as data management procedures, allowing for interoperability with existing operational databases.

  A working group on the maintenance and management of roadway infrastructures - "Cabina di Regia Lombardia Sicura" - was set up in conjunction with owners and operators of the regional transport infrastructure, with a view to defining a shared policy on the subject.

- **Poliedra**

  Poliedra is a consortium at Politecnico di Milano that operates as a consultancy and services centre, dealing with issues such as environmental sustainability, mobility, decision support systems, smart cities and communities. As such, it has supported institution and public administrations in the process of defining environmental policies; one of its most recent projects involved supporting the Italian Ministry of the Environment in developing the monitoring and evaluation process of its National Strategy for Sustainable Development ("Strategia Nazionale Sviluppo Sostenibile"). It also provides capacity building activities to institutions and players in the private sector: recently, it provided technical assistance to Unioncamere Lombardia in the promotion and dissemination of "green economy" best practices, with

particular reference to the application of Green Public Procurement procedures, by organising seminars on Green Public Procurement involving companies from the supply side, managing round tables with stakeholders, and directly supporting the contracting authorities in the drafting of the green specifications.

Affiliations and partnerships

- **European Charter for Researchers**

  The European Charter for Researchers is a set of general principles and requirements which specify the roles, responsibilities and entitlements of researchers, as well as those of the employers and/or funders of researchers; it affirms the **fundamental principles of academic freedom and freedom in research**. The aim of the Charter is to ensure that the relationship between researchers and their employers or funders leads to their success in generating, transferring, sharing and disseminating knowledge and technological development, as well as the researchers' career development. The Charter also recognises the value of all forms of mobility as a means for enhancing the professional development of researchers.

Administrative units and supporting bodies

- **Guarantor of Transparency:** The Guarantor of Transparency is responsible for verifying and promoting the circulation of information, publicity and the transparency of the decision-making processes of Politecnico di Milano. This figure is appointed by the Rector - based on proposal by the Academic Senate - from a pool of university professors, and remains in office for three years.

- **Head Against Corruption and for Transparency:** The Head Against Corruption and for Transparency is responsible for drawing up and submitting the Three-Year Plan against Corruption and for Transparency to the Board of Directors, assessing the effectiveness of the programme, defining the procedures for selecting and training the staff working in corruptible areas, and producing the Annual Report according to the national directives. The Internal Auditing Unit supports the Head Against Corruption and for Transparency in assessing how successfully the plan is being implemented.

- **General Affairs and Institutional Legislation Unit:** within the General Directorate, this is the unit responsible for managing electoral procedures within university bodies and coordinating the revision and updating of university regulations. It also assists the Head Against Corruption and for Transparency in performing their duties.

SDG17

PARTNERSHIPS FOR THE GOALS

Strategic programmes

POLISOCIAL

Polisocial promotes and encourages new multidisciplinary approaches with a particular focus on human and social development, expanding the training opportunities and chances for discussion and research offered to students, researchers, and the university's teaching and technical-administrative staff. Polisocial promotes technological cooperation in the service of local self-development, creating opportunities for field research in unconventional local and international areas. The network built by Polisocial is composed of international organisations, civil society associations, public administrations, foundations and private companies.

- **Polisocial Award:** annual competition run by the Polisocial programme with the aim of supporting academic research with high social impact. Proposals must guarantee the active and effective involvement of local partners, developing partnerships with them, and projects must have a strong social vocation. The purpose of the Award is to stimulate cooperation and inclusion processes in vulnerable contexts, develop innovative technologies, processes and services to reduce social inequalities, and consolidate research and co-design in collaboration with other university departments and/or external stakeholders. In 2018, a report entitled **Polisocial Award, Responsible Research Experiences** was published, summarising the experience of past editions of the Award.

