Sustainability Report 2022

Politecnico di Torino | PoliTO Sostenibile

Sustainability Report 2022

Polito Sustainability Report 2022

Politecnico di Torino

PoliTO Sostenibile

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METHODOLOGICAL NOTE

This Sustainability Report not only provides an overview of the activities and achievements of the university and its network of related bodies in the field of sustainability, but also promotes communication between stakeholders and the university. For the drafting of this Sustainability Report, the "Standard on University Sustainability Reporting" was adopted for the first time as drawn up by the RUS-GBS working group (Network of Universities for Sustainable Development – Reporting and Sustainability Group, ed. *acronyms in Italian*). The main framework used for the identification of sustainability actions and for reporting is the United Nations Sustainable Development Goals (SDGs), which takes a broad and integrated view of issues related to Sustainable Development.

This Sustainability Report considers as a time frame the actions implemented in the calendar year 2022. Where certain activities are reported according to the academic year, the academic year 2022/2023 was taken into account or in case of other references these were made explicit in the text.

Particular attention is paid to the relationship with other relevant University reporting documents, such as the Gender Balance Sheet.

For more information, please contact the University Sustainability Service: **Sostenibilita@polito.it**

INTRODUCTION

Patrizia Lombardi
Vice-Rector for Sustainable Campus and Communities,
President of the Network of Universities for Sustainable
Development

The year 2022 was a particularly important year for our polytechnic community in terms of sustainability. Indeed, it was the year in which the ambitious decarbonisation journey, which began in 2019 with the signing of the international Race to Zero initiative that commits us to achieving carbon neutrality by 2040, got under way operationally. The Board of Directors of the University supported the process, with an initial budget of 10 million to tackle with the first urgent operations of energy efficiency in buildings, self-production of energy from PV panels, construction of the first inventory of emissions and calculation of the total amount of CO2 equivalent produced annually by the various locations. In parallel, investments were made on initiatives to contain consumption and, more generally, to deal with the condition of growing international instability and rising energy prices, on sustainable mobility, on the promotion of the use of shared transport, from the public one, primarily, to mobility as a service, through incentives and agreements, on sustainable resource management, including water management, on enhancing the sustainability of agrifood chains, on responsible procurement management and on attention to refugees and the most vulnerable people.

The university's Sustainability Report 2022 reports and categorizes the various sustainability activities according to the "Standard on University Sustainability Reporting" drawn up by the RUS-GBS (Network of University for Sustainable Development – Budget Group and Sustainability), which adopts the UN Sustainable Development Goals (SDGs) framework for reporting. Thanks to these various actions and to the growing attention, over the years, paid to environmental and social sustainability, the Politecnico di Torino is now twentieth in the world according to the GreenMetric ranking with reference to teaching, research and actions implemented for campus management (energy, infrastructure, mobility to and from the University, water and waste management). Furthermore, we can proudly testify to the university's commitment to leading the transition towards the sustainability of the entire Italian academic system, through the RUS - La Rete delle Università per lo Sviluppo Sostenibile (Network of Universities for Sustainable Development), the first experience of coordination and sharing between all Italian universities committed to environmental sustainability and social responsibility. Lastly, at the international level, the university was a main player in important initiatives that brought the role of Italian universities to the forefront at EXPO2020 in Dubai and at the 27th Conference of the Parties (COP27) in Sharm el-Sheikh.

The path to sustainability is certainly scattered with obstacles and difficulties, but universities, like our Politecnico, have a responsibility unprecedented in the history of mankind: that of supporting communities and territories on the path towards sustainable development, thanks to the transformative action that they are able to generate, as institutions of higher education. As far back as 2001, Joseph Stiglitz, Nobel laureate in economics, argued that - at a time of deep crisis in economics and politics - non-profit organisations, such as Universities, represent the only social actors capable of making a breakthrough towards new sustainable equilibriums. The Report documents this commitment, which is only possible thanks to the daily efforts made by all of you, and to whom I extend my sincerest thanks.

I   **University Identity**
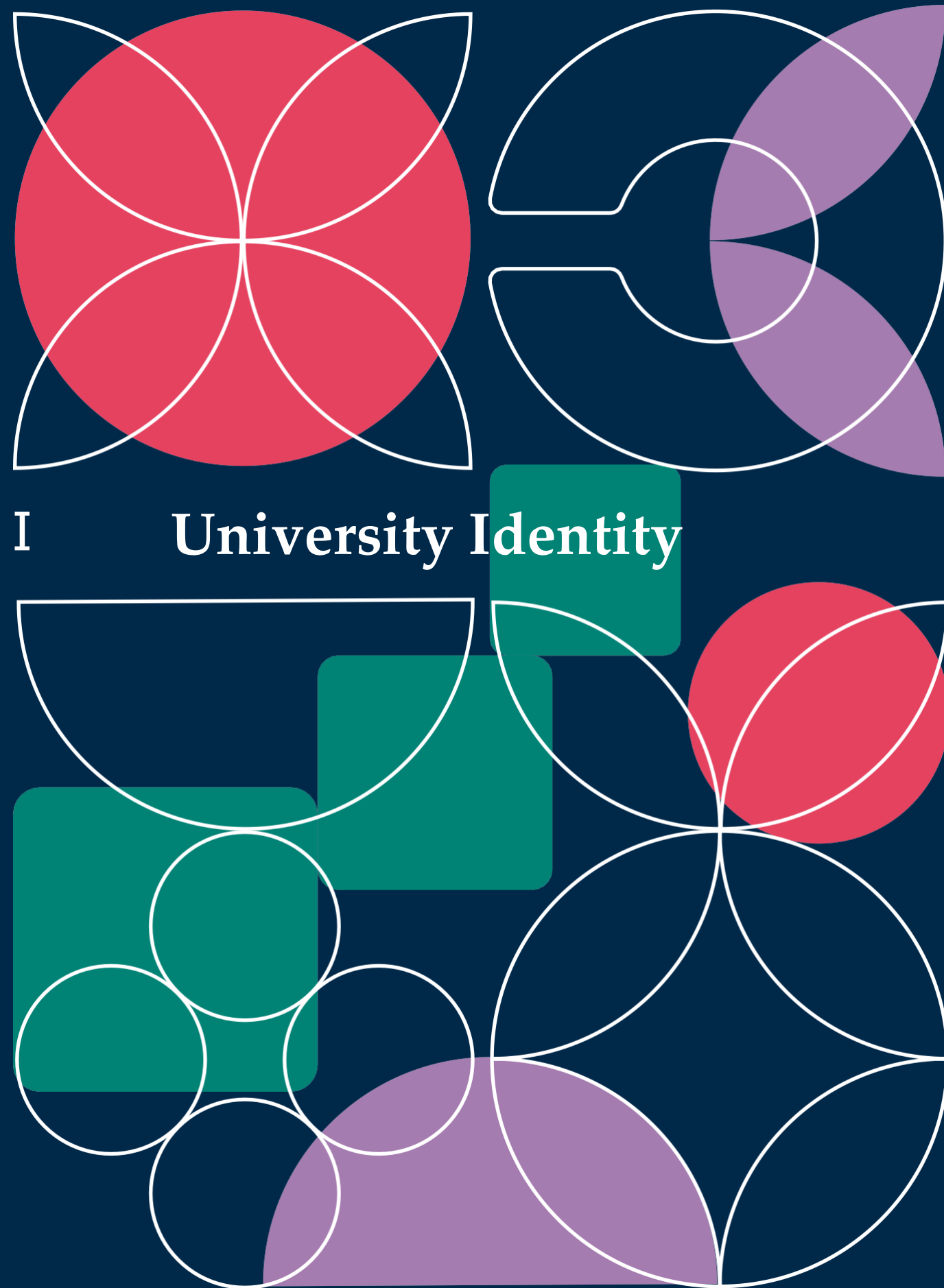
1   Organisation and sites

The Politecnico di Torino is organised into teaching, scientific and administrative structures, according to the model set out in the 2019 Statute for the efficient and shared management of the University.

The 11 Departments of the Politecnico are the reference divisions for Research, Education and Third Mission activities.

For the management of teaching, the 15 Colleges of the Course programmes support the departments, together with the 3 Schools for third-level education and the Alta Scuola Politecnica.

On the research and innovation front, however, departmental activities are also supported by the Interdepartmental centres and by the Platforms.

1.1 THE RESEARCH STRUCTURES

11 **Departments** belonging to 4 thematic areas are the reference divisions for carrying out research activities:

MANAGEMENT ENGINEERING AND MATHEMATICS FOR ENGINEERING

→ DIGEP   Department of Management and Production Engineering
→ DISMA   Department of Mathematical Sciences

INDUSTRIAL ENGINEERING

→ DENERG   Department of Energy
→ DIMEAS   Department of Mechanical and Aerospace Engineering
→ DISAT   Department of Applied Science and Technology

INFORMATION TECHNOLOGY

→ DAUIN   Department of Automatics and Informatics
→ DET   Department of Electronics and Telecommunications

CIVIL AND ENVIRONMENTAL ENGINEERING, ARCHITECTURE, PLANNING AND DESIGN

→ DAD   Department of Architecture and Design
→ DIATI   Department of Environmental, Land and Infrastructure Engineering
→ DISEG   Department of Structural, Building and Geo-technical Engineering
→ DIST   Interuniversity Department of Territorial Science, Planning and Policy

The interdepartmental centres pursue the strategic goal of making interdisciplinary collaboration systematic, amongst different technological and scientific fields. This is a new framework in which researchers from the various departments interact in order to pool expertise and produce knowledge in the field of so-called breakthrough technologies.

CARS@POLITO	Centre for Automotive Research and Sustainable Mobility
CWC	CleanWaterCenter@PoliTO
EC-L	Energy Centre Lab. Within the Energy Centre Initiative (ECI) of the Politecnico
FULL	Future Urban Legacy Lab.
IAM@POLITO	Integrated Additive Manufacturing
J-TECH@POLITO	Advanced Joining Technology
PEIC	Power Electronics Innovation Centre
PIC4SER	PoliTO Interdepartmental Centre for Service Robotics
PHOTONEXT	PoliTO Interdepartmental Centre on Applied Photonics
POLITOBIOMED LAB	Biomedical Engineering Lab
R3C	Responsible Risk Resilience Centre
SISCON	Safety of infrastructures and Constructions
SMARTDATA@POLITO	Big Data and Data Science Laboratory

The **Platforms** are coordination tools for communicating, promoting and enhancing the skills, services, products and infrastructures available within the University and its ecosystem, connecting them with public and private stakeholders interested in research and innovation activities in partnership with the Politecnico. The main objective of the platforms is to increase collaborations with enterprises and public entities, fostering an understanding of what the different components of the Politecnico di Torino and its ecosystem can offer, how collaboration can be activated and made operational. In addition, the Platforms also aim to gather needs and requests from outside and direct them within the Politecnico, stimulating an articulate and structured response from the units of the University specialised in the various research and innovation sectors.

STRATEGIC AREAS

DIGITAL REVOLUTION

CIRCULAR ECONOMY AND SUSTAINABILITY TECHNOLOGIES

ENERGY, WATER AND CLIMATE

MANUFACTURING 4.0

URBAN REGENERATION

3D MOBILITY

1.2 THE TRAINING STRUCTURES

At the Politecnico di Torino there are 25 Level I degree courses and 33 Level II degree courses, which belong to the 15 Colleges of the Course programmes:

- College of Architecture
- College of Design
- College of Computer, Film and Mechatronics Engineering
- College of Electrical
- Engineering College of Energy
- Engineering College of Electronic, Telecommunications and Physical Engineering (ETF)
- College of Environmental and Land Use Engineering
- College of Management and Production Engineering
- College of Mechanical, Aerospace Engineering of the Motor Vehicle
- College of Biomedical Engineering

- College of Chemical and Materials Engineering
- College of Civil Engineering
- College of Construction Engineering
- College of Engineering Mathematics
- College of Planning and Design

In addition, the Politecnico di Torino's educational offer is enriched by 3 schools and the Alta Scuola Politecnica programme.

DOCTORAL SCHOOL
A unit dedicated to the coordination of all activities related to the PhD programme. The Doctoral School supports the student community during the course of study and research at the University.

SCHOOL OF MASTERS AND LIFELONG LEARNING
The aim of the school is to promote, organise and manage Level I and II university master's degree courses and lifelong learning courses at the Politecnico di Torino. In cooperation with public and private partners, the school offers training courses that interpret the ever-changing needs of the working world and support students in their professional development.

GRADUATE SCHOOL
The School of Specialisation in Architectural and Landscape Heritage is a two-year level III educational path aimed at training high-profile professionals working in the field of protection, restoration, management and enhancement of the architectural and landscape heritage.

THE ALTA SCUOLA POLITECNICA (ASP)
From the great traditions of the Politecnico di Torino and the Politecnico di Milano, emerged the Alta Scuola Politecnica: a joint advanced education programme between the two universities, in parallel with the Master's degree programme.

THE ADMINISTRATION

The organisation of the Politecnico di Torino provides for a central technical-administrative unit coordinated by the General Management and, following the reorganisation in 2022, organised into 8 management directorates, 2 staff areas, 2 hubs and 11 Administrative departmental districts.

DIRECTORATES DEDICATED TO INSTITUTIONAL ACTIVITIES

→ STUDI   Students, Internationalisation Teaching
→ RIMIN   Research, Business Relations and Internationalisation

ORGANISATIONAL, ADMINISTRATIVE AND MANAGEMENT DIRECTORATES

→ PEPS   People, Planning and Development
→ PIFIC   Planning, Finance and Control
→ CCBI   Communication, Culture and Libraries

ORGANISATIONAL DIRECTORATES DEDICATED TO TECHNICAL SUPPORT

→ PROGES   Design, Construction and Safety
→ CALOS   Campus, Logistics and Sustainability
→ ISIAD   Infrastructure Information Services and Digital Administration

STAFF AREAS

→ AGACON   Procurement, Tenders and Public Contracts
→ ARIA   General Affairs, Institutional Relations and Archives

TECHNICAL- ADMINISTRATIVE AND LIBRARY STAFF (AS OF DECEMBER 2022)

914

STAFF TOTAL

61%   FEMALE PRESENCE

General Management

8 DIRECTORATES

INSTITUTIONAL ACTIVITIES
◆ STUDI | Students, Internationalisation Teaching
◆ RIMIN | Research, Business Relations and Internationalisation

MANAGEMENT AND ADMINISTRATION
◆ PEPS | People, Planning and Development
◆ PIFIC | Planning, Finance and Control
◆ CCBI | Communication, Culture and Libraries

TECHNICAL SUPPORT
◆ PROGES | Design, Construction and Safety
◆ CALOS | Campus: Logistics and Sustainability
◆ ISIAD | Infrastructure Information Services and Digital Administration

2 STAFF AREAS

◆ AGACON | Procurement, Tenders and Public Contracts
◆ ARIA | General Affairs, Institutional Relations and Archives

2 HUBS

◆ NUMED | *Multimedia Design & Production* Hub
◆ DOTT | PhD Hub

11 ADMINISTRATIVE DEPARTMENTAL DISTRICTS

◆ Sentinel functions located in the Districts
◆ Professional networks in liaison with the Directorates (belonging to the Districts)

LEGAL

Coordination of Management Directors (CoReGe)

Anti-Corruption Coordination and Privacy Transparency

--- Hierarchical connection
····· Functional connection
— Prevalent functional affiliation
— Prevalent functional affiliation

THE CAMPUSES

The model adopted by the Politecnico di Torino is Anglo-Saxon campuses, with four multi-purpose urban sites in Turin in which teaching, basic and applied research and services are combined.

