InComEss - INNOVATIVE POLYMER-BASED COMPOSITE SYSTEMS FOR HIGH-EFFICIENT ENERGY SCAVENGING AND STORAGE

InComEss seeks at developing efficient smart materials with energy harvesting and storage capabilities combining advanced polymer based-composite materials into a novel single/multi-source concept to harvest electrical energy from mechanical energy and/or waste heat ambient sources. Three Energy Harvesting Systems (EHSs) configurations will be realized through the combination of high performance piezoelectric (PE), thermoelectric (TE) and Thermo-Piezoelectric (TPE) generators and monolithic supercapacitors (SCs) to power selected wireless sensors nodes to be implemented in different IoT scenarios for Structural Health Monitoring (SHM) in buildings and aircrafts (using a new miniature wireless Fiber Optics Sensing (FOS) interrogator) and accurate location and monitoring of vehicles through GPS and MEMS sensing. Advanced concepts for efficient energy transfer will be implemented for increased energy conversion efficiency of the overall EHSs.
InComEss EHSs will involve the following smart materials developments: 1) advanced lead-free PE composite-based mono-/bi-component fibres with enhanced PE characteristics up to 100ºC/250ºC for their application into single/hybrid PE/TPE generators; 2) innovative high-performance thermoplastic-based p-and n-type TE composites with enhanced Seebeck coefficients in the range from –25ºC up to 250ºC for their application in single/hybrid PE/TPE generators; and 3) printable high energy density PANI/carbon-based composite electrode materials with enhanced specific capacitance and stability for their incorporation into the monolithic supercapacitor (SC) to store the energy harvested.
InComEss technologies, applications and services will impact the partners turnover by €100M after market up-take, generating more than 70 jobs and leveraging the EU economy to more than €4 billion and 12,000 employments and providing direct support to the realization of EU Digital Single Market and the wider implementation of IoT landscape.

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Find out more: **https://cordis.europa.eu/project/id/862597**