

## PhD Programme table 37th cycle – PON Call for application “Ricerca e Innovazione” 2014 – 2020



UNIONE EUROPEA  
Fondo Sociale Europeo



PROGRAMME'S NAME	<b>FUTURE EARTH, CLIMATE CHANGE AND SOCIETAL CHALLENGES</b>
DURATION	3 years
PROGRAMME START DATE	01/01/2022
LANGUAGE	Italian, English
COORDINATOR	Prof. Nadia Pinardi ( <a href="mailto:nadia.pinardi@unibo.it">nadia.pinardi@unibo.it</a> )
CURRICULA	<ol style="list-style-type: none"> <li>1. One Health</li> <li>2. The earth system</li> <li>3. Impacts, adaptation and vulnerability</li> <li>4. Technological innovations for a decarbonized society</li> <li>5. Socio-economic and legal studies for mitigation of climate change</li> </ol>
RESEARCH TOPICS	<a href="#">Detailed list at the bottom of the present document</a>
PhD POSITIONS	18
ADMISSION PROCEDURE	Qualifications and research proposal evaluation

### Available Positions and Scholarships

Actions	Pos. n.	Financial Support	Research topic
Action IV.5 “PhDs on green topics”	1	PhD Scholarship	Revealing hidden biodiversity before losing it: the lichens of the Dolomites and the challenge of global change
	2	PhD Scholarship	Computer simulations of structure and physical properties of organic semiconductor films for green applications
	3	PhD Scholarship	Development of a novel multi-platform approach to simulate changes in urban air quality
	4	PhD Scholarship	Optimization of Biogas Extraction and Management from Waste Landfills
	5	PhD Scholarship	High-resolution modelling of coastal inundation, its impacts along the Mediterranean coasts, with the aim of understanding and reducing the risk along our shores in view of climate change.
	6	PhD Scholarship	Touristic cities, tourism and sustainable development: governance processes in smart cities
	7	PhD Scholarship	Green Factors and financial intermediation
	8	PhD Scholarship	Feminist approach to organizational culture for sustainable work and green reporting(s)
	9	PhD Scholarship	Online and offline sustainability: the role of packaging and re-use platforms
	10	PhD Scholarship	Investments, capital stocks and financial valuation along a low-carbon transition
	11	PhD Scholarship	Economics of Climate Change and Methane Emissions

**AFORM Settore Dottorato di ricerca**

Strada Maggiore 45 | 40125 Bologna | Italia | Tel. + 39 051 2094620 | [aform.udottricerca@unibo.it](mailto:aform.udottricerca@unibo.it)

	12	PhD Scholarship	Benefits and Costs of new solutions for the management of the medical/hospital waste
	13	PhD Scholarship	Smart mobility hubs for a sustainable and integrated mobility
	14	PhD Scholarship	Responsible and sustainable recovery of bioactive compounds for human health and well-being in food processing by-products, reducing waste disposal and its environmental and economic impact in favor of ecosustainability and climate change mitigation.
	15	PhD Scholarship	The political economy of climate neutrality. Building the "green consensus" with new models of deliberative and participatory democracy
	16	PhD Scholarship	Artificial intelligence techniques applied to Big Data for the development of model and methods to evaluate the impact of climate changes
	17	PhD Scholarship	Cultures and Sustainability Practices in the Ecological Transition - Citizens' Agency and Models of Territorial Governance in Waste Management: A Comparative Analysis of Accountability Tools and Processes in Italian Metropolitan Areas
Action IV.4 "PhDs on innovation topics"	18	PhD Scholarship	Industrial sustainability transition: collection, integration and analysis of data to support the development of an entrepreneurial ecosystem in support of green technologies and social innovation

## Required and Supporting Documents to be attached to the application

*(only documents in Italian, English, French, German and Spanish shall be considered as valid and be assessed by the Admission Board)*

Only qualifications obtained during the last 5 calendar years shall be taken into consideration, except for the University Degree. **The Admission Board will assess the relevance of the supporting documents to the criteria listed in Art. 3 of the Ministerial Decree 1061/2021 (see also Art. 4 of the Call for applications).**

