Pursuing the 4th Industrial Revolution with the NANO-EH project

NANO-EH will enhance emerging classes of energy harvesting nanomaterials, while surpassing the current paradigm by developing non-toxic and rare earth/lead-free materials exhibiting CMOS-compatibility and scalability for low cost and large-scale manufacturing.

The 4th Industrial Revolution builds on use of emerging technologies and their fusion in the sense of blending of physical and digital spheres. As the modern society grows, the new urges for efficient, sustainable and ecological materials has increased. The NANO-EH project will follow this trend and focus on possible improvement of energy harvesting materials.

NANO-EH wants to exploit smart nanomaterials (e.g. Hafnium Zirconium Oxides and nanocellulose-based biodegradable nanomaterials) that are non-toxic, lead- and rare earth-free materials, and will demonstrate their recyclability potential at module level. This can be especially useful in the context of communication technologies and further development of Internet of Things (IoT) for newer application such as personalised medicine of the future, smart farming and environmental monitoring.

Dr. Mircea Modreanu, Principal Investigator at Tyndall National Institute-University College Cork (Ireland) and Coordinator of the project, summarised the main challenges: "The significant broadening of the wireless communication spectrum in Europe makes the radio frequency energy scavenging a highly desirable way forward for clean powering of the next-generation IoT. To enable next-generation, self-powered (autonomous) wireless devices the key challenge is to capture energy supply from energy harvesting sources, integrating new devices for energy storage and taking into account the micro-power management unit requirements for the miniaturised system operation."

The NANO-EH project was chosen in the FET Proactive: emerging paradigms and communities call (FETPROACT-EIC-05-2019) in subtopic "Breakthrough zero-emissions energy generation for full decarbonisation". The project starts in October 2020 and will run for 36 months. The NANO-EH project bring together a consortium of 10 partners from 4 countries (Ireland, Romania, Italy and France).

NANO-EH will fosters systemic interaction between academia-***Tyndall National Institute-University College Cork*** *(Ireland)*-***Coordinator***, ***IMT-Bucharest*** *(Romania)*, ***Universita Di Bologna*** *(Italy)*, ***Universita Politehnica della Marche*** *(Italy)* and ***INSA Rennes*** *(France)*, high-tech SMEs-***TE-OX*** *(France)*, ***Luna Gerber Engineering*** *(Italy) and* ***VERTECH Group*** *(France)* and large industry-***Thales*** *(France)*.

Background information

FET-Open and FET Proactive are now part of the Enhanced European Innovation Council (EIC) Pilot (specifically the Pathfinder), the new home for deep-tech research and innovation in Horizon 2020, the EU funding programme for research and innovation.

NANO-EH website: www.nano-eh.eu

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