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Introduction

The aim of this self-evaluation report is to provide a feedback showing precise reference to the recommendations included and collected in the evaluation report of February 2012, drafted by the EUA Evaluation Team composed of Julio Pedrosa, chair; Erdal Emel; Edward Jexierski; Kristine Bak Nielsen; Dionyssis Kladis, team coordinator.

Furthermore, this report has the aim of describing all the actions overtaken and innovations implemented, in particular in the period of time which followed the previous visit of the EUA Evaluation Team, with a particular focus on the Institutional Strategic Plan, approved in 2014 and the related Action Plan (appendices 1a and 1b).

This report is the result of the work of a team specifically appointed by the Rector, chaired and coordinated by the Deputy Rector Laura Montanaro, composed of 8 members as experts in different fields and representatives of the overall institutional complexity of Politecnico di Torino.

The self-evaluation team group is composed of the following members:

- Prof. Flavio Canavero Head of the Doctorate School
- Prof. Paolo Fino Head of the Department of Applied Science and Technology (DISAT), former member of the Board of Governors
- Prof. Patrizia Lombardi Head of the Interuniversity Department of Regional and Urban Studies and Planning (DIST)
- Prof. Michela Meo Former member of the Academic Senate
- Prof. Giuseppe Moglia Coordinator of the *Collegio* for Architectural Engineering and ANVUR (Italian National Agency for the Evaluation of the Italian University System and Research) expert
- Arch. Monica Naretto Assistant Professor in the field of Architecture
- Dr. Aldo Tommasin Director-General
- Mr. Marco Nicastro -Representative of students in the Board of Governors.

The group has been supported by some colleagues of the administrative staff:

- Dr. Chiara Biglia (SARTT area)
- Dr. Chiara Chiaberge (GESD area)
- Dr. Antonella Marino (SAV-STUD area)
- Dr. Cristina Orlando (SISTI service).

The document has been implemented also thanks to the contribution of the Vice Rectors and of many other colleagues, professors and administrative staff as well, belonging to all central administration areas. For the meaning of acronyms please see the Glossary at the end of this document.

I. A brief presentation of the context and background

In this brief overview of our University (<u>http://www.polito.it/index.php?lang=en</u>), some information appearing in the previous self-evaluation report drafted in 2011 (annex 1) have not been included, as well as any further detail already available in the leaflet "*Polito at a glance*", attached to this report (annex 2). By contrast, in the following we prefer to highlight some important aspects which have been significantly evolving in comparison with the outline of the situation provided previously.

I.1. Governance and organization structure

Within the framework of a coordinated program of activities, the Rector is supported by a Deputy Rector and by 6 Vice-Rectors, in particular a Vice Rector for Teaching, a Vice Rector for Research, a Vice Rector for Technology Transfer, a Vice Rector for Logistics, Organization and Infrastructure, a Vice Rector for International Affairs, and a Vice Rector for Quality. He also chairs the meetings of the Academic Senate and the Board of Governors, whose functions and tasks have been defined in the new Statute (annex 3) and in the General Regulations of the University, which were both approved by the Italian Ministry of Education, University and Research (MIUR). By contrast, the administration activities, the overall management and organization are led by the Director-General, whose responsibilities and tasks have been designed in accordance with the Italian law 240/2010.

The principal levels of the governance of our University are summarized in some organizational charts (appendices 2a,b,c,d,e,f).

I.2. Teaching and Research: the role of the Departments

In accordance with the recent reform of the Italian University system (Italian law 240/2010), Politecnico adopted a new Statute. The Faculties do not exist anymore and all their functions and activities are ascribed to the Departments, which now are in charge of both education and research activities. Furthermore, a rationalization process on the number and structure of the Departments, which are now 11, has been completed. The list and some figures of our Departments are summarized in annex 4.

Depending on the scientific and cultural objectives, each Department is responsible for some Bachelor and Master of Science courses, whose organization and management are coordinated by some connection structures called *Collegi*, which gather professors involved in one or more degree courses which have close similarities, as well as student representatives of the same degree courses.

Within *Collegi*, two roles have been identified:

- a Coordinator of all the educational programs within a specific thematic area;
- a Responsible of each educational program/degree course (the list of *Collegi* and of the Degree courses belonging to them is provided in annex 5).

I.3. Students and teaching

In the academic year 2014/2015 about 33,000 students attended Politecnico di Torino, as an overall number considering the three education levels (Bachelor, Master of Science, PhD); 18% of them were foreign and came from over 100 different countries. In the academic year 2013/2014, for the first time, the percentage of students who came from outside Piedmont has surpassed the percentage of Piedmontese students, showing an increasing appeal towards our University.

Approximately, each year about 5,500 students enroll in Politecnico in the first year of the Bachelor's level: among these students, in the academic year 2014/2015, 523 were international students.

In the tradition of the best technical universities in Europe, Politecnico di Torino is characterized by a comprehensive range of educational programs in Architecture and Engineering: 22 Bachelor - first level - programs and 30 Master of Science - second level - programs in the academic year 2014/2015, 18 of them being fully taught in English. The courses catalogue (<u>http://offerta.polito.it/index_en.html</u>) is enriched by first and second level Specializing Master programs (<u>https://didattica.polito.it/master/home/en/overview</u>). According to the Almalaurea report 2014 (ISTAT-Workforce; <u>https://www.almalaurea.it/universita/occupazione/occupazione12</u>), the employment rate of the second level (Master of Science)

students one year after graduation is 84.4% (above the national average of 68.2%). This rate represents an excellent placement capacity of Polito graduates in the job market, in spite of the prolonged economic crisis, as well as the youth employment rate.

I.4. PhD programs

PhD programs (<u>http://dottorato.polito.it/en/</u>) represent an even stronger link between education and research, where the value of merit and talent is enhanced by fellowships which have been increased in terms of number by our University, over the last years. According to the recent decree (February 8 2013) issued by the Italian MIUR with relation to the PhD programs evaluation, PhD courses offered by Politecnico, have been rationalized and reorganized. They are currently 17 and 5 of them are promoted jointly with other institutions, education and research bodies (University of Torino, INRIM-the National Institute for Metrological Research).

The total amount of PhD students of Politecnico is about 700, including high quality students coming from all over the world: international students who attend the PhD program corresponds to 33% of the total number. To the Doctoral School also belongs the III-level Specializing School on Architectural and Landscape Heritage (http://www.scuolabap.polito.it/).

I.5. International networks

Politecnico di Torino aims to compete with internationally recognized technical universities in the education and research fields. The fostering of the programs offered in English, the support to the international mobility of students (http://international.polito.it/) and professors, the attraction of foreign students coming from more than 100 Countries, the participation in international joint research projects and programs on all the main reference topics make our University a truly international campus. As a consequence, it offers a multicultural study environment to its students and has a close relationship to businesses, which share premises and work with us on many projects, providing students with the opportunity to gain work experience while still at university. At present, the Politecnico di Torino is involved in 402 agreements with foreign universities, 473 Lifelong Learning Programs/Erasmus agreements, 112 Double Degree agreements. As for the incoming/outgoing student mobility, Politecnico welcomed 1,099 incoming students and supported the mobility abroad of 927 outgoing students (a.y. 2013/2014).

I.6. Research and technology transfer

Politecnico particularly cares about developing a balanced mix of fundamental and applied research. Our University aims even more at creating networks within its socio-economic context and initiating partnerships with national and multinational companies. Fostering collaborative and interdisciplinary research and sharing knowledge with the industrial partners are between the Politecnico main objectives. In a period characterized by a reduction of public funding to the university system, Politecnico has been able to empower its capacity to attract public and private resources at a national and international level. In the forecast budget 2015, about 27% of the total revenue of our University is from research funds (Commercial agreements and European, National and Regional Funded Projects). Politecnico has adopted a flexible approach in collaborating with industry and each year, about 800 contracts are signed with companies for the provision of training and education services, consultancies for research, technology transfer and innovation. Technology transfer at Politecnico (http://www.polito.it/imprese/?lang=en) becomes a real "knowledge sharing", based on the complementarity of competences and reinforced by the presence of joint laboratories in the campus and by the participation through partnerships in research projects. In order to support such initiatives, our Institution has established, since a long time, an extension of its campus (called "Cittadella Politecnica"), where spaces and initiatives are shared with companies, in particular in the Business Research Center and in the I3P Incubator (http://www.i3p.it/en/).

The "Innovation Front End" service (<u>http://www.innovationfrontend.eu/</u>) is available to companies that want to invest in research and believe in innovation to compete in the market. An Interdepartmental laboratory for Technological Transfer has recently been established and is supported by a specifically dedicated Vice Rector appointed in May 2015.

I.7. Budget and human capital

Over the last years, the budget for Politecnico di Torino has been around 260 million Euros per year with an amount of funding from the Italian MIUR which represents less than 50% of the total revenues of our University.

Turn-over has been limited by very strict rules imposed by the Italian MIUR in order to monitor the public expenditure. This caused a progressive decrease in terms of number of academic and administrative staff, in comparison with the data presented in the previous report, in particular from 2011 till nowadays the total number of the academic staff has decreased from 839 to 798; on the contrary, administrative staff has very slightly decreased from 826 to 823 with an increase in the number of the fixed-term contract holders from 61 in 2011 to 82 up today. However, through some important initiatives (see section II.6) taken lately at a national level in this last period of time, the negative trend for academic staff has been countered.

