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## Fostering Sustainability @UniTs

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**Abstract** Promoting sustainability through innovative culture and models is nowadays a top task for universities. Their commitment oriented by the 17 United Nations' Sustainable Development Goals (UN SDGs) conveys the message that sustainability is not a "luxury" but an essential vehicle through which to pursue and guarantee everyone's rights, inclusion and future. Solving complex problems calls for collaboration among communities; aware of that, Italian universities set up the RUS - Italian University Network for Sustainable Development - which acts as a model to encourage collaboration between universities and cities, to spread social innovation at local level and to provide cultural awareness at national level. The University of Trieste (UniTs) joined the network in 2017. Consistent with its strategy for sustainability, UniTs has implemented measures on the macro-context (to raise public awareness and to support research) as well as on micro-context (to orientate behaviors and habits of its community). In particular, it focused on virtuous projects such as waste management, based both on the constant reduction of waste production and on the optimization of the use of materials and products (i.e. paper, glass, reagents), along with the setting of separate waste collection to reduce disposal and favor recycling. The paper will refer on the present framework and the implementation of new integrated projects, aimed at consolidating a community attentive and aware of sustainability.

**Keyword:**

sustainability, waste management, awareness, integrated projects.

### 1. Introduction

The significant role of the universities in the economic, social and cultural development of a territory has been recognized on a European level but also on a global level for some years now [1-3]. More recently, the centrality of the higher education institutions (HEIs) has been highlighted even regarding the advancing the achievement of the 2030 Agenda and the UN Sustainable Development Goals (SDGs) [4,5].

On the basis of their three core institutional activities ('missions') universities can be important key drivers both at a national and regional level. On one side, in fact, universities'

research activities can contribute proactively to the regional business innovation aligned with the Sustainable Development Agenda, while on the other side through their teaching mission they can develop the human capital and skills needed to address sustainability challenges and opportunities. Moreover, in the context of their third mission - defined as the “openness of the university towards the socio-economic context through the valorisation and transfer of knowledge” [6] – universities can foster a community development by using their expertise, authority and external leadership to influence policies and practices defined by various stakeholders in accordance to the 17 UN SDGs. And not forgetting the sustainability leadership role that universities can also step in by incorporating sustainability best practices into their governance, core business and operations, and by monitoring and reporting on their commitments to the SDGs and improvement activities.

Also, the University of Trieste is increasingly engaging on sustainability since 2012, when for the first time, in its Statute, among the principles for the organization of its activities (art. 4), it included the still present “pre-emptive assessment of the organisational and financial effects – and sustainability (also environmental) – of proposals submitted to the University’s bodies by research and teaching departments and support services” [7].

In particular, with a view to environmental sustainability, the University of Trieste has adopted virtuous behavior models with the aim of improving quality of life, the reduction in the production of waste and the dissemination to the whole community (staff and students) ways and behaviors in line with the 17 UN SDGs.

To present the UniTs case, the paper has been structured as follows: the introduction provides the background information related to the study and determines its primary goal. In Section 2, an introductory description of the University of Trieste and of its sustainability mission is provided, whereas Section 3 focuses specifically on the approaches and the internal procedures adopted for the waste management, along with the performance of UniTs for the Waste (WS) category of the UI GreenMetric World University Ranking. In the last section, the concluding remarks are provided, along with the implications for the near future activities oriented to deepen UniTs sustainability engagement.

## **2. UniTs community and its mission for sustainability**

### **2.1. Who we are**

The University of Trieste, founded in 1924, is a medium-sized university in the Italian public system. It is located in Northeastern Italy, in Trieste, a city on the Adriatic Sea, close to the border with Slovenia, and in a region near to other central and eastern European countries.

UniTs has about 1000 employees (of which about 40% are part of the teaching and research staff) and carries out teaching, research, and support activities through its 10 departments.

UniTs offers 30 Bachelor's Degrees and Master's Degrees: 6 cycle Master Degrees, 7 Inter-University Bachelor's and Master's Degrees, 28 Specialisation Schools, 15 PhD Programs (of which 4 Inter-University PhD Programs), 9 first level University Master's Programs, 12 second level University Master's Programs, 1 Professional development course.

From the latest official data (2018-19) UniTs counts 15,851 students enrolled at Bachelor's and Master's Degrees (2018-19) (of whom 4,760 first enrolled), and 1007 students enrolled at Postgraduate Courses [8].

The mission of UniTs highlights its role as a public institution of high culture, secular, pluralist and independent from any ideological, religious, political and economic orientation, in accordance with the principles of the Constitution of the Italian Republic and the international agreements undertaken by Italy in the field of scientific research and university education. In fact, research and education are the primary tasks of the University in order to promote the cultural, civil, social and economic development of the country [9].

