



## 4<sup>th</sup> Call for Short-Term Scientific Missions (STSMs) or Virtual Mobility Activities (VMs)

15 June 2023

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### NEXUSNET - STSMs & VMs

This is the 4<sup>th</sup> Call for applications for Short-Term Scientific Missions (STSMs) and Virtual Mobilities (VMs) funded by the COST Action CA20138 [“Network on water-energy-food nexus for a low-carbon economy in Europe and beyond – NEXUSNET”](#).

STSMs allow scientists to conduct short research and study visits to a research institution or laboratory in another [COST Country](#) to strengthen the existing networks and foster collaboration, learn a new technique, or use equipment, data, and/or methods not available in their own institution and contribute to the scientific objectives of the Action.

VMs allow scientists to conduct short research in a virtual setting among researchers or innovators within the COST Action, to exchange knowledge, learn new techniques, and contribute to the scientific objectives of the Action.

NEXUSNET is organized into 6 Working Groups (WGs). STSMs and VMs are considered a great opportunity for participants to focus their work on research topics that have been highlighted by WGs or introduce new ideas addressing the NEXUSNET objectives.

Details on the content and goals of WGs are available in the [Action’s Memorandum of Understanding \(MoU\)](#).

*NEXUSNET aims to empower collaborations between EU and international researchers and stakeholders, synthesize the existing empirical Nexus research and produce an intellectual toolkit, demonstrating a clear link to improved resource management and governance outcomes that underlie the value of Nexus.*

### Guidelines for applicants

STSMs benefit to:

- **STSM grantees**, who receive funding for implementing a project with an international team and gain knowledge or access to equipment or techniques not available in the home institution.
- **STSM hosts**, who receive an international partner in their institution and can develop long-lasting collaboration.

VMs benefit to:

- **COST Action**, which uses a flexible tool to implement virtual activities inside the network, achieve the MoU objectives and significantly increase their impact and reach. Contributes to European leadership in knowledge creation and increasing its innovation potential.
- **VM grantees**, who develop capacity in virtual collaboration and networking in a pan-European framework.

In the framework of this 4<sup>th</sup> Call, NEXUSNET offers **6 STSM positions**, supporting financially travel grants to individuals, and **1 VM position**. Grantees need to make their own arrangements for travel, accommodation, etc.

Regarding STSMs, the minimum visit should last for 5 days (including travelling), without any limit to the



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maximum duration. In the case of VMs, it is suggested that they last 5 to 7 working days. However, STSMs and VMs must be accomplished from July to September 2023.

Applications should be submitted by **27 June 2023**. Decisions will be announced by **30 June 2023**.

The maximum amount of STSM grants for this period is awarded to **2,500€ (per STSM) and the maximum amount for the VM grants is 1,500€ (per VM)**. Regarding STSMs, details about the maximum daily allowance that can be claimed for accommodation and meal expenses per country can be found in [COST Daily Allowance Rates](#). Applicants are also requested to consult the [Annotated Rules for COST Actions](#).

**Who is eligible to apply for an STSM or VM?**

*STSM travel grants or VM grants are available for researchers and innovators affiliated to a legal entity in COST Full/Cooperative Member, Near Neighbor Country, or European RTD. Young researchers and innovators (<40 years old) are strongly encouraged to participate.*

### Application instructions

Applications for STSMs or VMs are managed through the e-COST management tool. All applicants must have an [e-COST profile](#).

The applicant must use the e-COST management tool to register the STSM or VM application request. In addition to the information entered at the website, the applicants should also upload the following documents in a single PDF file:

- Short CV with recent publications.
- [STSM proposal](#) or [VM proposal](#).
- Requested budget in €.
- Confirmation letter from the Host Institution unless they select one of the NEXUSNET STSMs or VMs opportunities for this period.

For additional information on the submission via the e-COST system, applicants may visit the [Grant Awarding User Guide](#), or <https://nexusnet-cost.com/index.php/how-to-apply/>.

Once the STSM or VM has ended, the grantee must submit a [short report on the outcomes of the STSM visit or VM](#). The report needs to be submitted within 30 days after the end date of the STSM/VM or 15 days after the end of the Grant Period (whichever date comes first). It is noted that if the applicant does not submit the required report on time, the grant is cancelled. The grant payment is expected to be deposited within 30 days after the approval of the report.

