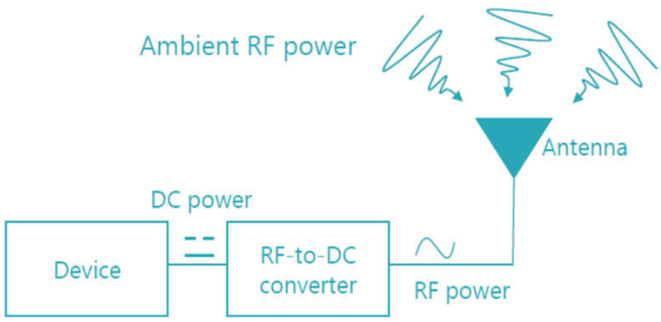
SURFAS Project

Interreg France (Channel Manche) England

Project SURFAS
European Regional Development Fund

Self-Powered Devices with RF Energy Harvesting

Challenges



Electromagnetic (EM) waves carry energy, but it is challenging to harvest it in buildings. EM power is relatively weak for energy harvesting, and architectural constraints hamper the propagation of waves. The following challenges will be tackled in this project:

- How to harvest the RF energy efficiently and focus it to energy harvester to power electronic devices as an alternative to battery power
- How to minimize attenuation and improve propagation of electromagnetic waves in buildings

Aims

SURFAS project aims to develop efficient RF energy harvesters and zero-power consuming smart electronic surfaces able to reflect a large part of the ambient waves in a preferred direction to significantly enhance available EM energy to energy harvesters, and to improve availability of RF signals in buildings (such as Wi-Fi signal strength).

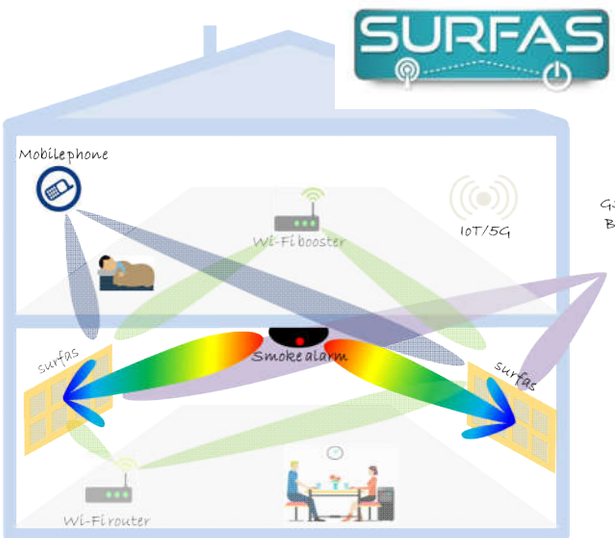
Targeted Applications

→ **Smoke Sensors**

SURFAS can be used in place of batteries, making smoke alarms more energy efficient and much more cost effective for consumers. With around ***13.5 million smoke alarms*** in the France (Channel) England area alone (5.6 million in France and in 7.9 million England), ***annual energy savings of 12.7MWh*** could be reached.

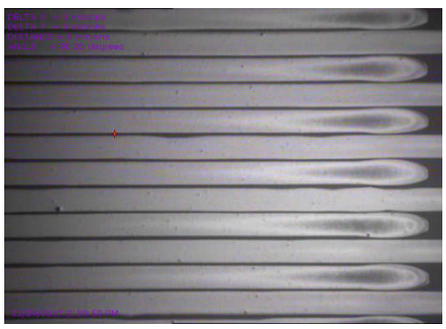
→ **Wi-Fi Signal Booster**

Project SURFAS will develop a technology that will significantly increase the range of Wi-Fi signals produced by household routers without consuming additional power. The device would provide a more energy efficient alternative to the Wi-Fi boosters which are currently used to improve Wi-Fi signals. This could lead to an ***annual energy saving of 5.9GWh*** if all the 225,000 Wi-Fi boosters in the Channel area were replaced.



Examples of University of Surrey's Activity

Inkjet Printed Microstrip Electrical Transmission (for testing RF parameters of printed nanoparticle conducting layers on plastic substrates)



Inkjet Printed Co-Planar Supercapacitor Electrodes for energy storage (to be integrated with RF energy harvester)

Total Project Budget: 1.859 Million Euros
Start date/ length: June 2017, 3.5 years
European Regional Development Fund contribution: 1.283 Million Euros
Number of Partners: 6 (3 in France, 3 in England)

ESIGELEC
Engineering school and laboratory specialized in embedded systems
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Leading university located within the county town of Guildford, Surrey in the South East of England
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