UniTs develops its activities in a particularly stimulating territorial context. Trieste, a crossroads of Central Europe and a centre of contact and dialogue between West and East, is a multicultural city with a great literary tradition and a consolidated scientific vocation. Universities, research and higher education institutions in the province of Trieste make this territory one of the areas with the highest concentration of scientific institutions in Italy and the highest density of resources employed in research in Europe. Trieste, in fact, has 37 researchers for every thousand active workers, compared to an Italian average of about 5 per thousand and a European average of about 8 per thousand [10].

On the basis of its quality policy and intense collaborations in a peculiar territorial context, UniTs can see the quality of its teaching recognized at national and international level and obtain significant excellent research results in many sectors. In particular, the University Quality Assurance System has allowed UniTs to obtain the recognition of accredited Italian quality university "A-level" by the Ministry of University and Research, in full conformity with ANVUR evaluations.

## **2.2. UniTs and sustainability**

Universities have a special position and a responsibility to play a key role in shaping a more sustainable future and the University of Trieste recognises that sustainability is one of the main challenges for the coming years. UniTs, with its activities of research, education, health assistance, knowledge transfer and public engagement, contribute to identify solutions to sustainability and global challenges as expressed in the 17 UN Sustainable Development Goals (SDGs).

It should be noted that the University of Trieste has adopted the most common and broad concept of sustainability, which includes the three key areas of environmental, economic and social issues. And the UniTs's Statute maintains a clear reference to sustainability at the Art. 4 "Principles relating to the organisation" [9].

Moreover, the University of Trieste's commitment to sustainability runs throughout all our practices, from the management of the university's campuses and facilities, through procurement, mobility and transport, community engagement, research, teaching and learning. To achieve its objectives, the University of Trieste adopts different instruments and tools to implement its policies oriented to pursue its sustainable aims and goals: ethical values and principles (Code of Ethics), academic guideline and best practices, internal regulatory and acts.

To support and coordinate these actions, the University of Trieste included sustainability in its Strategic Plan 2016-2019 and reinforced the relevance of sustainable goals in the new UniTs Strategic Plan 2020-2023. The strategy will target areas where the University can deliver the biggest positive impacts on sustainability. A wide range of University stakeholders must be included in the development of this strategy, and the new Social Report will also include some new elements related, in particular, to the environmental dimension of sustainability.

Moreover, the University of Trieste is also member of the Italian University Network for Sustainable Development (RUS), a project formalised within the Conference of Italian University Rectors (CRUI) in 2015 [11]. The RUS is the first experience of coordination and sharing between all Italian universities committed to the topic of environmental sustainability and social responsibility.

The main goal of RUS is to spread the culture of sustainability, both within and outside the Universities, sharing skills and experiences, with the aim of increasing the positive impact in terms of environmental, ethical, social and economic actions that are currently implemented by each university, furthering the recognisability and the value of the Italian experience on an International level.

The RUS is intended to be a model of best practice in the field of sustainability, with the aim of extending its policies to other sectors of the Public Administration, education and the general territory. Furthermore, RUS is working to incentivise the collaboration between university and city and to spread social innovation over the territory. Lastly, the network seeks to provide cultural stimuli for the entire country system and to promote new national politics for sustainability and sustainable growth.

The membership of the University of Trieste to the RUS is coherent with the 17th SDGs “Build Partnerships for the Goals”. A goal that the University of Trieste pursues also through the collaboration with the other public and private stakeholders at a national and local level. To be worthy of notice the collaboration with the Autonomous Region Friuli Venezia Giulia, the regional public administrative authority, aimed at designing the Regional Strategy for Sustainable Development.

UniTs aims to build a community of students, teaching-research staff and administrative personnel more aware and attentive to everyday choices, which is committed to collaborating on concrete and lasting projects characterized by greater sustainability. The University of Trieste therefore intends to implement a series of measures both on the macro-context (to raise public awareness and to support research and actions for the use of latest generation technological innovations) and on the micro-context (with the orientation of behavior and habits of its community).

Most of these interventions are linked with the workgroups of RUS that concern the following areas of the sustainability goals: mobility, waste, climate change, energy, education, food, inclusion. In particular, the workgroups on waste, together with those concerning mobility and energy, is one of the activities of RUS that determines the more relevant impact on the institutional activities of Italian Universities. In fact, this RUS group, through the exchange of best practices, contributes to improve waste regulation implementation and the waste management innovation inside the Universities. The goals of these actions concern adoption of optimal waste collection methods, increase recycling and reuse of materials, environmental impact reduction and climate change mitigation.

### **3. Waste management at UniTs**

#### **3.1. General framework**

The waste management service at the University of Trieste is organized to meet the needs of the institution, which depend on the size, territorial articulation, and its activities.

