



PEN@HYDROPOWER (CA 21104)

2nd Call for Short-Term Scientific Missions
15.2.2024

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PEN@HYDROPOWER and STSMs

This is the 2nd call for applications for Short-Term Scientific Missions (STSMs) funded by COST Action CA21104 [Pan-European Network for Sustainable Hydropower – PEN@Hydropower](#).

STSMs help PEN@Hydropower participants to conduct scientific missions to a research institution in another COST country. A scientific mission aims to fulfill its research objectives through (i) a research work carried out by the applicant at home and to prepare the travel to the host institution, (ii) a visit to the host institution to collect data and (iii) the work carried out upon returning home to complete the research and prepare the STSM report and STSM scientific report with additional supporting documents. STSMs aim to strengthen the networks of researchers' institutions by enabling collaboration and providing new skills and knowledge, not readily available within their institution. STSMs contribute to the scientific objectives of the Action. For all PEN@Hydropower participants, STSMs are an opportunity to focus their work on research topics highlighted by WGs or introduce new ideas addressing the PEN@Hydropower objectives.

STSMs are beneficial to:

- **STSM grantees**, who receive funding to conduct a project with an international team and gain knowledge or access to equipment or techniques not available at their home institution.
- **STSM hosts**, who can host an international partner at their institution and establish long-term collaboration.

Under this 2nd Call, PEN@Hydropower is offering 5 STSM positions, that include scientific missions for individuals. Details on the content and objectives of the working groups can be found in the [Memorandum of Understanding \(MoU\) of the Action](#).



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STSM full grant application instructions

Applications should be submitted by March 15, 2024. Decisions will be announced no later than March 31, 2024.

The STSM grant is awarded for the fulfillment of the research topic stated in each STSM opportunity. As a result, the research period allocated by the applicant to fulfill the scientific mission includes: (i) the time period at home for research work and to prepare the travel to the host institution (ii) the travel and visit to the host institution for data collection and preliminary data processing and (iii) the time period at home to complete the research and both STSM report and STSM scientific report with additional supporting documents.

The visit should last at least 14 days (including travel), while the maximum duration must be agreed upon with the host institution contact person. The coordination of the scientific mission is carried out by the supervisor appointed by the leader of the work package associated with STSM opportunity. The supervisor is in charge with coordinating all activities included in the scientific mission plan, from the beginning of the scientific mission to the verification and pre-approval of all STSM documents (e.g. STSM report, STSM scientific report with additional supporting documents, deliverables, KPIs and so on). The contact person of the host institution is in charge for the activities carried out by the applicant during the visit to the host institution and the verification and pre-approval of all documents associated with the visit.

Each STSM application should be agreed with the contact person of the host institution before submitting the working plan of the STSM scientific mission all details about travel and visit to the host institution, including the dates of travel and the period of the visit. All STSM scientific missions have to be completed no later than end of September 2024 in order to be considered in the second funding period (GP2) of the COST Action.

The maximum amount for each STSM scientific mission for GP2 is **€4,000**. For details on the maximum daily allowance that can be requested for accommodation and board per country, please visit [COST Daily Allowance Rates](#). Applicants are also encouraged to consult the [annotated Rules for COST actions](#).

Who is eligible to apply for an STSM?

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

Applications for STSMs are managed through the e-COST administrative tool. All applicants must have an [e-COST profile](#). Each applicant has to use the e-COST administration tool to register the



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STSM application. In addition to the information added on the e-COST platform to filled in STSM grant application, each applicant should also prepare and upload a **STSM full grant application** including the following documents in a single PDF file:

- brief CV with relevant activity and results (publications, patents, projects and so on) in the topic of the scientific mission;
- [STSM grant application](#), (based on e-COST template) including: (i) Details of the STSM, including title and start and end dates of the **visiting period including travel**, (ii) goals of the STSM (max. 200 words), (iii) STSM Working Plan (max. 500 words), and (iv) STSM expected outputs and contribution to the Action MoU objectives and deliverables. (max. 500 words);
- the STSM scientific mission plan including: (i) Details of the STSM, including title and start and end dates topic of the **scientific mission**, (ii) goals of the STSM, (iii) STSM detailed plan with summary, Working Plan for all three time periods (pre-visit, visit and post-visit), methodology, Gantt chart and requested budget in € and (iv) STSM expected outputs and KPIs, as well as deliverables and contributions to the Action MoU objectives and deliverables;
- **letter of confirmation** from the host Institution and the contact person with approval of the supervisor.

