D6.4 CROSS PROJECT COLLABORATION PLAN

ELECTRO-INTRUSION PROJECT

HORIZON 2020 | FETPROACT-EIC-07-2020
FET Proactive: Emerging paradigms and communities

GRANT AGREEMENT No. 101017858

Deliverable No.	D6.4	
Deliverable Title	Cross project collaboration plan	
Due Date	30.06.2021	
Deliverable Type	Report	
Dissemination level	Public	
Written by	Simone Meloni	
Approved by	General Assembly of Electro-Intrusion and Coordinators of other relevant projects: - 101017821 (LIGHT-CAP) - 101017928 (HYSOLCHEM) - 101017709 (EPISTORE)	30.06.2021
Status	Final	30.06.2021

This project leading to this application has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101017858.

REVISION HISTORY

Version	Date	Author	Partner	Changes
1	23.06.2021	S. Meloni	UniFe	Added section 4. Joint exploitatio activities as requested by Program Managers
2	30/06/2021	S.Meloni	UniFe	Added the explanation about the fact that this deliverable is a living document
3	30/06/2021	F.Matteucci	EC	Added updating of joint research activities (yearly workshop), meetings between the different communication/dissemination teams of each project

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LIST OF ABBREVIATIONS

Acronym / Short name	Meaning
PM	Program Manager
PO	Project Officer

PROJECT ABSTRACT

– Simultaneous transformation of ambient heat and undesired vibrations into electricity via nanotriboelectrification during non-wetting liquid intrusion-extrusion into-from nanopores –

Greenhouse gas emissions, pollution and rational energy use are civilization-scale challenges which need to be resolved urgently, in particular by the conversion of abundant waste heat and undesired vibrations into useful electricity. However, the low efficiency of existing conversion methods does not provide an attractive solution.

Electro-Intrusion project proposes a new and highly efficient method and apparatuses for the simultaneous transformation of mechanical and thermal energies into electricity by using zero-emission nanotriboelectrification during non-wetting liquid intrusion-extrusion into-from nanoporous solids.

To tackle these phenomena, Electro-Intrusion project brings together a consortium of multidisciplinary teams specializing in physics, chemistry, material science and engineering to address the project by the state-of-the-art methods of molecular dynamic simulations, high-pressure calorimetry and dielectric spectroscopy, materials synthesis and characterization, and prototype development. The FET-PROACTIVE call is a key solution to bring this early-stage multidisciplinary concept to higher TRLs, fill in the large knowledge gaps in the solid-liquid contact electrification and heat generation during intrusion-extrusion as well as enable its full impact on EU innovation leadership, competitive market and energy sector security.

The proposed method can be used for energy scavenging within a wide range of technologies, where vibrations and heat are available in excess (train, aviation, domestic devices, drilling, etc.). In particular, using European Environment Agency data, this project estimates that the use of the proposed approach only within the automobile sector can reduce the overall EU electricity consumption by 1-4% in 2050. With this regard, the final stage of the project implies regenerative shock-absorber development and field-testing for a drastic maximization of the maximum range of hybrid / electric vehicles.

Electro-Intrusion project is scheduled to run from January 1st, 2021 to December 31st, 2024, for a total duration of 48 months and has received funding from the European Union's H2020 research and innovation programme under grant agreement No. 101017858. A full list of partners and funding can be found at: https://cordis.europa.eu/project/id/101017858/es.

1. GENERAL STRATEGY

The collaboration among EPISTORE, HYSOLCHEM, LIGHT-CAP, Electro-Intrusion is envisaged along three main action lines:

1. Joint research activities on themes of common interest
2. Organization of joint dissemination/communication events
3. Joint exploitation activities

Given the fact that this deliverable involves the teams of several projects, each one with its own priorities, strategies and challenges, this document will possibly be updated along the implementation of the projects. In other words, this cross project collaboration plan is a living document that will be continually edited and updated to adapt it to the dynamic of the four projects and exploitation opportunities that might emerge, e.g., as a result of the Next Generation EU plan.