REQUIRED DOCUMENTS	
<b>Identity document</b>	Valid identity document with photo (i.e. identity card, passport)
<b>Degrees</b>	Documents attesting the awarding of the first and second cycle degrees (see Art. 3 of the Call for Applications)
<b>Curriculum Vitae</b>	No specific CV format is required
<b>Research proposal</b>	Multi-annual research proposal, with special emphasis on the activities to be completed during the first-year course. The proposal must meet the following requirements: <ul style="list-style-type: none"> <li>- it <b>cannot exceed 20.000 characters</b>, including spaces and formulas, if present. This figure does not include: the title, the outline, references and images (such as graphs, diagrams, tables etc. - where present);</li> <li>- it <b>must</b> be written <b>following the templates</b> provided for Action IV.4 – “PhDs on Innovation topics” and Action IV.5 “PhDs on Green topics”. The templates are attached to the Call for Application and available for download on the University website.</li> <li>- it <b>must mention</b> on the first page <b>the research topic</b> associated to the proposal</li> </ul>
SUPPORTING DOCUMENTS	
<b>Publications</b>	Lists of publications (i.e. monographs, articles on scientific journals), minor publications (conference papers, etc.), abstracts and posters presented during national and international conferences, etc.

<b>Reference Letter/s</b>	<b>No more than 2 reference letters</b> signed by <b>Italian and/or International academics and professionals</b> in the research field, which do not form part of the Admission Board, attesting the suitability of the applicant and his/her interest for the scientific research
<b>Thesis abstract</b>	Abstract of the <b>second cycle degree thesis</b> . Graduands may submit the approved draft of their thesis (abstracts cannot exceed 5.000 characters, including spaces and formulas, if present. The above figure does not include: title, outline, images such as graphs, diagrams, tables etc. if present)
<b>Other documents</b>	<ul style="list-style-type: none"> <li>- Certificates of Language proficiency and periods of study outside the country of origin (e.g. Erasmus programme or other similar mobility programmes)</li> <li>- Relevant work experiences</li> <li>- Teaching at University level</li> </ul>

### Evaluation criteria \*

The **results of the admission exams** will be available from **03/11/2021** on [Studenti Online](#) (select “summary of the requests in progress” > “see detail” and open the .pdf file at the bottom of the page). **No personal written communication will be sent to applicants concerning the examinations results.**

Minimum score for eligibility: 60 points, Maximum score: 100 points

<b>Qualifications evaluation</b>	University degree final mark. Graduands shall be evaluated according to the Weighted Average Mark (WAM).	20 points max.
	Publications	5 points max.
	Reference Letter/s	5 points max.
	Thesis abstract	5 points max.
	Other documents	5 points max.
<b>Research proposal evaluation</b>	Scientific value and innovative nature of the proposal	15 points max.
	Ability of the project to foster the synergy between research and the productive world	15 points max.
	Identification of parameters allowing the measurability of expected results	15 points max.
	Adherence of the Project to the chosen Research Topic	15 points max.

## Research Topics

### n. 1 - GREEN

<b>Thematic area SNSI 2014-20</b>	<b>Thematic Area: <i>Health, nutrition, quality of life</i></b> Development trajectories: Systems for urban environment safety, environmental monitoring and prevention of critical events or risks
<b>PNR 2021-2027*</b>	<b>Research Field: <i>Climate, Energy, Sustainable Mobility</i></b> Area of Application: <i>Climate change, mitigation and adaptation</i>
<b>Project title</b>	<b>Revealing hidden biodiversity before losing it: the lichens of the Dolomites and the challenge of global change</b>
<b>Project description</b>	Private companies engaged in biodiversity monitoring and conservation services have to increase their competitiveness developing innovative information systems and protocols that include sensitive organisms for succeeding in monitoring and nature conservation projects in a global change scenario. The candidate will focus on an emblematic case-study coupling lichens, as sensitive organisms, and the Dolomites, a UNESCO world heritage site, where sustainable management and public awareness on biodiversity conservation are mandatory to win the challenge of global change.
<b>Mandatory traineeship</b>	6 months
<b>Company type</b>	monitoring and conservation of biodiversity and production of information systems
<b>Mandatory stay abroad</b>	NO