INTERNATIONAL COOPERATION FOR DEVELOPMENT@POLIMI

Politecnico has formalised its vocation for university cooperation based on the interest and commitment of individual professors, who have been able to lay solid foundations on which to build more widespread interest and participation. From the outset, academic cooperation at Polimi has been defined by collaboration with universities in developing countries, with Africa in particular representing perhaps the longest-standing strategic geographical area. Politecnico di Milano's approach is characterised by research activities aimed at solving problems in developing countries, involving Polimi professors and young researchers working in synergy with local partners or stakeholders. Collaborations with universities in cooperating countries make up an important proportion of Politecnico's network, as do its close relationships with public administrations in the context of technical assistance services or the sharing of best practices. Within this line of action, the granting of scholarships (through national programmes financed by the AICS - the Italian Agency for Development Cooperation) and participation in mobility projects for the students and staff of universities in cooperating countries (mainly financed by the European Union) has seen an increase in recent years. A report entitled "Stories of Cooperation at Polimi" is due to be published in 2021 and will present a collection of the cooperation activities undertaken by Politecnico over the 2017-2021 period.

SUSTAINABILITY IN TEACHING

It is the university's aim to ensure that a culture of sustainability permeates the various training opportunities it offers, both in curricular teaching and in complementary activities. In order to spread knowledge and awareness of sustainability both within the university, amongst students, researchers and staff, and beyond, amongst citizens and school students, Politecnico therefore promotes various teaching activities.

In addition to the commitment to include SDGs in course curricula, Politecnico di Milano also offers specific curricular and extracurricular teaching activities which encompass all the themes of sustainability and the 2030 Agenda in particular:

- **Sustainable Development (course unit):** the course aims to introduce students to the theme of sustainable development and the role of technology in the complexity of global challenges. Sustainable development aims to identify innovative models for economic prosperity that are compatible with respect for the planet and the social inclusion of all people. It is through this lens that the rationale and logic behind this paradigm must be analysed and understood by the generations of engineers who will be working in increasingly global contexts.

- **Passion in Action – Passion for Sustainable Development (elective learning activity):** Politecnico di Milano offers particularly passionate and proactive students the chance to engage in "Passion in Action", a catalogue of innovative learning activities characterised by multidisciplinarity, transversality and soft skill development. One of the available paths, "Passion for Sustainable Development", aims to involve the students in a double-faceted process of learning and teaching about the SDGs and global sustainability challenges: the learning section is structured around seminars, workshops and individual study, whilst the "give-back" teaching phase involves peer education projects with secondary school students, in which Politecnico di Milano students take up the role of ambassadors for sustainable development and are tasked with educating the younger generation.

- **Higher Education for Sustainable Development Goals (MOOC):** classified as a "MOOC for citizens", this is open to the general public and aims to disseminate knowledge about sustainability, with a view to reaching the widest possible audience. The course introduces the concept of sustainable development whilst also providing an overview of recent debate and the policies promoted at the global level to tackle urgent environmental and societal challenges. The 17 SDGs are presented over the course programme. The course concludes with a call for action to accelerate and demonstrate the commitment of the higher education community.

As part of the university involvement in international cooperation and sustainability in teaching, Politecnico di Milano holds two UNESCO Chairs and manages one UNITWIN Network, promoting international inter-university cooperation and networking to enhance institutional capacities through knowledge sharing and collaborative work in key priority areas related to UNESCO's fields of competence:

- UNESCO Chair in Architectural Preservation and Planning in World Heritage Cities, aiming to develop innovative education, research and dissemination activities in the field of architectural design for heritage cities, by supporting the experimentation with new teaching and training practices, fostering international cooperation through the establishing of a cross-cultural network of partners, and facilitating the exchange and transfer of knowledge within different areas of the world.

- UNESCO Chair in Energy for Sustainable Development, which focuses on knowledge sharing and training on issues related to access to energy and sustainable energies strategies, in collaboration with international institutions and NGOs. The public-private partnership is enforced by working with the civil society players and/or public institution on research projects funded by private bodies for supporting local socio-economic growth.

