
The role universities and cities can play in the EU's Green Deal

Received: 29th August, 2021

Stefania Cerutti

Associate Professor, Università degli Studi del Piemonte Orientale, Italy

Stefania Cerutti is associate professor of economic and political geography at University of Piemonte Orientale in the Department of Economics and Business. Her research focuses on local and territorial development, cultural tourism, urban studies, inner and mountain areas and European project design. She is the promoter and director of the inter-departmental centre for tourism studies at her university, the UPOOnTourism, Strategy, Research Centre for innovative and sustainable tourism. She is a member of the inter-disciplinary centre, UPO4Sustainability.

Università degli Studi del Piemonte Orientale, Dipartimento di Studi per l'Economia e l'Impresa, Via Perrone, 18 – 28100 Novara, Italy
E-mail: stefania.cerutti@uniupo.it

Enrico Boccaleri

Associate Professor, Università degli Studi del Piemonte Orientale, Italy

Enrico Boccaleri is associate professor at the University of Piemonte Orientale in the Department of Science and Innovation Technology. He is part of the SusMat research group where he works on materials synthesis and characterisation, matching production processes and properties that are sustainable for energy-intensive materials. He is the promoter and director of the Interdisciplinary Centre UPO4Sustainability, a member of the waste working group of the Italian University Network for Sustainable Development (RUS) and coordinator of the degree course in green chemistry.

Università degli Studi del Piemonte Orientale, Dipartimento di Scienze e Innovazione Tecnologica, Via Michel, 11 – 15121
Alessandria, Italy
E-mail: enrico.boccaleri@uniupo.it

Enrico Ferrero

Associate Professor, Università degli Studi del Piemonte Orientale, Italy

Enrico Ferrero is associate professor of physics of the earth system and circumterrestrial medium at the University of Piemonte Orientale (UPO). His main research interests are atmospheric physics, atmospheric boundary layer meteorology, turbulence, atmospheric dispersion modelling and physical and numerical models. He is the coordinator of the degree course in environmental studies and sustainable development at UPO. He is co-ordinator of the climate change working group of the Italian University Network for Sustainable Development (RUS).

Università degli Studi del Piemonte Orientale, Dipartimento di Scienze e Innovazione Tecnologica, Via Michel, 11 – 15121
Alessandria, Italy
E-mail: enrico.ferrero@uniupo.it

Abstract Climate change and environmental degradation are an existential threat to Europe and the world. To overcome these challenges, Europe has shaped a new strategy, the European Green Deal, to help the EU's economy become sustainable. Much of its success will be determined by European cities where around 75 per cent of the European population live, work, travel and study. This paper considers European cities and their universities, in particular their strategic role in addressing societal and environmental challenges, training the younger generation, investing in research and engaging local communities in the transformational actions urgently needed. In particular, concrete actions and steps made by the University of Piemonte Orientale (UPO) in Italy to address environmental sustainability and social responsibility are presented in this paper.

Keywords: *Green Deal, European Union (EU) policy, environmental challenges, sustainability, cities, universities*

INTRODUCTION

The European Commission (EC) has highlighted the loss of soil function, land degradation and climate change, as well as feedstock consumption, energy and waste management as major contributors that threaten the flow of environmental goods and services that underpin Europe's economic output and well-being. Climate change and environmental degradation are an existential hazard to Europe and the rest of the world.¹

While the European environment and climate policies have helped to improve the environment over recent decades, Europe is not yet making enough progress and the outlook for the environment in the coming decade is not positive, according to the European Environment — State and Outlook 2020 report.² This report provides a stark snapshot of where Europe stands in meeting 2020 and 2030 policy targets as well as longer-term 2050 goals and ambitions to shift to a sustainable, low-carbon future. Even if some important progress has already been made, Europe needs better implementation and improved coordination between its current policies and it also needs additional policy actions to achieve fundamental change.³ This is the background to the new strategy, the Green Deal, which aims to transform the union into a modern, resource-efficient and competitive economy, which is climate-neutral by 2050. Transforming the economy and leaving no one behind in European cities and urban areas will comprise an important part of the Green Deal.

The main purpose of this paper is to investigate the changes that are occurring thanks to the Green Deal, with particular attention to the role universities can play in building more sustainable cities and 'responsible' communities, in particular the role of research and education, and the development of wise and conscious

communities. Universities are vital hubs of research and teaching on sustainability, community resilience and how to adapt to climate change; as large or medium-sized cultural organisations, they also produce significant emissions that contribute to the climate crisis. Hence universities should lead the global action, in terms of professional skills and civic consciousness, to limit climate change and the urban transition towards circular and green economies. This paper presents some concrete actions and steps made by the University of Piemonte Orientale (UPO) in Italy to address environmental sustainability and social responsibility.