II. Addressing the recommendations of the initial IEP evaluation

In this section of the report we intend to support the Evaluation Committee with some comments and analysis with the aim of addressing the main recommendations of the initial IEP evaluation. For a sake of clarity, we approach them following the same order proposed at the point 17 of the evaluation report (February 2012).

II.1. Governance at institutional level

The effectiveness and efficiency of the **dual model of governance** (Board of Governors, Academic Senate), dictated by Italian laws, have been guaranteed by the Rector who chairs both University Bodies, coordinates their activities and assures that the information is spread properly.

Where problems are too complex to be dealt without consulting committees for preliminary analysis, a mixed composition with members coming from both University Bodies turns to be a perfect solution. For example, with the aim of reviving the debate which brought the draft of the Institutional Strategic Plan called "Horizon 2020", completed within April 2014, the Rector has appointed a mixed committee (members from Board of Governors and Academic Senate), providing it with the support of other colleagues, who can be considered as representatives of the various "hearts" which characterize our Institution. The committee's works have been discussed by the University Bodies, also during joint meetings, in order to facilitate the exchange of views at a more wider level, both in the academic and administrative staff. With the same aim a dedicated webpage (http://www.pianostrategico.polito.it/) and a forum to collect comments and suggestions on the drafted text have been created.

Furthermore, the Rector decided to inform all Politecnico's staff about the main discussion topics brought to the attention of the University Bodies. Therefore within few days after each meeting of the University Bodies, the information is e-mailed by the University Bodies Secretary through a brief report on the main topics dealt during the meeting, the most important decisions which were taken, before of the publication of the complete minutes in a specific webpage.

The Institutional Quality Assurance Committee (*Presidio della Qualità di Ateneo*, Italian acronym PQA), established in June 2014, represents another important player within our Institution and performs a three-fold role: on one hand, it has an overall responsibility for institutional quality assurance, it interacts with the Rector, the Academic Senate and the Board of Governors periodically for the definition of the quality strategies; on the other hand it represents the link established between these bodies and the other institutional structures (Departments, *Collegi*, Doctorate School, Specializing master courses and lifelong learning School), as well as the other independent players (Joint Committee for Education, Italian acronym CPD; Institutional Evaluation Committee, Italian acronym NUV), involved in the quality evaluation process of Politecnico, as showed in the flowchart (annex 6).

Finally, it is important to note the role covered by the Responsibles for quality within the Departments, eleven professors, one for each Department: they are considered to be "privileged stakeholders" with the Institutional Quality Assurance Committee, as well as actively involved in the spreading of the quality culture at a wider level.

II.2. Governance at Department level

At an intermediate (departmental) level, Politecnico governance profits of some Bodies aimed to link and coordinate the department activities, to harmonize and adapt them to the strategic directions decided by the University Bodies. First, the Academic Senate represents an effective link between the Institution's policies and the strategies of each Department. In accordance with the Italian law, only 9 out of 11 Heads of Departments are members of the Academic Senate; in order to overcome this problem, the Heads of Departments who are excluded from the participation by election are in any case admitted to the Senate's meetings without the right to vote. A review of the Statute has been envisaged in the medium term in order to solve this lack of representativeness.

Secondly, as for the research activities and the enhancement of their values, in accordance with art. 26 of the Statute, a University Committee for Research, Technology Transfer and Services to the Community (CARTT) has been established. It is composed of the Vice Rector for research, the Vice Rector for quality, the Head of the Doctorate School, the Head of the Specializing master courses and lifelong learning School, and all the Heads of the Departments. CARTT is in charge of the implementation of the strategic guidelines given by the University Bodies, of the organization of the research activities which involve more Departments, in order to promote synergy and interdisciplinarity in the research field, by benefitting from the various cultural backgrounds existing in the Departments, as well as providing a single interface to public and private stakeholders.

As for education, a Committee for the coordination of all the educational programs has been established, chaired by the Vice Rector for teaching and composed by all the Coordinators of the *Collegi* with the aim of sharing the guidelines in relation to the topics of I and II education level (Bachelor and Master of Science) and to make uniform all the procedures related to teaching activities at an institutional level.

In the field of the III education level, the Doctorate School is operational (ScuDo), together with its Board composed, among the others, of the coordinators of the *Collegi* of the PhD courses which are all managed by the Departments. Its role is mainly the planning and monitoring of the activities concerning the specializing courses and those on transferable skills (course catalogue, http://dottorato.polito.it/en/courses), as well as promoting innovative research strategies.

The Head of the Doctorate School shall submit a report to the University Bodies on the achieved outcomes periodically, in relation to the investments for the Doctorate School (PhD fellowships), as well as to the setting-up of the Ph.D. courses and their periodical evaluation.

In accordance with art. 25 of the Statute, a Specialising master and lifelong learning School has been established, as well (<u>https://didattica.polito.it/master/home/en/overview</u>), whose Board is composed of a responsible for each Department and chaired by a Head, selected by the Rector. The School plays an intermediate coordination role between strategic guidelines of the Institution and the activities implemented upon proposal of a single Department or a group of Departments.

Finally, you have to remember that the Italian National Agency for the Evaluation of the Italian University System and Research (ANVUR) requires periodically a specific document called SUA-RD (evaluation form on the departmental research activities and strategies) to be completed on yearly basis on the Department research. This document includes data and information on the strategic policies and objectives of the Departments, on their logistics and human resources, the achieved outcomes in the field of research and third mission. Starting from 2015 Italian Universities have been required to fill in this form, which turned to be a precious tool to encourage an in-house cultural debate, and at a wider level within the Institution, on the Department governance model. The discussion characterizing each Department community has been shared, afterwards, among Departments, during some meetings organized by the Institutional Quality Assurance Committee, where the Heads of Departments and the Department Responsibles for quality compared their own experiences.

II.3. Academic restructuring: from Faculties to Departments

In accordance with the Italian law 240/2010, within the framework of a **revisiting action of the organizational model**, the Faculties do not exist anymore. As a result, this change required an adjustment of the academic and administrative structure which brought to the establishments of the so-called *Collegi* (according to the General Regulations and the Academic Regulations for Education of the University), while all the former organizational responsibilities and the management of education activities have been ascribed to the Departments.

Recently, the Academic Senate has proposed a reflection on the basis of the first year' experience of the new governance model and academic restructuring (implemented from a.y. 2012/2013) with the aim of detecting weaknesses and, if necessary, introducing corrective actions.

In particular, it seems that the small size and the quite high number of *Collegi* can limit a cultural exchange of views on a wider level and sometimes also the effort to promote educational initiatives characterized by a large interdisciplinarity with more certainty.

As a consequence, the Academic Senate, which is approaching to the end of its office, has approved a resolution addressed to the attention of the new Academic Senate with the aim of suggesting to check the situation and provide solution in order to improve the efficiency and effectiveness of the management of the educational activities.

With a particular reference to the recommendation suggesting a better **development of the synergies and bridges with the comprehensive University of Turin**, it is important to note that in 2012 an Interuniversity Department of Regional and Urban Studies and Planning (DIST) was established with the aim of facing the new social challenges at a urban and local level, in a view of sustainability. The DIST has recently developed an its own strategic plan, in synergy with the two Turin Universities' strategic plans.

Furthermore, Politecnico di Torino together with the University of Turin – School of Medicine, signed on November 14 2014, a framework agreement, where the two Institutions recognize the strategic nature of their mutual collaboration and they engage themselves to strengthen the cooperation in relation to some initiatives concerning research, education and teaching programmes, also belonging to the III education level strongly connected to the biomedical disciplines area. With this aim, the two Universities designed a common III level educational program, namely a Ph.D. course in Bioengineering and Medical-Surgical Sciences starting from the academic year 2014/2015.

In addition, they recognize, as a strategic asset for improving their own rankings, internationalization of the education and research activities, also through the participation in international and European projects. They also agree on the possibility of defining common actions for the establishment of international relationships, as well for the organization of cultural events to promote the topics subject of the agreement at least at a local level.

Moreover, the two Institutions jointly signed on November 11 2014, an agreement with the Technion - Israel Institute of Technology-Haifa with the aim of promoting joint research and education activities in the field of energy, nanotechnologies and tumor treatment.

In the building and urban sector, on June 20 2015, the two Rectors signed a memorandum of understanding with the City of Turin. The City granted an extended loan for the use of a 18,000 sq.m area for thirty years in order to establish a joint campus to host a multidisciplinary center, where education and advanced research activities can be performed, together with scientific and technological collaborations with public and private institutions to favor a development in the field of life sciences (surgery, motor rehabilitation, diagnostics) through the collaboration among researchers belonging to the medical-surgery area, as well as to the polytechnic area.

Besides the initiative described above in the field of the III education level, from the academic year 2014/2015 other two Interuniversity PhD courses have been launched in cooperation with the comprehensive University of Turin, in particular in Pure and Applied Mathematics and in Urban and Regional Development (<u>http://dottorato.polito.it/en/interateneo_programme</u>).

In the same year the PhD course in Metrology in cooperation with the National Institute of Metrological Research (I.N.Ri.M., http://www.inrim.it/n/index.php) started, too.

Finally, at the end of 2014 Politecnico and the University of Turin signed a Framework Agreement concerning their collaboration on the safety and health protection of workers at the workplace.

According to this cooperation, the two universities, in line with their strategic plans and institutional mission, should start joint actions in relation to the analysis and consequent implementation of the "measures for the protection of the health and safety at the workplace", in accordance with the Law Decree 81/2008. This has been agreed with the aim of defining possible models to be implemented also jointly in favor of the employees, and of any other subject allowed to attend and/or perform activities, whatever her/his role is, in the buildings of the institutions/bodies they belong to.

