University of Genoa
Savona Campus
ITALY

ISCN-GULF SUSTAINABLE CAMPUS CHARTER REPORT 2018
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WELCOME

I am pleased to introduce the first annual sustainability report of Savona Campus (University of Genoa) for the International Sustainable Campus Network. This document summarises the sustainable works undertaken during the last five years and highlights the targets for the upcoming programs.

The University of Genoa recognizes the Sustainability concept as one of the main pillars for its future evolution, in strict connection with the development lines of the surrounding territory, such as tourism, green & blue economies, hi-tech/his-skills industries and health, wellbeing & sport activities.

In particular, the Savona Campus is strongly committed in following an innovation path towards the paradigms of “Zero Emission Campus” and “Smart City Living Lab”. We really believe, indeed, that Universities have to act as Lighthouses of the Sustainability inside the society, in order to increase population awareness through the real demonstration of Smart City scenarios and the deployment of the best available technologies to increase the life quality of the Citizens.

From this point of view, ISCN plays a fundamental role in increasing the impact of the Universities’ action on the external world, defining a common vision and facilitating the sharing of knowledge among all the members.

We are very proud to belong to ISCN and really happy to look at a more sustainable future together with our students.

Prof. Federico Delfino
Head of Savona Campus - University of Genoa
INTRODUCTION
About the University of Genoa:

THE UNIVERSITY OF GENOA
The University of Genoa (Italian: Università di Genova, known also with the acronym UNIGE) is one of the most ancient academic institutions in Europe. It was founded in 1481 and today is ranked among the top 10 universities in Italy.

With more than 230 educational paths distributed in the headquarters in Genoa and in the campuses of Imperia, Savona and La Spezia, it is one of the most renowned multidisciplinary public universities in Italy, with peaks of excellence in several scientific and technological domains.

TEACHING
• 124 Degrees
• 28 Ph.Ds
• 53 Postgraduate Schools
• 27 Masters

STUDENT ENROLLMENT
The current student population is around 32,000 at both undergraduate and graduate levels. Nearly the 10% of them come from other countries.

RESEARCH
• 81 patent applications (8 in 2017)
• Systematic collaborations and sharing of facilities and infrastructure with high-tech national and international companies and research bodies
• 41 university spin-off
• 11 Interuniversity Research and Services Centres
• 2 Centres of Excellence

UNIVERSITY STAFF
The University of Genoa is composed by 22 Departments distributed over 5 Schools:
• Natural Sciences
• Medical Sciences
• Engineering & Architecture
• Social Sciences
• Humanities

The personnel consist of about 1300 academics and 1400 administrative and technical staff, of whom 12 top executive managers.
About the Savona University Campus

THE SAVONA UNIVERSITY CAMPUS
The Savona University Campus is both a research and a teaching facility of the University of Genoa and it is located in Savona, a city of about 60,000 inhabitants. 45 km far from Genoa, the main town of Liguria Region in the North-West of Italy. The Campus is only 2 km far from Savona highway exit and 10 minutes by bus from the city centre.

THE HISTORY
From 1930 to 1990 the area, of approximately 52,235 square meters, hosted a military compound of the Italian Army. In 1992 a urban regeneration process started to accommodate the University facilities into the pre-existing buildings. The architectural layout already included the installation of brise soleil systems: sun-shading structures that reduce solar heat gain within the building by deflecting sunlight. The area became property of the University of Genoa in 2014.

RESEARCH
- 11 research laboratories of the University of Genoa:
  - engineering sciences (energy, ICT, simulation, transportation and telecommunication)
  - medical sciences (neurophysiology, physiotherapy)
  - communication sciences (audiovisual)
- Research & Innovation Cluster on Sustainable Energy (www.es.sv.it):
  - 44 companies aggregated (20% large firms, 80% SMEs)
  - Power systems engineering & control
  - Renewables & storage systems
  - Planning, design and management of smart energy systems
  - Distributed Generation modelling and simulation
- International Environmental Research Centre (www.cimafoundation.org):
  - National Centre for Civil Protection
  - Disaster Risk Reduction
  - Biodiversity