EUROPE AND SUSTAINABILITY: NEEDS, SOCIAL CHALLENGES AND OPPORTUNITIES

A perspective from the European Environment Agency

SOER 2020 is the most wide-ranging environmental assessment ever undertaken in Europe. It notes that Europe has already made significant progress over the past two decades. Reducing greenhouse gas emissions, tackling air and water pollution, introducing new policies to tackle plastic waste and bolster climate change adaptation and the circular and bio-economy: these are the evident signs of improvement that are going hand-in-hand with other initiatives in the financial sector for driving the necessary shift to a sustainable future. While these feats are significant, Europe will not achieve its sustainability vision by continuing to promote unconditioned economic growth; the European Union (EU) needs to rethink its investments and actions, as shown in Table 1.

European countries, leaders and policymakers have to seize the opportunity and use the next decade to radically scale up and speed up actions to meet

medium and longer-term environmental policy targets to avoid irreversible change and damage. Achieving Europe's goals will require better implementation and improved coordination between current policies.

It will also need additional policy actions to accomplish fundamental change in the key systems of production and consumption that underpin our modern lifestyles, such as food, energy and mobility, which have substantial environmental impacts. The report also highlights the importance of how governments can enable a transition to sustainability — for example, Europe should rethink how it uses existing innovation and technology, how production processes could be improved, and how research and training could be fostered.

Finally, reaching such transformation will require investing in a sustainable future and stopping the use of public funds to subsidise environmentally damaging activities. Europe will hugely gain from such a change in investment priorities because of the economic and social opportunities that it can create.⁴

This report can be considered as an important source of knowledge that can lead the debate on future EU environmental and climate policies. It can help shape the European response to the United Nations Agenda 2030 and sustainable development goals (SDGs). Europe can lead the global transition to a healthier environment in an equitable and sustainable world, including its recovery from the COVID-19 pandemic. The idea of a Green Deal — outlined as the first priority in the Political Guidelines for the European Commission 2019–2024 — has the potential to provide an excellent framework for action, allowing for systems-based thinking and innovation needed to achieve this transition and create a sustainable future.

The Green Deal

While Europe is still facing notable challenges regarding the COVID-19 pandemic, it is important that the climate crisis and other ecological emergencies are not pushed aside.⁵ In fact, it can be argued that the recovery from the COVID-19 crisis presents an opportunity to accelerate a sustainable transformation. In line with this, the EU's recovery programme, Next Generation EU, adopted in July 2020, reinforces many of the initiatives proposed in the Green Deal, the new growth strategy for Europe to become the world's first climate-neutral continent by 2050.

It is ambitious and broad in scope, targeting agriculture, biodiversity, forests, food, green cities, the circular economy and much more. It can be considered as the roadmap for making the EU's economy sustainable, with actions to boost the efficient use of resources by moving to a clean circular economy, and to restore biodiversity and cut pollution. It also outlines investments needed and financing tools available and explains how to ensure a just and inclusive transition. Its success will depend on the development and implementation of many strategies and regulations.⁶

The Green Deal provides the strong commitment of Europe to make an unprecedented leap in the transition to sustainability, leveraging the exceptional investment effort required by the post-pandemic recovery in close connection with the 17 global goals (SDGs) of the 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015. This transition is divided into different dimensions that put the environmental pillar of sustainability at the heart of the interactions with the economic and social pillars: the transition towards decarbonisation (SDG 13), towards the circular economy (SDG 12), the food transition (SDG 2), towards a different

Theme	Past trends and outlook		Prospects of meeting policy objectives/targets		
	Past trends (10-15 years)	Outlook to 2030	2020	2030	2050
Protecting, conserving and enhancing natural capital					
Terrestrial protected areas					
Marine protected areas					
EU protected species and habitats					
Common species (birds and butterflies)					
Ecosystem condition and services					
Water ecosystems and wetlands					
Hydromorphological pressures					
State of marine ecosystems and biodiversity					
Pressures and impacts on marine ecosystems					
Urbanisation and land use by agriculture and forestry					
Soil condition					
Air pollution and impacts on ecosystems					
Chemical pollution and impacts on ecosystems					
Climate change and impacts on ecosystems					
Resource-efficient, circular and low-carbon economy					
Material resource efficiency					
Circular use of materials					
Waste generation					
Waste management					
Greenhouse gas emissions and mitigation efforts					
Energy efficiency					
Renewable energy sources					
Emissions of air pollutants					
Pollutant emissions from industry					
Clean industrial technologies and processes					
Emissions of chemicals					
Water abstraction and its pressures on surface and groundwater					
Sustainable use of the seas					
Safeguarding from environmental risks to health and well-being					
Concentrations of air pollutants					
Air pollution impacts on human health and well-being					
Population exposure to environmental noise and impacts on human health					
Preservation of quiet areas					
Pollution pressures on water and links to human health					
Chemical pollution and risks to human health and well-being					
Climate change risks to society					
Climate change adaptation strategies and plans					
Indicative assessment of past trends (10-15 years) and outlook to 2030			Indicative assessment of prospects of meeting selected policy objectives/targets		
	Improving trends/developments dominate	Year		Largely on track	
	Trends/developments show a mixed picture	Year		Partially on track	
	Deteriorating trends/developments dominate	Year		Largely not on track	

Note: The year for the objectives/targets does not indicate the exact target year but the time frame of the objectives/targets.