- UNITWIN Network on Green Chemistry Excellence from the Baltic Sea to the Mediterranean and Beyond, aiming to promote an integrated system of research, documentation, training and information activities on Green Chemistry as a contribution to actions aimed at preventing pollution and risks, promoting the exploitation of green resources and reducing the consumption of non-renewable resources.

Other actions

- **GreenMetric Ranking and Impact Rankings:** Politecnico di Milano has been participating in the UI GreenMetric Ranking since 2010 as a way of measuring its performance in terms of environmental sustainability against that of an ever-growing number of universities around the world (more than 900 in the 2020 edition); the participation of such a large number of universities allows the ranking to track the progress made by higher education institutions towards the sustainability goals and to gather data that can be used to direct actions and policies geared towards achieving sustainable development for all.

  2021 will mark the first time that Politecnico di Milano applies for the Impact Rankings organised by Times Higher Education (THE), an initiative in a similar vein which takes a broader look at the theme of sustainability, measuring each university's performance with regard to all of the SDGs.

Affiliations and partnerships

- **Festival dello Sviluppo Sostenibile (Sustainable Development Festival)**

  Since 2017, Politecnico di Milano has been taking part in this event organised by the ASviS – Associazione Italiana per lo Sviluppo Sostenibile, as a way of marking European Sustainanble Development Week. During the Festival, Politecnico di Milano organises a rich programme of events which are open and freely accessible to the general public.

  The Festival dello Sviluppo Sostenibile is a unique opportunity for academics, civil society players and NGOs to disseminate knowledge and best practices pertaining to the SDGs, as well as to create and strengthen cross-sectoral networks which can effectively contribute towards sustainable development in the local and global community.

- **RUS (Rete delle Università per lo Sviluppo Sostenibile)**

  The RUS - Network of Universities for Sustainable Development - is a network of Italian universities that cooperate with the aim of pursuing and promoting sustainable development, with the two main branches of environmental sustainability and social responsibility. The main purpose of the Network is the dissemination of the culture and best practices of sustainability, both within and outside the universities (at the urban, regional, national and international levels), with a view to increasing the positive impacts of the actions implemented by the members of the Network in environmental,

ethical, social and economic terms, so as to contribute to the achievement of the SDGs and bolster the recognition and value of Italy's experience at the international level. The members are organised into seven working groups, each of which focuses on a specific aspect of sustainability; Politecnico di Milano is the coordinator for two working groups: Climate Change and Resources & Waste.

- **CUCS (Coordinamento Universitario per la Cooperazione allo Sviluppo)**

  The CUCS - University Network for Development Cooperation - is a network of more than 30 Italian universities, all committed to playing a concrete and innovative role in strengthening and improving international cooperation for development. A CUCS conference is organised every two years by one of the member universities with a view to enabling valuable networking, peer learning, and the blending of experience and concepts.

- **ISCN (International Sustainable Campus Network)**

  The International Sustainable Campus Network brings together more than 80 universities from all over the world. The mission of the ISCN is to provide an international forum to support higher education institutions in the exchange of information, ideas and best practices for achieving sustainable campus operations and integrating sustainability into research and teaching.

Data

Polisocial Award

TECHNOLOGICAL PRODUCTS OFFERED TO WIDER SOCIETY	
	2014-2019
Interactive web platforms	6
Mobile apps	5
Medical devices	3
Cooling units	1
Lab-on-a-chip diagnostic tests	1
Energy systems (mini-grids)	1

RELATIONSHIP BETWEEN THE UNIVERSITY AND THE COMMUNITY		
PARTNERSHIPS	**2014**	**2019**
Schools	11	20
Local communities	3	15
Associations/NGOs/citizens' committees	24	59
Strategic partnerships with institutions	1	5

Additionally, through the Polisocial Award, 16 teaching and education products have been developed, as well as one patent; the number of active partnerships developed thanks to the Award rose from 74 in 2014 to 233 in 2019.