### n. 2 - GREEN

<b>Thematic area SNSI 2014-20</b>	<b>Thematic Area: <i>Smart and sustainable industry, energy and environment</i></b> Development trajectory: Technologies for smart grids, renewable sources and distributed generation <b>Thematic Area: <i>Digital Agenda, Smart Communities, Smart Mobility Systems</i></b> Development trajectories: - “Embedded” electronic systems, smart sensor networks, internet of things Technologies for smart building, energy efficiency, and environmental sustainability
<b>PNR 2021-2027*</b>	<b>Research Field: <i>Climate, Energy, Sustainable Mobility</i></b> Areas of Application: - <i>Environmental energy</i> - <i>Industrial energy</i>
<b>Project title</b>	<b>Computer simulations of structure and physical properties of organic semiconductor films for green applications</b>
<b>Project description</b>	Using molecular modeling techniques, it will be simulating the atomic structure of films (crystalline, amorphous, blends) of organic semiconductors for application in flexible electronic devices, in particular photovoltaic cells (renewable energy) and LED (energy efficiency). By means of electronic structure methods it will be assessed the efficiency of the electronic processes at the basis of device functioning, and their dependence on mechanical deformation
<b>Mandatory traineeship</b>	6 months
<b>Company type</b>	Renewable energy
<b>Mandatory stay abroad</b>	NO

### n. 3 - GREEN

<b>Thematic area SNSI 2014-20</b>	<b>Thematic Area: <i>Health, nutrition, quality of life</i></b> Development trajectory: Systems for urban environment safety, environmental monitoring and prevention of critical events or risks
<b>PNR 2021-2027*</b>	<b>Research Field: <i>Climate, Energy, Sustainable Mobility</i></b> Area of Application: <i>Climate change, mitigation and adaptation</i>
<b>Project title</b>	<b>Development of a novel multi-platform approach to simulate changes in urban air quality</b>
<b>Project description</b>	In addition to its direct effects on temperature increase, climate change will impact on air quality via the modification of several complex physical mechanisms, not yet fully

	<p>understood. This research proposes a novel multi-platform approach combining air quality models with a dense network of sensors to improve our current understanding of the microphysical processes driving precipitation scavenging, the main particle removal pathway.</p> <p>The activity will be articulated along the following objectives:          Research): 1) to deploy a network of low-cost/opportunistic sensors to monitor scavenging; 2) to use AI techniques on sensors data for improving the performance of air quality models; 3) to evaluate impact of climate change on particle removal.          Education): 1) to acquire skill in using non-conventional instruments for atmospheric observation, and in designing field campaigns; 2) to physically up/down-scale simulated processes across models of different resolution, utilizing AI techniques.</p>
<b>Mandatory traineeship</b>	6 months
<b>Company type</b>	Design and production of low-cost sensors
<b>Mandatory stay abroad</b>	6 months

#### n. 4 - GREEN

<b>Thematic area SNSI 2014-20</b>	<b>Thematic Area: <i>Smart and sustainable industry, energy and environment</i></b>
<b>PNR 2021-2027*</b>	<b>Research Field: Climate, Energy, Sustainable Mobility</b> Area of Application: <i>Environmental energy</i>
<b>Project title</b>	<b>Optimization of Biogas Extraction and Management from Waste Landfills</b>
<b>Project description</b>	<p>Around 22% of the atmospheric methane is presumed to come from waste landfill (Saunio et al., 2020). Moreover, the CH<sub>4</sub> global warming potential is estimated to be 23 times larger than the CO<sub>2</sub> potential.</p> <p>This project aims at analyzing the data gathered in the last few years within the frame of some pilot experiments conducted on waste landfills. Here, grids of electrodes were permanently settled inside some landfills, to study the correlation between the methanogenic processes and external (e.g., weather) or internal (biogas pumping rates) variations. This should allow to detect the most productive waste regions, maximize the biogas extraction and preventing the uncontrolled escaping of the gas into the atmosphere. This project is meant to develop the early pilot experiments with new geophysical tools and to develop new software routines to make the whole process more effective and attractive for private and public final users.</p>
<b>Mandatory traineeship</b>	6 months
<b>Company type</b>	Waste management and monitoring of its environmental impact
<b>Mandatory stay abroad</b>	6 months

#### n. 5 - GREEN

<b>Thematic area SNSI 2014-20</b>	<b>Thematic Area: <i>Smart and sustainable industry, energy and environment</i></b>
<b>PNR 2021-2027*</b>	<b>Research Field: Climate, Energy, Sustainable Mobility</b> Area of Application: <i>Climate change, mitigation and adaptation</i>
<b>Project title</b>	<b>High-resolution modelling of coastal inundation, its impacts along the Mediterranean coasts, with the aim of understanding and reducing the risk along our shores in view of climate change.</b>
<b>Project description</b>	<p>Coastal floods associated with extreme storms have wide socio-economic consequences, which are projected to increase in view of the ongoing climate change. Despite this, there is a clear lack of information and prediction skill in coastal flood mapping.</p> <p>The PhD will develop a high-resolution modelling framework able to capture the combined effects of sea level rise, storm surges, seiches and waves in proximity of the shore, and assess the relative skill of different inundation models and coupling strategies. The model data will be used to quantify the impact of coastal flooding at populated areas and critical infrastructures, and to understand how climate changes will affect future coastal risk. The results will provide the stakeholders with scientific basis for a timely coastal adaptation along our shores, contributing to the implementation of the</p>

