

# Smart and Flexible Energy Supply Platform for Wearable Electronics

## Smart2Go

### Introduction:

The widespread introduction of wearable devices is expected to be one of the major trends in the next one or two decades. First applications have already entered the market, like e.g. the smartwatch from Apple or various types of fitness trackers. Wearables will generate completely new opportunities for sensing (e.g. vital parameter monitoring), mobile data storage, wireless communication and internet of things.

Apart from legal topics, like e.g. data security, there are also technological bottlenecks. Today, design and appearance are significantly limited by given geometries of state-of-the-art components. Therefore, making devices thinner, safer, flexible and easy to integrate are major goals of current research and development activities. **Presently various obstacles still hinder the expected rapid development. The energy supply to wearable devices is probably the most serious challenge among these technological bottlenecks.**

### Project description:

**The aim of the Smart2Go project is the creation of an autonomous energy-supply platform. Based on the results of the project it will be possible to use a wearable without caring about recharging over its entire lifetime.**

This aim will be achieved by the combination of a powerful, thin and scalable battery with appropriate energy harvesting technologies. Each unit will be capable for a storage capacity up to 110 mWh (10 cm<sup>2</sup> area). All the performances will be retained after bending.

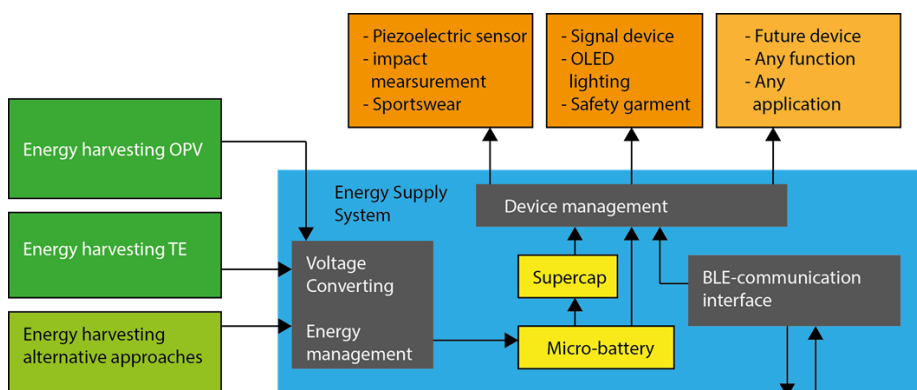


Figure 1: Block diagram of a fictitious Smart2Go device.

## Smart2Go

### Project facts:

Start date: 01/01/2019  
End date: 31/12/2021

Duration in months: 36

Project EU funding: € 3.97M

H2020 Research & Innovation Action  
Grant Agreement no.: 825143

Call (part) identifier:  
H2020-ICT-2018-2

Topic:  
ICT-02-2018: Flexible and Wearable Electronics

### Keywords:

Wearable technologies, Integrated flexible energy supply platform, energy harvesting technologies, flexible battery, wearable device demonstrators

The project will also develop ultrathin and lightweight films that will provide protection against environmental and mechanical impacts, handling and radiation. A roll-to-roll manufacturing process for the integration of all the components into the Smart2Go energy supply platform will ensure suitable production capacity with low manufacturing costs.

### Application cases:

The performance of the Smart2Go energy supply platform will be demonstrated in two application cases: (1) sport equipment integrating Smart2Go platform and pressure sensitive array and (2) safety garment integrating Smart2Go platform and lighting technologies (OLEDs). They represent a challenge for the demonstration of the Smart2Go platform reliability in extreme environment (i.e. cold temperature, snow, rain, etc.) and a proof of the technical feasibility of the Smart2Go solutions.

### Expected impact:

**Smart2Go project will integrate several technologies (energy harvesting, energy storage, and energy management) in one modular platform, where the different components (OPV, TE cells, supercapacitors) and functionalities, (piezo sensors, lighting technologies) can be easily replaced to serve many different applications in the area of flexible and wearable electronics.**

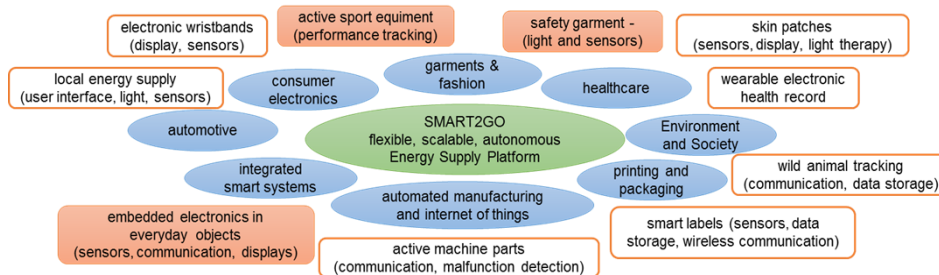


Figure 2: Fields of application and examples of product use cases for the Smart2Go energy supply platform.

The project includes top EU innovation performers (researchers and companies) involved in flexible electronics and energy scavenging and storage, as well as 2 partners with very challenging product use scenarios (high reliability need, extreme weather conditions), validating the platform as suitable for multiple needs.



### Consortium:

FEP	DE
VTT	FI
JOR	AT
UoS	UK
TUT	FI
ARM	FR
VMI	AT
ATO	AT
HH	NO
TRE	FI
AMI	CZ

### Contacts:

Project Coordinator:  
Dr. Matthias Fahland  
FEP (Germany)  
[matthias.fahland@fep.fraunhofer.de](mailto:matthias.fahland@fep.fraunhofer.de)

Project Manager:  
Elena Turco  
AMIRES s.r.o. (Czech Republic)  
[turco@amires.eu](mailto:turco@amires.eu)

Website:  
[www.smart2go-project.eu](http://www.smart2go-project.eu)



The project Smart2Go receives funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 825143.