## International cooperation for development projects

NUMBER OF PROJECTS		
	2011-2016	**2017-2020**
Projects	36	109
Partners	152	200

66 AFRICA

26 ASIA

16 EUROPE

9 AMERICA

1 OCEANIA

Main SDGs addressed by cooperation projects at Politecnico di Milano

90% of projects undertaken at Politecnico address themes that are related to six main Goals:

• SDG11 – Sustainable Cities and Communities
• SDG4 – Quality Education
• SDG7 – Affordable and Clean Energy
• SDG9 – Industry, Innovation and Infrastructure
• SDG8 – Decent Work and Economic Growth
• SDG17 – Partnerships for the Goals
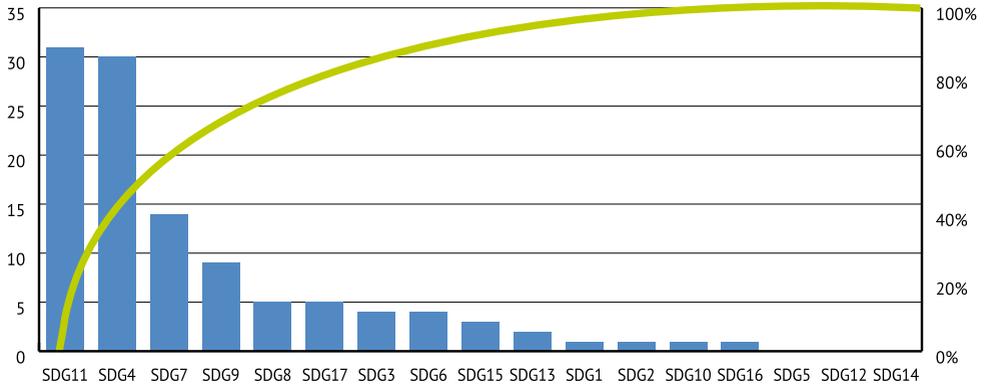
Administrative units

• **Social Responsibility Projects Unit:** established within the Public Engagement Division, this unit supports the action of the Polisocial programme and coordinates social responsibility projects developed at Politecnico di Milano and led by Rector's Delegates (Delegate to Cooperation and Development, Delegate to Civic Engagement and Social Responsibility).

• **Sustainability Unit:** established within the Campus Life Division; in addition to planning and developing actions related to environmental sustainability at the university, this unit has the role of spreading the culture of sustainable development and awareness about the 17 SDGs of the 2030 Agenda throughout Politecnico community and beyond, largely by promoting events and disseminating online content.

SDG 1, 2, 3, 14, 15 AT POLITECNICO DI MILANO

SDG1

NO POVERTY

Teaching

The self-mapping initiative POLIMI4SDGs identified only 1 teaching activity focused on the topic of SDG1, **Development Economics**, which aims to develop familiarity with some central themes and issues of economic development, and increase the understanding of the difference between growth and development, major growth theories, the measurement of inequality, significance of poverty, international trade, and role of foreign investments.

The testing of the keywords-based mapping methodology also yielded the same course, and identified 31 additional course units focused on SDG1; however, the pertinence of the majority of them does not appear to be satisfactory, suggesting that additional refining of the keywords is needed to achieve full mapping of teaching activities on this SDG.

Research

No recent research activity carried out at Politecnico di Milano makes explicit reference to SDG1, although a few projects indicate contributions to its achievement as secondary goals (3 research projects form the self-mapping initiative and 4 international cooperation projects with SDG11 as main focus).

SPESA SOSPESA
NOLO

CAMPUSPOLIMI

SDG2
ZERO HUNGER

Teaching

The activity of mapping course units on the SDGs identified only 1 teaching activity with close linkages to SDG2, **Trends in Food Industry Lab**, which analyses trends and challenges connected to the sustainable development of the food industry through the lens of the framework of the SDGs.

The school of Industrial and Information Engineering also offers a MSc in Food Engineering, in which the above-mentioned course unit is offered, which includes among its educational aims the ability of performing environmental and social sustainability analysis of food supply chains.