The two universities agreed on the fact that, through the mutual collaboration, the value of the knowledge and competence sharing can be enhanced to the benefit of the academic community with positive influence at least at a local level, as well as contributing to the spread of an innovative attitude, promoting the dissemination of scientific and technological culture, pursuing the objectives of effectiveness, efficiency and economy as aims of the Public Administration. All this can be implemented by sharing specific knowledge and competences in the field of safety, hygiene and health at the workplace, as well as the necessary human and instrumental resources.

II.4. Doctorate School

Through the implementation of the new Statute some aspects of the Doctorate School, not only at an organizational level, have been revisited. According to the new Regulations on PhD programs (<u>https://didattica.polito.it/zxd/cms_data/attachment/30/Regolamento_dottorato_%20FINALE_eng.pdf</u>) issued on July 5 2013, the Doctorate School is in charge of the III level education activities in cooperation

issued on July 5 2013, the Doctorate School is in charge of the III level education activities in cooperation with the departments.

The **link between the Doctorate School and the Departments** is first of all assured by the responsibles of the PhD courses, as permanent members of the Board of the School, who at the same time chair the *Collegi* of the PhD courses belonging to Departments, and which are composed of professors selected for their competence and high scientific qualification. Thanks to this organization a top-down effective spread of the information is assured, in parallel with time open to discussion and to the proposal of new projects based on a bottom-up approach.

Furthermore, the Head of the Doctorate School, besides submitting a report periodically to the University Bodies, is also member of the CARTT. Through this committee which gathers periodically, the Departments thanks to the participation of their Heads, can exchange their views with the Doctorate School and jointly promote education and research projects.

A relevant contribution to a wider spread of information and to a **growing integration of the Doctorate School within the Institution** has been provided by an important restyling of the website, which has also included some information about the opportunities for the PhD students to access the world of work (<u>http://dottorato.polito.it/en/</u>). As far as the education activities are concerned, a complete course catalogue of the educational programs offered can be found through the Doctorate School website (<u>http://dottorato.polito.it/en/courses offered</u>).

Within the Institution the Doctorate School also plays the role of "tester" of the courses on "transferable skills" (<u>http://dottorato.polito.it/en/courses_on_transferable_skills</u>), and of the creation of a catalogue of online-available interdisciplinary courses. With this regard, the School works in strong cooperation with the Specialising master and lifelong learning School, recently established, since they both share many common goals.

As for the last recommendation expressed on this topic (number of PhD students), it is important to note that Politecnico decided to invest heavily on PhD programs, which are considered to be strategic; among the actions started to enhance the value of merit and talent, by virtue of a recent decision of the Board of Governors (May 30 2014), and the Academic Senate (May 27 2014), both **the amount of money and the number of the PhD fellowships** have been increased.

The annual fellowship has been increased by 200 euros (including taxes) per month in comparison to the minimum amount, as provided by the Italian legislation; the number of fellowships has increased by 25%, by assuring a financial support to 233 PhD students out of 290 as total number (referred to each of the three years of duration of PhD courses in Italy). With this aim Politecnico employs both its own funding sources and funds coming from the Italian Government, as well from external public and private funds.

In this regard, another important initiative is represented by the economic contributions, for a total amount corresponding to 100,000 euro per year, which are awarded to those PhD students who achieve the best results in research during their education path. These PhD students are selected on the basis of standard evaluation criteria, which reflect the quantitative indicators employed by our Institution for the evaluation of the scientific production (bibliometric parameters), available on the following websites:

(https://didattica.polito.it/zxd/cms_data/attachment/30/Criteri%20Bibliometrici_ENGLISH.pdf; https://didattica.polito.it/zxd/cms_data/attachment/30/Contabilizzazione_attivita_dottorandi_ENG.pdf)

II.5. Administration

Politecnico has implemented some initiatives aimed at providing a concrete response to this recommendation. A specific administrative structure has been established with the purpose of **managing**

an adequate articulation between central and departmental administration. It is called COREGE, namely Departmental Administrative Managers Coordination area, and it is coordinated by the Deputy Director-General, who is in charge of providing the Managers (Italian Acronym RGA) with training and support with the aim of coordinating and supporting the so-called "Districts for Departmental Services", local administrative structures.

As far as budget issues are concerned, an important step has been represented by the introduction of a University Unified balance-sheet, aimed at an integrated accounting management between central administration and Departments, in accordance with the Italian law 240/2010. In order to implement this law within the Institution, from January 1 2012 a reorganization and a readjustment process has been involving Politecnico in terms of number of structures characterized by an accounting and finance autonomy, which have decreased from 25 to 12 (precisely, 11 Departments and the central administration). From January 1 2014 the Institution has officially issued such Unified balance-sheet, taking into account the Institution as a whole as management unit. However, with the aim of respecting the management and accounting autonomy of the Departments, in accordance with the Statute (art. 29), the software used for this purpose has been divided in 12 budget sections, so that the related accounting entries (costs, incomes, credits, debits) can be associated univocally, both in the case of the estimated budget and during management. The Director-General, as new management and administrative figure, in accordance to the Italian Law 240/2010, organizes periodical meetings with the departmental Managers in order to share the management policies with them, in most cases in compliance with the new Italian regulations against corruption, mafia and to assure a continuous support to the Departments' activities.

The review of the Regulations on agreements and contracts for cooperation activities or third party activities (approved by the Board of Governors on May 27 2015) together with an uniformity in terms of forms, approaches and processes and good practices sharing, thanks to the Research Support and Technology Transfer Area, represents another relevant action in order to foster the collaboration between central administration and Departments.

For the Departments, a fundamental role has been played by the progressive use of the certification procedures on research and education quality at a national level under the responsibility of ANVUR (<u>http://www.anvur.org/index.php?lang=it</u>). Through this tool, by using an approach based on objective parameters analysis, the academic staff, as well as the administrative personnel working in the Departments, have the possibility to deal with the analysis of the activities and initiatives started, with a more conscious and sustainable planning of new projects, and as result to identify roles and responsibilities in a clearer way in terms of local structures.

At a central administration level, it is appropriate to note that a relevant coordination action has been implemented by issuing an "Action Plan", aimed at achieving the objectives identified in the strategic plan "Horizon 2020". In this case, this activity involved academic and administrative staff belonging to different areas and services of the Institution. In addition, this task was performed in synergy with other initiatives, firstly in the field of the quality assurance and afterwards to monitor periodically the adoption of the "European Charter for Researchers and a Code of Conduct for the Recruitment of Researchers" principles, since in November 2013 Politecnico was acknowledged by the European Commission for its commitment towards the implementation of the Charter and Code through the 'HR Excellence in Research' logo (http://www.polito.it/ricerca/carta_europea/index.php?lang=en).

II.6. Teaching and learning

For our Institution a proper **balance between education**, **research and knowledge transfer activities** is essential, which our academic community must guarantee for an harmonious implementation of all the missions which characterize a University. This balance is often called into question due to a prevailing attention on parametric evaluation of the research activities and on several ranking system criteria, at a national and international level, which focus most of the attention on the aspects connected to the research outcomes.

Also the Italian Scientific Qualification, as new procedure of conferring a certification in order to cover a position for Full or Associate Professor, recently launched by MIUR, which at present experienced only two

evaluation steps (precisely in 2012 and 2013), is exclusively focused on the research activity and outcomes, without taking into consideration any aspect related to teaching and services to the community.

In the recent institutional strategic plan, Politecnico had to deal with these topics, being "..aware of the fact that the importance of a periodic evaluation is undoubtedly an essential tool in order to recognize the value of its work and to promote shared growth paths by our university". In addition, the Institution's belief is that an effective enhancement of the value of its human capital cannot be achieved without a "multidimensional assessment process of the academic staff, which takes into account the variety of the activities: education, scientific research, coordination of research and technology transfer groups and projects, service activities for the national and international scientific community, services and international roles" (Section 3.3 - The Human Capital Value, in strategic plan "Horizon 2020"), in order to "achieve a full involvement of each member of the academic staff in sharing the scientific and educational responsibilities of the University, as well as the ones concerning the organization and management of our University". On the basis of this strategic direction, the first concrete action has been put into effect through the publication of the University selection procedures in particular aimed at the recruitment of Associate and Full Professors. According to these selection procedures, the evaluation criteria include several activities so that the applicants can be identified and selected according to the balance among the activities which have been performed in the field of teaching, research, technology transfer, services to the academic community (annex 7).

As for the recommendation aimed at stressing the importance of focusing on student-centered learning, and improving their generic competences, it is important to note that our Institution has participated in the II test phase of the TECO project (Test on Competences), promoted by ANVUR. Through this project, a test has been submitted to a segment of students selected on merit-basis in order to check the acquired competences/skills. In particular, TECO's goals consist in: the assessment of the interdisciplinary competences acquired by students during their educational path (analytical reasoning, problem solving and written communication ability, conforming to skills/ability required to graduates for their professional future in the world of work); an additional official certification as useful tool to show that the graduate actually possesses the fundamental competences for the world of work, not certified by the university; the continuous improvement in the education activities in view of the competences required by the society, by the local and international production system. The first results of this II test phase of the test sessions organized for students by our Institution during June 2015 are supposed to be available at the end of October 2015. As mentioned in section II.3, the Doctorate School has been working on the implementation of some on-line available experimental courses, which will represent a precursor of the creation of an elearning catalogue which all education levels students can access. The school has started a systematic project specifically aimed at the development of the so-called "soft skills", in particular management skills, already widely spread and appreciated in the industrial and entrepreneurial sector.