SERVICES
10 buildings hosting:
- classrooms, study halls, laboratories
- library
- service centre
- cafeteria and canteen
- students accommodations
- more than 15 SMEs

Different sport facilities are present:
- tennis court
- football field
- U-gym
- U-trail (fitness trail)

EDUCATION
The Savona Campus offers:
- 4 B.Sc. courses
- 4 M.Sc. courses
- 1 Master program
- 1 Technical Institute

2021 students
220 University Staff

2021 students
220 University Staff
Organization

The Savona University Campus is managed by the Service Centre CENS\(^1\), headed by a President and a Managing Director and composed by three offices: Administration and Accounting, Student Desk – Internship and Technical Operations. CENS is also the structure of the University of Genoa that has in charge the promotional activities and the operation of important Research Infrastructures (RI) in the Sustainable Energy & Smart City sectors installed at Savona Campus, like a Smart Microgrid and a Smart Energy Building on which several research projects, in cooperation with industries and international and national research institutions, are ongoing.

Authorities of the centre are the Governing Council and the President. The Governing Council has in charge the general organization of the Campus, the decisions about investments and participation to competitive international and national fund-raising programs and the definition of the development strategies. It is composed by 11 members, among them faculty staff coming from different Departments and Schools and representatives of the students. The President represents the centre, leads initiatives, coordinates all the activities and is responsible for the fulfilment the yearly prescribed objectives.

About this report

This report is the first annual Sustainable Campus Charter Report of University of Genoa Savona Campus. It has been prepared for the International Sustainable Campus Network (ISCN) and it focuses on the three principles of the ISCN Charter:

1. **Sustainability performance of buildings on Campus**, sustainability considerations should be an integral part of planning, construction, renovation, and operation of buildings on campus to demonstrate respect for nature and society;

2. **Campus wide Master Planning and Target Setting**, include environmental and social goals to ensure long-term sustainable campus development;

3. **Integration of Facilities, Research and Education**, to align the organization’s core mission with sustainable development, facilities, research, and education should be linked to create a “living laboratory” for sustainability.

This document explains the performance of Savona Campus in 2017 and reports the target to be pursued to improve Savona Campus sustainability in the near future.

The report has been compiled by Paola Laiolo, Sustainability Officer at Savona Campus.

\(^1\) www.cens.unige.it
Savona Campus growth to Sustainability

1930-1990
The area hosted a military compound of the Italian Army

1992
Urban regeneration process to host University of Genoa facilities

2007
International Environmental Centre “CIMA Research Foundation”

2011
- Italian R&I Cluster on Sustainable Energy
- UNIGE project Energia 2020

2014
Unveiling “Smart Polygeneration Microgrid”

2016
Entry into ISCN

2017
- Unveiling “Smart Energy Building”
- Project “Energy Efficiency Measures”
- Entry into UI Greenmetric

Future
Project “Smart City Demo Campus”
PRINCIPLE 1: SUSTAINABILITY PERFORMANCE OF BUILDINGS ON CAMPUS

“To demonstrate respect for nature and society, sustainability considerations should be an integral part of planning, construction, renovation, and operation of buildings on campus”

A sustainable campus infrastructure is governed by respect for natural resources and social responsibility, and embraces the principle of a low carbon economy. Concrete goals embodied in individual buildings can include:

- minimizing environmental impacts (such as energy and water consumption or waste),
- ensuring equal access (such as nondiscrimination of the disabled),
- optimizing the integration of the built and natural environments.

To ensure buildings on campus can meet these goals in the long term, and in a flexible manner, useful processes include participatory planning (integrating end-users such as faculty, staff, and students) and life-cycle costing (taking into account future cost-savings from sustainable construction).
All the buildings inside the Savona Campus are property of the University of Genoa, which provides all the maintenance activities through the Technical Office inside CENS.