The activities that take place at the University of Trieste give rise to the production of waste which is classified, according to its origin, in municipal waste and special waste and, according to its hazardous characteristics, in hazardous waste and non-hazardous waste.

There is a regulation for the management of waste produced by the University of Trieste which defines the attributions of competences, in application of Italian Legislation.

The University of Trieste has a Waste Manager and an office dedicated to waste management.

The key principles that are pursued in waste management at the University of Trieste are precaution, prevention, sustainability, responsibility and cooperation of all those involved in the production, distribution, use and consumption of goods from which the waste originates.

More specifically, waste management takes place in compliance with the following hierarchy which establishes an order of priority of what constitutes the best environmental option:

- a. prevention;
- b. preparing for re-use;
- c. recycling;
- d. other recovery, (i.e. energy recovery);
- e. disposal.

Municipal waste is produced by administrative activities, by professors' studies in study rooms and libraries. Typical examples of produced wastes are paper and plastic from water bottles. With reference to municipal waste, UniTs has embarked on a virtuous path that wants to minimize production, and maximize the recovery of different types of waste. The collection and transport to final destination of municipal solid waste takes place by the multi-utility present in the city of Trieste.

Special waste is produced by the teaching and research laboratories. For the specializations present in the University of Trieste, special waste is divided into chemical and sanitary waste. The majority of special waste is hazardous and all management activities take place in full compliance with current legislation with a continuous search for the waste reduction, optimization of the collection and training of the personnel involved.

The correct management of the special waste takes place through precise and codified phases:

1. Codification of the waste produced by laboratory activities according to the CER code (European Waste Catalog, introduced by European Commission Decision 2000/532 / EC modified by Decision 2014/955 / EU of 18 December 2014) by the producer. If there are any doubts in the office of the University, the outsourcing services, there is an expert staff in the field of waste who can direct the choice of the code.
2. Storage - the waste is taken to a temporary deposit (usually present in the same building as the laboratory) which respects the conditions of hygiene and safety envisaged by current regulations. The same waste, in terms of characteristic and quantity, is recorded in an appropriate register.
3. Subsequently, the central outsourcing office identifies the final fate of the same types of waste collected in various temporary deposits in UniTs.
4. Collection and transportation - through a multi-year tender, the outsourcing office identifies the company that will manage the collection and transportation of special waste to final destination according to regulatory, environmental and economic criteria.

There is also a system of collection of organic waste in UniTs mainly due to canteens and bars.

### 3.2. Performance in GreenMetric

The results of GreenMetric ranking 2019 evidence a good global performance of the University of Trieste, in particular for what concern the waste dimension of sustainability (Tab. 1). The waste index of GreenMetric obtained in the ranking 2019 amount on 1,800 points the maximum score for this dimension, and this score contributes around to the 29% of the total score of the University of Trieste. This represents the higher contribution among the six sustainability dimensions considered to the final results respect the 17% of Education and Research, and Energy and Climate change, 16% of Transportation, 12% of Water and 9 % Setting & Infrastructure (Table 1 - Figure 1). To note that the six dimensions do not have the same weight to determine the total score, in particular Waste (WS) contribute to the 18% of the total point, together with Transportation, Education & Research and less than Energy & Climate Change (21%) (Tab. 2). Therefore, the performance of Waste index for University of Trieste results in GreenMetric ranking 2019 is particularly relevant.

Moreover, the waste index obtained a 100% of the total index point, while Transportation, Education & Research obtain around the 55-57% of the maximum point and Energy & Climate Change 51% of the total points available for these dimensions. A better performance for what concerns the Water index (72.5%), that has a limited weight (10%) in calculating the total score (Tab. 1)

Table 1 - University of Trieste results – GreenMetric Ranking 2019

Category	Point	% of point on total score	Maximum point	% of point on maximum point
Setting & Infrastructure (SI)	525	9 %	1,500	35.00 %
Energy & Climate Change (EC)	1,075	17 %	2,100	51.19 %
Waste (WS)	1,800	29 %	1,800	100.00 %
Water (WR)	725	12 %	1,000	72.50 %
Transportation (TR)	1,000	16 %	1,800	55.56 %
Education & Research (ED)	1,025	17 %	1,800	56.94 %
Total score	6,150	100 %	10,000	61.50 %

Source: owner elaboration on GreenMetric data [12]  
<http://greenmetric.ui.ac.id/detailranking2019/?univ=units.it>

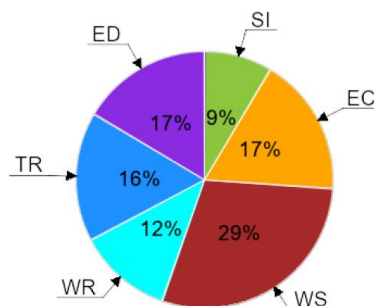


Figure 1 - University of Trieste: contribution of the different dimensions to total score - GreenMetric Ranking 2019