On the basis of a benchmark among universities, also at an international level, a project based on an interdisciplinary skills framework aimed at integrating the academic curriculum has been launched; it is characterized by four reference education fields: self-development, management of the research and innovation processes, interpersonal communication and teamwork skills. The project has been conceived as flexible and adaptable to offer modules which can combine with each other, in networks to favor the learning and knowledge of practical experiences, in synergy by using several tools (e-learning, workshop/seminars in classroom and on the website, individual interviews).

The project can be seen as a "laboratory in progress", characterized by innovative contents, for instance through the development of an interdisciplinary education program called "Humanities", aimed at the spreading of some skills and sensitivity towards some ethical and social topics, such the science ethics, the diversity management, working in multicultural contests/environment and some others more. All the elearning modules are delivered in English.

Lastly, it is important to remind that, from the academic year 2014/2015 Politecnico di Torino in cooperation with the CRT Bank Foundation has created an educational path for young talents, called "Quality and Commitment" (<u>https://didattica.polito.it/Percorso per i giovani talenti en.html</u>), aimed at talented Bachelor's students, which is complementary to the common educational program.

Through this path, students, besides the specialization in some curricular subjects, are also provided with the opportunity to take part in activities such as seasonal school, semesters abroad, professionalizing experiences in leading companies to the development of both vertical and horizontal skills, visits in high-repute international research centers, such as the CERN in Geneva. During this path, whose duration runs in parallel with the whole Bachelor's degree duration, students' merit is tested in order to confirm their participation, as well as assuring them the economic benefits, according to the program criteria.

This project also represents a sort of experimental model, whose positive aspects will be taken into consideration in order to propose similar initiatives for all the other students. It draws inspiration from the gained multi-year experience our Institution with the Alta Scuola Politecnica by (https://didattica.polito.it/ASP/Introduction.html), a joint venture of Politecnico of Turin and Politecnico of Milan, a school for motivated and exceptionally qualified students, with a passion for innovation, who wish to develop their potential in a multidisciplinary community. In this case, this project runs in parallel with the Master of Science programmes of Politecnico.

As for the "**numerus clausus**", the Italian Law 264/1999 introduced a specific distinction between the maximum number of available places established at a national level and at local/university level. The first criterion is established in accordance with MIUR regulations for some degree courses on the basis of the maximum number of places available for the different Italian professional categories, while the second one is based on the specific sustainability criteria of each University.

In accordance with this law, the Bachelor's degree course in Architecture in Politecnico di Torino is accessible through a "numerus clausus" established at a national level (for our Institution the number limit corresponds to 540 for the academic year 2015/2016).

The Institution also decided to introduce the "numerus clausus" at a local level for all Bachelor's degree courses in the Engineering Area and for the other Bachelor's degree courses in the Architecture Area, namely in Design and Visual Communication and in Territorial, Urban, Environmental and Landscape Planning. This decision is due to the fact that some internal analyses conducted on all the available infrastructures for the teaching activities (<u>http://www.polito.it/ateneo/sedi/?lang=en</u>), brought to reconfirm the maximum number of feasible places for students for our Institution, which corresponds to 4,600 new students who can be enrolled for the first time in the Engineering Area: this number is increased to 5,440, by summing the number of the new students enrolled in the Architecture area.

The debate on the introduction of the "numerus clausus" is very spread within our Institution and only some months ago (December 12 2014) the Academic Senate again expressed its opinion against the introduction of a "numerus clausus" which can limit access to the Institution under the sustainability threshold defined by Politecnico (Board of Governors, December 17 2014).

In order to better understand this debate, it is necessary to take into consideration the fact the Politecnico is a pole of attraction very appealing at a national level, with a percentage in terms of students enrolled for the first time coming from outside our Piedmont Region (Italian and foreign) which has definitely surpassed the percentage of Piedmontese students (about 60 and 40%, respectively).

This fact can be explained by taking into account that our Institution is one of the few Technical Universities existing in Italy and it has a good reputation; furthermore, the employment percentage of graduates in Politecnico is very high, definitely higher than the national average, in spite of the present crisis period at an economic and social level, which has lately caused a decrease in the number of graduates and a severe youth employment limitation at a national level.

In this regard, the Institution decided to comply with its role of social responsibility, by guaranteeing an opportunity to a wider number of young people. Moreover, through the recent recruitment policies of the academic staff, thanks to an extra-funding support from MIUR, defined *"Piano straordinario"*, ("Extraordinary assistance plan"), the Institution has been able to raise the number of the Associate Professors (147 new positions in total) significantly with a consequent increase in the amount of hours which can be delivered during the classes. However, this intervention could mitigate only partially the problem of the reduction of the academic staff due to a rigid block to the turn-over, as established by the Italian Government.

II.7. Students

Some initiatives have been started in order to solve some critical issues (insufficient **study halls**, limited number of hygienic services): the Board of Governors has recently approved some building works, such as the creation of 4 new classrooms, as well as of sort of "flexible" classrooms which can be converted into laboratories, the building requalification of some areas of the main seat of Politecnico to build another classroom, with 140 places, the construction of a block of hygienic services and a new study hall. Furthermore, the building works of the residence hall "Carlo Mollino" started in February 2015, and are due to be completed in 2017. The residence will host 100 students in rooms with wi-fi connection and will be equipped with spaces aimed at sports activities. The building works of the residence hall "Cesare Codegone" will start at the beginning of 2016, and are due to be completed in 2018; this residence will be equipped with 140 bed-places and the same facilities already mentioned for the residence " Mollino".

Besides these actions, through Politecnico website section devoted to education issues called "*Portale della didattica*" (<u>http://www.swas.polito.it/dotnet/orari_lezione_pub/RicercaAuleLiberePerFasceOrarie.aspx</u>) students can access a service to search the free available classrooms to use them as temporary study halls. A dedicated APP for Smartphone will be available in Autumn 2015.

In addition, through the participation of our Institution in the initiative "Study in Torino" (<u>http://www.studyintorino.it/studying/study-halls/</u>), promoted by the City of Turin, besides a further opened communication channel with students, a new area, called *Murazzi student zone*, devoted to study activities but also to socialization (<u>http://www.murazzistudentzone.it/</u>) is now available to our students.

Politecnico considers the involvement and participation of students in the institutional governance system to be a high value, since it represents an important enrichment for the whole community and mutual growth and improvement opportunity. As a result, **student representatives** are present both in the university and evaluation bodies (Academic Senate, Board of Governors, Joint Committee for Education, Institutional Evaluation Committee, the Equality Committee) and in the academic Boards of the degree courses, in the *Collegi* and in the departmental Boards. In 2014, the Academic Senate approved new procedures for the election of the student representatives in the university bodies, with a particular attention to those in the academic Councils of the degree courses, in the *Collegi* and departmental Boards. This proposal raised significantly the number of student representatives, which rose from 27 representatives, according to the previous regulation, to the present number of 59.

II.8. Research and Technology transfer

In relation to the ability of **developing multidisciplinary research** across various Departments, in 2013 Politecnico launched an internal competitive call for the creation of new Inter-departmental Laboratories aimed at developing interdisciplinary research with a high strategic value for the University, through the co-financing of equipment and research infrastructure. Seven inter-departmental and interdisciplinary Laboratories were selected and started their activities in 2014, receiving a total contribution of 1,900,000€, about 100,000-300,000€ each, that covered up to 75% of the Laboratory costs. The aim of each Laboratory is the following:

- GRAPHENE@POLITO: the main objective is to gather in a single lab all challenges related to the development of new products based on graphene materials. The activities of the Laboratory are closely linked to the European FET Flagship Graphene.
- S3+LAB-URBAN SUSTAINABILITY & SECURITY LABORATORY FOR SOCIAL CHALLENGES: through a multidisciplinary approach, the laboratory intends to support the design of public policies on safety and urban and territorial quality, by emphasizing the interdisciplinary dimension of the innovative approach in space planning and management.
- NEC Neural Engineering and Computation Lab: working on neuroscience within the activities of the FET Flagship Human Brain project (funded in FP7) it is focused on exploiting existing expertise for realizing nano-technology devices, neuromorphic design, signal analysis, the biological interfaces, large-scale data analysis, biological circuits modeling, distributed computing and information theory.
- BIGDATA@POLITO: Laboratory for the experimentation and development of technologies BigData: it aims at creating a computer center which provides access to Big Data technologies, in terms of

purchase, installation and configuration of a computing cluster consisting of server properly configured for the use of Big Data technologies.

- REI-INTELLIGENT ENERGY NETWORKS: it aims at analyzing local smart distribution networks (especially electric ones) in which many independent "players" interact as prosumers, retailers, distributed generators (including renewables), storage systems, interconnections with other energy networks (gas) or future (hydrogen), electric/hybrid vehicles, etc.
- MAKE LAB: it has two main objectives: 1. the development of instrumental goods (machine tools) concerning operation, competitiveness and sustainability of the processes; 2. the development of digital modeling instruments and advanced prototypes in order to cooperate with the market, the local authorities and local communities.
- BLUENERGY: it concerns "energy and water". The Laboratory combines fundamental, applied and applied research, taking into consideration the exploitation potential. It faces issues related to the production of energy from water and problems related to energy saving in water usage.