Since 2011, Savona Campus started an ambitious innovation project concerning with the increase of the global energy saving and the reduction of the overall CO₂ emissions, in partnership with the Italian Ministry of the University and Research, the Italian Ministry for the Environment and the Regional Government (Regione Liguria). Such project, fully conceived by the Power Systems research team of the University of Genoa, was called “Energia 2020” (www.energia2020.unige.it) since it aims at creating a model of “zero-emission” Campus within the year 2020. It is relevant to the construction of “intelligent” energy infrastructures and buildings, with high level of penetration of renewable sources and system automation, in order to reduce consumptions and to create high-comfort environments for the community of the Campus.

The Energia 2020 infrastructures allowed to obtain in March 2018 the Legambiente² (Italian League for Environment) “Treno Verde”³ (Green Train) award.

Following these lines, the main objectives pursued by Savona Campus can be divided in four categories:

- RESOURCE USE & ENERGY PRODUCTION
- WASTE & RECYCLING
- SUSTAINABLE BUILDINGS

**RESOURCE USE & ENERGY PRODUCTION**

**OBJECTIVES**

- REDUCE ENERGY CONSUMPTIONS (NATURAL GAS, ELECTRICITY AND WATER)
- INCREASE RENEWABLE POWER PRODUCTION
- PROMOTE GREEN PURCHASING

The Smart Polygeneration Microgrid (SPM), a three-phase low voltage “intelligent” network composed of electrical and thermal generation, distribution and control subsystem, helps to supply the energy demand of the Savona Campus since February 2014. The SPM is the first pillar of the Energia 2020 project.

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² https://international.legambiente.it/who-we-are

³ “Treno Verde” is a train set up to raise awareness about environmental topics, sustainability and climate change. A journey to 12 Italian cities: at each stop, Legambiente awarded, as “RenewABLES”, city administrations, public bodies, companies, citizens, associations and start-ups that have bet on renewables, efficiency and new forms of sustainable mobility.
Three microturbines ($\mu$GT), fed with natural gas, allow to produce electricity and hot water that is used to heat the buildings in winter and to refrigerate them during summer by the employment of the absorption chillers (AC). In winter the boilers (B) help to satisfy the thermal needs of the Campus. The electricity is also generated by renewables with 395 solar panels (PV) and 3 CSPs; these last allow also to produce domestic hot water (DHW) that is employed in the students accommodation buildings. The energy storages (ES) permit gathering the electricity surplus and returning it in case of need. Moreover, two traditional recharging stations for electrical vehicles and two V2G (Vehicle to Grid) recharging stations (EV) are present.

A central "brain", the Energy Management System (EMS), allows checking in real time the functional status of all the grid’s elements, informing in case of problems or breakdowns. It is also responsible of the optimization and planning of the power flows exchanged with the public electrical grid, by regulating generation and consumption units.

<table>
<thead>
<tr>
<th>Resource Use and Energy Production - Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Priority topics</strong></td>
</tr>
<tr>
<td>Natural gas consumption ($\mu$GT)</td>
</tr>
<tr>
<td>Electricity consumption</td>
</tr>
<tr>
<td>Water consumption</td>
</tr>
<tr>
<td>Energy Production from Renewables</td>
</tr>
<tr>
<td>Energy Production from natural gas ($\mu$GT)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Overall purchased products/materials</td>
</tr>
</tbody>
</table>
The Italian law put the constraint to have at least the 65% of recycling rate at the Municipality level. The Savona Campus wants to raise awareness on the issue of urban waste and wants to be a model of environmental impact reduction for population and institutional stakeholders in the surrounding area.

The waste management program implemented inside Savona Campus allowed to reach, in 2017, the 75% of recycling rate. Next years, this program will be strengthened both by increasing the recycling boxes (paper, plastic, glass&cans, batteries, cartridges) and by creating brochures and additional information material to distribute to the Campus population on how put in place a correct waste collection.