On the banks of the Po River is the Castello del Valentino, the seat of the University and the 17th-century Savoy residence, recognised as a UNESCO World Heritage Site. The building houses the Department of Architecture and Design and the Interuniversity Department of Science, Planning and Territory Policy.

The large complex in Corso Duca degli Abruzzi is the main seat of Engineering. Inaugurated in 1958, it is completed by the Cittadella Politecnica, in Corso Castelfidardo, with spaces dedicated to the student community, research activities, technological transfer and services.

The most recent campus is the Cittadella del design e della mobilità sostenibile (Citadel of Design and Sustainable Mobility) in an area adjacent to the Mirafiori production plant, a former Fiat industrial site that has now been redeveloped, as has the Lingotto site, which houses the School of Masters and Lifelong Learning.

The university also makes use of a regional network of technological hubs (Alessandria, Biella, Mondovì, Verrès), which are dedicated to research, technology transfer, training and territorial services.

Finally, like many international universities, the university has set up campuses outside its national borders. The Politecnico is present in Uzbekistan in Tashkent and in China in Shanghai at Tongji University for teaching activities. In collaboration with a number of partner universities, Skill centres have been set up for the development of joint activities, particularly in the field of research and technology transfer: in China with the South China – Torino Collaboration Lab at the South China University of Technology (SCUT) and the Energy Transition LAB in collaboration with Shanghai Jiaotong University (SJTU); in France with the Sydere Centre at the ECAM institute; in Japan with the POLITO-KIT JOINT LAB in collaboration with the Kyoto Institute of Technology (KIT). In addition, the university has set up a hub in Brussels, the headquarters of the Commission and other major European institutions, with the aim of influencing EU research funding policies and to better represent funding opportunities to its lecturers and researchers.

The University Masterplan

The transformation of the polytechnic community has profound effects on the definition of the spaces in which it lives. In order to govern this transformation process, a complex process has been under way for some years now, aimed at responding to this new – quantitative but above all qualitative – need for space.

The University Master Plan process represents a new and innovative element also at an international level. It is the place where the various requests expressed by the many components of the polytechnic community are transformed into tangible planning, guaranteeing environmental sustainability, consultation with local stakeholders, and contributing to the quality and development of the urban, environmental, cultural, economic and social context of the city.
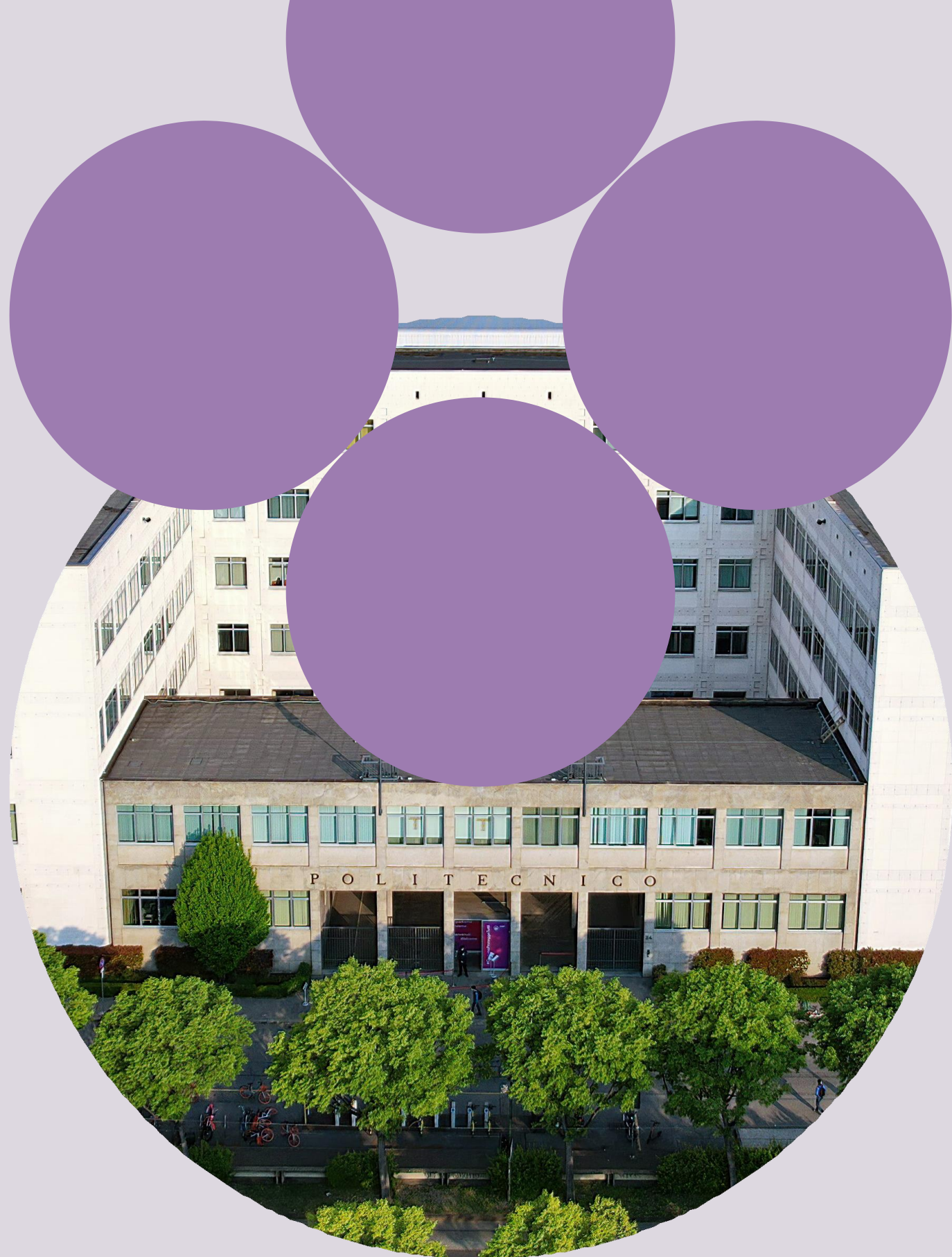
2 Governance System

2.1 The Rector and the governing team in 2022

The 2019 Statute provides for the following governing bodies:
- the Rector
- the Academic Senate
- the Board of Directors
- the General Manager
- the Evaluation Hub
- the Board of Statutory Auditors

There is also provision for:
- the Equal Opportunities Committee
- the Transparency Guarantor
- the Student Guarantor
- the Disciplinary Board
- the Student Council

2.1 THE RECTOR AND THE GOVERNING TEAM IN 2022

RECTOR
Guido Saracco

PRORECTOR
Laura Montanaro

VICERECTORS

→ **Vicerector for internationalisation**
David Chiaramonti

→ **Vicerector for internal policies**
Stefano Paolo Corgnati

→ **Vicerector for quality welfare and equal opportunities**
Claudia De Giorgi

→ **Vicerector for education**
Sebastiano Foti

→ **Vicerector for sustainable campuses and communities**
Patrizia Lombardi

→ **Vicerector for technology transfer**
Giuliana Mattiazzo

→ **Vicerector for planning, infrastructure and construction**
Luca Settineri

→ **Vicerector for research**
Matteo Sonza Reorda

DELEGATES OF THE RECTOR

→ **Rector's Delegate for International Relations with China and Asian Countries**
Michele Bonino

→ **Rector's Delegate for Strategic Assessments and Strategic Plan Implementation**
Marco Cantamessa

→ **Rector's Delegate for Alumni and Job placement**
Carla Chiasserini

→ **Rector's Delegate for Culture and Communication**
Juan Carlos De Martin

→ **Rector's Delegate for Information Technology**
Paolo Montuschi

→ **Rector's Delegate for Transparency and Internal Communication**
Anita Tabacco

→ **Rector's Delegate for International Relations in the Americas and Relations with the Africa University Task Force**
Francesca Verga

→ **Rector's Delegate for Doctoral Studies and International University Networks**
Roberto Zanino

3 Sustainability at the Politecnico di Torino

The Politecnico di Torino's path towards a Sustainable Campus is presided over by the Green Team, a hub aimed at gathering the skills and awareness relating to the 17 Sustainable Development Goals of the United Nations 2030 Agenda, applied to the university environment.

The Team's objective is to foster the integration of sustainable development issues into research, teaching, communication and all support activities, to prepare students and staff for the major challenges posed by the 2030 Agenda.

The organisation of work into specific Working Groups (WGs), chaired by University Coordinators, allows vertical themes to be implemented and transversal engagement actions to better support the University's "public and social engagement" objectives.

The Green Team relies on an administrative unit (Sustainability Service) that coordinates the operation of the various activities.

PATRIZIA LOMBARDI	Vice-Rector for Sustainable Campus and Communities Green Team Coordinator Education and Public Awareness Coordinator
BRUNO DALLA CHIARA	Mobility manager Sustainable Mobility Area Coordinator
DEBORA FINO	Resources manager Resources area coordinator
ALBERTO POGGIO	Energy manager Energy and Climate Change Coordinator
JOST VON HARDENBER	Energy and Climate Change Coordinator
GIUSEPPE QUAGLIA	Inclusion and Equity Area Coordinator

3.1   THE GREEN TEAM

The Green Team is made up of more than 60 members, including teaching and research staff and technical administrative library staff, representing all University units, areas and departments, as well as representatives of the student body and the University bodies.

Through five working groups, the members of the Green Team discuss and develop initiatives to foster the integration of sustainable development issues in the University's research, teaching, third mission and campus management activities.

Periodically, the Green Team meets in plenary form to update itself on the activities of the Working Groups and cross-cutting initiatives, so that the representatives of the participating Areas and Departments can take what has been discussed back to their own domains.

There are five areas of interest for the Green Team (Energy and Climate Change, Sustainable Mobility, Resources, Education and Public Awareness, Inclusion and Equity), each of which is coordinated by one or more reference lecturers.

3.2 THE SUSTAINABILITY SERVICE

The Sustainability Service (formerly known as the Green Team Office for support activities to the Green Team) was officially established as of 1st November 2022 following the reorganisation of the University's central administration and is part of the CALOS Directorate - Campus, Logistics and Sustainability.

The service mainly:

- coordinates actions to support the sustainable development of the University and promote its dissemination through the publication of the annual Sustainability Report;
- supports the actions of the University Green Team and its Coordinators and oversee activities in the various areas of competence (mobility, energy and climate, resources, training and public awareness, inclusion and equity)
- promotes, also through targeted communication campaigns, actions on sustainable development in its environmental and social aspects;
- supports awareness-raising activities on sustainable development issues among staff and the student community;
- oversees thematic rankings and sustainability reporting;
- support the achievement of the University's emissions inventory and decarbonisation plan, in particular for Mobility and Resources issues by collaborating with the respective managers;
- support the University's participation in networks and projects related to sustainable development and supports the chairmanship of the Network of Universities for Sustainable Development (RUS).

The Sustainability Service, as well as with the services of the other Directorates, collaborates with the other administrative units of the CALOS Directorate, especially with the **Campus Planning and Campus Services Monitoring Service**, which, in addition to monitoring and providing metrics and indicators for the Campus facilities and services, coordinates the implementation of the University's emissions inventory and the decarbonisation plan, in collaboration with the Energy Manager and the competent Directorates, and with the **Campus and User Logistics Services Service**, helping to harmonise the initiatives dedicated to improving Campus services and usability with a view to sustainability.

3.3 THE NETWORKS AND STAKEHOLDERS

The Green Team actively takes part in various networks on sustainable development issues, both national and international, including:

RUS - THE NETWORK OF UNIVERSITIES FOR SUSTAINABLE DEVELOPMENT

It was formally established in 2016 as part of the Conferenza dei Rettori delle Università Italiane (CRUI) - *Conference of The Rectors of Italian Universities* - with the aim of promoting the SDGs, spreading the culture and good practices of sustainability and reinforcing the value of the Italian experience at the international level. The RUS represents the first experience of coordination and sharing among all Italian universities committed to the issues of environmental sustainability and social responsibility. The Politecnico di Torino has been one of the promoters of the RUS since 2013 and has held the presidency and organisational secretariat since 2019. In 2022, Prof. Patrizia Lombardi (coordinator of the Green Team) was confirmed as president of the network for the 2022-2024 three-year period. Furthermore, the university's energy manager (Prof. Alberto Poggio) co-lead the energy working group from 2016 to2022, while the university's mobility manager (Prof. Bruno dalla Chiara) will co-lead the mobility working group for the 2023-2025 three-year period. The Politecnico di Torino also participates in all working groups with its own representatives.

In its role as RUS Presidency and Organisational Secretariat, in addition to drafting the RUS 2021 Report, conducting the annual survey to monitor current trends in the Network on sustainability activities, organising the annual Convention and General Assembly, and managing communication through the website and FB page, in 2022 the Politecnico coordinated the Network's many activities and collaboration with the promotion committee for Rome's candidacy for Expo 2030, which entails the participation of 84 Universities and the presence of 8 Working Groups; the 2022 activities coordinated by the Politecnico di Torino include:

- **EXPO 2020 DUBAI**
  The RUS has collaborated with the Italy Committee for Expo 2020 Dubai to promote and enhance the activities of the Italian university system in the run-up to Expo 2020 Dubai. Many activities have been coordinated by the Politecnico in this framework since 2020: from the organisation of the Unisustainathon, an international hackathon that saw the online participation of over 200 students from all over the world, to the RUS Challenge on Agenda 2030, a competition to award the best project among challenge-based activities organised by the Network's member Universities on the themes of the 2030 Agenda, leading up to the organisation in January 2022 of the Forum "Universities in action for the UN 2030 Agenda".

The Forum was organised by RUS in the week of the EXPO 2020 DUBAI Global Goals in collaboration with the Italian Pavilion and the Italian Alliance for Sustainable Development (ASVIS). The event was an opportunity for international higher education institutions, together with students, to discuss and imagine the role of universities within the UN Decade of Action centred on the three Ps: People, Planet e Prosperity. The Forum was sponsored by the Conference of Italian University Rectors (CRUI), the Ministry of Sustainable Infrastructure and Mobility (MiMS) and the Ministry of University and Research (MUR).

◆ **NATIONAL CFC4**
Between July and October 2022, RUS organised the fourth edition of Climbing for Climate, a "demonstration" event to raise local and national awareness of the climate crisis and the Sustainable Development Goals of the UN Agenda 2030 through local knowledge.
In addition to coordinating the "diffused" event, the Politecnico was involved in organising the national event on the slopes of Mont Blanc on 19-20 July 2022, held in collaboration with the Italian Alpine Club, with the universities of Piedmont and the University of Brescia, the creator of the initiative since 2019.

◆ **COP27**
Thanks to the presence of the Politecnico and other universities in the Network accredited as observers within the system of the UN Framework Convention on Climate Change (UNFCCC), RUS actively took part in the 27th Conference of the Parties, which took place from 6 to 18 November 2022 in Sharm El-Sheikh, Egypt, through the organisation of two "side-events". In particular, on 16 November at the Italian Pavilion, RUS organised a round table entitled "The Role of Universities in Supporting Institutions in Achieving Net Zero Emissions", which was attended by representatives of the UK Universities Climate Network (UUCN) and RUS. The two networks discussed their experience with the aim of providing solutions methodologies and training to support institutions on the path to achieving zero net emissions.