Table 1: Summary of past trends, outlook and the prospect of meeting policy objectives/targets

Source: SOER 2020

relationship with nature and more resilient ecosystems (SDG 14 and 15), towards an economic, productive housing system with zero pollution (SDG8 and SDG 11), the energy and infrastructural oriented transition to renewability and sustainability (SDG 7 and 9) — all this with the related social and economic repercussions that involve all the other goals of the 2030 Agenda.

Many authors agree that the Green Deal represents an unprecedented opportunity for Europe.^{7,8} Moving away from fragmented policymaking in the environmental field, it can reach a truly comprehensive and consistent policy framework capable of intelligently promoting deep decarbonisation and resource efficiency by seizing the economic and industrial opportunities it offers, and by ensuring its social inclusiveness. The Green Deal is a general policy strategy, outlining the ambitions and goals in sectors.^{9,10} It roughly outlines, in fact, an extensive transformation of the EU's economy, which will affect every aspect of our life if successfully implemented.

CITIES AND UNIVERSITIES IN THE GREEN DEAL

The role of cities for the success of the EU green strategy

Much of the success of the Green Deal will be determined by European cities where approximately 75 per cent of the European population live, work, travel and study. If cities are on board and if their contribution is recognised, Europe's next generations will be able to benefit from a future resilient recovery, which will in turn help cities thrive and make them healthier and more inclusive. Covering just 3 per cent of the earth's surface, metropolitan areas are currently home to 55 per cent of human beings and are

expected to increase dramatically over the next 20 years. Cities are also responsible for about 60 per cent of greenhouse gas emissions and 70 per cent of solid waste, while absorbing around 70 per cent of global energy. In Europe, over 65 per cent of CO₂ emissions come from cities, which is also where 85 per cent of the EU's gross domestic product (GDP) is produced. The EU cannot become climate-neutral by 2050 without them.^{11,12} Some cities are racing to zero emissions, while others offer a pool of innovative local solutions for coping with the effects climate change, including fires, flooding, heat islands, air pollution and health issues.

It is important to point out that the COVID-19 pandemic has redefined the limits, benefits and drawbacks of urban change and strategies. Many cities are moving quickly to take advantage of the opportunities offered by decreased mobility, especially low car volumes, by providing more road space and facilities for cycling and walking.¹³ Policymakers and planners are rethinking urban spaces and mobility to make up for lost time and to quickly decarbonise urban transport and increase cycling and walking through the city.^{14,15} In many cases the ongoing crisis has become the starting point for a new urban revolution based on green principles and the role of ecosystems services.¹⁶

Since the Green City Accord of 2020, signatory cities have progressed towards better implementation of EU environmental legislation, improving air quality, reducing noise pollution and promoting green urban areas. A €1.8tr package has been provided to regions and cities to help with a green, digital and resilient recovery. Additionally, a group of high-level experts have put forward a proposal for 100 climate-neutral cities in the EU by 2030.

The Intelligent Cities Challenge (ICC) is an EC initiative that brings together 136 cities to achieve intelligent, socially

responsible and sustainable growth through advanced technologies. It provides five thematic tracks (see Figure 1). Participating cities are encouraged to interact and learn from one another to creatively tackle city challenges. Cities are encouraged to form intelligent ecosystems and develop crucial long-term relationships with other ICC cities.

The Green Deal and ICC cities have developed innovative governance models for engaging local stakeholders in sustainable initiatives. The local authorities and communities have a crucial role in bringing the European sustainable vision and idea closer to citizens.

Education can lead the route towards more sustainable lives, cities and societies. Innovative policies and actions need to be co-developed by higher education institutions, student organisations, Member States and the Commission and the European universities. In particular, revisioning the role of higher education for sustainable development involves changing the means and processes of knowledge production and the way in which students are trained, making students more socially responsible, critical and sensitive towards sustainability issues lifelong.