	3 <sup>rd</sup> pillar of the EUSAIR strategy (environment quality), and to fulfilling the EU Climate Adaptation Strategy in the Mediterranean context.
<b>Mandatory traineeship</b>	6 months
<b>Company type</b>	Private consultancy for coastal engineering
<b>Mandatory stay abroad</b>	6 months

#### n. 6 - GREEN

<b>Thematic area SNSI 2014-20</b>	<b>Thematic Area: <i>Digital Agenda, Smart Communities, Smart Mobility Systems</i></b> Development trajectory: Systems for urban environment safety, environmental monitoring and prevention of critical events or risks
<b>PNR 2021-2027*</b>	<b>Research Field: Humanities, Creativity, Social Transformations, Inclusion Society</b>
<b>Project title</b>	<b>Touristic cities, tourism and sustainable development: governance processes in smart cities</b>
<b>Project description</b>	<p>Art cities, in addition to paying for the typical problems of the Anthropocene epoch, often become destinations of inhomogeneous tourist flows that are difficult to control. This, in turn, has negative consequences on other socio-economic sectors. Furthermore, this produces undesirable effects and undermines the environmental, economic and social sustainability of these cities.</p> <p>This project aims to understand the phenomenon and the weaknesses connected to the organization and management of art cities, to identify methods of governance and coordination capable of integrating the numerous actors involved in local decision-making processes. Through the exploitation of the large amount of data produced by the smart city phenomenon, strategic and organizational options available to public (local governments) and private stakeholders (tourism operators and alternative entrepreneurial activities) to stimulate a sustainable development of the socio-economic context, are identified.</p> <p>Areas of research and intervention:</p> <ul style="list-style-type: none"> <li>- Analysis of development and sustainability problems of art cities;</li> <li>- Identification of the stakeholder's network, of their interests, values and degree of conflict and forms of management of these conflicts;</li> <li>- Understanding the potential associated with the development of smart cities in relation to the governance of art cities and their ability to collect and analyze relevant data</li> </ul>
<b>Mandatory traineeship</b>	6 months
<b>Company type</b>	Utilities sector
<b>Mandatory stay abroad</b>	6 months

#### n. 7 - GREEN

<b>Thematic area SNSI 2014-20</b>	<b>Thematic Area: <i>Smart and sustainable industry, energy and environment</i></b>
<b>PNR 2021-2027*</b>	<b>Research Field: Digital, Industry, Aerospace</b>
<b>Project title</b>	<b>Green Factors and financial intermediation</b>
<b>Project description</b>	<p>In recent years we have experienced a real increase in exogenous shocks on global financial markets (e.g., the bankruptcy of Lehman Brothers, the Greek sovereign debt crisis, the Covid-19 pandemic, climate change, etc.). Although such events arose from different sides, they share a common feature, the ability to impact the entire financial system. Climate change, at the moment, is one of the most relevant.</p> <p>Adverse events related to climate change cause serious damage to property and infrastructure, devastate local economies and damage global economic development (IPCC 2014; US GCRP 2018). Since climate risk cannot be avoided or diversified but only mitigated (AA 2016), it must be properly assessed and managed in order to prevent further systemic shocks.</p> <p>This is even more relevant for the banking sector where climate risk is mainly concentrated on credit facilities (the main activity of commercial banks). The banking sector has a key role to play in mobilising financial resources in a manner consistent with climate objectives and sustainable growth patterns in the medium and long term.</p>