### Evaluation of applications

Each proposal will be assessed independently by the STSM/VM committee of the Action, and an evaluation score will be given considering (i) the clarity of the proposal, (ii) the degree to which the proposed STSM/VM complements or contributes to the Action strategic priorities and objectives as defined in the MoU, (iii) the compliance of the proposed STSM/VM work plan with the timing of the deliverables of the Action according to the MoU, iv) planned work plan feasibility and outputs, (v) the ability of the STSM/VM applicant to successfully complete the proposed STSM/VM and disseminate relevant outputs, and (vi) the added value to the ongoing work in the WGs.

The proposal should show clear evidence of how the proposed STSM will benefit the applicant and the Action. The proposal will be assigned to one of the following categories:

- **Very poor:** proposal unsound and incomprehensive. Not clearly linked to any of the WGs (0-10 points).
- **Poor:** proposal with limited understanding, planning and unclear objectives. Weakly linked to at least one WG (11-35 points).



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- **Fair:** proposal with some understanding, planning, and objectives. Moderate linked to at least one WG (36-60 points).
- **Good:** good proposal but needs input to develop feasible STSM/VM. Well linked to at least one WG (61-80 points).
- **Excellent:** proposal well designed in terms of planning, feasibility, and expected outcomes. Strongly related to at least one WG (80-100 points).

A proposal can reach a maximum score of 100. The proposals will be ranked and those 7 (6 STSMs and 1 VM) with the highest scores will be granted.

### STSMs and VMs opportunities

#### **STSM Topic 1:** Developing the Nexus Project Database - 1

**Description:** The STSM aims at developing the main structure in NEXUSNET, the main repository, where information is on all projects that focus on the WEF Nexus. The aim is to compare the measurable data on the effectiveness and efficiency of WEF Nexus solutions designed for FEW NEXUS Neighborhoods. The 15 students' teams design the projects for the same area (selected 15 ha in Gdansk). The students were requested to accommodate ca. five thousand residents.

The unique Internet platform has been already designed by Diploma student Kacper Lewandowski (as the MSc diploma project focused on the urban transformation tool). The platform can serve to upload any urban projects in the city context of Gdansk. Currently, MSc Arch students deal with FEW NEXUS neighborhood designs during the Local Planning Course at the Faculty of Architecture at Gdansk Tech. Their projects will be under internal competition considering the efficiency of FEW NEXUS. Therefore 15 different projects will be uploaded to the platform to enable acquiring the data to compare the results in the city context by the end of January 2023. There is an urgent need for STSM to study the received data resulting from these 15 projects uploaded to the internet platform in January 2023 and to progress the comparative study.

**Host Institution & contact person:** The Gdansk University of Technology, Faculty of Architecture, Department of Regional and Urban Planning – PhD Joanna Bach Glowinska, email: joanna.glowinska@pg.edu.pl

#### **STSM Topic 2:** Analyzing the interdependencies of Nexus components.

**Description:** The STSM is linked with MoU: WG1 - Monitoring and modelling the Nexus.

Nexus components are not isolated but highly interconnected and mutually interdependent. Interdependencies of Nexus components can improve the efficiency of Nexus techniques, but interdependencies can also increase system vulnerability. Due to the limited understanding of Nexus components' vulnerabilities and incomplete methodologies that allow estimating/quantifying the effects of climate change-related events on Nexus components, this is paramount under investigation. In this STSM, based on the emerging findings on knowledge, best practice, and analysis of the research gap identified from the literature review and stakeholder engagement, a road map of key actions will be developed to identify and quantify the potential risks climate change poses on Nexus components.

One of the main risks facing Critical Infrastructure is climate change, with extreme climatic events becoming more acute, such as increased storm surge levels. Therefore, existing CIs that were initially designed with a certain protection level against climate hazards face increased stress and, in turn, a higher risk of failure, as climate change further amplifies the effects of natural hazards. For this reason, responsible organizations need to understand the dependencies of CIs' possible cascading effects of a CI failure.