In order to strengthen its own mission in the **enhancement of the value of research and technology transfer outcomes**, at the end of May 2014 the Technology Transfer Interdepartmental Laboratory (LabTT) has been established with the following goals, aimed at implementing the Strategic Plan:

- 1. Strengthening the consolidated experiences in the field of the technology transfer, through a more rigorous approach and the development of standardized measurable methodologies and processes;
- 2. Filling the gap between research and production world, by starting actions to the benefit of the entrepreneurial culture growth of researchers and of the future PhD students (major focus in the sectors of industrial interest, commercialization of research outcomes, creation of spin-off firms);
- 3. Increasing the visibility of our Institution, also at an international level, as partner for research and innovation, by integrating the activities of technology transfer and internationalization at a European and Non-European level.

The LabTT is characterized by a governance system which involves a Vice-Rector, some delegates identified by the Board of Governors and representatives of the main Departments. The project has been funded for a three year duration, upon assessment, with an initial budget corresponding to 835,000€.

The LabTT acts in strong link with the Departments and with the SARTT - Area, which is the administrative structure in charge of the activities related to the research outcomes.

Besides providing researchers with support for the management of their own intellectual property, tutoring services and strategic consultancy in the field of spin-off firms and the evaluation of the commercial potential of the research outcomes, the administrative offices are involved in different international activities.

In the last year the LabTT dealt with different big Italian and multinational companies to better understand the business internal problems and evaluate solutions based on Politecnico research activities on the start of strategic partnerships. Moreover, patents in co-ownership and license agreements have been originated from the relationships with the big business groups.

Many have been the institutional initiatives both at a national and an international level, such as:

- Hong Kong Soft Landing Program, initiative organized and promoted by the Hong Kong Science & Technology Park (HKSTPC), to favor the cooperation between the west academic world and the local Chinese Industry in the adoption of new technologies, as well as the establishment of a Politecnico branch in Hong Kong;
- Cooperation with the IP Intermediary in Singapore, institute founded by the Ministry of Trade and in charge of transferring the research outcomes coming from all over the world in processes, products and innovative services to meet the innovation needs for companies;
- Broad P.I.T.T., initiative of technology organized in collaboration with the Turin Industrial Union and the Italian Bank Intesa San Paolo to promote a cooperation between the academic world and the Italian North-West small and medium-sized enterprises with the aim of favoring the sustainable innovation processes and innovative finance models;
- Participation in the Open Innovation Day, organized by the Turin Industrial Union in July 2015 with the aim of favoring the collaboration between university and local companies.

The participation in Proof of Concept initiatives at a national and international level has been supported. In this regard, a patented technology owned by Politecnico was awarded with a Grant ERC "Proof of concept", by benefitting of a funding corresponding 150,000€ to proof the technology on European scale. Moreover the participation to the national initiative "Proof of Concept NetworK" led to the award of 4 Proof of Concept grants for a total amount of 120,000€ for the development of prototypes and the demonstration of POLITO patented technologies.

The really positive outcomes, achieved through activities conducted by this new laboratory LabTT, have created the conditions for a new Vice Rector for the Technology Transfer to be appointed by the Rector last May (Rectoral Decree n.249/2015).

II.9. Quality culture

The topic of quality culture, which will be dealt in details afterwards, has been more and more spreading in our Institution. In this section a reply to the two recommendations proposed under this title is provided.

With reference to the **relationship between the two main University Bodies** (Board of Governors and Academic Senate), surely through the implementation of the new Statute the corresponding roles have been clarified. In particular, the Academic Senate represents a place of discussion, scientific and cultural debate and exchange of ideas and in this way it contributes to suggest the medium-long term strategic directions for research and education by expressing opinions on many subjects/topics, on which the Rector or the Board of Governors has direct responsibility. The Board of Governors, in charge of strategic direction, operates and takes decisions in relation to budget issues, as well as financial sustainability and plays a key role in the resource planning for the recruitment of both academic and technical and administrative staff.

In relation to the second recommendation, aimed at fostering a major focus on the **evaluation on teaching issues**, our Institution has been working to increase the response rate to the questionnaires submitted by the Joint Committee for Education (Italian acronym CPD) to students, through an online procedure and a note to inform and promote the participation in the initiative.

Some initiatives to foster participation and involvement of students and also of professors and to achieve a wider dissemination of the questionnaire's results are now under analysis.

Furthermore, the CPD results, provided as parametric indexes, is taken into consideration by our Institution to define criteria to assign incentives to professors.

ANVUR gave a relevant contribution to push professors in considering the importance of such evaluation step performed by CPD, by requesting the critical comment of the results of CPD questionnaire in the frame of an auto-evaluation document (named *Rapporto del Riesame*) aimed to monitor the quality of each degree course and the capability to correct the major flaws.

Starting from the questionnaire's results, the Joint Committee draws up an annual report to which is attached a growing importance; the dialogue between the Joint Committee and the Quality Assurance Committee is continuous and specifically aimed to improve the interpretation of results and to draw constructive indications and suggestions aimed at the improvement of the quality of teaching activities.

II.10. Capacity for change - The perspective of the Politecnico di Torino

The recommendation of the EUA Evaluation Team has been welcomed with enthusiasm by our Institution, which acts with perseverance in view of the enhancement of its potentialities. Two events can be considered to be the symbol of this unaltered and strong change, innovation and progress ability.

First of all, it is important to focus on the great collective work which, after about a year of internal discussions and debate with external interlocutors, originated the new strategic plan in 2014, described at point II.1. Through the definition of the mission and vision of Politecnico, important development strategic direction (better described in section IV) have been shared.

Another important exchange and growth moment has been represented by the implementation of the complex and significant process, which in November 2013, brought Politecnico di Torino to be acknowledged by the European Commission for its commitment towards the implementation of the European Charter for researchers and Code of conduct for the recruitment of researchers through the "HR

Excellence in Research" logo. The European Charter for Researchers addresses the roles, responsibilities and entitlements of researchers, their employers and their funders in both the public and private sectors. It aims at ensuring that the relationship between these parties contributes to successful performance in the generation, transfer and sharing of knowledge, and to the career development of researchers. The Institution dealt with the principles defined at a European level, by identifying major gaps between its regulations and those proposed by EU, distinguishing those not depending by its own choice (but, for instance, due to national regulations and laws) and those on which it could more and more approach the European standards through a detailed and objective gap analysis. On the basis of this analysis (http://www.polito.it/ricerca/carta_europea/gap_analysis.pdf), the Institution has planned a progressive reduction in the identified gaps in compliance with the Charter's principles.

Also this action has involved the academic staff and researchers (through a Focus group composed of full and associate professors, assistant professors, PhD students, fellowship holders), as well as the administrative personnel (with a team group committed in implementing the guidelines provided by the Focus Group in actions).

27 actions have been identified to implement the Charter and the Code more precisely, and to create an academic environment of high quality and more favourable for researchers from all over the world. Actions can be grouped under the following headings:

- SUPPORTING FUNDAMENTAL RESEARCH AND FRONTIER RESEARCH
- RAISING AWARENESS OF THE CODE OF ETHICS
- SUPPORTING DISSEMINATION AND PROTECTION OF RESULTS
- SUPPORTING PUBLIC ENGAGEMENT
- SUPPORTING INTERNAZIONALIZATION
- TRAINING ON TRANSFERABLE SKILLS
- PROVIDING CAREER ADVICE AND GUIDELINES FOR SUPERVISORS
- DEFINING APPROPRIATE PROCEDURES TO DEAL WITH COMPLAINTS/APPEALS OF RESEARCHERS.

III. Other reforms implemented

III.1. Internationalization

For years Politecnico has been operating unwaveringly and with good results in the field of the internationalization of research and education.

In 2012 a revisiting action on the institutional internationalization model was started in order to reach a better compliance and integration with research and technology transfer policies. With this purpose, in 2013 and 2014, through the publication in two editions of the *Bando Internazionalizzazione della Ricerca* (Call for Internationalization of Research), 12 projects were funded for a total amount of 550,000€ with the aim of favoring the long-term cooperation with the most prestigious universities in the world (positioned among the first 50 in the main international rankings) thanks to the support of incoming and outgoing mobility of the research groups involved in the projects. In July 2015 a third call was published for an amount of funding of further 250,000€.

New partnerships have been therefore started with academic and no-academic subjects located in several Countries (e.g., Korea, Singapore, Japan, Canada, U.S.A, Russia, India, Malaysia, Vietnam, Countries belonging to the Gulf, Mediterranean and South-East Asia areas). 69 new framework agreements with foreign universities, such as Shenzen Polytechnic, Seoul National University, University of South Australia, McMaster University, Technische Universität Dresden, University of Birmingham and 10 new Double Degrees with foreign universities such as the Eindhoven University of Technology, University of Stuttgart and Tshingua University have been signed.

Furthermore, our Institution is committed to make grow and strengthen its international campus in Uzbekistan at the Turin Polytechnic University in Tashkent; in this regard, Politecnico entered into negotiation for the next multi-year framework agreement which extends the cooperation to new areas and to the launch of specialising Master courses, to the establishment of joint laboratories and strengthening actions in the research, development and technology transfer activities, to new governance models and management participation; actions for the improvement of the quality of international students; new selection processes; synergies with the City of Turin for the recruitment of students.

In compliance with the objectives defined in the institutional strategic plan "Horizon 2020", Politecnico is aimed to extend its presence in some Countries considered to be strategic with the establishment of the so-called local "competence centres" with the aim of fostering a direct relationship with local companies, research institutes and government bodies. They will be located at the partner institution by building a multidisciplinary platform where research, education and industry converge and combine competences, services and resources to implement common projects in a win-win perspective.