**Hazardous waste**: the Italian law forces the public institutions that produce hazardous waste to track them by using the SISTRI system. The SISTRI (waste tracking system) is an information system created by the Italian Ministry for the Environment to monitor hazardous waste traceability. Therefore, the disposal of chemical laboratory waste (solvents, acids, liquid solutions etc.) of the Savona Campus is managed following the Ministry guidelines.
The Smart Energy Building (SEB) is a 2 floors Zero Emission Building, covering a total area of 1000 m², heated and cooled only by geothermal energy coming from the soil and electrically powered by photovoltaics and storages. The SEB construction started in 2016 and on December 4th 2017 the building was unveiled. The energy consumptions of the building and the production of its generation units are monitored in real-time in order to evaluate the environmental and economic benefits, through suitable KPIs. The SEB, designed by the University of Genoa to be an innovative and high performance building to meet goals of zero carbon footprint, energy and water efficiency and building automation, is the second pillar of the Energia 2020 project (www.energia2020.unige.it).

The Building Management System (BMS) of the SEB and the EMS of the SPM, allow the SEB to be an “Energy Prosumer”, which is able to produce energy (thermal and electrical) for its own and, in case of need, to recall energy from the SPM. This peculiarity characterizes the SEB as the first “Smart City” urban infrastructure in Italy.
A Rain Harvesting System is present inside the SEB. The rainwater collected from the roof, after passing through a filter, is stored inside an underground 5000 litres storage tank. A water level control allows, in case of exceeding the maximum capacity threshold, to discharge the additional rainwater to the Savona Campus storm drain system. The stored water is then pumped into the building and used for toilet flushing and for garden irrigation. An electric meter is connected to the hydraulic pump in order to measure the power consumptions. If the water level inside the tank falls below the minimum value, the water is integrated with that one coming from water mains.

In 2017, an important refurbishment of the existing buildings improved their energy efficiency and accessibility for people experiencing disabilities. The main interventions were:

- Changing window fixtures
- Improvement of the refrigeration system
- Changing light system by using led lamps
- Installation of wheelchairs ramps outside and lifts inside

<table>
<thead>
<tr>
<th>Sustainable Buildings &amp; Equal Access - Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priority topics</td>
</tr>
<tr>
<td>Stakeholder participation in planning</td>
</tr>
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<td></td>
</tr>
<tr>
<td>Landscape integration of building design</td>
</tr>
<tr>
<td>Handicap access</td>
</tr>
</tbody>
</table>
PRINCIPLE 2: CAMPUS WIDE MASTER PLANNING AND TARGET SETTING

“To ensure long-term sustainable campus development, campus-wide master planning and target-setting should include environmental and social goals”

Sustainable campus development needs to rely on forward-looking planning processes that consider the campus as a whole, and not just individual buildings. These processes can include comprehensive master planning with goals for:

- impact management (for example, limiting use of land and other natural resources and protecting ecosystems),
- responsible operation (for example encouraging environmentally compatible transport modes and efficiently managing urban flows),
- social integration (ensuring user diversity, creating indoor and outdoor spaces for social exchange and shared learning, and supporting ease of access to commerce and services).

Such integrated planning can profit from including users and neighbors, and can be strengthened by organization-wide target setting (for example greenhouse gas emission goals). Existing low-carbon lifestyles and practices within individual campuses that foster sustainability, such as easy access for pedestrians, grey water recycling and low levels of resource use and waste generation, need to be identified, expanded and disseminated widely.
The University of Genoa, beyond offering high education and scientific consultancy services, plays the fundamental role of cultural hub between local reality and global society. Therefore, it contributes to the social, cultural and economic development of Liguria Region (North West Italian district) through direct application, enhancement and use of knowledge, as well as lifelong learning and actions of public engagement. The University of Genoa recognizes, in its Charter, the Sustainability as one of the main pillars on which relying in order to continuously improve its international ranking and reputation. In particular, the following actions are pursued:

- enhance the knowledge by providing the necessary skills and innovation;
- raise the sustainability awareness among students, university staff and citizens;
- propose the University Campuses as “Living Labs” of Sustainability.

The University of Genoa is therefore committed to:

- promoting environmental sustainability in every aspect of the work;
- work closely with policy makers, municipalities & communities, industry & business and other universities.