Research

The voluntary self-mapping campaign POLIMI4SDGs identified 6 research activities linked to SDG2. Below is a selection of those that specifically refer to SDG2 in their research objectives.

- **SIVEQ (2018-2019):** developed at the Department of Electronics, Information and Bioengineering, this project examines the recovery and redistribution of excess food through non-profit organisations.

- **Internet of Plants (2019-2022):** a research project developed at the AIRLab – Artificial Intelligence and Robotics Laboratory of the Department of Electronics, Information and Bioengineering. The aim is to create a virtual model of each plant in a crop and monitor its health status through various sensors. Ultimately, the researchers wish to make it possible to carry out localised interventions in the event of disease or stress, thus reducing non-targeted interventions and the consequent waste of water and nutrients, whilst also minimising the use of pesticides. The long-term goal is to achieve sustainable agriculture through the use of Industry 4.0 technologies.

- **Surplus food recovery and redistribution (2011-ongoing):** carried out at the Department of Management, Economics and Industrial Engineering, this project deals with the recovery of surplus food generated by actors in the food supply chain and its redistribution to underprivileged people through cross-sector partnerships (e.g. business donors, food banks and NPOs, local governments), representing one of the main channels through which the challenge is addressed.

Other initiatives

"Zero Waste" and the Milan Food Hub: in 2016 the City of Milan, Assolombarda the School of Management of Politecnico di Milano signed a memorandum of understanding entitled "Zero Waste", drawn up to reduce food waste and implement a new method for recovering and redistributing surplus food, allowing it to then be donated to people in need. This gave rise to the first district Food Hub promoted by the City of Milan, Assolombarda, and the School of Management of Politecnico di Milano, in partnership with Banco Alimentare Lombardia (Lombardy Food Bank) and supported by the "QuBì Programme – The recipe against child poverty". In 2019, the Hub successfully collected 77 tonnes of food, corresponding to more than 150,000 meals.

SDG3

GOOD HEALTH AND WELLBEING

Teaching

The activity of mapping teaching activities on the SDGs identified 2 course units specifically focused on SDG3: the Passion in Action course **Robot development to play with people with disabilities** and the curricular course unit **Biomaterials for protheses**. Differently, the keyword-based mapping yielded a significantly larger set of teaching activities (86), the pertinence of which appears to be adequate, although further analysis and keywords refinement process are needed to reach a definitive classification.

Research

The voluntary self-mapping campaign POLIMI4SDGs identified 16 research activities linked to SDG3. Below is a selection of the most recent ones, including those which specifically refer to SDG3 in their research objective (Tid Mekii and uKNEEversal).

- **Tid Mekii (2017-2019):** carried out at the Department of Physics, this project developed an innovative rapid diagnosis test for malaria, specifically designed for application in areas where the disease is endemic.

- **Place4Carers (2018-2020):** a research project developed at the Department of Management, Economics and Industrial Engineering aimed at identifying services for fragile people living in isolated territories through a collaborative model involving different stakeholders.

- **uKNEEversal (2019-2021):** a research project carried out at the Department of Electronics, Information and Bioengineering by the Biomechanics research group. Its aim is to develop a miniaturised 3D in-vitro model of a human joint in order to obtain new knowledge on the pathophysiology of osteoarthritis (OA).

- **ACTS - A Chance Through Sports (2020-2021):** a research project carried out at the Department of Design. The research intends to support and test out the introduction of a programme of structured sports activities into Milan's prisons, with the aim of improving the wellbeing and sociability of inmates and prison guards.

Politecnico di Milano has also supported the achievement of the objectives of SDG3 through an international cooperation and research project entitled MASTR-SLS, aimed at mapping out the transmission risk of schistosomiasis in Senegal and developed at the Department of Electronics, Information and Bioengineering in 2017-2018.