The overall aim of this project is to collect and categorize evidence/information of climate change inferences on critical infrastructures to generate a repository of incidents, scenarios, and associated costs, allowing the development of a conceptual smart model ready to be trained in semi-autonomous/autonomous manner, identification and characterization tools based on intelligent systems. To observe the occurrence of natural hazards and climate-induced extreme events and the subsequent of the impact of such events on CIs, key variables such as extreme storm



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surge level, mean sea level, river discharge, wind speed, wave height, temperature and rainfall data will be reviewed. These data will be used to assess the potential cascading effects of a failure of one CI to another CI down the line. It is also anticipated that using the intelligent data analysis of the mathematical modelling of infrastructure dependencies will be performed to determine the interdependencies of critical infrastructures. Intelligent data analysis (machine learning algorithms) works will be fully supported by existing group members. One high IF journal paper is expected from this project.

**Host Institution & contact person:** University College Dublin (Ireland), School of Civil Engineering – Md Salauddin, email: md.salauddin@ucd.ie

### **STSM Topic 3:** Preventing Food-loss in NEXUS Applications

**Description:** The STSM is linked with MoU – WG4 with the aim to develop a meaningful Nexus case repository. With the NEXUS paradigm, natural resource flows and related policies shall be considered under an integrated rationale so that triple security in water, energy and food provisioning can be created. In the case of pre-harvest and post-harvest food loss European countries facing a number of challenges. In this STSM we want to do research on pre-harvest and post-harvest food loss in EU countries. The outcome of the STSM will contribute to the shift from synthetic pest control to biological and ecological pest management, ultimately leading to eco-sustainable farming systems, higher quality and quantity crop production and optimization of input use for ecosystem health in Europe.

Ecological pest and invasive species management has been rapidly developing in recent years with the emergence of policies to confront/mitigate climate change and reduce pollution from synthetics and these management practices and approaches should integrate with NEXUS applications. STSM participant will do research on tools, models, assessments, and methods that have not been known or common widespread. The suggested work would undertake a survey with experts and farmers and literature research, reaching out to ongoing food-loss related EU-funded projects to collect data.

The researcher will contribute to the NEXUSNET project by

doing work that investigates and collates reliable empirical data on pests and their impact on agroecosystems. The baseline furthermore will serve as a reference for impact monitoring.

At the end of the STSM, we are expecting participant to prepare an interview(video), two blogs on NEXUSNET on food-loss prevention methods, and Country baseline inventory: socio-economic, market/regulatory and management proxies.

**Host Institution & contact person:** MetaMeta Anatolia (Turkey) – Sukru Esin, email: sukruesin@metameta.nl

### **STSM Topic 4:** Understanding barriers and opportunities to implement WEFE Nexus: Mapping key stakeholders across scales and support the organization of the first Regional Nexus Policy Forum

**Description:** This STSM is linked with MoU – WG6 on Stakeholder Coordination and WG3 on Policy Measures. The STSM will support the efforts to map and involve stakeholders through the organization of the first Regional Nexus Policy Forum, to create and support direct links and regular dialogue exchanges with key actors within the European Nexus policy landscape. In this line, the STSM will support the team in reviewing the opportunities for the NEXUSNET team to participate and host jointly within other international events.

During the STSM, the grantee will support the organization of one of the planned Regional Nexus Forums (in total five will be organized). The outcomes and the key points will be shared with the European Commission in the policy brief format and barriers and opportunities for Nexus implementation at the regional level will be discussed.

**Host Institution & contact person:** Faculty of Economics, Business and Tourism, University of Split, Croatia – Prof. Srecko Goic, Department of Management, email: goic@efst.hr

### **STSM Topic 5 or VM 1 Topic:** Assessing Socio-Ecological Impacts of Wind Energy in Europe's Low-Carbon Economy

**Description:** The objective of this topic is to conduct a comprehensive socio-ecological impact assessment of on-and offshore wind energy, taking into account the water-energy-food nexus, in order to provide decision-makers with relevant





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and robust data for effective and equitable wind energy governance in Europe's low-carbon economy. This research aims to co-produce holistic impact assessment metrics that are specifically tailored to the social and environmental aspects of wind energy, including marine ecosystems. By analyzing the social and environmental impacts of different wind turbine configurations and associated layouts, this study seeks to identify optimal regions for wind energy operation under various dispatch schedules.

Multiple design options and farm control strategies will be explored within the operational envelope to mitigate identified impacts. For instance, approaches such as implementing pitch control to reduce RPMs during specific hours, incorporating avian protection measures, utilizing quieter but more expensive turbines, and adjusting wind farm designs to minimize noise and visual impacts will be considered. This analysis will encompass both operational and design aspects, allowing for a systematic exploration of trade-offs between cost optimization and other socially and environmentally significant factors. By integrating the water-energy-food nexus into the assessment, this research aims to provide a sophisticated framework for decision-makers to evaluate the holistic implications of wind energy development, fostering sustainable and just practices in Europe's transition to a low-carbon economy.