	<p>However, to date, regulatory interventions that facilitate this process and the design of prudential measures to mitigate climate risks are still under discussion. A growing debate concerns whether banks should consider environmental ratings in their lending (and investment) decisions, as well as the possible introduction of a "green factor" or a "brown factor" for the calculation of capital requirements.</p> <p>Therefore, it becomes crucial to analyse how banks view environmental risks in their credit risk model and to quantify the costs of ignoring these risks for individual institutions and the entire banking industry.</p> <p>This line of research identifies the most effective policy tools that can encourage banks to finance more environmentally friendly activities without distorting the market or compromising financial stability</p>
<b>Mandatory traineeship</b>	6 months
<b>Company type</b>	Banks or other financial institutions
<b>Mandatory stay abroad</b>	NO

#### n. 8 - GREEN

<b>Thematic area SNSI 2014-20</b>	<p><b>Thematic Area: <i>Smart and sustainable industry, energy and environment</i></b></p> <p>Development Trajectories:</p> <ul style="list-style-type: none"> <li>- Innovative, highly efficient production processes for industrial sustainability</li> <li>- Evolutionary and adaptive production systems for customised production</li> </ul>
<b>PNR 2021-2027*</b>	<p><b>Research Field: Humanities, Creativity, Social Transformations, Inclusion Society</b></p> <p>Area of Application: <i>Social Transformations and Inclusion Society</i></p>
<b>Project title</b>	<b>Feminist approach to organizational culture for sustainable work and green reporting(s)</b>
<b>Project description</b>	<p>The Covid-19 pandemic represented a shock with important and long-lasting effects on the organization of workplaces with a view to greater sustainability of rhythms and workloads. The almost two years spent working remotely, with rhythms often characterized by autonomy and control on the working hours, represent an important opportunity for change in the attitudes and behaviors of workers and in the organization's Human Resource practices. With this research project, the objective is to investigate the changes that Covid-19 has generated in individual behavior at work and in the processes and practices of People Management of companies. The emphasis will be on the following aspects that are important in creating a sustainable work environment in which each employee can express their potential and increase their level of well-being: organizational culture and leadership styles. Another aspect concerns the Feminist approach which completes the theoretical perspective and how changes in leadership style can be found in green reporting (s) by verifying these aspects through the use of Nvivo.</p>
<b>Mandatory traineeship</b>	12 months
<b>Company type</b>	Food sector
<b>Mandatory stay abroad</b>	6 months

#### n. 9 - GREEN

<b>Thematic area SNSI 2014-20</b>	<p><b>Thematic Area: <i>Smart and sustainable industry, energy and environment</i></b></p> <p>Development Trajectories:</p> <p>Innovative, highly efficient production processes for industrial sustainability</p>
<b>PNR 2021-2027*</b>	<p><b>Research Field: Digital, Industry, Aerospace</b></p> <p>Area of Application: <i>Digital Transition – i4.0</i></p>
<b>Project title</b>	<b>Online and offline sustainability: the role of packaging and re-use platforms</b>
<b>Project description</b>	<p>About a third of the waste created each year comes from packaging used in daily consumption. As a consequence, we can see a rise in the use of green packaging (it will increase globally by + 60% by 2028, reaching a turnover of more than 413 billion) and a rise of online platforms which act as intermediaries for the sale of used items and represent green alternatives to good disposal practices.</p> <p>This project aims to analyze how consumers perceive green attributes in online and offline contexts, which are the product categories that can adopt re-use online</p>

	platforms, how privacy and savings could inhibit or encourage sustainable behavior in online and offline contexts. Theoretical, methodological and empirical tools will be developed to identify the cues (visual, textual, tactile) of packaging that stimulate the perceptions of sustainability of the purchase and the consequences on the intention to buy. A particular attention will be devoted to the analysis of the buzz related to brands on social media that encourage consumers as well as the actors of the supply chain to adopt a more sustainable behavior.
<b>Mandatory traineeship</b>	6 months
<b>Company type</b>	Packaging sector
<b>Mandatory stay abroad</b>	NO