The next day, 17 November, was the turn of the event "Universities as key solution providers: leveraging our local and global networks for innovation", coordinated by the University of Toronto with the collaboration of the RUS and other international networks. Here too, the Politecnico brought its experience in demonstrating how universities can effectively play their unique role as solution providers in collaboration with local and national institutions.

RUS PIEDMONT
In the years 2020-2022, Piedmontese universities worked together in the PASS project (Piedmont and the Academy for Sustainable Development), financed by the Ministry for Ecological Transition and coordinated by the Politecnico di Torino which saw the four Piedmont universities engaged in defining methods and tools for shared governance of the actions to be put in place to implement the Regional Strategy for Sustainable Development. Over the course of 2022, with the aim of stimulating dialogue and discussion with local stakeholders on the PASS project topics, the universities of Piedmont organised many events such as Researchers' Night, Terra Madre, and the Biennale Tecnologia. At the end of the PASS project, the four universities in Piedmont wanted to define a coordination of the activities carried out on a regional scale within the framework of the national RUS, thus creating the RUS Piedmont with an agreement signed by the rectors of the four universities in February 2023. The collaboration between the four Piedmontese universities has the ambition of achieving joint actions aimed at increasing the knowledge, training and involvement of the new generations, in a broad reflection on the sustainable development of the territory.

RUNIPACE - NETWORK OF UNIVERSITIES FOR PEACE
RuniPace is promoted by the Conference of Italian University Rectors and to date some 70 universities have joined. The Network promotes (inside and outside the university community) reflection on the social responsibility of all disciplines and attention to the construction and consolidation of peace by peaceful means as a constituent vocation of the Academia and as a pivot for research, teaching, training and third mission activities. The Politecnico di Torino has been a member of RuniPace since 2020 and in 2022 gave its support to the PerugiAssisi March for Peace and Fraternity organised on 24 April.

CESAER – CONFERENCE OF EUROPEAN SCHOOLS FOR ADVANCED ENGINEERING EDUCATION AND RESEARCH

CESAER is an association founded in 1990 that represents and supports approximately 58 science and technology universities in 26 European countries, providing them with a forum for discussion on the topics of cooperation and exchange of knowledge and good practices for education, research policies, innovation, and the role and impact that science and technology can have in the knowledge society for a sustainable future. The Politecnico takes part in several task forces and working groups of the network, including the Sustainability task force.

CLUSTER – CONSORTIUM LINKING UNIVERSITIES OF SCIENCE AND TECHNOLOGY FOR EDUCATION AND RESEARCH

CLUSTER is a consortium of 11 European technical universities. Initially focused mainly on technical education, today it is an active platform on the topics of education, research, innovation. The Politecnico di Torino takes part in several working groups, including one dedicated to sustainability.

UMOB – EUROPEAN NETWORK FOR SUSTAINABLE MOBILITY AT UNIVERSITIES

The network is financed by the European Commission under the LIFE programme with the main objective of facilitating the exchange and transfer of knowledge on best practices on sustainable mobility between European universities. The Politecnico di Torino has been a member of the network since 2022 and promotes its initiatives, including the MUV tournament, a virtual competition between universities on sustainable travel.

CUCS – COORDINAMENTO UNIVERSITARIO PER LA COOPERAZIONE ALLO SVILUPPO

The network is promoted by CRUI to aggregate the reflections and actions of the university world related to sustainable development cooperation. The Politecnico di Torino has been a member of the network since its establishment in 2007 and is currently a member of the Board. It continues its activity with the Journal founded by UNITO and POLITO after the CUCS Congress held in Turin in 2013; the journal JUNCO - Journal of Universities and international development Cooperation deals with issues related to international development cooperation with a focus on the role of universities in its three missions (research, education and third mission). In 2022, the Politecnico took part in the conference that the CUCS organises every two years in Naples.

PIU-AEI NETWORK

The Politecnico di Torino is part of the PIU-AEI - Piemonte Università Accoglienti Eque Inclusive - project with other Piedmontese universities. The project supports initiatives to guarantee better living, study and working conditions for those who live in situations of vulnerability and envisages the active and networked involvement of institutional and Third Sector actors in the region in order to steer policies, elaborate shared strategies and initiatives that can strengthen what already exists and give coordinated feedback to what is still unanswered. The objective is to create conditions that, at least in part, mitigate the ordeal of those who live the situation of refugees, asylum seekers and people from complex countries and territories, with fragile economic and political situations or who enjoy little protection in Italy in terms of support and assistance.

UNITE!

Unite! is one of the first 17 European University Alliances, bringing together nine universities connecting different European regions in the economic, entrepreneurial and innovation fields, in order to renew the European university space through its Erasmus+ pilot project and thanks to a common research & innovation agenda developed with the further Horizon 2020 project. The Politecnico di Torino actively participates in the various Unite! communities, including the one dedicated to sustainability.

In addition, the university is a member of the following networks that deal with sustainability issues in line with the goals and activities of the Green Team:
- ISCN – International Sustainable Campus Network
- ASviS – Italian Alliance for Sustainable Development
- SDSN Italia – Sustainable Development Solution Network Italy
- IASS – Italian Association for Sustainability Science
- IUSDRP - Inter-University Sustainable Development Research Programme

3.4   SUSTAINABILITY RANKINGS

The Politecnico di Torino participates annually in international rankings that compare universities around the world on specific objectives. On the subject of sustainability, the best known rankings are GreenMetric and THE Impact (Times Higher Education).

THE IMPACT RANKING

Times Higher Education is a periodical magazine that annually creates international rankings of universities and higher education institutions. In 2018, the association launched the first edition of THE Impact, an innovative ranking that assesses the economic and social impacts of universities based on the Sustainable Development Goals of the United Nations 2030 Agenda.

In 2021, Politecnico di Torino ranked 17th among more than 470 international universities for SDG 11 (Sustainable Cities and Communities) and 88th among more than 377 for SDG 13 (Climate Change).

In the 2022 edition, it ranked in the top 100 for SDG11 and SDG9 (Business, Innovation and Infrastructure) out of almost 800 participating universities, taking top marks for Research on Industry, Innovation and Infrastructure, and very good marks for the number of patents citing university research and the number of spin-offs.

9 COMPANIES, INNOVATION, AND INFRASTRUCTURE

90,6
SCORE

79 /873
RANK

11 SUSTAINABLE CITIES AND COMMUNITIES
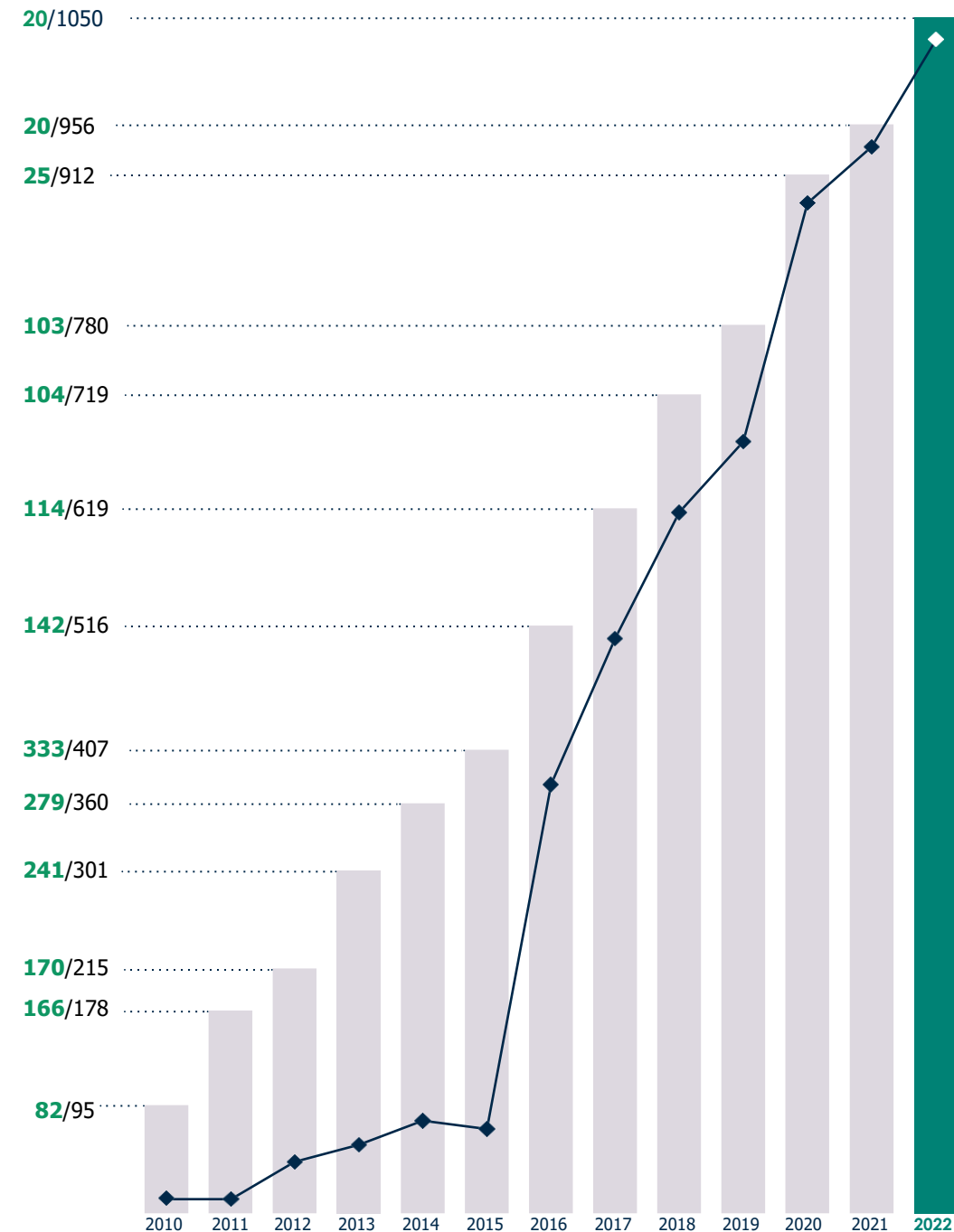
63,1
SCORE

201-300 /860
RANK

**Results of the Politecnico di Torino for THE ranking Impact**

UI GREENMETRIC

The UI GreenMetric international ranking was created in 2010 at the initiative of Universitas Indonesia and aims to compare actions and policies related to Green Campus and sustainability in universities around the world. The survey evaluates teaching, research and third mission, as well as policies and actions implemented for the campus management (energy, infrastructure, mobility to and from the University, water management and waste treatment).

The Politecnico di Torino has been present in GreenMetric's rankings since 2012 and its position is constantly growing. In 2022, as in 2021, the university was confirmed in 20th place worldwide.

20/1050	
20/956	
25/912	
103/780	
104/719	
114/619	
142/516	
333/407	
279/360	
241/301	
170/215	
166/178	
82/95	

2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 **2022**

Results of the Polytechnic of Turin to Greenmetric ranking compared to the number of participating universities

II   **Sustainability Report**
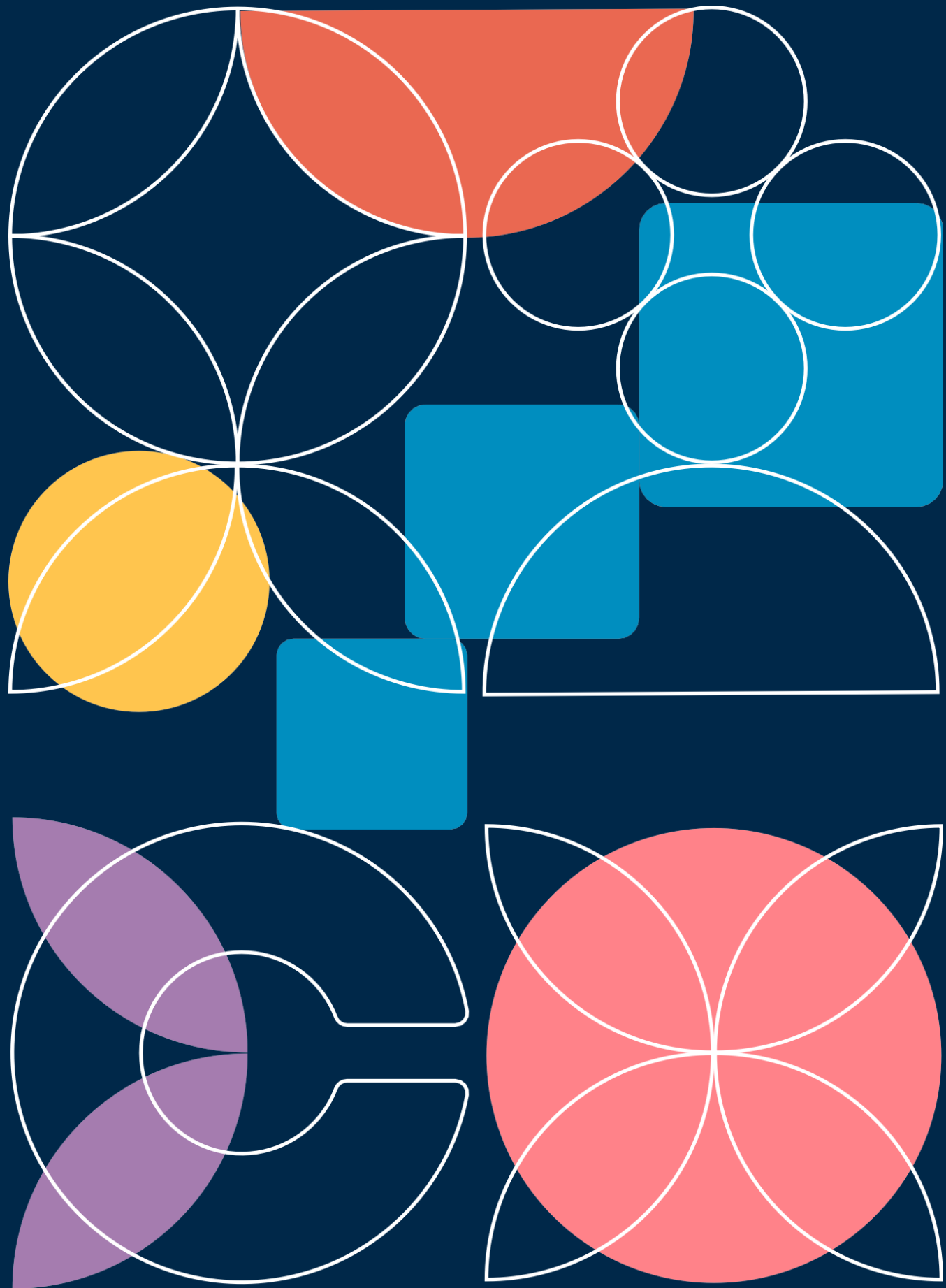
1 Education and training

The Politecnico di Torino offers a complete range of courses in Architecture, Engineering, Design and Spatial Planning, within a stimulating university environment, in which a solid basic education goes hand in hand with teaching that makes the most of new technologies and non-traditional forms of teaching by placing the student at the centre of the educational path.

38,700

ENROLED IN I AND II LEVEL DEGREE COURSES

740

ENROLED TO LEVEL I AND II MASTER'S DEGREES, LIFELONG LEARNING COURSES AND TRAINING COURSES FOR COMPANIES

1,302

ENROLED IN DOCTORATE COURSES

1.1   CURRICULAR TEACHING

In the tradition of the best technical universities in Europe, the University offers a complete range of courses in Architecture, Design, Planning and Engineering (25 Level I and 36 Level II courses in the academic year 2022/2023), with more than 30% of the teaching provided entirely in English. The range of courses is enriched by Level I and Level II Master's courses, the Level III training of the Doctoral School and the courses of the School of Specialisation in Architectural Heritage and Landscape.