2. JOINT RESEARCH ACTIVITIES

To establish possible joint research activities, it is first necessary to map expertise/skills available in the different projects partnership and then identify common interests that might justify common research activities. To this end, we planned to hold three **Brainstorming workshops**:

1. **Introductory workshop**: each project describes its scientific and technological objectives, its partnership expertise/skill as well as tools available/to be developed within the project that can be helpful for the others, e.g., state-of-the-art *facilities* that are not commonly available in the national/international infrastructures/labs.
2. **Materials**: discussion of the materials that will be developed within each project as well as synthetic routes or chemico-physical-technological characterization techniques that can be of interest for the others.
3. **Planning**: a final workshop will be devoted to planning in detail joint research activities, such as collaborations on the development of materials of common interest, access to state-of-the-art *facilities* available in partners' labs/institutions, staff exchange, editing of a special issue on a journal, etc.
4. **Updating**: yearly workshop, or if necessary with higher frequency, where discussing the results of the common research activities or where eventually identifying new common research activities.

It is envisaged that each workshop consists of a brief presentation from each representative of a project, 20-30', followed by a discussion on the themes of the meeting. In this second part, all partners participating in the meeting are invited to give their contribution.

Brainstorming workshops will be organized in the coming months, indicatively within October 2021.

3. JOINT DISSEMINATION/COMMUNICATION EVENTS

EPISTORE, LIGHT_CAP and Electro-Intrusion last 4 years while HYSOLCHEM lasts 3 years: it is envisaged the organization of one joint workshop/symposium/school per year in which young and more mature researchers focusing on the themes of energy production, storage and scavenging will be gathered. In particular, the following joint events are planned to be organised:

1. HYSOLCHEM will organize the first meeting at IMDEA Energy Research Center (Madrid | Spain) to be held in face-to-face between the end of 2021 and beginning of 2022 (as of sanitary conditions allow).
2. The partners will submit a proposal for a symposium at the e-MRS fall meeting 2022 (deadline July 15, 2021). In order to identify possible common themes for a symposium at the e-MRS fall meeting 2022, each project will circulate an abstract and few keywords illustrating/summarizing their objectives. If time allows, a poster or leaflet will be prepared to present the four projects.
    - Ilka Kriegel (LIGHT-CAP) volunteered to collect these contributions
3. The third event will be, alternatively, a summer school or a CECAM workshop, to be held on 2023.
4. The fourth event, to be held on the last year of the EPISTORE, LIGHT_CAP and Electro-Intrusion projects with the involvement of HYSOLCHEM partners, will be more industrial-oriented: EPISTORE (Albert Taracón and Nerea Alayo) will identify possible large events in this sector in the context of which organize a symposium.

These events represent an implementation of the dissemination plan of the EPISTORE, LIGHT_CAP, Electro-Intrusion and HYSOLCHEM projects. We expect that joint organization of scientific events increase the impact of the dissemination activity of our projects.

Besides, it is planned a meeting between the different communication/dissemination teams of each project to be held approximately every six months to discuss of other common potential activities or to share best practices.

4. JOINT EXPLOITATION ACTIVITIES

Joint research activities will likely open new opportunities for exploitation of the outcome of the four projects. This might be the result of i) the development of novel technologies arising from the joint research between two or more projects, ii) the expertise, skills and techniques developed by one or more teams supporting the development of the technology of another project, iii) the complementarity of the technologies developed by two or more projects, which might be offered to potential final users or actors of the projects' value-chain as a solution to their needs, iv) the discussion with other actors of the projects' value-chain.

To develop such joint exploitation activities, the actions described below will be done. It is noteworthy that, since the projects started only six months before the submission of this document, these actions might be updated or revised in the future to better fit with the advancement of the projects and evolution of the socio-economic conditions, especially as a consequence of the Next Generation EU program.

1. Nominating an innovation manager for each project responsible for the joint exploitation activities:

PROJECT	RESPONSIBLE	CONTACT
EPISOTRE	Nerea Alayo	nalayo@irec.cat
HYSOLCHEM	Fabio Ugolini	f.ugolini@innova-eu.net
LIGHT-CAP	Samuele Morales	Samuele.Morales@iit.it
Electro-Intrusion	Simone Meloni	simone.meloni@unife.it

2. Regular meetings (approximately 2 times per year) with PMs and POs to discuss:
   2.1. exploitation strategy: long- and short-term objectives and applications
   2.2. preliminary application (market) analysis
   2.3. preliminary stakeholders' engagement analysis
   2.4. fundraising opportunities
   2.5. Individual *vs* cross project exploitation plans and activities

The plan is to hold a first meeting in July 2021 to perform a preliminary analysis and to plan in detail a calendar of the meetings.

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