European universities and the sustainability (r)evolution

‘Universities educate most of the people who develop and manage society’s institutions. For this reason, universities bear profound responsibilities to increase the awareness, knowledge, technologies, and tools to create an environmentally sustainable future. Universities have all the expertise necessary to develop the intellectual and conceptual framework to achieve this goal. Universities must play a strong role in the education, research, policy development, information exchange, and community outreach to help create an equitable and sustainable future.’¹⁷

Since the end of 1990s, sustainability has become a key factor in academic life and activity from both an infrastructural and a cultural point of view.

As affirmed in the European University Association (EUA) Strategic Plan, the need for a strong commitment by universities has never been greater in addressing societal challenges. The COVID-19 pandemic, climate change, resource scarcity, ageing populations, feedstock and energetic transition, migration and managing artificial



Figure 1: Thematic tracks.

Source: ICC

intelligence provide many examples where universities have a major impact.¹⁸

In the last few years, the rise of the knowledge economy, globalisation, and both the financial and the environmental crises are unprecedented challenges that have contributed considerably to redesigning and extending the mission of universities.^{19,20} Recently, there has been increasing pressure on universities to shift from mainly teaching and performing research, and adding a third mission (TM), considered as an essential contribution to society.²¹ Universities are becoming engines that contribute to the social, economic and cultural development of the regions and cities in which they operate, by transferring knowledge and technologies to industry and to society at large.²²⁻²⁴

Within the current framework and commitment for climate change and the environmental policies, European universities are strategically involved in the transformative plans and actions urgently needed. As recommended in the Green Deal communication, schools, training institutions and universities are well placed to engage with pupils, parents and the wider community on the changes needed for a successful transition. The Commission is working to prepare a European competence framework to help develop and assess knowledge, skills and attitudes on climate change and sustainable development, providing support materials and facilitating the exchange of good practices in EU networks of teacher-training programmes.

‘The major challenges of the 21st century create an urge to switch from climate-changing technologies and approaches to sustainable models. This environmental revolution, which includes the goal of reaching a carbon neutral society by 2050, is an urgent necessity – especially in view of the stern warnings about global

warming, massive loss of biodiversity and an approaching major crisis in access to resources and energy. In the present world landscape, it is also a strong opportunity for Europe to take the lead again and to transform its industrial, economic and societal models. It is also a strong opportunity for Europe's universities to take the frontrunner position, by boosting truly interdisciplinary approaches.²⁵

In most European universities, multi-annual mitigation action plans require large structural investments in buildings and other assets, aimed for instance at reducing their energy consumption and largely increasing their thermal efficiency. To do this, the European universities urgently require increased funding, and the Green Deal could provide a strategic framework to facilitate the deployment of ambitious funding schemes. To become more sustainable by making practical changes to the way their institution is run, several European universities have switched to greener energy, reduced energy output and encouraged sustainable habits in staff and students.

This is not the only way that universities can help fight climate change, however. As leaders in knowledge creation and research, universities are in a unique position to leverage their expertise and make significant advancements in the fight against the climate crisis. How institutions operate, conduct research and educate their students can all help to act as a catalyst for real and lasting change.

An example of how universities can work together to effect change is the ESSSR (European School of Sustainability Science and Research), an inter-university consortium of 54 members over 19 European countries to date, sharing their interest on sustainability science and sustainable development.²⁶ The leading scope of ESSSR is to coordinate sustainability teaching and research,

by promoting publications, managing a cooperative doctoral programme on sustainable development research (CDPhD-SD) and jointly applying to EU funding schemes.

Publications issued by the academic members of ESSSR offer collaborative frameworks to help revise, promote and design science programmes and education, including on societal challenges for sustainability. These frameworks comprise non-conventional learning and SDG, sustainability initiatives in higher education global contexts, the role of universities in sustainability policies, and the education of sustainability-aware leaders.²⁷

Sharing thinking and learning has strengthened the ability to propose new teaching methods. An example of this is the Master's programme on sustainable development goals implementation (MSDGI), developed with the help of the ESSSR by the University of Malta, together with Manchester Metropolitan University, Šiauliai University, CBS International Business School, Aristotle University and the Turkish Education Association University to contribute to the education of the next-generation sustainability scientists. The study course will be delivered essentially using digital learning provided by summer schools. The programme is expected to welcome international students from October 2021.²⁸

The increasing demand for students, businesses and local bodies with knowledge about sustainability and climate change, and the skills required to tackle related problems, creates exciting opportunities for educational and training establishments.