#### n. 10 - GREEN

<b>Thematic area SNSI 2014-20</b>	<b>Thematic Area: <i>Smart and sustainable industry, energy and environment</i></b> Development Trajectories: - Innovative, highly efficient production processes for industrial sustainability Technologies for smart grids, renewable sources and distributed generation
<b>PNR 2021-2027*</b>	<b>Research Field: Climate, Energy, Sustainable Mobility</b> Areas of Application: - <i>Climate change, mitigation and adaptation</i> - <i>Industrial energy</i>
<b>Project title</b>	<b>Investments, capital stocks and financial valuation along a low-carbon transition</b>
<b>Project description</b>	A transition towards climate neutrality, which the European Union has set itself the goal of achieving by 2050 with its EU Green Deal, will entail a significant productive reconversion, especially in the energy sector. Investment choices in new industrial capital (renewables, hydrogen, carbon capture and storage, and more) take place in a context of great uncertainty regarding the evolution of markets, the introduction of policies and the direction of technological progress. At the same time, a premature disposal of fossil-based production assets could lead to losses and negative impacts on the company's valuation on the market. The aim of the project is to study the dynamics and optimal direction of investments in new energy technologies, using a modelling framework characterized by inertia of physical capital, multiple sources of uncertainty and volatility in financial valuations
<b>Mandatory traineeship</b>	6 months
<b>Company type</b>	Energy production and supply
<b>Mandatory stay abroad</b>	6 months

#### n.11 - GREEN

<b>Thematic area SNSI 2014-20</b>	<b>Thematic Area: <i>Digital Agenda, Smart Communities, Smart Mobility Systems</i></b> Development trajectory: Systems for urban environment safety, environmental monitoring and prevention of critical events or risks
<b>PNR 2021-2027*</b>	<b>Research Field: Climate, Energy, Sustainable Mobility</b> Area of Application: <i>Climate change, mitigation and adaptation</i> Sections: 1. Determination of sources and wells of climate-altering agents, attribution and quantification of anthropogenic causes 2. Assessment of the effectiveness and sustainability of mitigation measures
<b>Project title</b>	<b>Economics of Climate Change and Methane Emissions</b>
<b>Project description</b>	Methane is the second biggest contributor to climate change after carbon dioxide. Its low persistence in the atmosphere makes it our best opportunity to reduce temperatures in the short and medium term, leveraging emissions from the energy, waste and agriculture sectors. The European Commission has set an explicit goal of reducing methane emissions by at least one third by 2030. This project aims to study the economic aspects of methane emissions, with particular attention to incentives to reduce so-called fugitive emissions. Urban and industrial processes are characterized by methane leaks into the atmosphere, the containment of which can simultaneously



	bring economic gains and climate mitigation. The student will focus on the economic and institutional aspects that can lead to the reduction of emissions
<b>Mandatory traineeship</b>	6 months
<b>Company type</b>	Management of Methane distribution network
<b>Mandatory stay abroad</b>	NO

#### n. 12 - GREEN

<b>Thematic area SNSI 2014-20</b>	<b>Thematic Area: <i>Smart and sustainable industry, energy and environment</i></b> Development trajectory: Water and waste treatment systems and technologies  The project analyses and proposes more sustainable solutions for waste in the health sector, with particular reference to the management and management of hospital waste infected and, more generally, of those contaminated also arising from other sectors.
<b>PNR 2021-2027*</b>	<b>Research Field: Climate, Energy, Sustainable Mobility</b>  Green technologies, which allow to implement concrete and synergic solutions to issues of sustainability, in fields of application such as the prevention of contamination of soil and water from hazardous substances and not least "the reduction of waste and the promotion of a culture of recovery; the restructuring of production chains in order to eliminate waste"
<b>Project title</b>	<b>Benefits and Costs of new solutions for the management of the medical/hospital waste</b>
<b>Project description</b>	The waste management in hospitals offers many issues for improvement both in terms of treatment of special waste (infectious) and in terms of a better separate collection of them. Innovative solutions exist in the market and they are able to sterilize the contaminated waste. The aim of the project are: (i) to analyse costs and benefits of a complex model for the virtuous management in hospitals with a particular focus on the environmental benefits and the cost reductions both for the collection and the final disposal; (ii) to analyse the feasibility and the economic advantage, for the society, of a new system of treatment for contaminated liquid waste derived from medical laboratories to put them (after the treatment they become biodegradable) in the sewage network.
<b>Mandatory traineeship</b>	6 months
<b>Company type</b>	Manufacturing sector
<b>Mandatory stay abroad</b>	NO