In 2015 the University of Genoa established a Commission on Environmental Sustainability with the goal of bringing the University in evidence in the national context, implementing projects and activities that achieve results in the field of the sustainability. This Commission works closely with other working groups that operate on issues related to green economy, such as the Working Group on Energy Saving of the University.

The Service Centre CENS has the task of schedule all the sustainability actions and programs at Savona Campus following the mission of the University of Genoa. To ensure long-term sustainable campus development, the main objectives pursued by Savona Campus can be divided in the following six categories:

- **CARBON EMISSIONS**
- **TRANSPORTATION**
- **FOOD**
- **WELLBEING**
- **SOCIAL INCLUSION AND PROTECTION**
- **LAND-USE AND BIODIVERSITY**
Inside Savona Campus, the following technologies allows to reduce CO₂ emissions:

- Renewable energy production and storage
- Trigeneration power plant (microturbines coupled with absorption chillers)
- High efficiency geothermal heat pump
- High efficiency led lamps installed in the external areas of the Campus
- High efficiency led lamps installed inside buildings

The UNI ISO 14064 standard allows to estimate the total amount of carbon dioxide emission dividing it in three parts:

- Scope 1: All direct emissions;
- Scope 2: Indirect emissions from consumption of purchased electricity;
- Scope 3: Other indirect emissions not covered in Scope 2

The University of Genoa calculations refer only to Scope 1 and Scope 2 because Scope 3 emissions are significantly lower than Scope 1 and Scope 2 ones.

As a general comment, one can observe the significant decrease in carbon dioxide emissions due to the SPM entry in operation in 2014.
TRANSPORTATION

OBJECTIVES

- Encourage the use of sustainable transportation by enhancing the electrical mobility in public transportation and within university staff and campus users
- Improve bike rental and parking

PUBLIC TRANSPORTATION

10/15 minutes from city centre and from the railway station
4 lines (90 bus rides per day)

PRIVATE TRANSPORTATION

338 car parking lots
95 motorcycle parking lots

BICYCLES

73 bike parking lots
Bicycles available, upon request, for students staying at the Campus accommodations

ELECTRICAL MOBILITY

2 traditional charging units
2 V2G charging units (from 2017) - electric car battery can also be used as support storage to the electric grid

PEDESTRIAN ACCESS

2 pedestrian access
Pedestrian ways, on a wooden deck, located in the central aisle of the Campus (about 35% of the Campus area)
Transportation -Details

<table>
<thead>
<tr>
<th>Priority topics</th>
<th>Key Initiatives - Planned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Transport</td>
<td>• electric bus service connecting Savona Campus to the city center</td>
</tr>
<tr>
<td>Bicycles</td>
<td>• Bike rental improvement&lt;br&gt;• Savona Municipality is in the process to build a new bikeway connecting the Campus to the railway station and the city centre</td>
</tr>
<tr>
<td>Electrical Mobility</td>
<td>• Buy a new electric vehicle (Nissan Leaf) for research purposes (V2G test)</td>
</tr>
</tbody>
</table>

FOOD

OBJECTIVES

• ENSURE ENERGY-SAVING EQUIPMENT AT THE CANTINE INSIDE THE CAMPUS  
• PROMOTE SUSTAINABLE FOOD AND DRINKS AT THE CANTENE AND AT VENDING MACHINES  
• REDUCE PACKAGING PRODUCTION

The food services inside Savona Campus are:

24,611 meals per year

Canteen & Cafè

No packaging production: suitable dispensers allow to have water and beverage directly into a glass.