The first of these competence centres, officially opened in May 2015, is the South China-Torino Collaboration Lab, at the South China University of Technology (SCUT) in Guangzhou. This centre will operate in the fields of Automotive and Mechanical Engineering, ICT, Architecture and Urban Planning and will move in parallel within the framework of cooperation with industry, research, education and consultancy activities. On the occasion of the official opening of the centre, the first meeting of the Industrial Advisory Board of the Collaboration Lab took place, in which representatives of several companies such as DeLonghi, Luxottica, FCA, STMicroelectronics, COMAU, Magneti Marelli, Piaggio, and the Italian Chamber of Commerce in China participated.

Finally, among the high prestige collaborations, it is important to note that Politecnico di Torino has recently become member of an international and interdisciplinary institute of collaborative research in the field of energy, the "Siebel Energy Institute" together with the consortium composed of top level reputed institutions: UC-Berkeley, MIT, Princeton, Carnegie Mellon University, University of Illinois at Urbana Champaign, École Polytechnique de Paris, and University of Tokio.

III.2. Links with society and industry

Besides the already cited actions implemented to strengthen the relationships with the local, national and international companies, as well as fostering the cooperation with the University of Turin and with other

national and international research centres, over the last years, our Institution increased the number of actions aimed at the public engagement to the benefit of the local community.

In 2013 an important initiative was represented by the establishment of an Institutional Committee for enhancing the value of Politecnico cultural heritage. For Politecnico the knowledge sharing also to the benefit of general public symbolizes an important tool to build networks within the Territory and to contribute to make Turin even more a "City of the culture", in conformity to the strategic directions of the Municipality and the Metropolitan City. As a result, the new Committee has started a wide and systematic programme aimed at the monitoring and enhancement of our archives and museums heritage. This heritage, characterized by an high cultural value, has been subject to analyses, digitizing actions, definition of thematic itineraries and exhibitions/workshops. In particular, an interactive presentation has been implemented with the aim of providing a wide overview on the richness and heterogeneity of the safeguarded heritage, which ranges from scientific collections to a very rich archives heritage composed of important documentary collections acquired during the education and research activities ().

Also the Valentino Castle, historical seat of our School, part of the UNESCO World Heritage, being one of the Savoy Residences, has been subject to actions enhancing its value, as well as to promotion actions, both from a cultural and touristic point of view. Indeed, the Committee has promoted the creation of a website (<u>http://castellodelvalentino.polito.it/?lang=en</u>), which, through the support of an accurate iconographic choice, provide the visitors with a detailed description of the architectural history. At the same time, the Valentino Castle has been opened to the public, who can take part in educational exhibition itineraries.

For Politecnico music is important, as well. Besides a rich concert season which from longtime has been hosted in the Main Hall-Aula Magna, organized by a leisure association of the Politecnico staff and supported by the Institution, in 2014 a chorus was founded, called "POLI JTNICO": the name represents a real pun with the Italian words "Politecnico" and "Etnico-ethnic", to underline its goal to act as a pole of integration and be the voice of the several ethnic groups existing in our Institution.

As far as large-scale cultural events, some activities related to the organization of events not only of the academic community, but even more to the local community of the Turin citizenry have been put into effect.

In particular, 2015 has been full of events connected with the EXPO 2015 and to "Torino 2015 Capitale Europea dello Sport-Turin, European Capital of Sport 2015".

A rich programme of the initiatives related to the topic "Nutrire le città/Feed the cities", jointly proposed with the University of Turin has been defined.

The blog <u>www.torino2015oncampus.it</u> has been launched and a cycle of meetings called "I mercoledì dello sport- Wednesdays in Sports", in collaboration with the University Sport Committee of Turin (CUS Torino), to represent and enhance sport values within the academic community and to offer visibility to the contribution provided by the Politecnico scientific research to the sport world.

It is important to underline, on the occasion of the Woman Day (March 8) the success of the annual sport event "Just the Woman I Am", organized by CUS Torino, aimed at raising funds for scientific research in the oncology area and to promote the main research activities in the biomedical field to a wider audience.

The same logic is on the basis of the well consolidated event "Notte dei Ricercatori – Researchers' night", which reaches its 10th edition in 2015. Researchers take advantage of the booths in the main squares in the city centre to share their knowledge with the audience in an informal and recreational way.

In 2013, from the initiatives of the *Collegio* of the degree courses in Industrial and Management Engineering "Top experiences", was officially opened as a cycle of meetings with top managers, businessmen and innovators, which provide students with the opportunity to learn about concrete professional experiences of former students of Politecnico di Torino and qualified professionals.

III.3. Personnel: Merit-based recruitment policies

Over the last years, in relation to the academic staff recruitment, an important evolution took place. As mentioned in section II.5, the members of the academic staff were selected on the basis of criteria which could take into consideration different aspects of their commitment in the Institution. These criteria were based not only on the research and education activities performed by the applicants, but also tried to take

into account their international reputation, their self-financing ability, their commitment to the service to their scientific community and Institution, as further characteristics to be considered in order to define the applicants' profile.

In particular, this evolution has been put into effect when MIUR assigned a considerable amount of additional resources for the hiring of Associate Professors up to 147 positions.

In accordance with a Board of Governors' resolution, in compliance with the law in force, these positions have been assigned according to the following criteria:

- Quality of the research activity performed in the seven years' time between 2004-2010, on the basis of the results of the evaluation conducted at a national level, included in the ANVUR report;
- The overall resources acquired for research activities for the seven years' time 2006-2012;
- Indicators related to the evolution of the academic staff, to intervene in the fields most affected in terms of academic staff availability, enrolled students, course hours to be delivered.

This mechanism for the assignment of the resources among the different areas of Politecnico and for the academic staff recruitment, on the basis of objective and rational evaluation principles and criteria, has been already employed within our Institution and will be used also for the academic workforce planning until 2018 (election of the new Rector).

Furthermore, in line with the strategic objectives of strengthening of the internationalization policies, Politecnico has been working on a programme of actions aimed at the creation of an international scientific community through the attraction of scholars of high scientific qualification and international reputation from foreign qualified research centres and institutes.

As a result, the Institution established to assign an appropriate number of Visiting Professors positions for internationally reputed researchers, preferentially selected upon Departments' proposal, as well as the promotion of double-appointment agreements which concern the possibility of participating in a mobility period for 3/6 months, involving both incoming and outgoing researchers of our Institution.

In addition particularly significant is the recent publication of international calls for Associate Professors positions, in research key fields or in fields to be renewed. On the basis of this experience, selection procedures for Full Professors positions may be held, as well.

III.4. Investment in environment sustainability and in a sustainable campus

The Politecnico di Torino has already established the principle of sustainable development as a central paradigm of its activities in research, education and management, while encouraging various activities which aim at developing the knowledge and awareness of environmental sustainability. In 2009, Politecnico hosted the second G8 University Conference and sign an international declaration, fostering sustainable and responsible development in society (<u>http://www.g8italia2009.it/G8/Home/News/G8-G8 Layout locale-1199882116809 1199896737969.htm</u>).

Over the last years, Politecnico has been characterized by its choice/decision to create open campuses (such as the *Cittadella Politecnica*, <u>http://www.cittadellapolitecnica.polito.it/</u>) which host laboratories and research centres of companies and other research bodies. This decision created a a fruitful environment for the development of new projects and joint activities among the different participants in development and innovation.

Some overall revisiting actions of the spaces of the metropolitan campus and of the other buildings, also including rehabilitation and restoration, to improve energy and environmental sustainability. The project for enlarging our main seat has included the creation of new green areas; many areas have been converted as lawns or places for socialization, relax and study.

The idea is to see our university campus no longer as a mere educational establishment, but as a laboratory for promoting innovation and capitalizing on the social, economic and environmental value offered by an on-going transformation. "Laboratory" means that eventually we, as campus users and researchers, can take advantage of gathering together, listen to those who are looking after same problems/database/softwares/business models/methods, and share energies and ideas to improve our communities and its resilience study (see www.politoward.org). In order to encourage and increase projects, strategies and actions that are coherent and consistent with the principle of sustainable

development, the Politecnico has set aside facilities for sustainability, but it also aims to use these achievements as a foundation for establishing a set of suitable key performance indicators which are able to record current conditions and also identify improvements that may be made. For instance, measures are in place to reduce the environmental impact and CO_2 emissions with the use of low consumption equipment and of electrical energy from renewable sources; the headquarters of the Politecnico and the adjoining *Cittadella* are heated by using the connection to the district heating network of the City of Turin.

Politecnico has implemented a series of measures in order to reduce emissions and improve energy efficiency; it also invested in renewable energy through the construction of a photovoltaic plant system in 2010. In the same year, the Living Lab was established, as a center towards which all the data of measurement and control systems, converge and afterwards are stored and analyzed in order to optimize the efficiency of plants. The portal http://smartgreenbuilding.polito.it has been created with the aim of spreading the culture of the energy and environmental sustainability and providing all the Politecnico community with information, useful contents, technical manuals and "good practices" for an individual or departmental use, as well as making available the data related to the consumption monitoring in order to encourage good behavior. An Energy Manager has been appointed as representative of the Rector in the field of energy sustainability.