COMPOSITION

71.5%   MALE STUDENTS

28.5%   FEMALE STUDENTS

ORIGIN

61%   ENROLED FROM OUTSIDE THE REGION

41%   Italians residing outside Piedmont

20%   Foreigner

ENROLMENTS

5,956

ENROLED A.Y. 2022/2023

25 BACHELOR'S DEGREE COURSES (LEVEL I)

4 in the area of Architecture, Design and Planning
21 in the area of Engineering

36 LEVEL II DEGREE COURSES

9 in the area of Architecture
27 in the area of Engineering

35 TRAINING COURSES ENTIRELY IN ENGLISH

18 PHD COURSES,
of which 5 in agreement with other universities (3)
and research organizations (2)

**32 LEVEL I AND II MASTER'S DEGREES
AND LIFELONG LEARNING COURSES**

ENTERPRISING COURSE for Bachelor's degree students in
the Honours Programme

THE ALTA SCUOLA POLITECNICA (ASP) COURSE
for students of Level II degrees

The Grand Challenges course

Starting from academic year 2021/2022 onwards, a new cross-curricular course with the evocative name "Grand Challenges" was activated as compulsory and fundamental training for all learners enrolled in engineering. These are six contemporary Grand Challenges, i.e. Climate, Mobility, Digital, Health, Energy, Technology and Humanity, with a total of 24 courses co-taught by a lecturer from a "technical" background and a "humanist-social scientist". The two co-teachers provide the students with a highly interdisciplinary theoretical introduction to the subject matter, followed by project and workshop work, which enable them to put what they have learnt into practice. The course represents a virtuous example of education in the field of sustainable development as recently defined by the Guidelines on the so called "lesson zero", i.e. zeroing the knowledge on the subject, developed by the Network of Universities for Sustainable Development (RUS).

1.1.1 Classification of teaching relative to the SDGs

The Politecnico di Torino has embarked on a path to integrate the principles of sustainability and the SDGs into its activities (teaching, research, third mission and campus management). Ongoing mapping and monitoring activities were started in 2018 and allow the integration and impact to be verified.

As part of the path of progressive integration of sustainability principles and the SDGs into teaching, research, third mission and campus management activities, as of 2018 the teaching courses provided by the University are classified relative to the SDGs.

The activity was developed with a self-assessment approach, in which teachers attribute one main and up to two secondary SDGs to the teaching they are responsible for, indicating the possible impact area of their teaching.

The main objectives of the mapping activity are:
- Promote a culture of sustainability among lecturers and students in the polytechnic community
- Identify the areas of sustainable development to which the University contributes through the provision of courses and teaching, and support the identification of the technical and transversal skills needed to address contemporary global challenges
- Create a solid, quality database for participation in thematic rankings

In the 2022/2023 academic year, the SDG field was filled in for the entirety of the lectures (1523), 88% of which were associated with the SDGs, the remaining 12% being "N/A - not applicable". The most frequently reported primary SDGs are SDG9 (412 associations, corresponding to 27%) and SDG11 (202 associations, corresponding to 13%). As for a correlation analysis with the secondary SDGs, the most frequently reported combinations are: SDG9+SDG12, SDG9+SDG8, SDG9+SDG11, SDG11+SDG9, and SDG11+SDG13.

More than 350 teachings have associated SDG4, however, these are very often wrong associations, linked to the consideration that the teaching contributes to the goal dedicated to Quality Education by its intrinsic characteristics and mode of delivery, without considering the contribution effective in achieving the SDGs.

For this reason, a project is under way to improve this classification, acting on the training of compilers and the revision of the sheets, including through keyword-based tools.
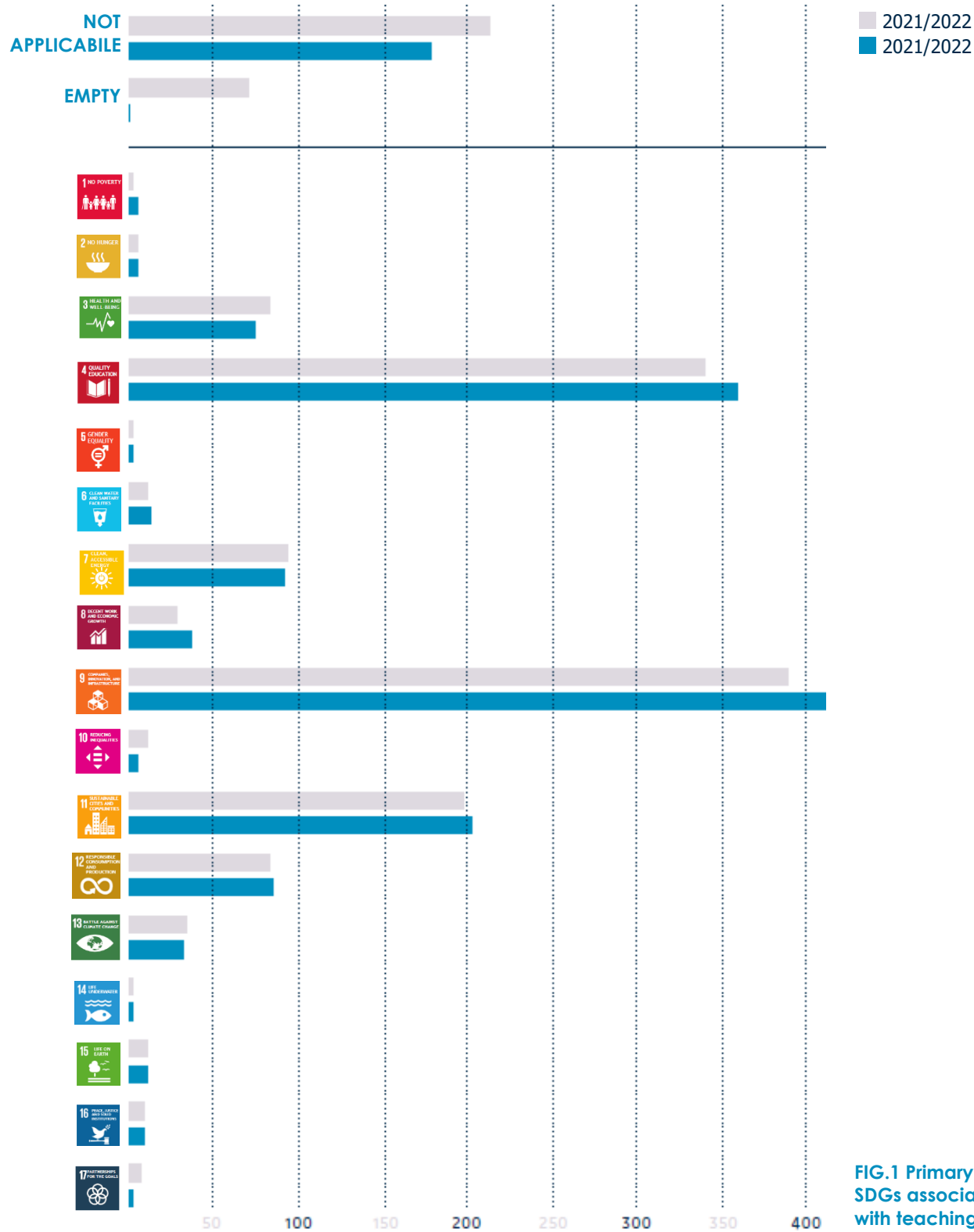
"SDGs Mapping" in degree dissertations

As of 2022, the association of reference SDGs relative to the teaching area of the university was extended to Level II (Master) degree dissertations. Candidates can therefore identify between 1 and 3 SDGs related to their thesis work. The aim of this classification is to spread the culture of sustainability among students and to monitor the impact of the thesis work on the SDGs. From the first results extracted, it is possible to identify the areas most frequently addressed by Master's theses. Almost 30% of the dissertations reported on SDG9, 13% on SDG11 and 12% on SDG13.
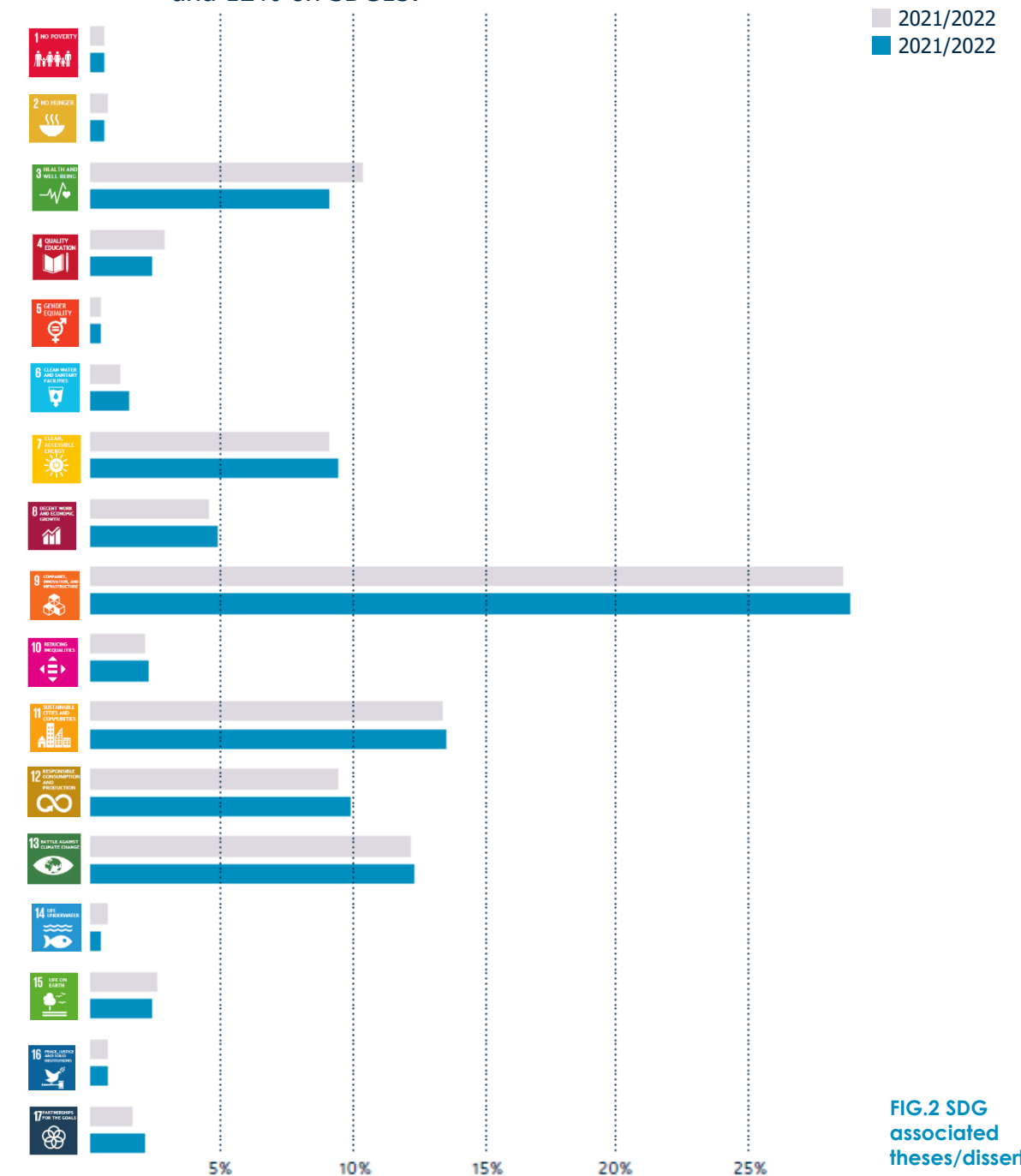

FIG.1 Primary SDGs associated with teachings

FIG.2 SDG associated theses/dissertations

1.2 CROSS-CURRICULAR PROGRAMMES

The Politecnico offers many experiences of innovative teaching and participative teaching.
Comparison in a group setting and coming together of people from different cultural backgrounds are key characteristics for all offers, to pursue specific objectives of contemporary society.

These are different types of pathways, which fit into everyone's curriculum, which aim to reward the **talents**, which allow experimentation from conception to implementation through the development of projects on major themes.

Multidisciplinary University Course on education for Children's and Adolescents' rights in light of the 2030 Agenda and the Sustainable Development Goals

Since 2021, the Politecnico di Torino has been cooperating with other universities in Piedmont and with UNICEF for the creation of a Multidisciplinary Course in Education on the Rights of the Child and Adolescent. The first edition of the course took place between March and May 2022, with the collaboration of PoliTo and UniTo lecturers.

1.2.1 The Challenges

The Challenges@PoliTO are innovative educational activities held in the premises of the CLIK (Connection Lab and Innovation Kitchen). These are real challenges to find the most innovative idea: 30 Master's degree students work in multidisciplinary teams with different backgrounds from all degree courses to find new solutions and solve the proposed challenges.

The Challenges were conceived according to a dual and complementary trajectory: to expand the training offer and to open and consolidate relationships with businesses.

In 2022:

13 ACTIVATED CHALLENGES

300 STUDENTS INVOLVED

The Challenges activated in 2022 include four closely related to sustainable development issues:

◆ **DSS for Sustainable Infrastructures Maintenance** with MOVYON (Autostrade Tech) on the definition of a Decision Support Tool to optimise the sustainable life cycle management of infrastructure assets

◆ **A NEW Life for Alumina-based Wastes** with SACAL on a Circular Approach to Aluminium Scrap Reuse and Secondary Raw Material Creation

◆ **The Next Gen of Coffee Packaging** with Lavazza on defining future trends related to sustainable packaging for the food industry

◆ **Circular and sustainable inputs for renewable energy** with Enel Green Power on the definition of models, projects and indicators for the adoption of alternative and circular materials in renewable energy generation

1.2.2 Honours Programs

The Politecnico offers deserving students the opportunity to take part in highly innovative paths of excellence parallel to the three-year and master's degree courses. These courses are aimed at enhancing and developing the training of the best talents by broadening the disciplinary horizon with experimental teaching initiatives and with a cross and project-based approach.

ALTA SCUOLA POLITECNICA
The Alta Scuola Politecnica is a two-year programme parallel to the Master's degree, developed together with the Politecnico di Milano, reserved for talented students wishing to broaden the horizon of their disciplinary education.

YOUNG TALENTS / ENTERPRISING PATHWAY
Young Talent Pathway / Enterprising Pathway is the project for talented, top-performing Bachelor's degree students in the various courses. It is an integrated, cross academic pathway to support their personal growth, strengthen their multidisciplinary skills and encourage methodological and study comparison and educational experiences abroad.

1.2.2 Teaching Lab

The Teaching and Language lab (TLlab) is an open learning community that aims to promote initiatives and research that make a university's first mission, teaching, more effective.

For this reason, TLlab studies, experiments and promotes the use of different tools, spaces and teaching methods, both new and consolidated, that put the student at the centre of teaching, in the perspective of educational equity, inclusion and multiculturalism, the development of critical thinking and creativity.

1.3 PhD

Education and research are closely connected in the PhD, the third level of university education. The Doctoral School, established in 1999, manages the 16 PhD courses offered by the University, 3 of which are in agreement with the University of Turin, 1 with the National Institute of Metrology (INRIM); there is also a strong collaboration with the National Institute of Nuclear Physics (INFN) for the electronic devices sector. The Politecnico is also a partner in 2 national doctorates activated by the MUR.