Vending Machines

4 vending machines (food & beverage)

Sustainable food and drinks

Food -Details

<table>
<thead>
<tr>
<th>Priority topics</th>
<th>Key Initiatives - Planned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food supply chain and environmental impact</td>
<td>Install energy-saving equipment</td>
</tr>
<tr>
<td>Fair trade food sourcing</td>
<td>• Fair trade products&lt;br&gt;• Promote local food systems</td>
</tr>
</tbody>
</table>

UNIVERSITÀ DEGLI STUDI DI GENOVA
**Wellbeing**

**OBJECTIVES**

- CREATE A SMART WORKING ENVIRONMENT
- IMPROVE SPORT INFRASTRUCTURES TO ENSURE HEALTH AND WELLNESS FOR THE CAMPUS COMMUNITY
- PROMOTE THE ACADEMIC EDUCATION ON SPORT SCIENCES AND PHYSIOTHERAPY/REHABILITATION IN ORDER TO SPREAD HEALTH AND WELLBEING BEST PRACTICES

Health & Wellbeing topics are strengthening inside Savona Campus. During the last 3 years several courses and activities were developed in those areas:

- B.Sc. Sport Science and Health
- Master on Rehabilitation of Musculoskeletal Disorders
- University spinoff, located inside the Campus, dealing with physiotherapy:
  - Scientific research on prevention and rehabilitation of Musculoskeletal Disorders
  - Training activity on rehabilitation and psycho-physical wellbeing
  - Consultancy activities to Physiotherapy operators

Related to these programs, the Campus offers, for its students and users, several sport infrastructures.

![Tennis Court](image1)
![Football Field](image2)
![U-Gym](image3)
![U-Trail](image4)

**Wellbeing -Details**

<table>
<thead>
<tr>
<th>Priority topics</th>
<th>Key Initiatives -Planned</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sport infrastructures</strong></td>
<td>• Football field roofing</td>
</tr>
<tr>
<td></td>
<td>• Water &amp; sailing sport center on the beach in front of the Campus</td>
</tr>
<tr>
<td><strong>Workplace health and safety</strong></td>
<td>• Cyber security countermeasures implemented</td>
</tr>
<tr>
<td></td>
<td>• Video surveillance on all the Campus</td>
</tr>
</tbody>
</table>
SOCIAL INCLUSION AND PROTECTION

OBJECTIVES

- Ensure equal opportunity and social inclusion of foreign students
- Prevent any form of discrimination
- Increase the availability of students accommodation
- Promote the Savona Campus activities through public information events and with any communication channel

The University staff working at Savona Campus is composed by:

- 200 Faculty/Non-permanent teachers
- 16 Technical & Administration
- 4 Operations & Maintainance

The University of Genoa offers inside Savona Campus two Engineering courses in English (M.Sc. Energy Engineering and M.Sc. Engineering for Natural Risk Management) in order to guarantee an international attendance. For the moment, nearly 10% of the student body come from foreign countries.

CENS communicate with every Campus users (University staff, students, employees and visitors) using different communication channels.

Website (www.cens.unige.it)

Facebook (Campus Universitario di Savona - Università degli Studi di Genova @savonacampus)

Twitter (Centro Ateneo Savona @censunige)

Targeted e-mails

In addition, Savona Campus participated to 4 events in 2017, related to Environment and Sustainability, organized both by University of Genoa – Savona Campus and Savona Municipality to share sustainability knowledge to the citizens:

- **Energy-saving and sustainability lessons for children** at Savona Campus. During the Italian week devoted to energy-saving (20th-24th February 2017), 16 classes of children from 12 to 14 years old came to Savona Campus for a simplified lesson about energy-saving, renewable energy production and sustainability. Moreover, our researchers guided the kids and their teachers on a tour of the energy research infrastructures located inside the Campus.

- **Energy Games for children**: on May 6th and 7th a group of our Energy Engineering students were involved to propose two activities for kids during the
event “Città dei bambini” (City for Children), a social event organized in Savona city centre for children with games and laboratories aimed to teach them different topics. Our Campus gave its contribution to the event offering two games on energy saving and renewable energy production. For both games, the winners were those who proposed high-efficient solutions.

- **WhyBio**: an exhibition on sustainability, wellbeing, innovation, green mobility, environment and energy organized by Savona Municipality in the city centre. The Savona Campus was present in a stand proposing its courses and research activities, on environment and energy-saving, to the citizens.