As for the dining services, Politecnico has always been promoting a policy focused on quality and sustainability; in the staff canteens, among the several initiatives implemented, the attention is put on the use of zero-mile domestic agricultural products and the use of reusable cutlery and crockery. A collaboration with the Food Bank for the collection and distribution of surplus food is now fully operational. June 2011, Politecnico joined the EPA Protocol (Public Procurement **Ecological:** In http://www.provincia.torino.gov.it/ambiente/agenda21/acquisti ecologici/), promoted by the Province of Turin (now Metropolitan City) and aimed to favor the introduction of some basic environmental criteria in in tender standard specifications, related to specific product categories.

Politecnico daily supports a catchment area of mobility estimated to be around 20,000 units, of which about 1,500 are part of university staff. In all its seats, Politecnico has experienced and promoted studies and solutions on sustainable mobility, by defining the logistics related to the students and employees as much as possible through a specific organization of services, courses and work. Since 2008, our University has been supporting the regional initiative to co-finance the seasonal transport tickets for employees; it has been participating in the project "TO-bike" sponsored by the city of Turin aimed at providing some new bike racks in the perimeter of Politecnico buildings located near the bike paths (http://www.tobike.it/Default.aspx).

A differentiated waste collection service is fully operational at Politecnico; in order to foster process simplification and dematerialization, Politecnico has been participating in the project "Green Mobile Campus", by implementing paperless administrative activities (paperless payment orders, pay slips, invoices liquidation, communications, internal correspondence) to reduce remarkably paper consumption and paper waste.

In 2015, Politecnico started to promote an Italian network of sustainable campuses, together with Politecnico of Milan, University of Bologna and IUAV of Venice (among other universities), and has recently joined the *International Sustainable Campus Network* (ISCN), a global forum that sustains academic institutions in brainstorming activities, information and best practices in order to complete the sustainability aspect of their activities. This choice derives from the awareness that sustainability is increasingly becoming a key factor in global development and that Politecnico can play a major role in promoting these values, as well as orienting its research towards these issues. In July 2015 Politecnico edited its first ISCN-GULF Sustainable Campus Charter Report (annex 8).

III.5. Three year planning's projects

During the sessions of March 11 2014, the Governing Bodies of Politecnico approved the so-called "Threeyear planning" document (Decree of January 31 2005). This document includes the strategic policies of our University, in accordance with Ministerial Decree 827/2013, by defining objectives and by supporting the proposed projects. Together with the Strategic Plan, it defines the general context in which goals and actions are included.

Within this framework, Politecnico has proposed the following three projects: (1) strengthening of digitalization actions of administrative procedures by implementing several paperless administrative activities to favor no space/time limit information flows and services. A large number of processes and services to the student community (online registration, access to digital libraries, procedures for the final exam). It is important to note that Politecnico website is subject to continuous implementation, to improve accessibility by all categories of visitors and to offer more efficient services, with particular attention to students' needs (digitalization of secretary processes and academic career monitoring and follow-up); (2) aware of its role of "bridge between education and research", of its vocation to enhance the value its scientific and technologic roots through a high level research, Politecnico has the goal to increase the total number of the PhD students, with a particular focus on their qualification. From an analysis of the context, the need to promote joint research projects for specific Doctoral programs in synergy with other research institutions of high scientific level has emerged. This goal has been achieved through a PhD course in Metrology in agreement with INRIM, from 2014; (3) finally, Politecnico supported initiatives to foster international cooperation and bilateral agreements to support the student mobility period abroad (courses and internship), with the aim of creating more opportunities in terms of available grants/scholarships, as well as in terms of number of partner universities to be chosen by outgoing students.

III.6. Open Access

In 2011 an Open Access International Repository (PORTO) was created in order to store and make available articles, conference proceedings, doctoral thesis, edited by the staff of Politecnico. In this regard, Politecnico implemented a policy action with the aim of supporting researchers through the spread of the principles of Open Access, also in relation to the National and International research programmes (among the others Horizon 2020, since it requires open-access to publications related to results, and, in a test phase, for some specific fields, to research data, as well). With this aim, several thematic meetings held by high reputation professors and a course devoted to PhD students (open-access and scholarly communication) were organized and a team (composed of scientific responsibles of each Department, library staff, scholarship holders) was created to support research staff about all the issues relating to copyright. At the beginning of 2015 an editorial agreement was signed with the publishing company Springer aimed at the publication of a series of books dedicated both to research (in particular to encourage young researchers) and to support teaching activities. This experience represents the first step to achieve a University Press for scientific and tutorial monographs (together with the Institutional Repository), in order to increase the visibility of the scientific production of our University to citizens and companies and to publish in open-access research products. The new project "Research of Talents", supported by CRT Bank Foundation and Politecnico, born with the aim of supporting the scientific independence and enhance the value of talented young researchers, requires only an open-access result dissemination.

III.7. Equal opportunity and welfare

Politecnico, in accordance with the Directive 4/03/11 of the Presidency of the Council of Ministers as "Guidelines on functioning '*The Equality, Non-Discrimination and Anti-Harassment Committee*' to the enhancement of the welfare of those who work and against discrimination", in July 2014 established its CUG (*Comitato Unico di Garanzia*, "Equality, Non-Discrimination and Anti-Harassment Committee"). On May 28 CUG joined the regional network called *Rete CUG*. CUG aims to prevent and protect every worker against all forms of discrimination, in particular those related to gender, age, sexual and political orientation, race, ethnic origin, disability, religion, language and violence - either moral or psychological - towards female and male workers, and all members of the university community.

It is characterized by proactive, consultative and verification tasks; it contributes to improve the overall quality of work, promoting an environment characterized by respect for the principles of equal opportunities and organizational well-being. Furthermore, it proposes the Plan of Positive Actions (PAP) to

the Board of Governors, upon approval of the Academic Senate. Finally, it is in charge of reporting and Gender Balance, implementing Welfare Policies (services and facilities of work-life balance and trial good practices), Networking and sharing good practice, raising awareness on gender issues, and antidiscrimination, preventing discomfort, discrimination and harassment. Some many welfare initiatives are implemented, as well, such as the initiative aimed to improve conciliation between life times and working (https://www.swas.polito.it/services/cpo/progetti/prog_vitalavoro.asp), time baby-parking service (https://www.swas.polito.it/services/cpo/progetti/prog_policino.asp) and nursery service Policino (https://www.swas.polito.it/services/cpo/progetti/micronido14.asp). In order to favour the participation of both Italian and international applicants, the call for the assignment of positions at the nursery Policino has been also drafted in English.

III.8. Promoting the quality of research and the talent of individual researchers

The quality of the scientific and technological research is the main element on which the European Universities reputation is based. In accordance with its strategic plan, over the last years Politecnico has implemented dedicated actions aimed at supporting fundamental and collaborative research as well as knowledge sharing and technology transfer, as already mentioned with the description of the new Technology Transfer Interdepartmental Laboratory (LabTT). As far as fundamental research is concerned, Politecnico has launched several initiatives focused on the growth of its academic staff in terms of high-level scientific production, international visibility and participation in European opportunities and funding schemes focused on fundamental research:

- the project "ERC@POLITO" was adopted by the Board of Governors in October 2013 to offer support and dedicated actions to top researchers who apply for a prestigious European Research Council Grant at Politecnico. Very positive results have been obtained in the first round of the ERC calls of Horizon 2020: in 2014 the participation was three times higher than the average of the Seventh Framework Programme, and, most importantly, in 2014 four ERC proposals were funded, which is the same number of proposals funded in the whole 7FP;¹
- in parallel with the already mentioned initiative "Quality and Commitment" aimed at talented Bachelor's students (see section II.6), in April 2015 Politecnico launched the new initiative "Research Talent" ("La ricerca dei talenti") with dedicated funds for talented young researchers to perform highly innovative and interdisciplinary research at Politecnico.

Regarding collaborative and interdisciplinary research, in FP7 Politecnico obtained the best success rate of funded projects per researcher in Italy. It is also participating in the EIT ICT Labs which is one of the first Knowledge and Innovation Communities set up by the European Institute of Innovation. Moreover Politecnico is the only Italian Partner in two projects of the FET flagship initiatives funded by the European Commission with 1 billion euro related to the strategic themes *Graphene* and *Human Brain*. In order to create the conditions for successful participation in the new Framework Program for Research and Innovation Horizon 2020, which is highly competitive, the following initiatives have been launched:

- the aforementioned internal competitive call for the creation of new Inter-departmental Laboratories, in 2014 led to the set-up of seven Inter-departmental Laboratories where equipment and spaces are shared by researchers in strategic research activities, which require to cross the boundaries between different fields of research;
- in June 2015 the project "H2020@POLITO" was adopted by the Board of Governors to support the participation to the new European Framework Programme for Research and Innovation Horizon 2020. Starting from the results of a SWOT Analysis, the goal of the project is to enhance the strengths of the University and to prepare it for facing the new challenges of Horizon 2020,

¹ Results related to ERC calls 2015 are not available yet since evaluations are still ongoing. At the moment two consolidators have passed the first step of the evaluation and have been called to the Interview that will be held in October 2015.

focusing its action on proposal writing, multidisciplinary research, networking, international visibility.

III.9. Improving employability and continuing development of skills and competencies

The increase of the number of actions dedicated to support the career development of researchers, especially young researchers, is one of the outcomes of the aforementioned process related to the full implementation of the principles of the European Charter for Researchers.