Other initiatives

- **NECSTCamp**

  An initiative developed at the CST Laboratory of the Department of Electronics, Information and Bioengineering. This project has the specific aim of improving self-confidence and self-awareness in both students and staff, boosting their fear and stress management abilities through training activities based on the CrossFit methodology, balance training activities for breath and stress management, nutritional counselling, and psychological counselling to guide the self-awareness improvement process. The first edition saw the participation of 45 people, which increased to 150 in the second edition. NECSTCamp has become part of the "Passion in Action", an innovative education programme at Politecnico di Milano.
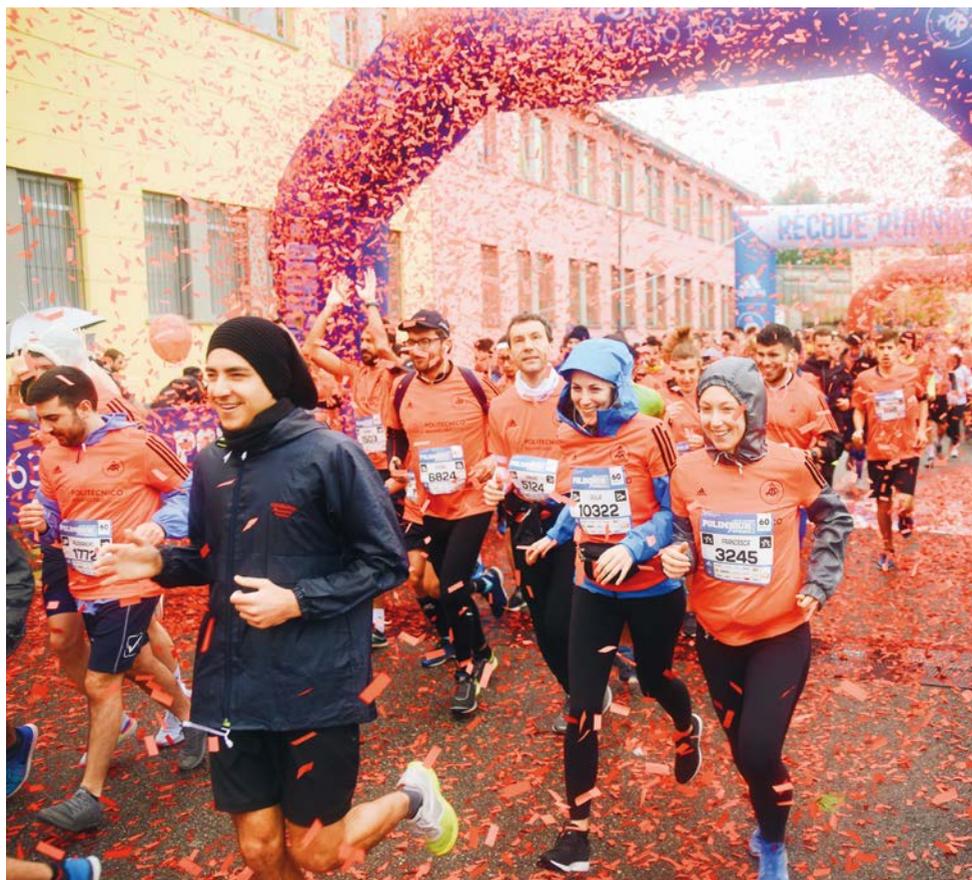
- **Sport@Polimi**

  Politecnico di Milano encourages all its students to practice sports. Sport is a tool to support individual training and professional growth - an opportunity for people to come together, increasing their sense of belonging, stimulating competition and building self-esteem. The university manages the Giuriati Sports Centre and membership of its facilities, which are open to Politecnico staff and students as well as all citizens of the community. The dedicated service organises activities in the facilities and events to promote a culture of sport and wellbeing within the university community, as well as opportunities for interaction between the activities of Politecnico and those of the city of Milan.