- **Sustainable Development Festival**: the Italian Alliance for Sustainable Development, Alleanza Italiana per lo Sviluppo Sostenibile (ASviS), promoted in 2017 the Sustainable Development Festival, the first exhibition in Italy regarding sustainability and the United Nations Sustainable Development Goals of Agenda 2030. In this context, the Savona Campus proposed a workshop about sustainability in Universities with a particular focus on the research infrastructures and best practices developed and promoted by the University of Genoa inside the Savona Campus reality.

### Social inclusion and protection - Details

<table>
<thead>
<tr>
<th>Priority topics</th>
<th>Performance 2016</th>
<th>Performance 2017</th>
<th>Key Initiatives -Planned</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Students</strong></td>
<td>1869</td>
<td>2021</td>
<td></td>
</tr>
<tr>
<td><strong>Incidents of discrimination</strong></td>
<td>None</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Social aggregation</strong></td>
<td>University Amateur Sport Clubs (CUS and CUG) organize sport activities for students and university staff</td>
<td>Creation of a social cooperative to promote social-cultural events inside the Campus</td>
<td></td>
</tr>
<tr>
<td><strong>Accommodations, interaction spaces, and services</strong></td>
<td>• 2 student accommodation buildings inside the Campus (90 beds) with common areas • Study halls • Green public areas</td>
<td>Create 43 accommodations in an historical structure located in the city center and implement an electrical shuttle connection to the Campus</td>
<td></td>
</tr>
</tbody>
</table>
Green areas inside Savona Campus cover about 23% of the global area. These areas are mainly characterized by trees (pine, palm, olive, cedar and plane trees), laws, gardens, land and gravel areas.

Regarding lawns and gardens inside Savona Campus, a centralized and fully automated irrigation system is present. A programmed irrigation scheduling can be set for all the green areas from a unique control unit, which has been positioned on the main workstation of the SPM Control Room. It is also possible to manually open and close some parts of the irrigation system.

Finally, a vertical hydroponic garden is present inside the SEB.

### Priority topics

<table>
<thead>
<tr>
<th>Green areas</th>
<th>Performance 2016</th>
<th>Performance 2017</th>
<th>Key Initiatives - Planned</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>11.982 mq</td>
<td>12.252 mq</td>
<td></td>
</tr>
</tbody>
</table>
PRINCIPLE 3: Integration of Facilities, Research, and Education

“To align the organization’s core mission with sustainable development, facilities, research, and education should be linked to create a “living laboratory” for sustainability.”

On a sustainable campus, the built environment, operational systems, research, scholarship, and education are linked as a “living laboratory” for sustainability. Users (such as students, faculty, and staff) have access to research, teaching, and learning opportunities on connections between environmental, social, and economic issues.

Campus sustainability programs have concrete goals and can bring together campus residents with external partners, such as industry, government, or organized civil society. Beyond exploring a sustainable future in general, such programs can address issues pertinent to research and higher education (such as environmental impacts of research facilities, participatory teaching, or research that transcends disciplines). Institutional commitments (such as a sustainability policy) and dedicated resources (such as a person or team in the administration focused on this task) contribute to success.
Research, scholarship and education are linked together in our campus in order to construct a community in which members share the responsibility for present and future people. To do this, some activities have been organized, such as:

- possibility of performing a master final project (thesis) or to run a Ph.D. program on the available experimental facilities on the topics of sustainability and energy-saving (SPM and SEB);
- definition of bachelor and master courses programs in order to take into account the sustainability aspects both from a theoretical point of view and from the application one (i.e. the subjects of many different courses are mainly focused on renewable energy sources);
- Two double degrees in Energy Engineering have been activated with MCI Innsbruck and University Savoie Mont Blanc;
- Each year we organize “open days” inside the Campus to meet local high schools describing them Campus facilities and our teaching offer;
- specific activities have been promoted in which our campus students and researchers meet the secondary school students sharing with them their experience about sustainability projects;
- specific activities have been defined for children from local schools in order to start making them aware of the concepts of sustainability and of energy-saving;
- a counseling center has been opened in which students can find expert people able to listen to what is important for them;

The main objectives related to the integration of sustainability in research, facilities and education are:

- **TOPICAL INTEGRATION**
- **SOCIAL INTEGRATION**

The following pages explain in details, for each category, the performance obtained into Savona Campus.

