ERDF, Innovation and New Technologies to achieve a Greener Europe

Generalitat de Catalunya
Government of Catalonia

Content of the Session organized on the 21st of October as a Partner Event of the **European Week of Regions and Cities 2020**

REGIONS & CITIES
European Week | Brussels

About the session:

As the European Commission highlighted, new technologies, sustainable solutions and disruptive innovation are critical to achieve the European Green Deal goals. By using cohesion funds (ERDF) to innovate and capitalizing on new technologies, regions could contribute to achieving these goals. With this in mind, and in the context of the European Week of Regions and Cities, the Government of Catalonia organized a session to present the Research and innovation Programme in **Advanced Digital Technologies** (ADT) and its up-coming project **Roads that supply Energy**.

About the speakers:

Daniel Marco, Director General for Innovation and Digital Economy at Government of Catalonia, is an Electronic Engineer from Polytechnic University of Catalonia and holds a Master in Business Administration from ESADE Business School. He is currently Director General at the Department of Digital Policies and Public Administration, where he has held other responsibilities. Previously he developed his career in the private sector in the field of strategic consulting in the sector of ICT and in R & I.

Anna Bullich, Senior Project Manager at Government of Catalonia, is a Civil Engineer from the Polytechnic University of Catalonia and holds a postgraduate degree in Roads Engineering. She is currently working on empowering change and innovation at the Directorate General of Mobility Infrastructure at the Department of Territory and Sustainability where she has held other responsibilities. Previously, she worked in the private sector in the field of civil engineering consulting and as a senior project manager in a UK Services Company.

Núria Querol, **R+D Technician and Researcher at Sorigué**, holds a PhD and a Degree in Chemistry and Biochemistry. She is one of the leading researchers at Sorigué, where she has performed different tasks such as quality control, design and R+I of materials. She is part of the technical committee of the Technical Association of Bituminous Emulsions, where she coordinates different working groups for the promotion and development of cold techniques. She can be reached at nuria.querol@sorigue.com

Fernando Salazar, **Project Development Director at International Centre for Numerical Methods in Engineering** (CIMNE), holds a Master of Science degree in Civil Engineering and a PhD in Structural Analysis. He has coordinated several projects related to the application of numerical methods and machine learning techniques to solve practical problems in different areas of engineering. He has authored 20 scientific articles published in leading scientific journals in this field. He can be reached at fsalazar@cimne.upc.edu

Svetlozar Andreev, **Administrator in charge of Research and innovation at the SEDEC Commission**, Committee of the Regions, moderated the session.

More information about the session at:

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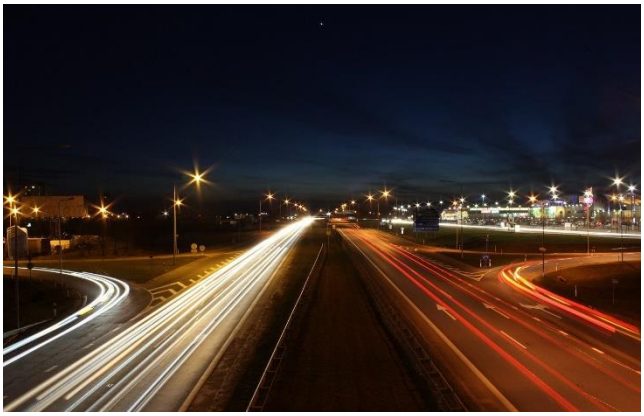
R + I Policies in the Government of Catalonia

Due to its classification within the EU Cohesion Policy, Catalonia has to use 80% of ERDF for innovation actions. With this in mind, the Catalan Government created the **Program in Advanced Digital Technologies** (ADT), an initiative to develop new solutions to improve the efficiency of public administration and innovate by using advanced digital technologies. To come up with these solutions, the different Departments of the Government of Catalonia identified **challenges and ideas** that could be addressed through this program. After a public consultation, these ideas evolved into **project proposals**, which will be implemented in the coming years (being the Project of *Roads that Supply Energy* one of them).

The ADT program has followed a ***mission-driven*** approach, based on the strategic objectives of the Government and its Departments, and the **Ris3 *quadruple helix model*** (involving citizens, companies, research centers and administration). This program also aims at transferring the results achieved by the public sector to the private sector so as to create economic growth and achieve global leadership (***dual – use***). This program represents the efforts to boost and coordinate the different **Research and Innovation actors of the ICT sector** to transform Catalonia into a European and global hub in transformative digital technologies for the economy and society.

Problem and need the project proposal wants to address

The project proposal "**Roads that supply energy**" aims at finding innovative solutions to address the challenge of energy transition and efficiency and derives from the analysis of **the needs of the roads of the future**: the use of autonomous and electronic cars as well as the increasing number of ICT devices connected to the infrastructure will require more energy.



Currently, most of the technological efforts and developments shaping the mobility of the future deal with the connectivity and interaction of vehicles with the environment, but **ignore the road as a key future actor**. This is because, in most cases, the road is a public good that does not need to create immediate value in the markets. In front of this situation, **Public Administrations, which are directly responsible for the relations vehicle to infrastructure** (V2I), need to take the lead.

Description of the proposal

The goal of this project is to determine whether the public domain of **road platforms and roadsides could be used to produce energy** and store it at an acceptable performance. To do so, this project proposes to use **piezoelectric materials** that, once deformed by traffic, could create electric energy.

Implementation of the Project Proposal

The International Centre for Numerical Methods in Engineering (CIMNE) would be the research centre responsible for the execution of the project. CIMNE is a research organization created in 1987 with the aim to develop numerical methods and computational techniques for advancing knowledge and technology in engineering and applied sciences. **Piezoelectric energy's potential is still at an early stage and, although results obtained so far are promising; they need more research to become competitive**. To implement the project and achieve its goal, the following phases have been foreseen:

Phase 1: Create the knowledge to optimize and define prototype assemblies and connections of the piezoelectric elements.

Phase 2: Generate a first demonstrator and establish a first technological breakthrough in the fabrication of piezo electric elements.

Phase 3: Advance in the pre-industrial production and evaluation.

Phase 4: Initiate a pilot phase to implement the solutions on a short outer lane length of a high capacity road.

Phase 5: Subject to the above objectives are met, the Government of Catalonia, through innovative public procurement, would light the *Coll Cardús* Tunnel.

The perspective from the Private Sector

To explore the possible impact of the project, the opportunities for companies and their experience, this session is also bringing a representative from SORIGUÉ, a construction company specialized in the manufacture and laying of all types of bituminous mixtures and in the development and application of environmentally sustainable techniques such as cold recycling, ultra-thin layer asphalt or low temperature asphalt. In this session, **they are presenting their experience in the development of asphalt mixtures containing piezoelectric materials**.

Considering that the road is a key actor for the mobility of the future and that all future applications will require an energy source to function, they consider **that the development of smart roads is imperative and that it must go hand in hand with the development of the connected autonomous mobility**.

As a company specialized in road construction, SORIGUÉ wants to be at the forefront of these developments and believes that the asphalt power generation unit will be **a reality for which a new market niche will open.** This new demand can offer them a possibility of expansion, giving the road an additional value different from that of being a simple vehicle transporter and transforming it as a **key element for the connected mobility**.

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