Please consider the cost of living for each country in Europe to prepare a realistic estimate of the STSM science mission budget. (<https://www.numbeo.com/cost-of-living/>). Upon completion of the STSM scientific mission, each applicant has to submit to all STSM documents within maximum 30 days of the STSM travel end.



Please be advised that if the applicant does not submit the required report in a timely manner, the grant will be cancelled. Grant payment is expected to be made within 30 days of scientific report approval.

For more information on how to submit via the e-COST system, please refer to the [Grant Awarding User Guide](#) or the [How-to-Apply Guidelines](#).

Evaluation of the STSM full grant applications

Each **STSM full grant application** will be independently evaluated by the COST Action Core Group. The evaluation will consider (i) the clarity of the scientific mission, (ii) the extent to which the



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proposed STSM complements or contributes to the strategic priorities and objectives of the PEN@Hydropower Action as defined in the MoU, (iii) the relevance of the scientific mission working plan, estimated budget and deliverables, and (iv) the ability of the STSM applicant to successfully complete the STSM and disseminate the relevant deliverables. Each STSM full grant application should clearly demonstrate the benefits to the applicant and the PEN@Hydropower Action. STSM full grant applications will be ranked, and the highest-scoring applications will be selected for funding.

The STSM applications submitted to the 2nd STSM call are selected with priority of those who did NOT benefit from funding in the previous STSM calls (e.g. 1st STSM call) in order to give the chance to as many applicants as possible to participate in this COST Action.

STSM scientific mission: approval, development and completion

The Grant Awarding Coordinator will approve/reject the STSM grant application on behalf of the MC. In case of rejection, a justification needs to be encoded. The justification will be included in the e-notification to the applicant. **The STSM applicant will negotiate the STSM scientific mission plan and its budget with the supervisor before its approval.** Upon approval, the Grant application status will change from submitted to pre-approved. The applicant becomes a grantee of the STSM grant when she/he receives the grant letter from the GH manager. Then, the grantee must contact the supervisor to inform her/him about the starting of the STSM scientific mission and the contact person of the host institution to agree all details for the visit. STSM grantees must make their own arrangements for travel, accommodation, etc.

Each grantee receives a reminder to upload the STSM report and STSM scientific report with additional supporting documents between 1 day and 10 days after the end of the STSM travel period. Upon completion of the STSM scientific mission, the grantee must complete:

- STSM **visiting report** (based on e-COST template) including: (i) Details of the STSM, including title and start and end dates of the **visiting period including travel**, (ii) goals of the STSM (max. 200 words), (iii) STSM Working Plan (max. 500 words), and (iv) STSM outputs and contribution to the Action MoU objectives and deliverables. (max. 500 words). The STSM visiting report has to be uploaded on the e-COST platform within maximum two weeks of the STSM travel end;
- STSM **scientific report** including: (i) Details of the STSM, including title and start and end dates topic of the **scientific mission**, (ii) goals of the STSM, (iii) STSM detailed summary, with detailed research activities and results according with the Working Plan for all three time periods (pre-visit, visit and post-visit) included in the grant proposal approved, methodology,



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(iv) a clear statement on the performance of the activities, the fulfillment of the objectives and the stage of achievement of the KPI's defined according to the STSM scientific mission plan approved and (v) additional supporting documents (e.g. data collected, paper outline/draft, publications collected and used as references in the study). The STSM scientific report has to be uploaded on the PEN@Hydropower platform (TEAMS) within maximum four weeks of the STSM travel end but no later than the end of September. The procedure for reimbursement of the funds to the STSM grantee will start after the approval of the STSM scientific report by the supervisor. The STSM grantee will lose the funds if the SSM scientific report is not approved by the end of September 2024;

- After completion, the STSM grantee should **present her/his work** to the PEN@Hydropower Action community within the WG.

Please be advised that if the applicant does not submit the required report in a timely manner, the grant will be cancelled. Grant payment is expected to be made within 30 days of report approval.



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STSMs opportunities

Applicants may apply for the following STSM opportunities, or they may submit their own STSM full grant application.