### TOPICAL INTEGRATION

**OBJECTIVES**

- INTEGRATE SUSTAINABILITY TOPICS IN EDUCATION, RESEARCH AND INFRASTRUCTURES

In the Savona Campus, 4 Bachelor's degree courses, 4 Master of Sciences, 1 Professional Master and 1 Superior Technical Institute are currently available. The mentioned courses are4:

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4 More information about the teaching programs available at http://www.cens.unige.it/en/didattica/
Most of the modules offered by Engineering courses (i.e. Energy Engineering and Engineering for Natural Risk Management) deal with sustainable energy and environmental sciences; while health, sport and wellbeing topics are part of B.Sc. Sport Science and Health. Moreover, M.Sc. Digital Humanities and B.Sc. Communication Sciences have some modules on sociology, ethics and innovative communication.

### Topical Integration - Details

<table>
<thead>
<tr>
<th>Priority topics</th>
<th>Performance 2016</th>
<th>Performance 2017</th>
<th>Key Initiatives - Planned</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total modules offered</strong></td>
<td>249</td>
<td>261</td>
<td>It is planned to activate in 2018-2019 a new M.Sc. on Sustainable Tourism. In addition, the B.Sc. in Industrial and Management Engineering will be transformed into the new B.Sc. Mechanical Engineering – Energy &amp; Industry 4.0</td>
</tr>
<tr>
<td><strong>Modules integrating sustainability</strong></td>
<td>71</td>
<td>81</td>
<td></td>
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<tr>
<td><strong>Programs connecting facilities, research, and education</strong></td>
<td>“Energia 2020” research infrastructures (SPM &amp; SEB) are used to:</td>
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<tr>
<td></td>
<td>• Research activities</td>
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<tr>
<td></td>
<td>• Educational purposes (the infrastructures are technically described during some course of Energy Engineering)</td>
<td></td>
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<tr>
<td></td>
<td>• Collaboration activities with external industry (i.e. Enel S.p.a., Ansaldo Energia, Siemens, ABB, Technogym)</td>
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<td></td>
<td>The gym, U-Gym, inside SEB was designed to be used:</td>
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<tr>
<td></td>
<td>• By students, university staff and Campus users</td>
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<td></td>
<td>• As Sport Science and Health Lab to sport performance studies</td>
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<tr>
<td></td>
<td>• For rehabilitation programs promoted by the Master on Rehabilitation of Musculoskeletal Disorders</td>
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</tbody>
</table>
Savona Campus collaborates with several external companies for two different reasons:

- **Internships.** Our students, after their graduation, have the opportunity to activate internships at selected companies that are in contact with the University. The CENS website constantly reports the available internships;

- **Scientific research.** Research laboratories collaborates with 34 external companies, 10 public authorities and 24 universities, at national and international level.

Moreover, it is important to underline that the SEB and SPM are part of the “Living Lab Microgrid”, an “open air” laboratory, in partnership with the Italian Electricity company, Enel S.p.A., aimed to test the Smart City technologies in ICT and energy sectors. “Living Lab Microgrid” is one of the 4 Enel “Open Innovation Labs” in the world.

Different social activities are available inside our Campus:

- **Sport Activities**
  - students and workers have the possibility to practice sport using the sport facilities located inside the Campus

- **Targeted and self-managed courses**
  - guitar, informatics, photography

- **Social events**
  - it is possible for the students to organize and participate to social events inside the Campus

- **Campuswave**
  - a radio managed by the students of the B.sc. Communication Sciences recently became the University of Genoa official web-radio

- **Campus Press**
  - an editorial lab managed by students of the B.sc. Communication

- **Joint activity with a music school**
  - to prepare concerts and give the student the possibility to learn to play an instrumental with reduced fees
SAVONA CAMPUS