



Edito

Happy summer!

EnSO is fully on its 3rd year now, and has launched a series of dissemination actions to spread the results on AMES and Harvesting systems. The [successful workshop and booth exhibition](#) EnSO has organized at the IoT week (see p.1 & 2), brought insightful results and discussion. The [ECSEL JU Symposium](#) was the occasion to meet regulatory bodies and policy makers, and to show the latest info on the project (see p.3). Finally, you'll have the chance to understand more the work done on power management at EnSO, with the interview of Peter Spies, WP3 leader (p.4).

We look forward to seeing you at the next events (see p.2), in the meantime, enjoy the reading !

Raphaël Salot



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From Ideas to Use-Cases

In the past few months, a big effort was made to disseminate EnSO results and challenges. Let's go back to the two major events of June 2018.

This year has seen the development of strong collaborations of EnSO with other European projects. In this context, the communication team at EnSO has set up a [workshop on harvesting systems](#) on the 7th of June 2018 (see the Newsletter 3 for a full program), inside the [IoT week](#) event held in Bilbao. Besides a successful half-day of talks, the EnSO consortium had the chance to present advanced demonstrators at a booth during the whole week. From harvesting technics to indoor localization systems, several demonstrators were presented at the exhibition hall.

KEEP IN MIND

ECSEL

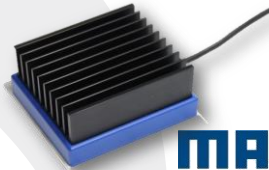
- The [ECSEL Joint Undertaking](#) - the Public-Private Partnership for Electronic Components and Systems – funds Research, Development and Innovation projects for world-class expertise in these key enabling technologies, essential for Europe's competitive leadership in the era of the digital economy.

AIOTI

- The [Alliance for Internet of Things Innovation](#) (AIOTI) was initiated by the European Commission. The overall goal of this European Commission's initiative was the creation of a dynamic European IoT ecosystem to unleash the potentials of the IoT.

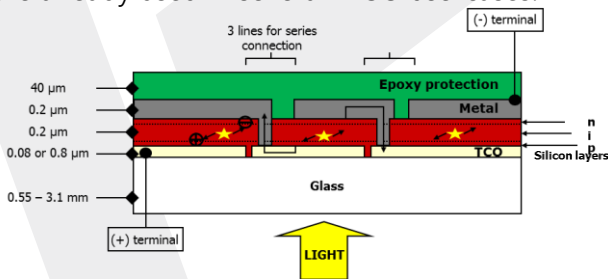
Thermoelectric Harvesting:

Designed and manufactured by MAHLE Thermoelektronik, this thermoelectric energy harvesting system is directly converting ambient heat into electricity. This low cost solution is perfect for IoT device. It is composed of Nano-structured thermoelectric materials made by sputtering technology. Its harvesting modules are working with very small temperature differences (2-3 K) up to 200 K.



MAHLE
Driven by performance

Solar Harvesting: Solems-designed photovoltaic thin-film silicon solar cells are used as excellent indoor charging system. Charge is possible in all light conditions, the cells are active under near UV and visible light 350 -750nm and proven reliable for 15 years. They are already used in several EnSO use-cases.



SOLEMS
L'énergie lumière

Wearable healthcare for more information see newsletter #1 : Maastricht Instruments is developing its next version of its medical patch for physical activity monitoring and accelerometry measurements. The EnSO technologies enable the company to improve the user comfort, since it is composed of a flexible battery solution and does not have connectors anymore by using wireless solutions.

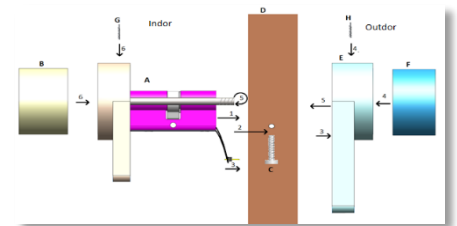


Maastricht UMC+
Maastricht University

Smart lock (for more information see newsletter #2): Smart Locks are electronic locking systems that can be opened with a phone, and for which users' accesses can be managed anywhere in the world. The innovative solution is designed for smartphones to control the lock, independently from electrical network of Wi-Fi access. Moreover, it benefits from low power consumption and PVC energy harvesting systems.

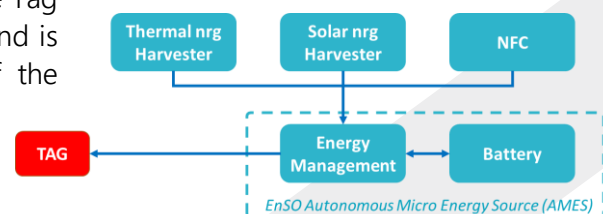
ojmar
INTELLIGENT LOCKING SYSTEMS

idneo Naturgy



Indoor localization (for more information see newsletter #3): This indoor localization lies on the measurement of a distance between a Tag and the Anchors. Thanks to the use of UWB the communication is robust against obstacles and multipath, also being immune to reflections. The Tag is powered by the EnSO AMES (Autonomous Micro Energy Source) and is optimized for very low power consumption for long term use of the device.