#### n. 13- GREEN

<b>Thematic area SNSI 2014-20</b>	<b>Thematic Area: <i>Digital Agenda, Smart Communities, Smart Mobility Systems</i></b> Development trajectory: Smart Urban Mobility, Systems for logistics and people
<b>PNR 2021-2027*</b>	<b>Research Field: Climate, energy, sustainable mobility</b> Area of application: <i>Sustainable mobility</i> Sections: 1. Systems to support analysis and governance of mobility 2. Mobility and transport services
<b>Project title</b>	<b>Smart mobility hubs for a sustainable and integrated mobility</b>
<b>Project description</b>	Sustainable and shared mobility is at the centre of transport and urban development policies, aiming for the concept of smart city. This interest is rooted in the expectation to alleviate traffic and congestion problems in cities, and to reduce the incidence of the transport sector on emissions of polluting agents. This project focuses on the introduction of smart mobility hubs (SMHs), dedicated road stations in which citizens can choose between shared and sustainable mobility options, and offering digital contents and tools to the public. The PhD student will investigate the desirability of SMHs and the conditions by which they become advantageous for the city and the users (citizens and visitors). Furthermore, it will be necessary to investigate how SMHs influence accessibility locally and at the aggregate level, as well as the resilience of the

	transport system. The PhD student will be able to exploit the collaboration with the partners of the JPI-Urban Europe project SmartHubs
<b>Mandatory traineeship</b>	6 months
<b>Company type</b>	Public transportation
<b>Mandatory stay abroad</b>	6 months

#### n. 14 - GREEN

<b>Thematic area SNSI 2014-20</b>	<b>Thematic Area: <i>Health, nutrition, quality of life</i></b>
<b>PNR 2021-2027*</b>	<b>Research Field: Food, Bioeconomy, Natural Resources, Agriculture, Environment</b> Area of Application: <i>Food Science and Technology</i> Sections: 1. Hygiene and health safety of food 4. Healthy and sustainable food 6. Emerging trends in food technologies and process efficiency
<b>Project title</b>	<b>Responsible and sustainable recovery of bioactive compounds for human health and well-being in food processing by-products, reducing waste disposal and its environmental and economic impact in favor of ecosustainability and climate change mitigation.</b>
<b>Project description</b>	The project aims to develop a responsible and ecosustainable approach for the green recovery of bioactive molecules from food and the characterization of their biological activities in cellular models. The goal is to obtain nutraceuticals or cosmetic ingredients with low environmental impact and high added value with a wide industrial impact, in a perspective of circular economy and upcycling, thus allowing the enhancement of waste and biodiversity
<b>Mandatory traineeship</b>	6 months
<b>Company type</b>	Chemical and Pharmaceutical supply chain
<b>Mandatory stay abroad</b>	NO

#### n. 15 - GREEN

<b>Thematic area SNSI 2014-20</b>	<b>Thematic Area: <i>Health, nutrition, quality of life</i></b>
<b>PNR 2021-2027*</b>	<b>Research Field: Climate, energy, sustainable mobility</b>
<b>Project title</b>	<b>The political economy of climate neutrality. Building the "green consensus" with new models of deliberative and participatory democracy</b>
<b>Project description</b>	The project aims to introduce new and innovative models of deliberative and participatory democracy to broaden inclusiveness in the transition processes towards the green economy that will transform the EU into a climate-neutral society (SDG 3,6,7,9,10,11,12,13). The green transition has created conflicts and political divisions at the national, supranational and transnational levels. These conflicts can be resolved by building the "green consensus". To this end, voters and stakeholders must be involved in the political and economic processes concerning the green transition through new deliberative and participatory models. As current participatory and deliberative models often reproduce social inequalities, they are not suitable for fully involving citizens in the green transition. New and more inclusive participatory and deliberative models must be designed in order to achieve this transformative goal. The project applies an almost experimental action-research approach using laboratories where new participatory and deliberative models are co-designed and evaluated. The project is highly consistent with the issues related to the green transition because it aims to identify and analyze the obstacles and solutions to increase citizens' awareness and participation towards the energy transition.
<b>Mandatory traineeship</b>	6 months
<b>Company type</b>	Utilities sector
<b>Mandatory stay abroad</b>	NO