The Politecnico's PhD programmes are aimed at the acquisition of an autonomous scientific research capacity through which creativity and methodological rigour can be expressed in the working world, both in academia and, increasingly, in industry. Those with a PhD can, in the business world, convey a true culture of progress, thanks to the ability and sensitivity to manage innovation and creative originality in the development and implementation of projects and services. The University has chosen to invest significantly in the doctoral pathway, which it considers strategic, and among the actions taken to enhance merit and talent, there is the increase in the amount of doctoral scholarships by around 30% compared to the national average and also in the number of doctoral scholarships made available: 90% of PhD enrolments include a scholarship or other types of funding for the work carried out. Prizes are also awarded for a total amount of 100,000 Euro per year for the best PhD and PhD students of each course. It is the University's intention to further increase the number of international students.

Italian and foreign companies have over the years intensified collaborations with the Doctoral School on topics of common interest: 25% of the PhD scholarships are financed by entities outside the university and 30 PhD apprenticeships have so far been activated.

In addition, the Doctoral School places great emphasis on skills with high transferability between various fields (soft skills) that can have an important impact on the professional success of PhDs, offering a catalogue of courses on these topics.

1.4 SCHOOL OF MASTERS AND LIFELONG LEARNING

The School of Masters and Lifelong Learning stands as a hub of excellence for the definition of innovative training policies that are permeable to the needs of the economic context. The School intends to satisfy a need for high-level technical training that can specialise the knowledge of traditional degree courses and respond dynamically to the ever-changing needs of the working world, to support it in the global competitive challenge and increase its entrepreneurial capability. The School responds to the technological and scientific innovation needs of the industrial and service world, designing and implementing tailor made training programmes for recent graduates, newly hired staff and senior personnel. To this end, it has developed partnerships over the years with other Italian and international universities, public bodies and leading industrial groups. In line with the challenges arising from the digital transformation and the technical-scientific innovation in industry and society in general, the School continuously adapts its offering with innovative technological topics. The programmes guarantee applied training in the field, thanks to the possibility of gaining experience in companies, also abroad. The range of Master's and Lifelong Learning courses is aimed at students from Italy and abroad, in line with the internationalisation process of the University, while preserving its traditional roots in the region.

2   Scientific research

2.1   Funded Research

2.2   The mapping of research products with respect to the SDGs

The international context of scientific research is increasingly global and complex. The Politecnico fits into this scenario by directing its research activities towards the major social challenges worldwide, with the aim of making a growing impact both locally and at country level, as well as to further increase its contribution to the work of the international scientific community. The new frontiers of scientific and technological research call for an interdisciplinary and collaborative approach, involving both university structures and stakeholders from the socio-economic system so that research is geared towards providing concrete answers to the sustainable development goals of the United Nations 2030 Agenda.

2.1 FUNDED RESEARCH

As far as internationally funded research is concerned, from 2014 to 2021 the University received funds in the Horizon 2020 programme amounting to 104 million Euro from 268 projects, ranking 4th and 57th respectively in Italy and Europe in terms of the number of projects won. In line with the objectives of the Strategic Plan, both fundamental and collaborative research projects were boosted through internal actions and university calls for proposals, which were also financed thanks to the contribution of bank foundations (Compagnia di San Paolo and Fondazione CRT). The H2020@POLITO and ERC@POLITO projects offer lecturers and researchers an organic set of actions and tools aimed at achieving this goal and will continue through a new project that will support participation in the current Horizon Europe framework programme (2021-2027). The enhancement of research projects was also supported by internal calls for proposals such as "Network your research idea", which financed collaborative research projects submitted by lecturers in the start-up and consolidation phase of their scientific careers, in partnership with academic and non academic institutions, and by the activation of Starting Grants to attract lecturers of high scientific reputation from external institutions.

The University's investment in the internationalisation of research is significant, through initiatives that stimulate mobility and strengthen collaborations with the best international organisations. In this context, there are initiatives such as the call for the internationalisation of research, which aims to promote collaborations with Universities ranked in the top 50 international rankings or located in geographical areas of strategic interest for the University, and the MITOR programme (since 2009), to support research projects between the Politecnico and the Massachusetts Institute of Technology. In addition, there are actions such as the Call for Long-Term Visiting Professors to attract highly qualified scholars with a proven international reputation permanently working abroad, and joint projects with international institutions of excellence to support research through the exchange of PhD students. The University takes part in prestigious international thematic networks including: ECSEL, N.ERGHY, ECTP, NEREUS, IAF, EPIC, EERA, EGVIA, EFFRA. Among its industrial partners, the University has collaborations with, among others, Ansaldo, Avio Aero, ENI, Ferrari, Finmeccanica, General Motors Powertrain Europe, Enel, Ferrero, HP, IBM, Indesit, INWIT, Italdesign, Michelin, Microsoft Italia, Nokia, Philips, Piaggio, Pininfarina, Pirelli, Siemens, SKF, Stellantis, STMicroelectronics, Terna, TIM, Thales Alenia Space. In 2013, the European Commission granted the Politecnico the HR Excellence in Research award for its commitment to providing researchers from all over the world with a positive and engaging environment by implementing the principles of the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers.

RESEARCH FUNDING
Source Profit & Loss Report - 2020 Financial statement

52	Million Euro Research income 20% of the Politecnico's revenue
29	Million Euro from competitive financing
23	Million Euro from business with institutions and companies

SCIENTIFIC PUBLICATIONS – 2022

2561	Journal contributions
1268	Contributions in conference proceedings
74	Research monographs
566	Volume contributions

INTERNATIONAL FUNDED RESEARCH
from 2014 to 2022

395 European and International Projects
132 Million Euro

269 2020 Horizon Projects
of which **68** coordinated
105 Million Euro

16% SUCCESS RATE

44 Horizon Europe projects
of which **11** coordinated
3 Million Euro

17% SUCCESS RATE

4 EIT communities

FUNDING FROM PNRR
Granted on 31.12.2022 for the period 2022-2026

197 Million Euro PoliTO contributions

27 Projects involving PoliTO

Further projects under evaluation or negotiation

NATIONAL AND REGIONAL FUNDED RESEARCH
from 2014 to 2022

267 National and Regional Projects
53 Million Euro

Including 1 Competence Centre "Competence Industry Manufacturing 4.0" established within the framework of the MiSE Industry 4.0 announcement

MIUR-FUNDED PROJECTS
within the 10 National Clusters

70 PRIN (MIUR call 2015, 2017 and 2020)

27 Projects in Regional Platforms:

Smart Factory Health and Wellbeing Bioeconomy and Supply Chain

3 IR2 projects
Industrialisation of research results

1 CTE-NEX Project
Home of Emerging Technologies

RESEARCH PROJECTS

197 R&D projects with Compagnia di San Paolo

1 "1000 PhD students" initiative with Fondazione CRT

2.1   THE MAPPING OF RESEARCH PRODUCTS WITH RESPECT TO THE SDGS

In 2021, work began on mapping various research activities of the university against the SDGs, implementing a specific field to be filled out in the University's Current Research Information System (CRIS) IRIS and other databases. In the specific Research Management module of CRIS, lecturers and researchers were able to fill in one or more SDG fields to describe their research profile on the basis of the UN Agenda Goals. The Research Management module of CRIS was implemented in 2021 providing lecturers and researchers with the possibility of voluntarily adding the SDGs that relate to their research topics. These are partial data because compiling in the field is not mandatory and consequently the SDGs represented may not give the full picture, but nevertheless offer important indications regarding the 2030 Agenda Goals that are the main focus of research at the University.
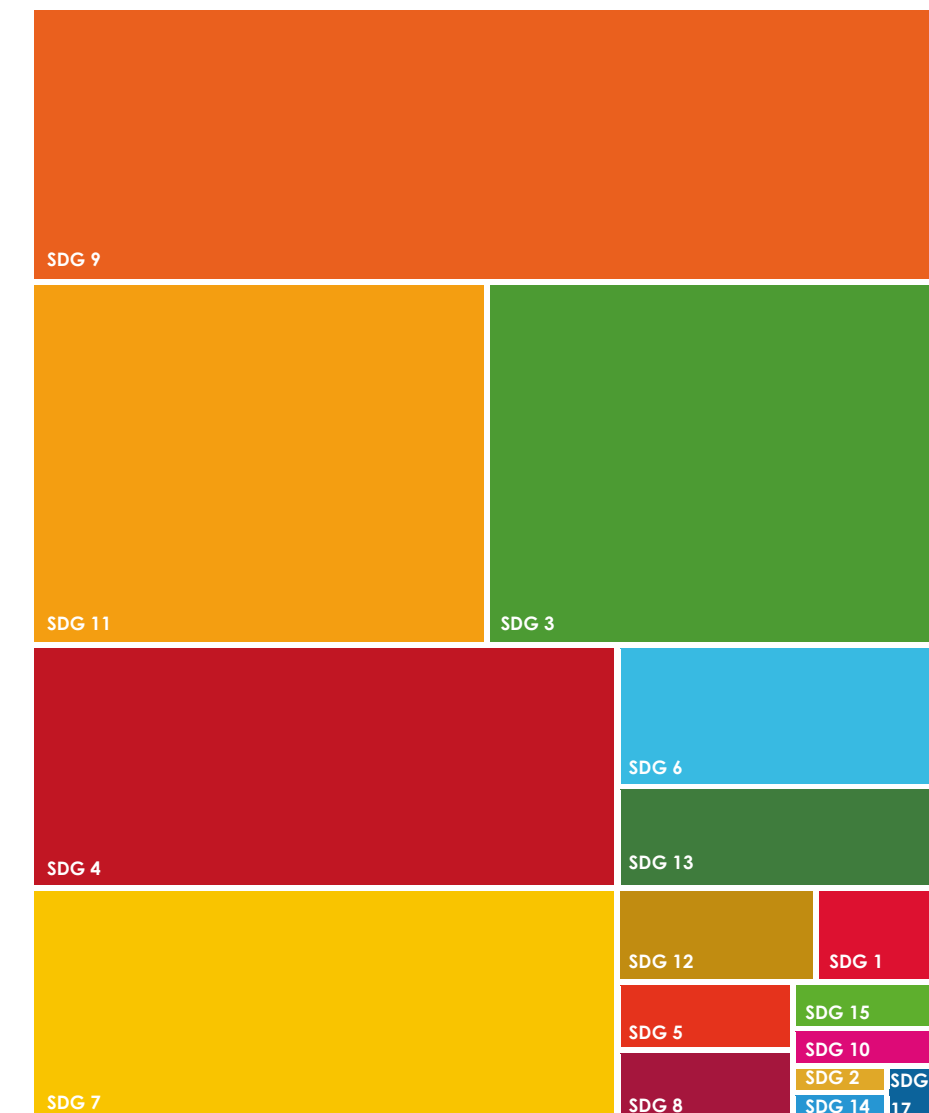

FIG.3
SDGs associated with research profiles on IRIS RM

Similarly, the automatic mapping of the SDGs for research projects registered in the university database was implemented in 2022.
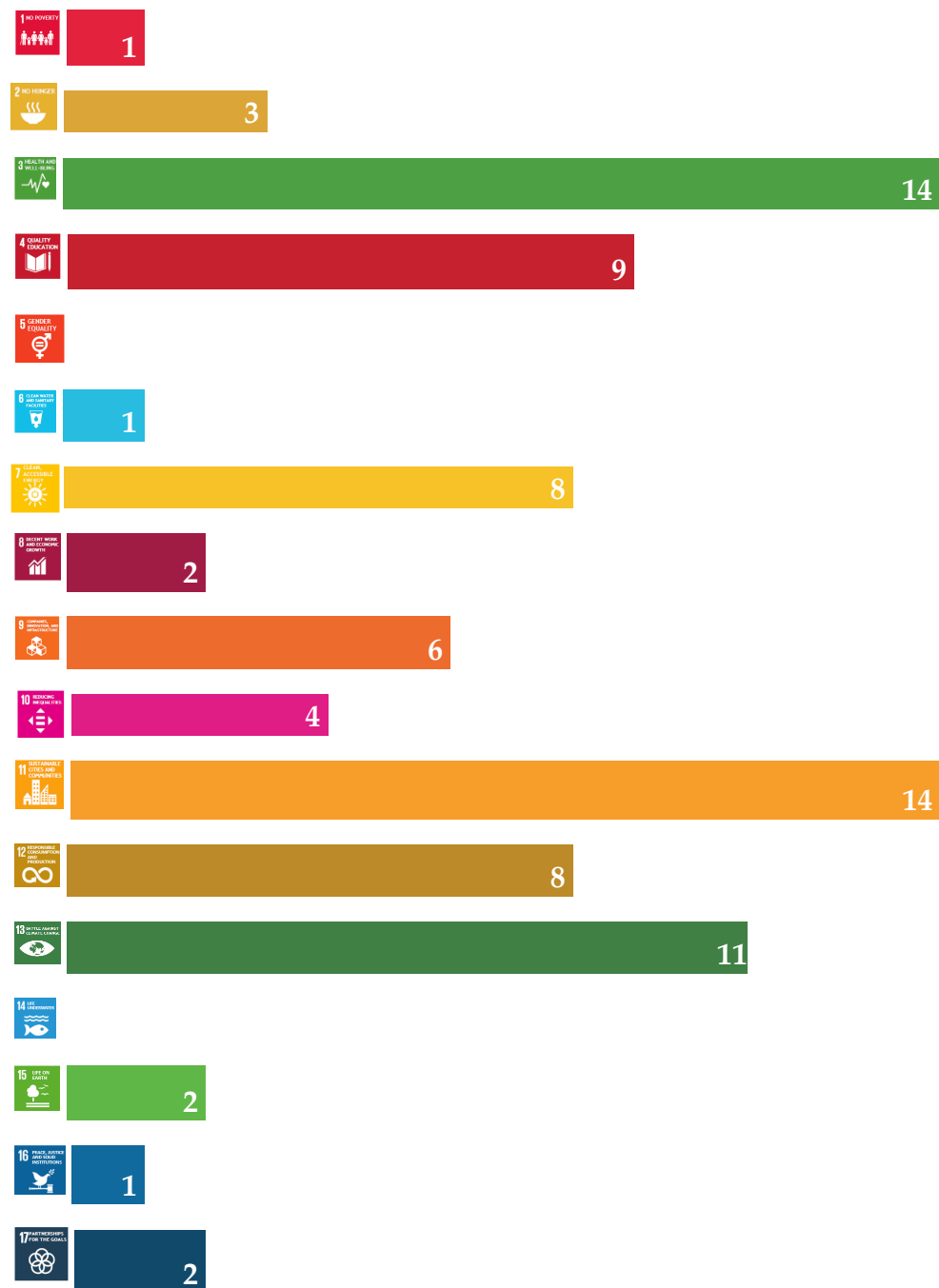
In both types of research output, one can appreciate that the the Politecnico research activity covers all SDGs, with a prevalence of topics related to Goals 11, 3, 13, 7, 12, 9.

3   Third Mission

The Politecnico di Torino recognises the centrality of Third Mission activities. Over time, the Politecnico has actively supported the development of the Piedmontese territory and of the country, collaborating with industry at various stages, starting with civil infrastructures and the first industrialisation of the 19th century, when it was still a School of Application for Engineers, then moving on to the "electrical revolution" during the second industrial revolution, to the massive industrialisation of the post-World War II period, and finally to the electronics and IT revolution of recent decades. In a similar way, the Politecnico is now contributing to the "fourth industrial revolution", putting to good use decades of research activities into the "Industry 4.0" Competence Centre.