Universities exist as a network of different individuals, organisations and communities. International partnerships, students, staff, local businesses and communities all have something to gain by connecting with one another in

this system, and these connections will increasingly help to face the climate challenges by developing innovative, collective, cooperative actions within cities or regions where they are located.²⁹ Universities are in fact crucial actors in urban sustainable regeneration because they provide useful resources that are difficult to obtain by other means.³⁰

THE ITALIAN UNIVERSITIES' NETWORK AND THEIR ACTION PLAN FOR THE GREEN DEAL

The role and aims of university networks in sustainable development

The societal and environmental issues being faced, as well as the pandemic, have prompted universities to make important developments in the way they approach learning (including adopting remote, online, lifelong, student-centred approaches), research (Open Science, virtual laboratories, data-driven research) and innovation (by fostering closer partnerships with businesses as well as with cultural, civic and public stakeholders in cities and regions). With regard to Italy and Europe, university and academic networks have the required interdisciplinary approaches, both in research and in education as well as the TM. Hence, university networks can play an active role in setting out concrete actions to ensure innovation and efficacy in the face of rapidly changing circumstances.

The Italian University Network for Sustainable Development (RUS) has been in existence since July 2015. It is the first network for all Italian universities specifically committed to the topic of environmental sustainability and social responsibility cooperation.³¹ The main goal of RUS³² is to spread a 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. It also aspires to contribute to SDGs and to strengthen the visibility and value of the Italian experience on a European and international level.

As stated in SDG 17 and in the Green Deal, partnerships are encouraged across sectors as well as across countries. Partnerships and networks, including RUS, help to:

- Harmonise institutional activities and improve the management of environmental and social aspects by members;
- Create a community which is able to develop/spread/transfer/adapt national and European best practices;
- Promote projects and develop joint initiatives, in areas such as knowledge and skills transmission, education and university management, with a focus on learning and on a multistakeholder/multidisciplinary approach;
- Develop a multidisciplinary approach in university programmes, with the purpose of contributing to the growth of a sustainable development culture and guiding students towards a positive lifestyle;
- Train and update the staff (professors, technical administrators, collaborators and linguistic experts) on the topic of sustainable development;
- Develop awareness and promotion campaigns at local, national and international level;
- Stimulate stakeholder engagement and increase collaboration with public bodies as well as with public and private businesses within the frame of the universities' TM.

Hence, the link between universities in Italy and other EU countries can produce real academic benefits in terms

of governance, management, performance and reputation.

The UPO's approach to sustainability

In the last few years, the UPO, located in the Piedmont region in northwestern Italy, has encouraged and carried out many initiatives related to the different sustainability approaches and issues. It promotes the culture of sustainability through a cohesive approach and concrete measures to address an important paradigm shift starting from within the 'UPO system'.

UPO has designed and operated infrastructure projects taking into account economic, social, environmental (including climate resilience) and institutional sustainability. Realising that a substantive improvement in the sustainable performance of urban and societal systems goes hand-in-hand with an integrated vision of objectives and resources, these projects have required a greater synergy between tools, organisations and skills.

Training, research and TM have become the tools used for facing the numerous and complex challenges of today. Embracing the 17 SDGs and the Green Deal vision, UPO is engaged in action at various levels that affects all its systems, teachers, researchers, technicians and administrative staff and students.

In 2019 UPO focused its European Researchers' Night event on the topic 'Climate, Environment and Sustainability'. The event demonstrated that the scientific interests of many researchers in the faculty are focused on the 2030 Agenda issues and Green Deal opportunities.

UPO has joined RUS and provided representatives at a variety of RUS working groups in specific fields, such as energy, mobility, waste, climate change, education and food. In particular, this collaboration reveals the strong focus by UPO on TM strategies and actions, and

has enabled UPO to contribute to the social, economic, cultural development and sustainability of cities.

UPO is working hard to create and maintain direct and indirect links between academia and business. Based on the five categories that interact to shape the entrepreneurial agendas within universities internally,³³ the UPO sustainable entrepreneurial agenda includes: organisations (TTOs and incubator ENNE3); strategies (institutional goals developed with the Piedmont region, RUS, local bodies and industries); systems (networks of communication and links between organisations and departments); leadership (multidisciplinary key leaders, administrators, boards of directors, department heads, 'star scientists' involved in the TM); and culture (institutional, departmental and individual attitudes and norms within the TM). It is important to underline that these activities from the research sphere are linked to the teaching field and university engagement in social and cultural life. UPO can be a key player due to a participatory governance process managed with the involvement of inhabitants and local communities in the three cities and the local urban area where UPO is located.

Some initiatives by UPO, in collaboration with RUS activities and other universities in the Piedmont region, have been rewarded by the Italian Ministry of the Environment with funding — in particular from the PASS project (Piemonte e Accademia per lo Sviluppo Sostenibile) — with the aim of supporting the sustainable development strategy of the region, bringing together both economic, institutional as well as citizen stakeholders. As part of the PASS project, the UPO interdisciplinary research activity has a specific focus on sustainable governance of Piedmont universities.