- **Medical device testing and hand sanitiser production during the COVID-19 pandemic**

  During the COVID-19 pandemic, many of Politecnico di Milano's departments and laboratories supported the local and national effort to increase the production of medical equipment. The Department of Chemistry and the Department of Energy converted some of their laboratories, dedicating them to the production of liquid hand sanitiser according to WHO guidelines. The Department of Energy sanitiser saw extensive use within university facilities, whilst more than 100,000 litres of the one produced in the Department of Chemistry (Polichina) were donated to the regional healthcare authorities, the Lombardy Civil Defence, and Milan's three prisons.

  At the same time, laboratories at the Department of Aerospace Engineering were testing the materials of face masks, disposable gowns and shoe covers to certify their adherence to standards.

SDG14

LIFE BELOW WATER

Teaching

The self-mapping initiative of teaching activities at Politecnico did not identify any course unit with specific focus on SDG14; this section was therefore integrated through keyword search mapping, which yielded 1 teaching activity linked to the themes of SDG14: within the **Built Environment and Landscape Design Studio**, students are challenged with the transformation project of a coastal settlements by addressing the relationship between natural open spaces and the built sectors, improving biodiversity and environmental quality; the integration between the coastal ecosystem and the built environment; the mediation between land and sea forces through the configuration of a resilient edge that can adapt and have "dynamic stability" respecting the natural actions; landscape strategies aimed at the prevention of the environmental risks connected with climate change and pollution, with particular attention to the comprehensive reconfiguration of the water management system.

Research

- **SAFENET (2016-2019):** a research project carried out at the Department of Electronics, Information and Bioengineering. The project evaluated different fishery management tools in the north-west of the Mediterranean Sea in order to identify the practices that best ensure the protection of fish stocks, as well as the socio-economic benefits of both small-scale and industrial fishing. The active involvement of the main stakeholders allowed for the management objectives of the fisheries to be identified and suitably prioritised. The results of the project show that an extension of the protected areas, or the implementation of measures to limit fishing effort, can have positive effects on both the conservation status of the stocks and the profitability of the fishing activity.

SDG15

LIFE ON LAND

Teaching

The self-mapping initiative of teaching activities led to the identification of 5 curricular course units dealing with themes linked to SDG15; in particular, the courses which present the strongest linkages to SDG15 are **Soil remediation** and **Ecology**, both offered within the BSc and MSc programmes of Environmental and Land Planning Engineering. Parallelly, the testing of the keyword-based mapping identified 6 teaching activities linked to SDG15 (among which Soil remediation can be found), which are offered by the School of Civil, Environmental and Land Management Engineering and by the School of Architecture, Urban Planning and Construction Engineering, with very high pertinence (all course curricula indeed appear to integrate "life on land" in educational content and/or teaching objectives).

Research

The voluntary self-mapping campaign POLIMI4SDGs identified 6 research activities linked to SDG15. Below is a selection of the most recent ones, including those which specifically refer to SDG15 in their research objective (Posidon and IO NON LI DISTURBO).

- **Posidon (2019-2022):** developed at the Department of Civil and Environmental Engineering for the Trieste Naval Authority, this project deals with the development of effective and affordable land reclamation techniques with a low environmental impact.

- **Protecting the Rural Landscape Heritage Starting from Agrobiodiversity and Local Knowledge (2018-2021):** a project carried out at the Department of Architecture and Urban Studies which addresses the protection of traditional rural landscapes, taking a holistic approach to ensure both the preservation of a unique historical and cultural heritage and the conservation of agrobiodiversity and natural resources, with the aim of ensuring the sustainable development of local communities over time.

- **IO NON LI DISTURBO (2019-2020):** a project carried out at the Department of Architecture and Urban Studies to develop materials for the drafting of a best practice manual for the construction of recreational structures to minimise disturbance to birds in protected wetlands.

- **FORESTAMI: IL PARCO METROPOLITANO MILANESE (2018-2020):** a project developed at the Department of Architecture and Urban Studies with the aim of drafting a "green strategy" for the city of Milan.

Credits

The 2021 SDGs@Polimi report has been prepared by a dedicated working group:

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