La The Third Mission, originally intended and limited to so-called technology transfer, has gone progressively evolving and expanding its sphere of action. In its relationship with companies, the University has increasingly started to talk about "sharing" and "cogeneration" of knowledge. In its relationship with society, it stated the fundamental role of academia in the dissemination of research results and active participation in dialogue and open debate on the social, economic and political impact of technologies. The resulting model is that of an open, permeable, quality-of-life and inclusive campus that, by promoting a continuous dialogue with society and the local area, succeeds not only in developing technologies, but also in fostering and demonstrating positive applications inspired by sustainable development.

CULTURE AND COMUNICATION

As part of its Third Mission, the Politecnico aims to strengthen its commitment to interacting with society in order to disseminate research results and to establish a dialogue with citizens and institutions on topical issues.
The Politecnico features as an open community, which derives from society and intends to evolve with it through a close dialogue based on common values.
With this in mind, the university organises meetings and discussions in various forms with all components of society, from companies, institutions and citizens, placing its role as a place of culture at the centre.

COMUNICATION ACTIVITIES
Year 2022

8,000 +500 +2,000

MEDIA REPORTS **CONFERENCES AND SEMINARS ORGANISED** **SCHOOL STUDENTS INVOLVED IN ACTIONS OF OUTREACH**

COMUNICATION CHANNELS
- PoliFlash online magazine
- PoliTOweekly: weekly newsletter of appointments and news
- Press releases and media relations activities to disseminate institutional activities, research projects and achievements
- Press review: every day, a thoughtful collection of articles about the Politecnico, University, Research and job opportunities

SOCIAL MEDIA PRESENCE
as of December 2022

80,722	43,900	177,466
FACEBOOK followers	**INSTAGRAM followers**	**LINKEDIN followers**
19,417	7,331	19,417
TWITTER followers	**WECHAT followers**	**YOUTUBE followers**

2	Central Libraries
9	Departmental libraries
417,000	Research monographs
9,000	Printed periodicals
61,000	Dissertations
65,000	Electronic periodicals
200,000	E-books
39,000	Book lending transactions
1,454,000	Download of full-text electronic resources
60,000	Freely searchable digital resources

CULTURAL EVENTS FOR THE GENERAL PUBLIC

- Biennale Tecnologia
- Difficult times
- European Researchers' Night
- Just The Woman I Am
- Top Experiences
- Salone del Libro
- Liberi Libri
- Prepararsi al future (*Preparing for the future*, from an idea by Piero Angela)
- Cinque libri

Biennale Tecnologia

In 2019, the Politecnico di Torino organised the first edition of the Festival of Technology, with four days of meetings, debates, workshops, exhibitions and shows: an opportunity for universities, citizens, businesses, public administration and the third sector (*not-for-profit* sector) to meet and reflect on the great challenges of an increasingly technological society. Since 2020, the initiative has become Biennale Tecnologia: a biennial event lasting four days, a wide-ranging review to offer an articulate, inclusive and accessible reflection on the increasingly important topic of the relationship between technology and society, starting with the most recent technological innovations and recalling Italy's technological roots. The calendar of meetings is characterised by a strongly interdisciplinary approach, to which the languages of fiction, film, music and the visual arts also provide a contribution. The Politecnico also organises a series of meetings and initiatives that unfold throughout the months between one edition and the next, to accompany the public to the next Biennale.

Notably, the Green Team took part in the following events within the programme of the 2022 Biennale Tecnologia:

- **National Sustainable Development Strategy: Time for Action at the Territorial Level**, with Carmen Aina, Jacopo Chiara, Mara Cossu, Enrico Giovannini, Anna Piccinni, Alice Siragusa, moderated by Patrizia Lombardi (Green Team coordinator).
- **Food and Climate**, with Franco Fassio, Rhoman Rossi, Tommaso Valle, Debora Fino (Green Team resource manager)
- The workshop **The consumer footprint and our impact on the planet** by the University's Green Team

3.1.1 Events on sustainability topics

Of 657 events organised at the Politecnico di Torino in 2022, 210 dealt with sustainable development topics.
The Politecnico promotes and organises events on sustainability issues, often in collaboration with local organisations, associations and communities, to strengthen the network of collaboration committed to achieving the goals set by 2030 Agenda. In 2022 it is worth mentioning:

CLIMBING FOR CLIMATE
The Politecnico di Torino took part in the fourth edition of Climbing for Climate, the demonstration event organised by the RUS and the Italian Alpine Club (CAI) with the aim of raising local, national and international awareness of the effects of climate change through a symbolic and coordinated action that sees the university communities engaged in hiking and trekking in their respective areas. The Politecnico di Torino organised the event of national importance at feet of Mont Blanc together with the other universities in Piedmont and the Brescia CAI (Italian Alpine Club).

COP27
The Politecnico di Torino was the main player of two meetings together with other Italian and international universities attending the 27th Conference of the Parties (COP27). The Conference brought together more than 30,000 people united by the "together for implementation" invitation launched by UN Secretary General António Guterres to fulfil the Paris agreements made at COP21. Both events were attended by the Vice President for Sustainable Campus and Communities at the Politecnico, who is also President of RUS:

- **Universities as key solutions providers: leveraging our local and global networks for innovation** as part of the COP27 Blue zone side-event programme was attended by RUS and representatives of various inter-national networks. The meeting focused on how universities can effectively play their role as solution providers to tackle the climate crisis, highlighting the importance of networks and collaboration to deal with global challenges.
- **The Role of Universities to Support Institutions in Achieving Net Zero Emissions**, hosted at the Italian Pavilion and promoted dialogue between RUS and the UK Universities Climate Networks (UUCN)

CHANGING THE CLIMATE
With the aim of reaching an even larger audience, in July 2022, theatre and scientific research intertwined in Faber Teater's show/conference "Changing the Climate", organised and promoted by DIATI (Department of Environmental, Territorial and Infrastructural Engineering of the Politecnico di Torino). The conference/performance was staged on 5 July 2022 in the Aula Magna of the Politecnico di Torino.

3.1 TECHNOLOGY TRANSFER

The meaning that the Politecnico di Torino attributes to Technological Transfer is that of an activity capable of linking research with the market, and thus of producing innovation. Through it, the Politecnico operates with the aim of transforming the knowledge generated by public research into technology, understood as "ability, skill in doing", in order to have a real impact on society and the economy.
The Politecnico confirms the project's consistency with its desire to create an overall vision on the enhancement of research results through the "innovation chain", which starts from the development of skills and research results, and ends with their concrete application, and on the sharing of knowledge in its various forms by involving many players both inside and outside the University, hence producing the Technology Transfer System.
The University encourages the protection of research results and provides inventors with support in the enhancement of developed knowledge, offering various tools for the development and commercialisation of technologies, such as Proof of Concept funds, support in the creation and growth of research spin-offs, and various innovation supply and demand Match-making initiatives with companies and other stakeholders.
Businesses, organisations and associations that feed the economic fabric of the region with their activities find in the University a counterpart open to dialogue and collaboration, offering multiple opportunities to meet the real needs of stakeholders.
In order to meet the needs of companies in solving even complex problems, the Politecnico offers flexible and interdisciplinary research and consultancy services, which rely on excellent facilities and the development of human capital, also capable of successfully tapping funding from European, national and regional programmes.

3.2.1 Competence Industry Manufacturing 4.0

It is a 5 million Euro grant from the Ministry of Economic Development on the Industry 4.0 Plan, to which other funding from participating companies will be added. The Competence Industry Manufacturing 4.0, which ranked first in the MISE ranking, is focused on Advanced Manufacturing in the automotive and aerospace sectors and relies on the collaboration of 23 private companies. Located in the TNE premises in Mirafiori, it is the national reference centre for manufacturing companies oriented towards the digitalisation of industrial processes with a view to Industry 4.0. CIM4.0 provides companies with:

- ◆ two pilot demonstration lines to test cutting-edge technologies (Additive Manufacturing and Digital Factory)
- ◆ calls for investment support
- ◆ training to evolve and manage change

KNOWLEDGE GENERATION

→ LabTT   Interdepartmental Technology Transfer Laboratory
→ CLIK   Contamination Lab & Innovation Kitchen
→ EIC   Centre for Entrepreneurship and innovation

CKNOWLEDGE SHARING

1,193 TOTAL PATENTS DEPOSITED (SINCE 2004)

479 ACTIVE PATENTS

244 ACTIVE PATENT FAMILIES

ACTIVE PATENTS BY SECTOR

32 AERONAUTICS, AEROSPACE AND AUTOMOTIVE

6 ARCHITECHTURE AND DESIGN

52 BIOMEDICAL, CHEMICAL AND PHARMACEUTICAL

14 ENERGY AND RENEWABLE SOURCES

36 PHYSICS, MATERIALS AND NANOTECHNOLOGIES

63 COMPUTERS, ELECTRONICS AND TELECOMMUNICATIONS

14 CIVIL, ENVIRONMENTAL AND CONSTRUCTION ENGINEERING

27 INDUSTRIAL, MECHANICAL AND MECHATRONIC ENGINEERING

SPIN-OFF

74 SPIN-OFFS ATTRIBUTED AS OF 31.12.2022

40 SPIN-OFFS ACTIVE AS OF 31.12.2022

13.8 MILLION EURO FUNDING at the end of 2021, including GRANTS and AWARDS

+52 MILLION EURO, current-post money value as at 31.12.2021

PROOF OF CONCEPT (POC) CALL

+100 PROJECTS FINANCED

+5,1 MILLION EURO FUNDS DISBURSED (2016-2022) POC@POLITO POC INSTRUMENT 1.0/2.0 POC-OFF

+6 MILLION EURO OF FUNDS AVAILABLE (2023-2026) POC INSTRUMENT 2.0 POC NODES

4 FRAMEWORK AGREEMENTS WITH VENTURE CAPITAL FUNDS IN: MATERIALS SUSTAINABILITY AEROSPACE

10 PROJECTS FINANCED FOR A TOTAL OF 1.2 MILLION EURO

4   Campus and Community

The Politecnico di Torino has a welcoming academic community and offers many services and opportunities to improve the experience within the University. There are plenty services aimed at improving the well-being of the university's users. In addition, the University aims to increase awareness of its social role through a series of initiatives to create a sustainable campus and an active and aware community. In particular, the Politecnico di Torino is committed to making its campuses more sustainable by focusing on the issues of energy and climate, sustainable mobility and responsible use of resources.

4.1 WELL-BEING IN THE UNIVERSITY

The Politecnico intends to offer its academic community, but also those who attend the University campuses, an open, inclusive, dynamic environment that ensures a high quality of life, in physical, social and psychological terms. Particular attention is devoted to welfare, support and listening activities and counselling, on the one hand to foster integration, aggregation and equal opportunities, and on the other to strengthen the sense of community, also through activities such as sports, for example. Furthermore, the University confirms its acceptance and implementation of the principles of the European Charter for Researchers. By applying the principles of the Charter, the Politecnico – the first University to do so in Italy – has established the figure of the Researchers' Guarantor, responsible for protecting researchers, especially in the early stages of their careers, from possible conflict situations.

4.1.1 Welfare and organisational well-being

The primary objective is to foster the complete self-fulfilment of those who work and study at the Politecnico through the promotion of physical, psychological and social well-being.
Fundamental to the improvement of corporate welfare is the care and attention towards the people who make up the University.
On the one hand welfare services, on the other the well being of an organisational life that has to do with the relationship between individual, work and the organisation as a whole. In order for working life to be of real quality, the Politecnico di Torino has equipped itself with two tools: the Organisational Wellbeing Survey, now in its third edition in 2021 and carried out with the scientific contribution of the Department of Psychology of the University of Turin, and the Listening Space, which offers free psychological support to the entire student population and University staff.
With a view to well-being, the buddy programme was activated for the student community, and the possibility of agile working (or remote working) for administrative and library staff.
The buddy programme, now in its fourth year in the a.y. 2022/23, is a project that involves scholarship-eligible students carrying out a mentoring and support activity for first year students as indicated in detail here.
Agile work (or remote working) is a way of executing the employment relationship with the absence of time or space constraints that helps TAB staff to reconcile work and life and, at the same time, promote productivity growth. The Politecnico di Torino was a pioneer in using this form of work organisation among its employees, recording, before the pandemic, a pick-up rate of between 15 and 20% of the technical-administrative staff in service.

4.1.2 Equality and inclusion

The University starts from the recognition of the **legal and social equality of every individual**, regardless of gender, religion, ethnicity, disability, age, sexual or political orientation. The aim of **Equal Opportunities policies** is the enhancement of differences and the promotion of inclusion, through the implementation of positive actions that achieve the substantial equality of each person, especially between men and women, in the work and student context, as stipulated in the national equal opportunities code.

In order to **harmonise gender policies**, the University appointed the **Gender Observatory** in 2019, which is responsible for the **gender balancing process**. Starting with the comprehensive analysis document published every three years (first publication September 2020), the process elaborates policies and verifies their implementation.

In 2018, the **Poliwo – POlito for WOmen** project was also activated, with, among other things, the creation of the **WeAreHERe campaign** to promote the enrolment of female students in engineering courses in the 2019 and 2020 editions. With similar aims, the design and realisation of **awareness-raising videos, presentations and public events** is managed on various equal opportunities and inclusion issues, aimed at both the student population and the staff of the Politecnico.

4.1.3   The Politecnico for refugees

As part of its Strategic Plan "PoliTo4Impact", PoliTo4Impact aims to create the conditions for inclusion, equity and acceptance that will enable:

- foreign students, already part of the University community but at risk of leaving because of objective difficulties (loss of stay permit, visa, status, residence, poverty), to be supported in starting/re-establishing the conditions for studies and life in our city;

- talented people residing in developing countries and/or with refugee, asylum seeker and migrant status to access and study, or work, at the University (in the Turin campus or in future hubs in other countries) to best express their potential as part of an academic and territorial community that offers them organised and easily accessible services in terms of cost and clarity of procedures.

To achieve this goal, the Politecnico signed – together with more than 35 Italian universities, including the University of Turin, the University of Eastern Piedmont and the University of Gastronomic Sciences **– the Inclusive University Manifesto promoted by UNHCR** to guarantee better living, studying and working conditions for refugees and asylum seekers who have been accepted in Piedmont.

PIU-AEI Network

Since 2022, the four universities in Piedmont have set up the PIU-AEI (Piedmont Welcoming and Inclusive Universities) project, the aim of which is the active and networked involvement of the institutional and Third Sector actors in Piedmont - City of Turin, City of Vercelli, City of Bra, Piedmont Region, EDISU, IRES Piedmont, Prefecture of Turin, Police Headquarters of Turin, Prefecture of Vercelli, Police Headquarters of Vercelli, Compagnia di San Paolo Foundation, Ufficio Pio Foundation, CRT Foundation, CRC Foundation, UPMMigrant Pastoral Office.

The aim of the project is to identify and address policies, elaborate shared strategies and initiatives that can strengthen what already exists and provide coordinated responses to what is still unanswered, creating conditions that at least partially mitigate the drama of those who live in the situation of refugees, asylum seekers and people from complex countries and territories, with fragile economic and political situations or who enjoy little protection in Italy in terms of support and assistance. Particular attention is paid to refugee women, asylum seekers or refugee-like subjects, because their rights are most at risk.