One of the main advantages of a small to medium-sized university such as UPO

is the ability of the different research departments within the university to share knowledge and information. Lessons and courses are distributed throughout the three main UPO sites to all the departments and knowledge sharing and integration is encouraged. This has proved to be an effective way for a shared vision for sustainability in research, teaching and the dissemination of knowledge. This resulted in the development of the Interdisciplinary Centre for Sustainability, UPO4Sustainability: Environment, Society, Economy and Education. The centre, officially approved in December 2019, promotes the growth of a common culture on sustainability grounded on the skills and expertise of the researchers participating in it, comprising scientists in the core sciences, health and medicine, geography and environment, economics, law and humanities.

Since the end of 2020 a branch of UPO4Sustainability has operated the Interdepartmental Centre for Tourism Studies, known as the UPO on Tourism – Vision, Strategy, Research for innovative and sustainable tourism. The centre researches trends and hot topics linked to sustainability and post-pandemic issues with the aid of an expert advisory panel from inside and outside the university, from both the public and private sectors and with expertise on research, training and TM UPO activities. The two centres pay close attention to the opportunities that the Green Deal offers to UPO and the region for investing in a green and sustainable future.

UPO has been recently involved in the organisation of the Virtual Conference Climate EXP0 for the COP26 Universities Network conference. The COP26 Universities Network is a growing group of more than 55 UK-based universities working together to raise tangible outcomes from the UN COP26 Climate Change Conference (taking

place in Glasgow, Scotland in November 2021). The climate EXPO took place from 17th–21st May, 2021 in partnership with RUS and Cambridge University Press, sponsored by the UK Research and Innovation programme (UKRI) and supported by the UN Climate Change Conference UK 2021.

UPO has also adopted a strategic plan and handbook for 2019–24 for everyone involved and working at UPO. The plan prioritises its sustainable activities and sets out goals for how best to make use of its resources; this is a huge step towards sustainability as set out in the Agenda 2030 goals and by the Green Deal actions.

As part of its strategic plan, UPO has also created a new department focused on sustainable development and ecological transition.

Teaching sustainability in UPO: Courses and approaches

UPO has systematically planned educational initiatives focusing on sustainability, green culture and environmental protection as the key disciplines for the sustainability challenge. This has included designing and creating a three-year bachelor's degree in environmental studies and sustainable development and a bachelor's degree in green chemistry.

The new department and courses bring together contributions from a wide variety of disciplines in order to achieve a critical and thorough understanding of the issues and to provide key competencies to students as well to practitioners in the region. Sustainability is both an integrated discipline and a multidisciplinary project; it has both scientific and humanistic aspects that UPO can explore and offer. Although sustainability is a global goal, its problems and solutions are important at a local level, for local ecologies and communities. That is why UPO

offers place-based and project-based opportunities for students. Some examples of this include encouraging students to think of the university campus as a sustainability laboratory, improving their problem-solving capacity and inviting them to create and design future scenarios. At the same time, UPO works to build international and interdisciplinary research teams, therefore building interdisciplinary courses and classrooms (including using different teaching methods such as 'the cooperative classroom', guest speakers' interviews).

When planning a new degree course, a fundamental step is meeting with social and economic stakeholders, especially when the course intends to have a strong impact on the region. Interesting suggestions for the design and development of a course are received from these meetings, but also approval for issues addressed in the course and applicability to the needs of companies and organisations operating in the areas involved. The experience from developing these new degree courses at UPO are useful for other educational institutions. The difficult period when the course was designed — during the severe phase of COVID-19 — led to different ways of consulting social partners and third parties during the research phase, as the usual face-to-face meetings could not be organised in the spring of 2020. Therefore, a series of online meetings was held, and a questionnaire was sent out. The online method also made it possible to repeat the meetings several times, thus addressing the needs of the people invited. Another important factor favoured by this particular situation is the tripolar nature of the UPO university, which covers three different provinces. The possibility of holding online meetings has to some extent eliminated regional distances and enabled the setting up of a steering committee comprised of

experts from the different regions to help develop this new degree course. Important elements and suggestions have emerged from these meetings, in terms of its content and teaching methods as well as its industry links, job opportunities and the professionals it intends to create from attending the courses. UPO has developed integrated and multi/transdisciplinary courses with the aim of enabling students to analyse industrial and environmental systems as well as manage problems such as circularisation of processes, waste and sewage management and ecosystem preservation. Furthermore, the courses are experiment-based and practical, involving work in the university laboratories and the analysis of case studies and best practices, and have been developed in collaboration with external professionals including entrepreneurs and managers. At the end of the programme, students can continue towards a master's degree in higher education or turn towards the world of work. These new scientists, green chemists and sustainability experts can play a key role in the Green Deal transition, finding jobs in the chemical field as well as in environmental protection and sustainable development in local and national government, in NGOs as well as in the commercial world.