AED
Engineering



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UPCOMING EVENTS

€ MRS
Warsaw, Poland,
Sept. 17-20

electronica
Munich, Germany,
Nov. 29-30

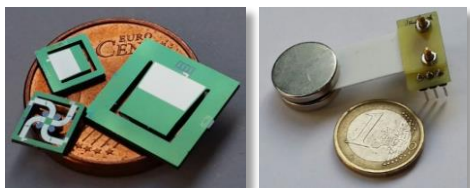
IOT SOLUTIONS WORLD CONGRESS
THE LEADING IOT INDUSTRY EVENT
BARCELONA 16-18 OCTOBER 2018
Barcelona, Spain, October 16-18

Harvesting: A new challenge for powering IoT nodes

EnSO held a very successful event on the 7th of June 2018 at the IoT week, with a trendy topic for IoT: harvesting. After a very interesting Keynote of **David Langley**, from the Alliance for Internet of Things Innovation (AIOTI), the workshop continued with technical talks on harvesting technologies, from thermoelectrical to mechanical, solar, and vibrational systems. Presentations are available on demand (*send an email to: enso.ecsel@gmail.com*).



What was very interesting, is to see how these technologies could be integrated into devices. Thus, the workshop was followed with presentation of uses cases which contained AMES and/or harvesting technologies from EnSO project. These IoT device were also present at the EnSO booth (see p.2). The event was also the occasion to follow the work of a spin-off from CNM-CSIC: EnergIoT, which works on piezoelectric harvesting for autonomous IoT device.



The workshop ended with a very interesting round table on EU projects in markets roll out, composed of **Juan Rico, ATOS**, for the Project VICINITY, **Corne Rentrop, TNO**, for the Project INSCOPE, **Raphaël Salot, CEA-LETI** for the Project EnSO, and finally **Carles Cané, CSIC**, for the NMBP Committee H2020. Conclusion was made that Europe is still a leader in the field of IoT, and that collaboration between European countries strenghtened this position. Moreover, it is necessary to communicate between all of the key players, to make sure that nothing is repeated, missing inside a project, and that we all work towards the same direction. Carles Cané only regretted that no policy maker nor member of regulatory bodies were around the table to discuss regulation issues.

EnSO was at the ECSEL JU Symposium

The ECSEL JU organized a symposium on **"Shaping digital innovation"**, on the 19th to the 20th of June 2018 in Brussels. A wide range of European and global stakeholders in the Electronics Components and Systems field, met to talk about the next challenges for the Electronics and Microelectronics components in Industry and Research.



Overall, emphasize was put on he need to have more collaborations between different ICT domains, such as the **High-Performance Computing** and Electronics Components topics. For instance, the **Artificial Intelligence**, a very hot topic, will have a proper call in the next European projects calls.

EnSO had the chance to present the project and one of its use-cases. Indeed **Freek Boesten** came to show the wearable healthcare device Maastricht Instruments is developing. EnSO won the second best communication price among the numerous ECSEL project!

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KEEP IN TOUCH

Our next newsletter will be released in October 2018!

Please contact us at enso.ecsel@gmail.com if you want to receive it automatically



PROJECT NEWS

ISSUE 4 / JULY 2018



Interview with Peter SPIES, Fraunhofer



Dr. Peter Spies is manager of the "integrated energy supplies" group in Fraunhofer IIS where he is doing research and design on the field of power and battery management and energy harvesting. In EnSO, he is the Work Package (WP)3 leader, focused on energy harvesting and smart recharge.

Hello Peter, so you work in Nuremberg, can you tell me a bit more about it ?

Peter Spies: Actually I don't live in Nuremberg city center, but in a little town 25km away called Herzogenaurach. Since the Fraunhofer Institute for Integrated Circuits (IIS) is located on the outskirts of Nuremberg, it's very convenient to come by car, no traffic jam! Nuremberg itself is a very nice city, very lively thanks to a lot of students, technical schools, and Universities. It's a really cool place to live in.

Sounds nice! Any specificity in your region ?

P.S.: Yes indeed! Nuremberg is at the border of the Franconian Switzerland, a famous touristic spot, with beautiful landscape thanks to amazing rocky hills, forests and small villages. You can enjoy a lot of outdoors activities, like hiking, cycling and running. A fun fact: it's the region with the highest density of breweries in the world! A lot of this small villages/towns have their own microbrewery where you can enjoy a beer after a little hiking.

Well, you convinced me to come and visit, for sure! Let's go to the EnSO project. What's your role in it ?

P.S.: My role is divided in two parts. First, I'm the WP3 leader, focused on energy harvesting and smart recharge. The aim is to develop technologies that will use any ambient energy to charge batteries. It goes from light with solar cells to vibration and temperature harvesting systems. A further option is recharging by wireless energy transmission like NFC. The second part of my work in Enso is the development and research in the field of power and battery management to adapt the different energy harvesters to the battery. My team at IIS is contributing to this topic in Enso..

Adapt? So adaptation is needed between harvesters and batteries?

P.S.: Yes, it is a very important part in the development of energy harvesting systems. All harvesters have a different output profile (different voltage, current...), and might act differently in various environment. You always have to think of the best energy efficiency, i.e., the minimum loss and the best power output. For instance, a solar cell will not provide the same power when it is outside directly under the sun, than inside a house, or in the shade. It also means that when the power is high, the voltage or current that goes into the battery is high as well, and your battery might not support it. You don't want to kill the battery! So you need to have specific power management to handle the issue. These systems are here to adapt the voltage and current in different conditions to get the maximum power into the battery without increasing the losses or even damaging it. Adapting the power is also a way to cope with battery ageing. To reduce it, you can adapt the charge profile, and use low current for instance.

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PROJECT

Leader:



Grenoble



32 Partners and 5 third parties

8 countries

Start: 1-1-2016

Duration: 48 months

Total investment: €M 82

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