EUROPEAN COMMISSION
Directorate-General for Research and Innovation

RTD.F – Prosperity
F.4 – Materials for Tomorrow

ANNEX 1 (part A)

Research and Innovation action

NUMBER — 862095 — SYMPHONY

1.1. The project summary

Project Number [1]	862095	Project Acronym [2]	SYMPHONY

One form per project

General information	
Project title [3]	Smart Hybrid Multimodal Printed Harvesting of Energy
Starting date [4]	01/05/2020
Duration in months [5]	48
Call (part) identifier [6]	H2020-NMBP-ST-IND-2019
Topic	LC-NMBP-32-2019 Smart materials, systems and structures for energy harvesting (RIA)
Fixed EC Keywords	Materials engineering (biomaterials, metals, ceramics, polymers, composites, etc.)
Free keywords	energy harvesting, piezoelectric, printed electronics, polymer batteries

Abstract [7]

The 21st century has been dominated by an ambient digitalization, a trend that is mirrored by the use of catchwords such as Smart Energy, Smart Homes & Smart Cities and the increasing use of electronics in everyday objects. Current IoT scenarios expect a number of around 75 billion connected devices by 2025, and the powering of these devices by batteries will result in a considerable amount of potentially hazardous waste. The spread of electronic systems in remote locations should thus be accompanied by a change in power generation, making use of dislocated and disordered energy sources. A cost-efficient and environmentally friendly realization of energy harvesting (EH), however, is still a challenge, as the required input of functional material and electronic components in comparison to the energy output is high and often involves lead-based materials, manufacturing methods that consume high amounts of energy and costly assembly steps.
SYMPHONY aims for the development of new materials for low-cost and scalable printing and structuring processes to fabricate multimodal EH solutions based on the ferroelectric polymer P(VDF-TrFE) as well as printed energy storage devices and rectifiers not using rare elements and heavy metals. The hybrid integration of these devices on flexible films with low power harvesting ICs will result in a specific cost below 1€/mW (well below the value for piezoceramic and electrodynamic EH). The reduction of hazardous waste and energy consumption in SYMPHONY starts with material selection and manufacturing, but ultimately unfolds its full potential in the most CO2-relevant application areas: renewable energy generation, room heating/cooling and mobility. The innovative EH concept of SYMPHONY used to power distributed sensor nodes will reduce emissions by 50% increasing the efficiency of wind turbines (Smart Energy), making room heating/cooling 20% more efficient (Smart Home) and supporting the transformation of urban mobility (Smart City).

1.2. List of Beneficiaries

Project Number [1]	862095	Project Acronym [2]	SYMPHONY

List of Beneficiaries

No	Name	Short name	Country	Project entry date[8]	Project exit date
1	JOANNEUM RESEARCH FORSCHUNGSGESELLSCHAFT MBH	JOR	Austria		
2	FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V.	Fraunhofer ISC	Germany		
3	RISE RESEARCH INSTITUTES OF SWEDEN AB	RISE	Sweden		
4	EVONIK CREAVIS GMBH	EVO	Germany		
5	EOLOGIX SENSOR TECHNOLOGY GMBH	EOL	Austria		
6	ARKEMA FRANCE SA	ARK	France		
7	MESSFELD GMBH	MES	Austria		
8	POLYMER COMPETENCE CENTER LEOBEN GMBH	PCCL	Austria		
9	TUBOLITO GMBH	TUB	Austria		
10	LINKOPINGS UNIVERSITET	LiU	Sweden		
11	SEMPERIT TECHNISCHE PRODUKTE GESELLSCHAFT MBH	SEM	Austria		
12	INFINEON TECHNOLOGIES AUSTRIA AG	IFAT	Austria		
13	WURTH ELEKTRONIK EISOS GMBH & CO KG	WUE	Germany		