STSM 1 Topic WG1:

Storage needs of future electricity systems and the role of hydropower

STSM 1 Grant Period Goal:

Understanding the basic assumptions of electricity accumulation for different water sources and conditions.

Contributes to: SO1

STSM 1 KPIs:

Database for at least 5 countries storage forecast from numerical simulations
Scientific conference paper

STSM 1 Description:

The STSM is linked the grant period goal of working group 1 and refers to the objective of evaluation of the future role of hydropower for a flexible and resilient energy system. The predominance of intermittent RES production in the future electricity systems will require vast energy storage capabilities, in terms of both installed power and capacity. The latter can be provided only by large hydro pumped storage units, capable for long duration (several hours to several days) energy storage. In this STSM the trainee will use a specialized software to produce estimations of the future storage needs of electricity systems of EU countries, starting from the system of Greece. The objective is to provide quantitative results (numbers, graphs, etc.) in a technical report, showing the future storage needs that could not be covered by other conventional technologies (batteries, etc.), and thus may require the use and further development of hydro pumped storage facilities.

STSM 1 Supervisor:

Prof. Ioannis Anagnostopoulos

Dr. Elena Vagnoni

STSM 1 Contact person:

Prof. Ioannis Anagnostopoulos

email: anagno@fluid.mech.ntua.gr

STSM 1 Host institution:

National Technical University of Athens,

Laboratory of Hydraulic Turbomachines, Athens, Greece



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STSM 2 Topic WG2:

Defining digitalisation barriers for HPP refurbishment

STSM 2 Grant Period Goal:

Defining strategies for the implementation of digitalization and innovative technologies for various types of hydropower plants considering the age of the power plant: newly installed, upgraded, refurbished, considering the scale: micro, mini, small, medium or large, considering the type: run-of-river, hydropower with reservoirs and pumped storage hydropower plants, while continuing to review the most recent advances in hydropower technologies.

Contributes to: Defining strategies for the implementation of digitalization in refurbishment cases

STSM 2 KPIs:

Literature review of 30 related publications, paper draft, synergy with task leaders

STSM 2 Description:

This STSM is expected to identify barriers against digitalization in hydropower refurbishment. Firstly, the STSM will determine the scale of the hydropower plant to be focused. Then, the potential equipment or systems to be refurbished will be identified. The benefits of digitalization on refurbishment of these equipment will be listed. Finally, the barriers for accomplishing the digitalization in refurbishment will be identified. Here we suggest focusing on some of the challenges for Norwegian hydropower:

1. Generalizing and standardizing data model – like RDS-PS to compare and benchmark hydropower plants
2. Identifying limitations in terms of data storage and the 3 Vs – veracity,
3. Cybersecurity issues to bring together data from multiple hydropower plants
4. Handling ever-increasing data and data types with introduction of novel sensing and instrumentation.
5. Economics of this – what is the cost vs benefit of implementing more digitalization?

STSM 2 Supervisor:

Dr. Ivana Hreljac Lučin (Task Leader in WG2)

STSM 2 Contact person:

Surya Teja Kandukuri (suka@norceresearch.no) and Lars Kristian Vognild (lavo@norceresearch.no)

STSM 2 Host institution:

NORCE Norwegian Research Centre AS

Jon Lilletuns vei 9 (H-building, 3rd floor), 4879 Grimstad, Norway



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STSM 3-1 Topic WG3:

The effect of hydropower on the continuity of underwater life by analyzing the effects of sediment transport

STSM 3-1 Grant Period Goal:

To identify and classify local environmental impacts and mitigation methods for hydropower in regulated rivers for current and future climate change scenarios and impacts.

Contributes to: Defining strategies for mitigation methods for the future. Looking into other species than fish will go beyond the current state of the art

STSM 3-1 KPIs:

Paper outline/draft. Short report. Field work or hydraulic modelling (optional).

STSM 3-1 Description:

The STSM builds on the outcome of the STSM in 2023 where local environmental impacts and mitigation methods of European hydropower in regulated rivers for both current and future scenarios (climate change) were identified and classified.

A particular focus will be on continuity, with the option of including field measurements and hydraulic modelling. After validation of a case in Norway and the relevant information from Europe, the model and analysis shall be useful for other cases. The STSM will provide a summary of the common European perspective in the form of a report, database, or similar.