Collection of basic necessities

In December 2022, the Politecnico decided to support and host the "Sharing Our Daily Bread" campaign promoted by Sermig to collect basic necessities for the most fragile people in Italy, Ukraine and conflict-affected countries.

The initiative is part of the PIU_AEI network initiatives.

The response of the polytechnic community to the solidarity campaign was significant, with 55% of participants belonging to the Politecnico staff, 41% to the student component and with contributions also from people outside the university, demonstrating great support for those in difficulty and the strong link between the Politecnico and citizenship.

During the five days of the campaign, 761 kg of material was collected, including 603 kg of food, 48 kg of hygiene products and 110 kg of clothes. The collaboration with SERMIG was desired and promoted by the university governance and realised thanks to the valuable operational involvement of the student associations.

The Special Needs Unit, which interacts with the University's other structures, is the point of reference for all those people who, for various reasons, are part of the polytechnic community – student population and staff – and who experience a difficult situation due to temporary or permanent disability problems. The aim is to improve working conditions or to make a personal contribution to the **overcoming of physical, perceptive, communicative, virtual and cultural barriers**.

Among the projects completed or being completed for personnel, the **sharing space**, a "platform" to foster communication between employees interested in the topic of disability and/or with disabilities, personal assistance, and meal delivery for health reasons in the office, reserved for staff who are unable to go to the canteen independently for health reasons.

The **Rector's Contact person for initiatives in support of assistance, social integration and the rights of people with disabilities** coordinates, monitors and supports all initiatives necessary for the integration of people with disabilities and/or special needs within our University.

Thus operates the **Diversity Manager** appointed by the University, with the aim of promoting actions for the enhancement and respect of all the diversities present in the organisational context.

4.2   ENERGY AND CLIMATE ACTION

In 2021, the Politecnico di Torino officially committed to achieving carbon neutrality by 2040[1], anticipating the goal by 10 years with respect to the "Net Zero" commitments made at international level, and in 2022 it operationally launched its ambitious decarbonisation process.

With this in mind, the University is constantly striving to reduce and rationalise its energy consumption and its impact on the environment through:

- ◆ energy efficiency of existing facilities;
- ◆ designing new premises according to high quality standards (with environmental sustainability certificate according to the ITACA Protocol) and favouring the reuse of existing facilities;
- ◆ the use of efficient plants and the implementation of self generated energy from renewable sources.

The Politecnico also constantly monitors its consumption (electricity and heat), thus being able to ensure more effective campus management and periodic verification of progress on its path towards decarbonisation.

[1] Board of Directors meeting of 30 March 2021

In parallel, the Politecnico is undertaking climate change adaptation actions in order to make facilities and spaces more resilient, safe and comfortable with respect to current and future climate changes.

4.2.1   Emission Inventory

In the course of 2022, there was the completion of first emission inventory of the Politecnico di Torino and, consequently, the calculation of the total amount of CO2 equivalent produced annually by its sites. The methodological approach used is based on the GHG Protocol, the international tool that establishes standardised global frameworks for measuring and managing greenhouse gas (GHG) emissions, together with the operational guidelines of the RUS Climate Change Working Group. The activity of collecting and systematising consumption data in relation to the relevant emission factors allows the foundations to be laid for a more detailed analysis of the general phenomenon, providing solid support for the planning process of strategic actions for the years to come.

The emission inventory concerned the calculation of the CO2 equivalent produced in 2022 with reference to the GHG Protocol scopes. In order to track the effect of the actions that contribute to decarbonisation, the decision was taken to build a history of the University's emissions over a four-year period (2019-2022) in order to assess the phenomenon over an extended period, including before and after the years of restrictions related to the Covid-19 pandemic.

The graph below (Fig. 5) shows an overall view of a broad estimate of emissions for each year and for each scope, i.e., scope 1, which includes direct emissions whose source is owned or controlled by the University, scope 2, which includes indirect emissions generated by energy purchased and consumed by the University, and scope 3, which considers all other indirect emissions. The year 2020 marks a clear and significant reduction in emissions (around 30%) compared to 2019 due to the arrival of the Covid-19 pandemic restrictions. With 2021 and subsequently 2022, the University's activities in presence (research, teaching, administration, technology transfer) gradually resumed, so emissions did increase. However, between 2019 (pre-Covid representative year) and 2022 (post-Covid representative year) a reduction of 9% was monitored in overall emissions, largely attributable to the initiatives implemented in the area of energy containment and rational use of the University's infrastructure.
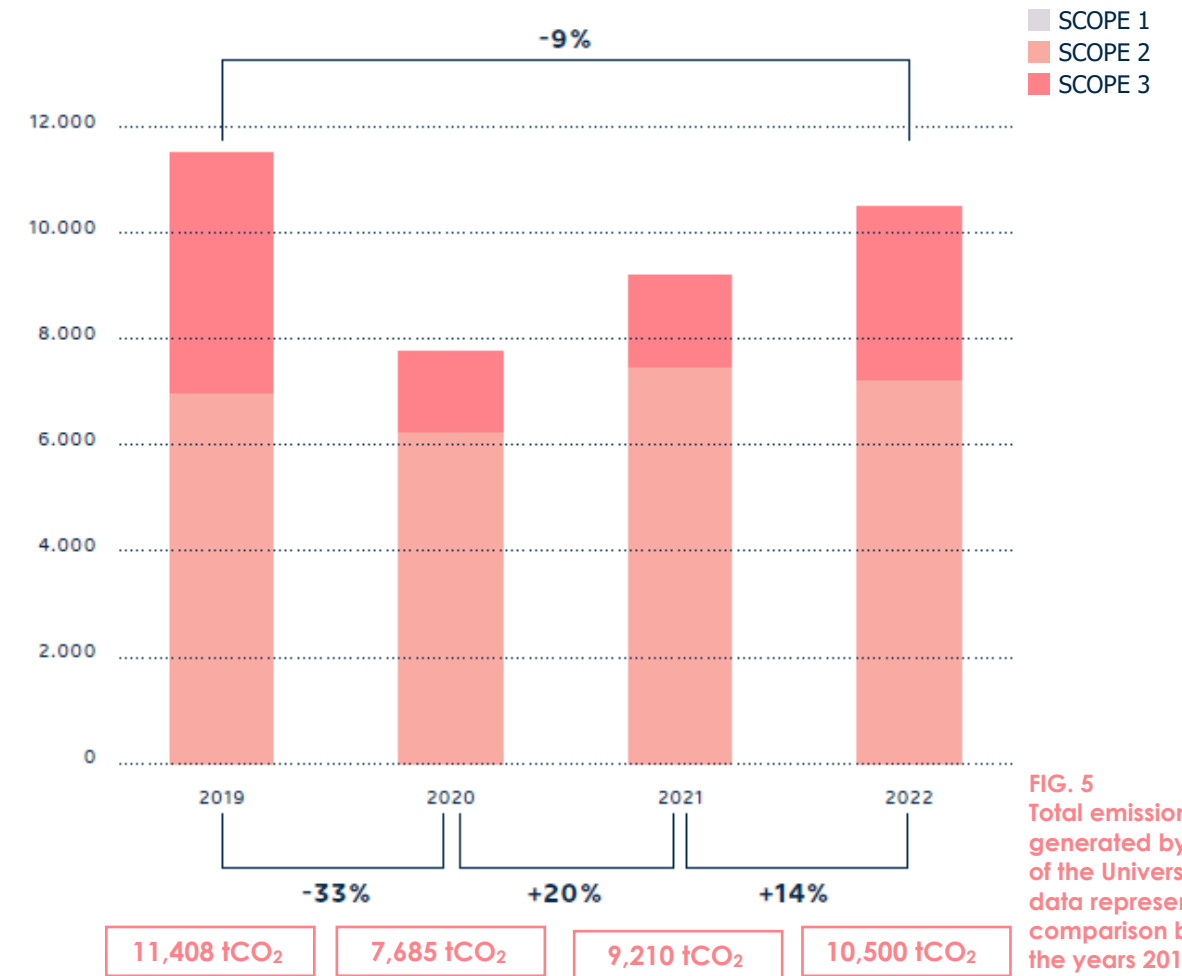
FIG. 5
Total emissions generated by activities of the University. The data represent the comparison between the years 2019 to 2022

The figure below (Fig. 6) shows a scope-by-scope comparison of the last two years of observation (2021 vs. 2022). Although an increase in overall emissions is observed, mainly due to the post-Covid restart in every area of the University's life, the analysis of the annual changes in the different scopes allows for some interesting considerations. Regarding Scope 1 (direct emissions), there are significant decreases in emissions associated with the modernisation of the University's fleets: between 2021 and 2022, emissions decreased by 39%. With regard to Scope 2 (indirect energy emissions), a 10% reduction in heating related emissions is observed thanks to the initiation of active strategies on energy and climate emergency issues, as well as the switch to district heating for an entire campus of the University (the Castello del Valentino). With regard to the contribution of the share of electricity in terms of emissions, on the other hand, the transition between 2021 and 2022 marked a 6% increase. This increase is mainly attributable to a growth in research installations, i.e., an aspect that is characteristic of the nature of the University and will therefore be unavoidable in the years to come, albeit associated with increasingly stringent planning and control procedures to ensure a high degree of efficiency.

With regard to Scope 3 (other indirect emissions), the increase in associated emissions is evident: on the global scale, an increase of 15.4% occurred from 2021 to 2022, associated with the full resumption of all administrative, teaching and research activities. The resumption of business travel, as well as the daily home-university commute (excluded, however, from the specific survey) and the active and continuous use of the University's infrastructures are in fact the reason for this significant growth. From 2023, the ambition will be to initiate actions and implement strategies that significantly influence the emissions associated with Scope 3 areas.
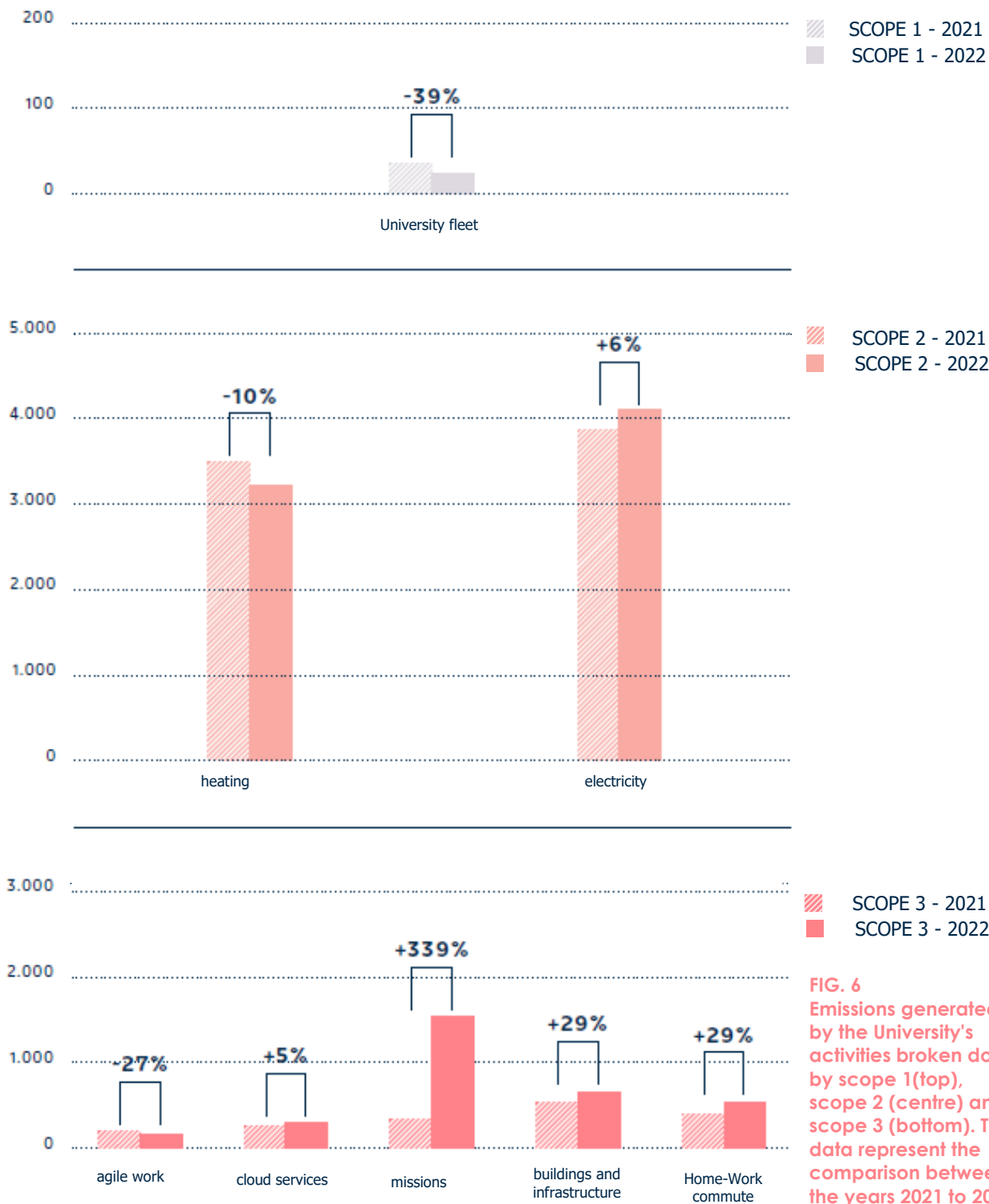
FIG. 6
Emissions generated by the University's activities broken down by scope 1(top), scope 2 (centre) and scope 3 (bottom). The data represent the comparison between the years 2021 to 2022

Actions to counter the climate and energy emergency

In February 2022, the University decided to implement a number of voluntary initiatives with the aim of coping with increasing international instability and rising energy prices.
The main consumption containment actions include:

◆ a 1°C reduction of temperatures in the centralised control of heating systems (for the winter period);

◆ switching off all hot water heaters in sanitary facilities, with the exception of showers and washbasins serving changing rooms and laboratories;

◆ the gradual switching on of air-conditioning systems, starting with the rooms most exposed to rising temperatures;

◆ the increase of the cooling temperature in water dispensers;

◆ the updating of policies for automatic switching on and off of lights in common areas.

The entire University community was also involved in order to tangibly achieve the effects of these initiatives through the request to adopt virtuous behaviours in regulating the temperatures of individual terminals (called fan coils) for heating and cooling, in lowering the air input speed in individual rooms, in limiting unnecessary electricity consumption by switching off room lighting and electrical equipment when not needed at the end of working hours.

District heating and Photovoltaic

In 2022, work was completed for the connection of the Castello del Valentino building to the metropolitan district heating network, abandoning the previous local gas heat generation systems in favour of systems with less environmental impact.

The Board of Directors earmarked 10 million Euro for the upgrading of photovoltaic systems for the headquarters in 2022 (in addition to a plan to replace lighting fixtures with new LED elements and to complete the replacement of window frames).

To date, this self-production guarantees more than 4% of the total needs of the headquarters with an extension of about 4,800 square metres of photo-voltaic (PV) panels. By the end of 2022, 960 kW of installed power and an average annual production capacity of more than 1.2 GWh had been reached. Electricity that is not self-generated continues to be purchased from suppliers that annually certify 100% supply from renewable sources.

Outdoor areas

The Politecnico's campuses are located in urbanised contexts and, consequently, are more exposed to the effects of global warming, through a phenomenon known as "heat island", which causes higher air temperatures in metropolitan areas. In order to counter these effects, the University is working to completely overhaul the outdoor areas of its campuses to make them comfortable and usable even in the summer, when solar radiation is greatest, through the use of appropriate paving, new trees and new shading elements.