### **Host Institution & contact person:**

Department of Business Development and Technology, Centre for Energy Technologies, Aarhus University Birk Centerpark 15, 7400 Herning, Denmark – Prof. George Xydis, email: gxydis@btech.au.dk; gxydis@gmail.com

### **STSM Topic 6: Developing the Nexus Project Database - 2**

**Description:** The STSM aims at developing the basic NEXUSNET repository to compare the measurable data on the effectiveness and efficiency of WEF Nexus solutions.

The Non-Invasive Measurement System is one of the CRUNCH project results and it has been operating at the Laboratory since August 2021, collecting data in the building environment focused on the Nexus micro-scale. Therefore, searching for the feasibility of Nexus use in the building is enabled based on the acquired data on the internet website. You can compare the results based on data from the pandemic lockdown and standard times. There is a need for

STSM to study the gathered data resulting from ongoing measurements to monitor and calibrate the process in Laboratory and to progress the CRUNCH research on the Nexus microscale in buildings.

**Host Institution & contact person:** The Gdansk University of Technology, Faculty of Architecture, Department of Regional and Urban Planning – Joanna Bach Glowinska, joaglowi@pg.edu.pl; Department of Mechanical Engineering – Prof Jacek Lubinski, email: jacek.lubinski@pg.edu.pl

### **STSM Topic 7: Monitoring and Modelling the Water-Food-Energy-Ecosystems Nexus**

**Description:** The STSM will be aligned with the activities of WG1, which main goals are the assessment of monitoring and modelling Nexus techniques so that the assessment of state-of-the-art approaches and the development of a Nexus typology will be provided. Specifically, during the STSM, based on the emerging findings on modelling and monitoring frameworks identified from the literature review and stakeholder engagement, a report will be prepared to map existing monitoring and modelling Nexus techniques and to identify gaps for a reproducible and sustainable Nexus typology. The report will include (but not limited) to the below sections: (i) Definition of the WEFE Nexus and its nodes, (ii) Models and indicators to quantify the WEFE Nexus, (iii) soft links of modelling approaches and indicators, (iv) analysis of survey data on modelling and monitoring Nexus approaches and (v) Challenges reported and gaps identified to improve Nexus modelling and monitoring in the future.

**Host Institution & contact person:** Technical University of Munich (TUM), Munich (DE) – Maria Vrachioli, email: maria.vrachioli@tum.de

### **STSM Topic 8: Convergence of agrivoltaics, sustainable architecture and water**

**Description:** The Faculty of Science and Technology at the Norwegian University of Life Sciences invites scientists for Short-Term Scientific Missions that converge at least two research areas: (i) agrivoltaics, (ii) sustainable architecture and (iii) sustainable water.

I. Agrivoltaics is the combined use of agriculture and



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photovoltaic electricity generation on the same land. The idea is to achieve a better utilization of the land compared to separate photovoltaics and agriculture use.

The solar panels are commonly installed high of the ground or in a vertical position to give access to the crops below. The design of the agrivoltaic plant is adjusted so that they do not block sunlight completely, but rather cast a beneficial shade on the crops below. This can improve plant performance in hot, dry conditions and reduce evaporation, thereby saving water.

Agrivoltaics is still a relatively new field, and more research is needed on its potential to address several critical issues, such as the microclimate conditions in agrivoltaic plants, suitability for different types of climates, and optimization of plant-crop yield.

II. Sustainable architecture is a design philosophy that focuses on producing architectural structures with minimal environmental impact. It's guided by a commitment to ecological and social responsibility, and the aim is to build more efficiently and responsibly, considering the full life cycle of the resources used. Research in this area can address energy, water, material efficiency, waste reduction, building management, and indoor environmental quality. The sustainable architecture of hospitals is of particular interest in this call.

III. Sustainable water includes the collection, protection, distribution, and treatment of water resources in a manner that can meet current demands without compromising the ability of future generations to meet their own needs. The focus of this call is on technologies that enable sustainable water management, balancing the competing needs of different sectors of society, including agricultural, industrial, residential, and environmental uses, while also ensuring that the water itself remains safe and clean for both human use and the natural ecosystems it supports.