STSM 3-1 supervisor:

Elena Pummer, Marie-Pierre Gosselin

STSM 3-1 Contact person:

Elena Pummer

STSM 3-1 Host institution:

NTNU, Norway



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STSM 4-1 Topic WG4:

The role of hydropower in the EU energy transition

STSM 4-1 Grant Period Goal:

Understanding EU trends of electricity generation and consumption. Evaluation of current hydropower role and operation in EU members and simulations of future hydropower couplings.

Contributes to: Role of hydropower in in energy transition; identification of current policy gaps

STSM 4-1 KPIs:

Preparation before STSM start. Research paper.

STSM 4-1 Description:

The STSM will examine the trends in electricity generation in the EU (dispatchable, non-dispatchable, distributed generation, etc.) over the last decades. This way assessing the role of hydropower in the EU and the different regions (Eastern Europe, Northern Europe, Western Europe, Southern Europe) compared to other renewable energy sources. After the STSM, the paper from the collected data is expected from the trainee.

STSM 4-1 supervisor:

Dr. Egidijus Kasiulis
egidijus.kasiulis@vdu.lt

STSM 4-1 Contact person:

Dr. Egidijus Kasiulis
egidijus.kasiulis@vdu.lt

STSM 4-1 Host institution:

Vytautas Magnus University
Department of Water Engineering



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STSM 4-2 Topic WG4:

The future of hydropower couplings

STSM 4-2 Grant Period Goal:

Understanding EU trends of electricity generation and consumption. Evaluation of current hydropower role and operation in EU members and simulations of future hydropower couplings.

Contributes to: Identification of new requirements on hydropower; requirements on innovations

STSM 4-2 KPIs:

Preparation before STSM start. Review paper.

STSM 4-2 Description:

During the STSM the examination of the future of hydropower couplings is expected. The requirements and simulations of future hydropower to X coupling (energy storage, power to fuel, power to gas, other energy conversions) must be described. Including hybridization options (with PV, with wind power and other). After the STSM, the review paper from the collected data is expected from the trainee.

STSM 4-2 Supervisor:

Dr. Egidijus Kasiulis
egidijus.kasiulis@vdu.lt

STSM 4-2 Contact person:

Dr. Milena Rajić
milena.rajic@masfak.ni.ac.rs

STSM 4-2 Host institution:

University of Niš
Faculty of Mechanical Engineering



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STSM 5-1 Topic WG5:

The Case for Transboundary Dimensions of Hydropower Sustainability Standard

STSM 5-1 Grant Period Goal:

This STSM is designed in line with GP2 goal to investigate social acceptance and controversies related to (flexible) hydropower

Contributes to: Sustainability standard, identification of policy gaps

STSM 5-1 KPIs:

Identification of the gaps in a form of report.

Paper outline/draft.

STSM 5-1 Description:

This short-term research mission seeks to contribute valuable insights to the ongoing discourse on sustainable energy development, fostering international cooperation for the responsible utilization of hydropower resources across borders, as well as identifying missing stakeholders in the current standards. This research initiative aims to assess the environmental, social, and economic aspects of hydropower projects with a specific focus on their implications across borders.

The mission involves a comprehensive examination of existing Hydropower Sustainability Standard, addressing the transboundary dimension, acknowledging that rivers and water resources often traverse political boundaries.

Key objectives include evaluating current Hydropower Sustainability Standard and identifying gaps or areas for improvement; investigating the environmental impact of hydropower projects, emphasizing transboundary implications; assessing social and economic aspects, considering the livelihoods and well-being of communities on both sides of international borders; exploring best practices for transboundary cooperation and conflict resolution in the context of hydropower development; providing recommendations for refining and implementing sustainable hydropower practices with a transboundary perspective.

STSM 5-1 Supervisor:

Marina Cerpinska, Marina.Cerpinska@rtu.lv

STSM 5-1 Contact person:

Charles Rouge, c.rouge@sheffield.ac.uk

STSM 5-1 Host institution:

The University of Sheffield, UK

Department of Civil and Structural Engineering



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Questions/inquiries

If needed, please contact:

- **PEN@Hydropower Chair:**
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- **PEN@Hydropower Grant Awarding Coordinator:**
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