Source: owner elaboration on GreenMetric data [12]  
<http://greenmetric.ui.ac.id/detailranking2019/?univ=units.it>

Table 2 - Categories used in the ranking and their weighting

Category	Maximum point	% of total point
Setting & Infrastructure (SI)	1,500	15 %
Energy & Climate Change (EC)	2,100	21 %
Waste (WS)	1,800	18 %
Water (WR)	1,000	10 %
Transportation (TR)	1,800	18 %
Education & Research (ED)	1,800	18 %
Total score	10,000	100 %

Source: GreenMetric Guidelines (<http://greenmetric.ui.ac.id>) [13]

This result depends on some specific actions adopted by the University of Trieste. In particular, UniTs, in its campus, adopts an extensive separate waste collection (paper, plastic, glass, wood and metal, etc.) both inside the university buildings and outside in the open area of the university campus.

This procedure is carrying out according to the national legislation and municipality regulation. The waste collected separately is then delivered to the waste management company of the city of Trieste. The University of Trieste has been carrying out several initiatives addressing environmentally friendly and paper-saving way of working in the campus:

1. the recommendation to print document on double side, if it is possible;
2. the recommendation to print the e-mail only if it is really necessary;
3. the obligation to record the results of the students' exam using the online platform and not the paper register;
4. internal communication with staff mainly relies on e-mail and online tools. Paper-based communication is used only if strictly necessary;
5. replacing the student's paper booklet (for the registration of the exams' results) with an electronic multifunction card;
6. degree program application via the online application service University of Trieste <http://www2.units.it/immatricolazioni/>;
7. the online procedure for delivery of the thesis (final exams of master degree): the students do not delivery a printed copy of their thesis but upload a pdf file on a web platform. (<https://www.units.it/studenti/laurearsi>).

Therefore, the score for waste index of 1,800 on the total score of 1,800 (100%) depends on the good performance in the all six indicators that determine the waste index (Table 3).

Table 3 - Percentage of Score to Maximum Score for Waste Index

Indicator	Score	Maximum score
WS.1 Recycling program for university waste	300	300
WS.2 Program to reduce the use of paper and plastic in campus	300	300
WS.3 Organic waste treatment	300	300
WS.4 Inorganic waste treatment	300	300
WS.5 Toxic waste treatment	300	300
WS.6 Sewerage disposal	300	300

Source: owner elaboration on GreenMetric data [12]  
(<http://greenmetric.ui.ac.id/detailranking2019/?univ=units.it>)

#### 4. Concluding Remarks

Universities play a key role in shaping a more sustainable future. The University of Trieste explicitly recognizes that sustainability is one of the main challenges that await us in the coming years, to be declined in its wider environmental, economic, and social meaning. UniTs with its research activities, education and knowledge transfer, contributes to finding solutions to sustainability and global challenges, in line with what the United Nations has expressed.

The UniTs involvement in sustainability has grown over time and has been extended to all community value creation activities, from university facility management, procurement, mobility and transport, research, teaching and learning. To coordinate and achieve its objectives, UniTs has included sustainability in its Strategic Plan as early as 2016 and has strengthened the relevance of these issues in the new 2020-2023 Plan. In addition to the environmental aspect, on which this paper is mainly focused, UniTs is also working to increasingly improve actions aimed at pursuing social and economic sustainability objectives. With regards to the social aspects, here it is important to recall the Code of Ethics, which UniTs has adopted on the basis of its Statute. It is a public declaration expressing the general principles and rules of conduct to which the University conforms, aware of its responsibilities towards civil society and, in particular, the young people who are trained there. In this sense, UniTs requires all its personnel to respect, protect and promote the fundamental values of the university institution, namely the centrality of the person and the protection of human dignity, the rejection of all discrimination, respect for fundamental freedoms and rights. Furthermore, UniTs requires the members of its community to commit themselves, in carrying out their respective activities, to protect the freedom of research and teaching, promote knowledge, foster critical debate, guarantee equal opportunities, reduce disadvantages, recognize and value merit. Another important initiative towards social sustainability is the Unique Guarantee Committee (the so-called CUG) for equal opportunities, the well-being of workers and against discriminations. In addition to this committee there is also the figure of the Councilor of Trust, whose task is to provide information, free advice and assistance to members of the community who suffer discrimination, molestation and injury to dignity or mobbing.

An important step to develop and disseminate sustainability goals and good practices is to involve the many stakeholders, both inside and outside the university. By starting to involve first of all those who participate in the academic community, in their different roles (students, researchers, and all the teaching, technical and administrative personnel), it will then be easier to direct the entire community of the reference territory towards a more sustainable development.

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