The Politecnico di Torino is constantly committed to adopting a flexible and multi-modal approach to the issue of mobility in general, both for the whole community and for occasional and individual journeys, promoting conscious and responsible choices with a view to reducing both the local and global environmental impact produced by the daily movement of students and employees. In detail:

- ◆ It actively encourages the use of shared transport, including public transport, through incentives and agreements;
- ◆ it promotes walking and cycling also with the implementation of dedicated equipment and services;
- ◆ it promotes environmentally friendly means of transport, both for service and daily travel, through the availability of both rechargeable and refuelling vehicles and charging points for private vehicles.

The repeated monitoring of the modal choices made by Politecnico staff and students makes it possible to periodically check the impact of the policies adopted and, at the same time, to keep an up-to-date picture of aggregate consumption and related CO2 emissions, which make up the basic cognitive component to support the path towards decarbonisation undertaken by the University.

4.3.1   University Home Commute Plan

As of 2021, the University has a current Workplace Relocation Plan (PSCL)1 in place as required by industry regulations for entities with more than 100 employees that are located in a regional capital city, a metropolitan city, a provincial capital or in a municipality with a population greater than 50,000 inhabitants. The purpose of the document is to define actions and policies aimed at the permanent reduction of urban traffic congestion levels and air pollution. In order to meet this legal obligation, the Piedmont Region has activated a digital platform called EMMA (Electronic Mobility Manager Application) which allows mobility managers to digitise and systematise the data collection activities on the mobility of their employees and/or students. This regionally integrated tool facilitates the collection and organisation of data, the integration of mobility demand, the centralised and harmonised visualisation of Home-Work and Home-School Travel Plans (PSCL and PSCS) and the possibility of modelling the public transport offer according to actual demand.

As of January 2023, the Politecnico di Torino, in cooperation with the University of Turin is planning to start a discussion table with the Piedmont Region, the Metropolitan City and 5T in order to develop a variation of the platform that may adapt to the specificities of university contexts. This collaboration represents one of the first examples in Italy of a joint activity between the Region and universities for a Mobility Management tool specifically designed for universities in the context of the drafting of a University Home Commute Plan.

Bicycle repair totems

In March 2022, three new bicycle storage facilities were installed at the University's Turin sites, complementing the maintenance kits already present in the gatehouses.
These recent facilities or Totems offer a range of tools to enable users to carry out minor repairs and basic maintenance themselves. The Totems are equipped with a pump for inflating inner tubes, a clamping device for securing the bicycle during maintenance operations, a Phillips screwdriver and a slotted screwdriver for basic adjustments or repairs. In addition, there is a roller spanner in a range of sizes (0 to 22 mm) and fixed spanners in specific sizes (14-15 mm and 12-13 mm) as well as two levers for removing and replacing tyre treads.
This initiative aims to provide users of the University's premises with the basic tools to maintain bicycles, thereby also encouraging the use of this environmentally friendly means of transport and promoting a healthy and sustainable lifestyle.

Electrified vehicles and demand analysis

In the Politecnico's headquarters, an underground car park is currently being built (2022- 2024): it will provide approximately 650 parking spaces for staff from the autumn of 2024 onwards, hence allowing too free many external spaces which may be destined to other uses, including areas for community life as well as for teaching.
Stimulated by the University's Mobility Manager as well as the Green Team's mobility group, an entire floor of the car park to be built, comprising around 165 parking spaces, will be equipped with electric sockets for recharging vehicles – hybrid rechargeable or electric-only – in order to support the gradual conversion to vehicles capable of moving at least in urban areas with electric traction by the university community. In order to effectively plan the provision of charging points, a thematic questionnaire was administered in July 2022, the results of which made it possible to estimate the time trend in demand for parking spaces with recharging, with a projection up to 2040. The study of demand trends is currently supporting the planning of the start-up phases of the service.
At the departmental level, there are some charging points for plug-in vehicles.

University MaaS

In 2022, the Politecnico di Torino ended its coordination activity of the thematic subgroup of the RUS Mobility Working Group dedicated to "Technology and Innovation" and published the results of the annual activities in the document Guidelines for the planning of academic mobility management interventions at Italian universities, editing in particular the section entitled "First Guidelines on University MaaS" (document available on the RUS website).

MaaS is a new concept of mobility as a service (Mobility as a Service) which is based on the principle of serving the demand for mobility (i.e. people) by means of not a single service, but several integrated services for both network arcs (travel by various modes of transport) and nodes (parking, recharging) through a single instrument, whether material (card or smart card) or immaterial.

At the local level, the University confirms its interest in supporting the development and improvement of this technology by taking part, as a user of the service, in a first MaaS experimental initiative promoted by the City of Turin and 5T in the summer of 2022, as well as a subsequent one in 2023 within the MaaS4Italy programme.

In December 2022, the Politecnico di Torino was appointed to the national coordination of the Mobility Working Group of the RUS network for the 2023-2025 three-year period, acknowledging the importance of fostering the sharing of knowledge and the good practices concerning academic mobility management and supporting Italian universities in planning and promoting sustainable mobility for their communities.

4.4 SUSTAINABLE RESOURCE MANAGEMENT

The Politecnico di Torino is committed to promoting the responsible management of resources by promoting the reduction of consumption, by discouraging waste and by favouring recycling and reuse policies with a view to a circular economy.

The actions implemented by the University regarding Resources concern the management of waste, water resources, green public procurement, and food.

- ◆ waste disposal management aims to reduce and rationalise waste production and promote separate waste collection, thereby reducing its environmental impact. The "reduce-reuse-recycle" approach is used with a view to completely closing the life-cycle of products in a sustainable manner; a first tangible example is the distribution of water bottles to students and staff of the University in order to limit the use of disposable water bottles, thereby reducing the ecological footprint; a second example is the use in the canteen of a free self-service beverage dispenser where users, during the meal, can help themselves to the beverages made available as many times as they wish, through the use of a reusable glass;

- ◆ water resource management is implemented through the monitoring of consumption and the promotion of strategies to reduce waste, as well as the free distribution of drinking water to the Politecnico community through various "water points" located in various parts of the university

- ◆ the choice of sustainable agri-food chains is enhanced through the selection of local products and the encouragement of guidelines for catering suppliers within the university.

- ◆ The responsible management of consumer goods procurement focuses on the adoption of green public procurement guidelines (EPA Protocols), so as to respect the environment without neglecting the cost-effectiveness of procurement.

4.4.1 Waste management

The University started a project to renovate **the waste collection areas**, also in cooperation with the student team EcòPoli. The old bins were mapped, painted with a unique colour code and relocated to collection areas, containing for the first time also the organic portion.

With the aim of improving the quality of separate waste collection and raising awareness among users, the collection areas were given a new graphic design with explanatory panels containing the most common waste at university campuses and their proper disposal. In 2022, the new areas were set up at the headquarters and will subsequently be installed on all University campuses.

WEEE Collection

The EcòPoli and WEEEOpen student teams organised two awareness-raising events in 2022 on the correct disposal of WEEE waste, each lasting two days. During both events, students and university staff were able to hand in their e-waste for proper disposal through AMIAT. Furthermore, during these events, student teams provided expertise and support for the repair of damaged electronic equipment, thus extending its useful life.

The water footprint of food choices

On the occasion of the World Water Day, an initiative was organised in cooperation with the "Water to Food" team of researchers to discover the water hidden in the production of the food we consume every day. In particular, with the aid of a "talking placemat", users of canteens and cafeterias were able to calculate the water footprint of the meal consumed
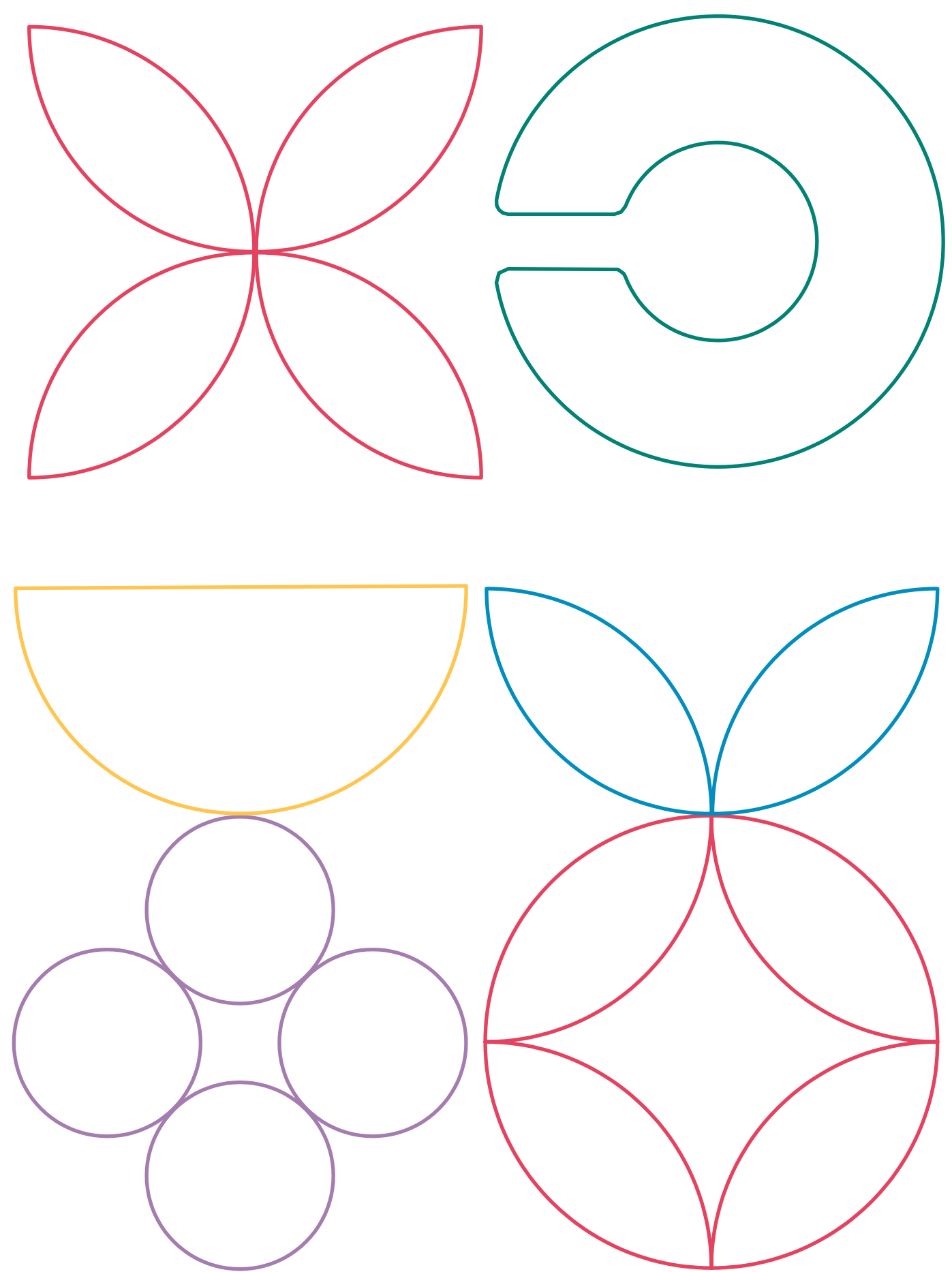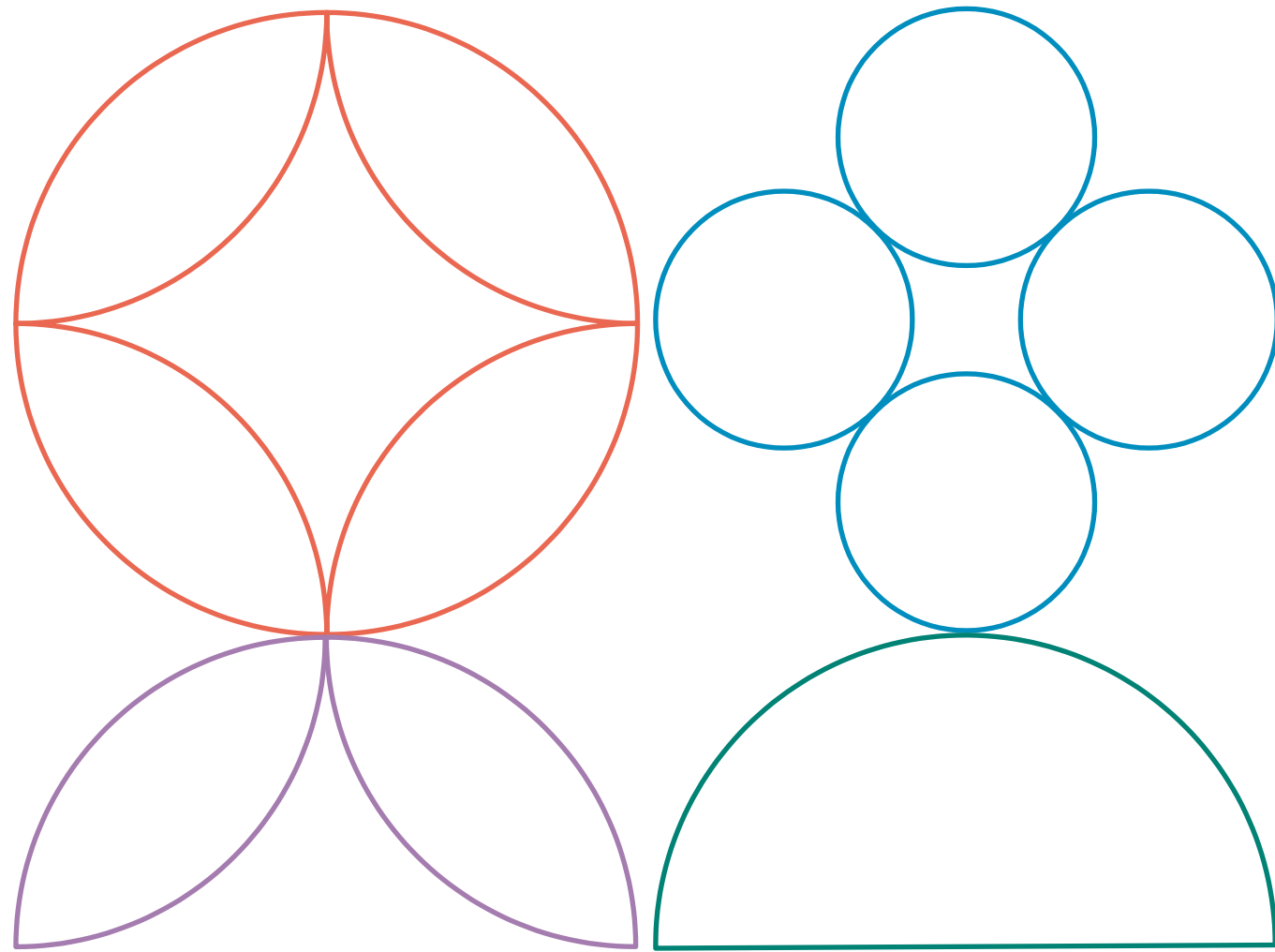
The Sustainability Report 2022 was produced by the University Green Team with the support of the Sustainability Service (CALOS).

We would like to thank the CALOS, RIMIN, PEPS, CCBI and ARIA offices for their support in data retrieval and text revision.