**Host Institution & contact person:** The Faculty of Science and Technology at the Norwegian University of Life Sciences, Ås (NO) – Zakhar Maletskyi, email: zakhar.maletskyi@nmbu.no

**STSM Topic 9:** Analysis of the intensity of application of system standards within NEXUSNET-defined geographic regions – standardization in the service of low-carbon development and WEF NEXUS principles

**Description:** The aim of this STSM is linked with MoU: WG2 on Nexus applications and WG3 on Policy Measures. The level of responsibility of a certain society in reference to WEF components can, among other things, be quantified by the degree of application of system standards in various economic activities according to the ISO sectors' nomenclature. In parallel, strategic-national goals, e.g., low-carbon development in practice is operationally achieved as a sum of the performance of individual organizations, where the goal is unambiguously defined and the approaches to achieving that goal are usually not. In this sense, the ISO system standards represent an almost ideal basis for reaching the various WEF NEXUS goals in the application domain. An already established system of energy, environment or food safety management at the level of specific organizations as business entities guarantees the existence of a suitable conceptual framework, i.e. responsible stakeholders who have already developed a positive perception towards the SDGs and environmental protection in general. In this sense, understanding the structure, requirements and implementation models of the ISO system standards constitutes a comparative advantage in the domain of Nexus applications.

Within this STSM, analysis of the relevant system standards (W – ISO 14001, E – ISO 50001, F – ISO 22000) application will be performed in order to create the interdependence evaluation focusing on primary Nexus components. Besides online available ISO surveys, the World Bank data (Climate Change, Environment, Energy, Infrastructure) would be used as a data source for the creation of derived indicators.

The analysis involves a focus on four geographic regions of interest for the NEXUSNET action, the selection of at least 5-10 representative countries within each region (with reference to the Nexus projects database), as well as an analysis of the application of three relevant system standards in the period 2018-2021.

Potential STSM candidate should be capable to work with Excel data, conduct trend, comparative and cluster analysis, as to understand the system approach.

A blog to be published on NEXUSNET website and social accounts, and a synthesis report to be published in the Open Research Europe Platform under the auspices and support of NEXUSNET are expected as deliverables from this STSM.



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**Host Institution & contact person:** University of Niš, Faculty of Occupational Safety, Čarnojevića 10a, 18000 Niš, Republic of Serbia – Prof. Dejan Vasović, email: [dejan.vasovic@znrfak.ni.ac.rs](mailto:dejan.vasovic@znrfak.ni.ac.rs)

**VM Topic 2:** Quantifying the Ecosystem element of the WEFE Nexus

**Description:** The Ecosystem element of the WEFE nexus is becoming even more important to be included in the nexus analysis, especially given the biodiversity collapse that is exacerbated by climate change. This virtual mobility will focus on exploring methodologies for quantifying the impact of WEF resources on ecosystem. Various metrics can be proposed, based on the literature. A case study to test the proposed methodology will be developed at a national, regional, or river basin scale.

**Host Institution & contact person:** University of Thessaly (UTH), Volos, Greece – Prof. Chrysi Laspidou, email: [laspidou@uth.gr](mailto:laspidou@uth.gr)

**VM Topic 3:** Populating the NexusNet Graphical database of Project Case Studies

**Description:** A Graphical Database for nexus case studies coming from projects is currently under construction. The database is intended to be published and allow new case studies to be introduced through an online form. This VM Grant will fund a person that will input data in the database under construction and will assist in its design. The data has already been collected separately and will populate the online graphical database in order for the information to be best visualized.

**Host Institution & contact person:** University of Thessaly (UTH), Volos, Greece – Prof. Chrysi Laspidou, email: [laspidou@uth.gr](mailto:laspidou@uth.gr)

### Questions/inquiries

Please contact:

- NEXUSNET Chair: Prof. Chrysi Laspidou ([laspidou@uth.gr](mailto:laspidou@uth.gr))
- NEXUSNET Grant Awarding Coordinator: Ms. Naomi Timmer ([ntimmer@h2o-people.eu](mailto:ntimmer@h2o-people.eu))
- NEXUSNET Grant Holder Manager: Dr. Giannis Adamos ([giadamos@uth.gr](mailto:giadamos@uth.gr))