Of particular importance in this respect are the following three initiatives: (1) in July 2015 the project "Empowerment for Employability" was adopted by the Board of Governors. The project is aimed at increasing the potential of work placement of researchers, PhD students and postdocs of Politecnico. The activities to be implemented relate to the dynamics that have an impact on the relations between candidate and company for highly specialized profiles, such as: the need to formalize clearly the area of applicability of the knowledge acquired by the candidate and to effectively communicate the technical content of his career path; the need to increase awareness of the transferability and attractiveness of the acquired qualification and skills for companies; the need to provide training in soft skills to facilitate the communication between candidate and company; (2) the number of training courses in transferable skills on issues such as IPR, Open Access, fundraising, proposal writing, project management has increased; (3) the creation of a new area of the University website dedicated to opportunities for researchers, where internal and external researchers can find information on research funding, incoming/outgoing mobility opportunities, strategic initiatives of the Politecnico di Torino (eg. Project "ERC@POLITO", Project "H2020@POLITO", Project "Research Talent", etc.), course catalogue of the University in transferable skills, support services for international researchers.

IV. New challenges faced by the Institution

In order to build the following section of this report it is necessary to refer to the above mentioned Institutional Strategic Plan and the related Action Plan, which are included in **appendices 1a and 1b**.

IV.1. Mission

Aware of its role of Public university, Politecnico works to create and disseminate innovative highly qualified scientific and technological content knowledge and to train Architects and Engineers with professional skills and social responsibility able to face the challenges of a continuously changing society. This is put into effect in order to contribute to the cultural progress and to a competitive and sustainable development of the local Community and of the Country.

IV.2. Vision

- To make an open community grow in a stimulating multidisciplinary and multicultural international environment, able to attract top talented students, researchers and professionals, as well as strategic investments at local Community level, as well as for our Country.
- To recognize the value of our University among the top technical universities in Europe and in the World, by combining high profile scientific research, high quality education, together with effective actions of technological transfer and knowledge sharing.
- To contribute to the technological and economic development and to the competitiveness of the local Community and of the Country by reinforcing a long-term partnership with the industrial system, by promoting the setting up of innovative companies and by creating qualified job opportunities for young generations.

IV.3. Strategic priorities and actions for their implementation

• THE APTITUDE FOR QUALITY EDUCATION

<u>Certifiable education on the basis of quality criteria at an international level.</u> According to the European Standards and Guidelines of European Association of Quality Assurance (ESG-ENQA) our university must adopt a policy and related procedures in order to assure the quality of offered courses and formal qualifications.

<u>An increased attention towards deserving talented students.</u> Politecnico works for attracting and retaining the most talented and motivated young people from all over the Country from the most qualified foreign universities, in order to strengthen an international and cultural environment.

ORIENTATION AND SELECTION TO ASSURE BEST OPPORTUNITIES IN EDUCATION AND PROFESSIONAL WORLD

It is necessary to face the disagreeable situation regarding the student drop-out and to be aware also of the need to contrast the phenomenon, through effective solutions supported by statistical data based on a multiple-year monitoring.

• TO INCREASE THE EDUCATIONAL VALUE AND FLEXIBILITY OF THE "3+2" (Bologna) MODEL

Politecnico is willing to open a wide cultural debate on the Bologna process model, that should be declined in a range of educational opportunities able to train professionally and culturally differentiated professionals.

- STRENGTHENING OF THE ROLE OF THE DOCTORATE (PhD)
 Politecnico is aware of its role as ideal connection between education and research, as well as of its
 vocation to reinforce its scientific and technological roots through a high level research, which serves
 also as a symbol of its social mission as higher education Public Institution. For these reasons,
 Politecnico promotes the centrality of the PhD education as key objective for tying these two linked
 attitudes.
- CENTRALITY OF RESEARCH AND KNOWLEDGE SHARING
 <u>Promotion of the research quality and potentialities of single researchers</u>. Politecnico has been facing and establishing relationships with the international research world for years, must foster the scientific

production quality, by promoting and enhancing the value of the publications recognized at an international level, by referring to the indicators and criteria mainly recognized.

- GROWTH OF THE IMPACT OF RESEARCH ON SOCIETY
 Politecnico is characterized by a long and well-established cooperation tradition with the production
 and professional world and through "Cittadella Politecnica" has been pioneer in the implementation of
 a university campus, where it is possible to originate and strengthen technological transfer and
 knowledge sharing processes.
- THE STRENGHTENING OF AN INTERNATIONAL COMMUNITY A strengthening in the networking actions with high qualified universities and research centers can be realized also through an approach to a cooperative research at an international level.
- THE HUMAN CAPITAL VALUE The reputation of Politecnico, which aims to be included as one of the top technical European universities, is mainly based on the enhancement of its human capital and especially on the capacity to involve and motivate the whole university community.
- ASSESSMENT AS A GROWTH TOOL

The principle of the evaluation of all those who work in public institution, whichever task or role they have, has been recently associated with other important social aims (anticorruption, transparency, effectiveness and efficiency); this principle can be pursued also by the establishment of structures (ANAC, Italian national Authority for Anticorruption, for evaluation and Transparency within the public administrations; ANVUR), which examine what has been done by Public Administration and as a result by universities and their technical, administrative and academic staff, as well.

IV.4. Development policies and enabling tools

- STRENGHTENING OF INTERNATIONALISATION POLICIES For Politecnico the internationalization policies have an impact which involves various aspects, in particular the fields of education and research and it is considered as a surplus value the transformation of its own campus in an even more cosmopolitan scenario.
- TOWARDS A SUSTAINABLE CAMPUS Conforming to the top international universities, one of Politecnico's aims is to increase the awareness for its social role (as individuals and institution), through culture and sustainability education.
- CONTINUOUS DIALOGUE AT A LOCAL LEVEL

One of the goals of Politecnico is to make grow its own capacity of generating and sharing knowledge firstly at a local ad at a national level, as well as at an international level, in order to maintain and assure its own contribution to the cultural, economic and social growth.

V. Appendices

Appendix 1 a – The Institutional Strategic Plan of Politecnico di Torino

- Appendix 1 b Action plan of the Strategic Plan
- Appendix 2 a General Scheme of Politecnico Organisation
- Appendix 2 b Organizational chart of the Central Administration and support services

Appendix 2 c - Chart of the interactions between Vice-Rectors and the Central Administration Areas

- Appendix 2 d Organizational chart of the Research Support and Technology Transfer Area
- Appendix 2 e Organizational chart of the Student Affairs Area Chart
- Appendix 2 f Organizational chart of the International Affairs Area

Appendix 3 – Student numbers for the whole Institution, with a breakdown by faculty, over the last three to five years; time-to-graduation; drop-out rates; gender distribution by faculty, detailed for scientific areas; student/staff ratio; demographic trends in the wider target population

Appendix 4 – Academic staff numbers (by academic rank and faculty) for the whole Institution, over the last three to five years, with a breakdown by level, discipline, gender and age

Appendix 5 – Funding: government funding (amount and percentage of total budget), other funding sources (type and percentage of total budget) and research funding (percentage within total budget); amount of institutional funding for teaching and research per faculty over the last three to five years

Appendix 6 – Infrastructure in relation to the number of students and staff: number and size of buildings, facilities, laboratories, and libraries; their location (e.g., dispersed over a large geographical area or concentrated on a single campus); condition of the facilities

Appendix 7 – Handbook for prospective international students

VI. Annexes

Annex 1 – Politecnico Self-evaluation Report (2011)

- Annex 2 Leaflet Polito at a glance (June 2015)
- Annex 3 New Statute of Politecnico di Torino
- Annex 4 The Departments of Politecnico di Torino
- Annex 5 List of Collegi and related Departments and of Educational Programs
- Annex 6 Institutional Quality Assurance Flowchart
- Annex 7 Selection procedure for Full Professors

Annex 8 – Politecnico di Torino- ISCN GULF-Sustainable Campus Charter Report 2015

VII. Glossary

Departments

DAD - Department of Architecture and Design
DAUIN - Department of Control and Computer Engineering
DENERG - Department of Energy
DET - Department of Electronics and Telecommunications
DIATI - Department of Environment, Land and Infrastructure Engineering
DIGEP - Department of Management and Production Engineering
DIMEAS - Department of Mechanical and Aerospace Engineering
DISAT - Department of Applied Science and Technology
DISEG - Department of Structural, Geotechnical and Building Engineering
DISMA - Department of Mathematical Sciences
DIST - Interuniversity Department of Regional and Urban Studies and Planning

Central Administration Areas

AFLEG: Legal Affairs Service AQUI: Purchasing Area BIBLIOM: Libraries and Museum Area COREGE: Departmental Administrative Managers Coordination Areas EDILOG: Estate Facilities and Logistics Area GESD: Student Affairs Area INTE: International Affairs Area IT: Information Technology Area PAF: Planning, Budget and Finance Area PREP: Health and Safety Service RDPS: Reporting and Monitoring Area RGA: Departmental Administrative Managers RUO: Human Resources, Organisation, Salary and Social Security Treatment Area SARTT: Research and Technology Transfer Support Area SAV: Evaluation Support Service SISTI: Institutional Support Service SSPQA: Support Service to Quality Assurance Committee STUD: Strategic Studies Service

Institutional Bodies

CARTT: University Committee for Research, Technology Transfer and Services to the Community CPD: Joint Committee for Education CUG: Equality, Non-discrimination and Anti-harassment Committee LabTT: Technology Transfer Interdepartmental Laboratory NUV: Institutional Evaluation Committee PQA: Institutional Quality Assurance

External Bodies

ANVUR: Italian National Agency for the Evaluation of the Italian University System and Research CUS Torino: University Sports Committee INRiM: National Institute for Metrological Research MIUR: Italian Ministry of Education, University and Research

