EnerHarv 2022: Building The Ecosystem For Powering The Internet Of Things

by Mehmet Ozturk, General Chair, Brian Zahnstecher, General Co-chair, Mike Hayes, Tech Co-chair, and Shad Roundy, Tech Co-chair, EnerHarv 2022

Have you never heard of EnerHarv? What is it? What did you miss? When is the next event?

EnerHarv was created in 2018 by the Power Sources Manufacturers Association's (PSMA) Energy Harvesting Committee (EHC) as an international workshop on energy harvesting and micro-power management, particularly for ultra-low power IoT applications. The committee recognized the growing awareness and acceptance of EH technologies and their critical role in enabling battery life extension in IoT/IIoT, wearable, industrial automation, smart mobility and many other industries. The vision was to create "a focal point for a community of experts and users of energy harvesting & related technologies to share knowledge, best practices, roadmaps, experiences and create opportunities for collaboration."

The inaugural EnerHarv 2018 was hailed as a major success. There were 81 attendees representing every major populated geographical region on the planet. The program was divided more-or-less evenly between lecture sessions, functional demonstrations, and interactive panel discussions with plenty of time reserved for networking and team-building prospects as well as a poster session as a bonus. There were 20 lecture presentations (including two keynotes and three panel introductions), 16 functional demonstrations, and 19 posters. (Proceedings can be found on the EnerHarv website).

Carnegie Mellon's Brandon Lucia energizes the crowd with the need for software in EH designs. (image on left). Analog Device's Jane Cornett discusses the massive potential of chip-scale thermoelectrics (image on right).

Gerd vom Bögel (Fraunhofer IMS) demonstrates his Industrial EH-powered sensor for Alex Weddell (Univ. Southampton/ARM) (image on left). Some of the EnerHarv 2018 delegation is pictured in the image on the right. (Photos courtesy of Tyndall National Institute.)

Participants (and indeed those who missed it!) have been eagerly and persistently asking "when is the next EnerHarv?" Initial plans were to make it a biennial event, having EnerHarv 2020 PSMA in Raleigh, North Carolina, USA, hosted by NCSU (North Carolina State University). But those plans were put on ice due to COVID.

After a long wait we are now pleased to announce that EnerHarv 2022 will be held from April 5-7, 2022, retaining the same host and venue. From EnerHarv 2018 we saw the value in bringing a broader range of stakeholders to our ecosystem (e.g. packaging, software, and industrial design) and the critical need to bring in more end users across multiple applications (building management, medical technologies, assisted living, environmental, conditional monitoring of equipment, systems and power supplies).

This realization strongly influenced our decision to host the event in the Raleigh/Durham area where there is already a hotbed of industrial and academic activity. This area already has a collaborative ecosystem in place via the ASSIST Research Center for Advanced Self-Powered Systems of Integrated Sensors and Technologies, which is hosted by NCSU.

EnerHarv 2018 demonstrated a need for technology and thought leadership in this sector and the potential benefits of emerging technologies, if properly guided and integrated. The workshop cross connects not just suppliers and developers of power electronics components and systems but also demonstrates the power of collaboration when experts from power electronics, ICT and MEMS co-develop standardized, inter-operable and system-optimized solutions for real-life applications.

The ecosystem has already grown substantially and is addressing the challenge of reliably powering the one trillion sensors the world will have by 2025. This large and expanding market and ecosystem offers unprecedented growth opportunities for developers and integrators of power electronics parts and systems.

As per the inaugural workshop it will mainly (but not exclusively) be dedicated to making portable power sources last longer for ultra-low power IoT edge devices. However, the door is open for the scope to be broadened in the future, subject to feedback from our ecosystem. Ideally, devices can be powered indefinitely using energy harvesting where ambient energies are available, but at the very least, technologies can be embedded that minimize power consumption and maximize conversion efficiencies.

Attendees will learn of the many constituents of an existing, energy harvesting/micro-power management product ecosystem and how to apply these products to their application requirements in a system-optimized way. They will also learn valuable information to drive optimal design execution and address common pain points to bring a variety of products to market that will enable a dramatic penetration of energy harvesting solutions into a broader range of applications.

Through networking, attending tutorials, viewing real life demos and participating in discussions, developers will gain a step-function increase in their knowledge and ability to develop/gain access to energy-harvesting-powered solutions. The workshop will demonstrate examples of successful energy harvesting products already created via synergies between the developers of energy harvesting sources and the loads (IoT edge devices).

EnerHarv 2022 will be supported by the EU EnABLES project (No. 730957), which has already (in collaboration with PSMA and other stakeholders) built an international "power IoT" community comprising >500 academic and industry stakeholders. EnABLES also funds feasibility studies and provides free-of-charge access to expertise and facilities across leading research institutes in Europe.

IEEE Power Electronics Society (PELS) & China Power Supply Society (CPSS) are also technical sponsors with industrial sponsorship coming from Analog Devices, Wurth Electronics, and UBITO. Additionally, EnerHarv has media partnerships with How2Power.com and Bodo's Power Systems. We are also proud to announce our keynote speakers as outlined below in the table.

Name	Affiliation	Title
Patrick Mercier	University of California San Diego, USA	Energy Harvesting and Self-Powered Sensing for Miniaturized IoT and "Unawareable" Devices
Baoxing Chen	Analog Devices Inc., USA	Powering the IoT: An Energy Harvesting Perspective
Veena Misra	ASSIST Center, NCSU, USA	Self-Powered Wearable Sensors for Health and Environmental Monitoring

Our first wave of confirmed speakers has also been announced with participants from CEA LETI (France), Tyndall (Ireland), Univ. Of Exeter (UK), ST Microelectronics (Italy), Univ. of Florida (U.S.A.), Wisepower (Italy) and Stokes UL (Ireland). Watch this space for further announcements. We recently announced an open call for posters and demos, a great opportunity for people to demonstrate their work in this area, get feedback, form collaborations, etc. Details can be found here.

EnerHarv is now open for registration with attractive discounts for partners and students. For more details and to register see the EnerHarv registration page.

EnerHarv 2022 is an opportunity not to be missed by anyone interested in "powering the internet of things". If you are interested in learning more please feel free to contact any of us via email:

- Mehmet Ozturk, general chair EnerHarv 2022

- Brian Zahnstecher, general co-chair EnerHarv 2022, PSMA EHC

- Mike Hayes, tech co-chair EnerHarv 2022, PSMA EHC

- Shad Roundy, tech co-chair EnerHarv 2022.

For more information on the ASSIST Research Center for Advanced Self-Powered Systems of Integrated Sensors and Technologies, see the website and for more on the EU EnABLES project see their website.

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