CONCLUSION

The Green Deal provides a strategy for Europe to become the world's first climate-neutral continent by 2050. It is ambitious and broad in scope, targeting areas such as agriculture, biodiversity, forests, food, green cities and the circular economy. The year 2021 is a crucial year for progress, and Italy is playing a fundamental role as chair of the G20 and co-chair of COP26 in achieving the goals set by the EU to meet the 2030 Agenda and implement the Green Deal. European cities and universities can play a key role

in this endeavour and help drive and shape a more sustainable future. During the COVID-19 emergency period, universities gained a lot of experience, were forced to operate differently and learnt valuable lessons that could be useful to other stakeholders involved in sustainability and green cities. Universities also have the capability of networking across the EU and with non-EU countries at a national, international and local level. Universities must receive support to strengthen their commitment³⁴ to improving teaching, research, technology transfer, public and social engagement, knowledge sharing and human resource development and as agents for change in the sustainable development of cities and in their local regions. By increasing knowledge, transversal skills and best practices, and sharing this knowledge with cities, urban regions, urban service providers and green-oriented companies and organisations, universities can make a significant contribution in awakening a new respect for life, in achieving sustainability, in the acceleration of the struggle for justice and peace, and in the joyful celebration of life.³⁵

References

1. Montanarella, L. and Panagos, P. (2021), 'The relevance of sustainable soil management within the European Green Deal', *Land Use Policy*, Vol. 100, 104950, available at <https://www.sciencedirect.com/science/article/pii/S0264837720304257> (accessed 10th September, 2021).
2. European Environment Agency (2019), 'The European environment — state and outlook 2020: Knowledge for transition to a sustainable Europe (SOER 2020)', available at <https://www.eea.europa.eu/publications/soer-2020> (accessed 10th September, 2021).
3. *Ibid.*, ref. 2.
4. *Ibid.*, ref. 2.
5. Fetting, C. (December 2020), 'The European Green Deal', ESDN, Vienna, available at https://www.esdn.eu/fileadmin/ESDN_Reports/ESDN_Report_2_2020.pdf (accessed 10th September, 2021).