### n. 16 - GREEN

<b>Thematic area SNSI 2014-20</b>	<b>Thematic Area: <i>Smart and sustainable industry, energy and environment</i></b>
<b>PNR 2021-2027*</b>	<b>Research Field: Climate, energy, sustainable mobility</b> Area of Application: <i>Climate change, mitigation and adaptation</i> Section: 3. Improvement of Earth system models and reduction of projection uncertainty
<b>Project title</b>	<b>Artificial intelligence techniques applied to Big Data for the development of model and methods to evaluate the impact of climate changes</b>
<b>Project description</b>	In the next decades, the study of climate changes will require a massive use of numerical simulations of the earth climate system. The data produced by these simulations are of Petabyte order and they cannot be analyzed using classical physical and statistical techniques. The project aims at developing new methods and data analysis frameworks based on artificial intelligence and statistical learning techniques together with climate forecasts, in order to achieve a deeper understanding of the model data produced to control the climate risk and to develop strategies for adaptation. A specific focus will be dedicated to the development of artificial intelligence methods applied to ensemble oceanographic forecasts. The goal is to train the PhD student to represent a valuable interface between the academic world and the entrepreneurship of digital services and sustainable development.
<b>Mandatory traineeship</b>	6 months
<b>Company type</b>	Management of large databases and implementation of IT infrastructure, hosting services, cloud computing, artificial intelligence, and consulting in the IT and strategic sector
<b>Mandatory stay abroad</b>	6 months

### n. 17 - GREEN

<b>Thematic area SNSI 2014-20</b>	<b>Thematic Area: <i>Smart and sustainable industry, energy and environment</i></b> Development trajectory: <i>Water and waste treatment systems and technologies</i> <b>Thematic Area: <i>Health, nutrition, quality of life</i></b> Development trajectory: Systems for urban environment safety, environmental monitoring and prevention of critical events or risks
<b>PNR 2021-2027*</b>	<b>Research Field: Humanities, creativity, social transformation, inclusion society</b> Area of Application: <i>Social change and the inclusion society</i> <b>Research Field: Climate, energy, sustainable mobility</b> Area of Application: <i>Environmental energy</i>
<b>Project title</b>	<b>Cultures and Sustainability Practices in the Ecological Transition - Citizens' Agency and Models of Territorial Governance in Waste Management: A Comparative Analysis of Accountability Tools and Processes in Italian Metropolitan Areas</b>
<b>Project description</b>	As regards waste cycles, the project includes the following actions: analysis of legislation; literature review; research and data analysis on waste production and recycling in Italy; mapping of management models and best practices. Empirical activities include: identification of case studies based on waste collection, management and disposal models; interviews with key informants to identify local governance models and critical elements; survey identifying - with a particular focus on separate waste collection - determining factors associated with Italian citizens' practices and cultures of environmental sustainability (questionnaire development, pre-testing, sampling); interviews with citizens to explore meanings attached waste recycling and reasons that (dis)incentivize it; identification of actions promoting citizen and local community participation in the ecological transition
<b>Mandatory traineeship</b>	6 months
<b>Company type</b>	Environmental services
<b>Mandatory stay abroad</b>	6 months

## n. 18 - INNOVATION

<b>Thematic area SNSI 2014-20</b>	<b>Thematic Area: <i>Smart and sustainable industry, energy and environment</i></b> Development trajectory: Innovative, highly efficient production processes for industrial sustainability
<b>PNR 2021-2027*</b>	<b>Research Field: Climate, energy, sustainable mobility</b> Area of Application: <i>Industrial energy</i>
<b>Project title</b>	<b>Industrial sustainability transition: collection, integration and analysis of data to support the development of an entrepreneurial ecosystem in support of green technologies and social innovation</b>
<b>Project description</b>	<p>The contribution of entrepreneurship to economic development is well known in the literature and, more recently, its role in the effective solution of social and environmental problems has been emphasized in order to accelerate sustainable development. Green enterprises represent, in this context, a way through which entrepreneurship can satisfy the demand for a business orientation and for the development of greener and more environmentally friendly innovations. However, access to financial resources is a critical factor for the development of technological innovations, which is even more severe in the case of green innovations, due to strong information asymmetries and the temporal mismatch between the large funding required in the short term and the returns. uncertain and long-term economic and financial issues that such innovations can generate.</p> <p>The project involves the development of data collection methodologies based on artificial intelligence in order to study the main factors of the entrepreneurial ecosystem in transition towards sustainability and towards a social-oriented nature (consisting of both private and public "impact" loans , government regulations, profit and non-profit enterprises, universities engaged in third mission activities, geographical, sectorial or dimensional factors, heavy industries or SMEs) and their interactions capable of shaping the development, growth and diffusion of green technologies on large scale. The project also aims to look at the internal structure of sustainability-oriented companies to analyze which governance and accountability models are able to support the sustainable and social transition process</p>
<b>Mandatory traineeship</b>	6-12 months
<b>Company type</b>	IT and big data management
<b>Mandatory stay abroad</b>	6 months

\*the translation of PNR 2021-2027 has been carried out by the PhD Unit.