6. *Ibid.*, ref. 5.
7. Sabato, S. and Fronteddu, B. (September 2020), 'A socially just transition through the European Green Deal?', ETUI Research Paper – Working Paper 2020.08, SSRN, available at <http://dx.doi.org/10.2139/ssrn.3699367> (accessed 10th September, 2021).
8. Sikora, A. (2021), 'European Green Deal – legal and financial challenges of the climate change', *ERA Forum*, Vol. 21, No. 4, pp. 681–697.
9. *Ibid.*, ref. 8.
10. European Commission (2019), 'Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the regions. The European Green Deal', Brussels, 11.12.2019 COM(2019) 640 final, available at https://ec.europa.eu/info/sites/default/files/european-green-deal-communication_en.pdf (accessed 10th September, 2021).
11. IPCC Intergovernmental Panel (2021), 'Climate Change 2021: The Physical Science Basis – Summary for Policymakers', Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, available at https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf (accessed 10th September, 2021).
12. Nielsen, D. (March 2021), 'How Cities Hold the Key to the European Green Deal's Success', Commentary, ISPI, available at <https://www.ispionline.it/en/publicazione/how-cities-hold-key-european-green-deals-success-29676> (accessed 10th September, 2021).
13. Nello-Deakin, S. (2020), 'Environmental determinants of cycling: Not seeing the forest for the trees?', *Journal of Transport Geography*, Vol. 85, 102704, available at <https://www.sciencedirect.com/science/article/pii/S0966692319309974> (accessed 10th September, 2021).
14. Barbarossa, L. (2020), 'The Post Pandemic City: Challenges and Opportunities for a Non-Motorized Urban Environment. An Overview of Italian Cases', *Sustainability*, Vol. 12, No. 17, 7172, available at <https://www.mdpi.com/2071-1050/12/17/7172> (accessed 10th September, 2021).
15. Sharifi, A. and Khavarian-Garmsir, A. R. (2020), 'The COVID-19 pandemic: Impacts on cities and major lessons for urban planning, design, and management', *Science of the Total Environment*, 142391, available at <https://www.sciencedirect.com/science/article/pii/S0048969720359209> (accessed 10th September, 2021).
16. Filho, W. L., Barbir, J., Sima, M., Kalbus, A., Nagy, G. J., Paletta, A., Villamizar, A., Martinez, R., Azeiteiro, U. M., Pereira, M. J., Mussetta, P. C., Ivars, J. D., Andrade Guerra, J. B. S. O. de, Silva Neiva, S. de, Moncado, S., Galdies, C., Klavins, M., Nikolova, M., Gogu, R. C., Balogun, A-L., Bouredji, A. and Bonoli, A. (2020), 'Reviewing the role of ecosystems services in the sustainability of the urban environment: A multi-country analysis', *Journal of Cleaner Production*, Vol. 262, 121338, available at https://www.haw-hamburg.de/fileadmin/LS/FTZ-NK/PDF/Publications/Reviewing_theRole_ofEcosystem_Services.pdf (accessed 10th September, 2021).
17. Association of University Leaders for a Sustainable Future (ULSF) (1990), 'Talloires Declaration, Report and Declaration of the Presidents Conference', available at <http://ulsf.org/report-and-declaration-of-the-presidents-conference-1990/> (accessible 10th September, 2021).
18. European University Association (June 2020), 'Europe's Universities Shaping the Future', available at <https://eua.eu/downloads/publications/eua%20strategic%20plan%20final.pdf> (accessed 10th September, 2021).
19. Trencher, G., Yarime, M., McCormick, K. B., Doll, C. N. and Kraines, S. B. (2014), 'Beyond the third mission: Exploring the emerging university function of co-creation for sustainability', *Science and Public Policy*, Vol. 4, No. 2, pp. 151–179.
20. Compagnucci, L. and Spigarelli, F. (2020), 'The Third Mission of the university: A systematic literature review on potentials and constraints', *Technological Forecasting and Social Change*, Vol. 161, No. 120284, available at <https://www.sciencedirect.com/science/article/pii/S0040162520311100> (accessed 10th September, 2021).
21. Abreu, M., Demirel, P., Grinevich, V. and Karataş-Özkan, M. (2016), 'Entrepreneurial practices in research-intensive and teaching-led universities', *Small Business Economics*, Vol. 47, No. 3, pp. 695–717.
22. Agasisti, T., Barra, C. and Zotti, R. (2019), 'Research, knowledge transfer, and innovation: The effect of Italian universities' efficiency on local economic development 2006–2012', *Journal of Regional Science*, Vol. 59, No. 5, pp. 819–849.
23. Lazzeroni, M. (2013), 'Identità e immagine della città della conoscenza e dell'innovazione: teorie, politiche, strategie' [Identity and image of the city of knowledge and innovation: Theories, policies, strategies], *Rivista Geografica Italiana*, Vol. 121, No. 2, pp. 99–117.
24. Lazzeroni, M. (2021), *Geografie dell'università: Esplorazioni teoriche e pratiche generative* [University geographies: Theoretical explorations and generative practices], Mimesis Edizioni, Sesto San Giovanni, Milano.
25. Tombre, L. (November 2020), 'The environmental revolution: A major challenge and opportunity for Europe and its universities', Université de Lorraine, available at <https://eua.eu/resources/expert-voices/199-the-environmental-revolution-a-major-challenge-and-opportunity-for-europe-and-its-universities.html> (accessible 10th September, 2021).
26. European School of Sustainability Science and

- Research (ESSSR), available at <https://esssr.eu/> (accessed 10th September, 2021).
27. European School of Sustainability Science and Research (ESSSR), 'ESSSR Publications', available at <https://esssr.eu/publications/> (accessed 10th September, 2021).
 28. European School of Sustainability Science and Research (ESSSR) (2020), 'ESSSR releases its two-year period report', available at <https://esssr.eu/esssr-releases-its-two-year-period-report/> (accessed 10th September, 2021).
 29. Filho, W. L., Morgan, E. A., Godoy, E. S., Azeiteiro, U. M., Bacelar-Nicolau, P., Ávila, L. V., Mac-Lean, C. and Hugé, J. (2018), 'Implementing climate change research at universities: Barriers, potential and actions', *Journal of Cleaner Production*, Vol. 170, pp. 269–277.
 30. Fernández-Esquinas, M. and Pinto, H. (2014), 'The role of universities in urban regeneration: Reframing the analytical approach', *European Planning Studies*, Vol. 22, No. 7, pp. 1462–1483.
 31. Italian University Network for Sustainable Development (RUS), 'Goals and Objectives', available at <https://reterus.it/en/goals-and-objectives/> (accessed 10th September, 2021).
 32. Italian University Network for Sustainable Development (RUS), 'Open Letter', available at https://reterus.it/public/files/Press/RUS_open_letter_ENG.pdf (accessed 10th September, 2021).
 33. *Ibid.*, ref. 30.
 34. Nelles, J. and Vorley, T. (2010), 'Constructing an entrepreneurial architecture: An emergent framework for studying the contemporary university beyond the entrepreneurial turn', *Innovative Higher Education*, Vol. 35, No. 3, pp. 161–176.
 35. The Earth Charter, available at <https://earthcharter.org/> (accessed 10th September, 2021).