



Energy Harvesting Committee (EHC) Minutes 18th June 2024

Attendees	Apologies/Non attendees	
John Horzepa, PSMA Matthias Kirn, WTO Norm Elias, Norm Elias Model/Sim Cristina Rusu, RISE Maeve Duffy, Univ. of Galway Roberto la Rosa, ST Brian Zahnstecher, PowerRox Mike Hayes, Tyndall	Hani Kanaan, Dracula Tech Prateek Asthana, Wago Jean-Michel Bidault, ITEN Joe Horzepa, PSMA Ed Spence, Machine Instrumentation Group Ningning Wang, Hangzhou DU Soumyajyoti Maji, Univ of Galway Torben Dankwort, Fraunhofer ISIT Pallawi Joshi, Juniper Networks Dan Stieler, PowerFilm Francesco Carobolante, IoTissimo John Fiske, Armor James Rohan, Tyndall Ed Spence, TMIG (guest) Justin Henspeter, IBM Eric Swenson, IBM Pulgurtha Markondeya Raj, (Dr. Raj), FIU Sergiy Tykhonov, FRABA Baoxing Chen, Analog Devices Dinesh Kithany, Wired & Wireless Cem Som, Wurth Lorandt Foelkel, Wurth Vincenzo Pecunia, SFU-SEE	Lisa Horzepa, PSMA Peter Spies, Fraunhofer IIS Denis Pasero, Ilika George Slama, Wurth Renee Yawger, EPC Technologies David Tang, Netbit Gary Johnson, Ilika Toby Best, FRABA Johan Pederson, Ignion Nathan Jackson, Univ of New Mexico Mike Donnelly, Mentor/Siemens Christian Pennisi, Jennova TBD, Wisepower Juan Carlos Rodriguez, ADI Andreas Beckes, FRABA Dusan Vuckovic, Zverttech John Flannery, Tyndall Thomas Becker, Thobecore Steve Savulak, Collins Aerospace Michalis Kiziroglou, Imperial College London Toshi Yamamoto, Nichicon Sebastian Bader, MIUN

(Co-chairs in bold font) (New/First-time members indicated in GREEN)

Next meeting:- **Tue 23rd July 9 am CT US** Mike to chair, Brian to type.

Agenda for 18th June

1. Welcome any new members/guests.
(APEC 2025 planning on hold until Aug)
2. EnerHarv 2024.
3. ~~Industry Event Watch & List of EH companies~~
4. Media activities
5. ~~'Treasure Chest' at end of the minutes.~~

1. Welcome new members

(APEC 2025 - PSMA Energy Harvesting Industry Session - on hold until August)

- o Put more thought into session/talk naming in future to draw in more folks with “buzzword appeal” to compete with all else in program.

2. EnerHarv 2024 planning Ref www.enerharv.com and [Energy Harvesting Forum | Power Sources Manufacturers Association \(psma.com\)](http://Energy Harvesting Forum | Power Sources Manufacturers Association (psma.com))

- **SEPARATE** Workshop committee created & meetings underway
- Just 1 week to go! 86 people expected, 79 registered so far. Great line up check out our website.
- Congrats to Brian for securing ePeas as replacement keynote at short notice as Ambient Photonics cannot make it.
- Should generate a moderate surplus to fund future events.
- Nice gifts for attendees (dot card) & speakers (local artisan ceramic).
- UNPIG did great work on the workshop event booklet, **WILL CIRCULATE COPY WHEN AVAILABLE.**
- **BRIAN & MIKE TO UPDATE QUESTIONNAIRE** and use it to get feedback.
- Remove NIPS tour from the agenda. **BRIAN TO INFORM TEAM.**
- Booklet will include commemoration page for our dear colleague, mentor and friend Joe Horzepa, RIP – there would be no EnerHarv without Joe!

- Francesco & Roberto planning to create an affiliated proceedings booklet post event for those interested in having proceedings published – slides/posters + narratives
- Need to start EnerHarv 2026 cycle EARLY to secure speakers, participants, venue, etc.
- VAT issue was resolved but PSMA TO NOTE COMPLEXITIES FOR FUTURE EVENTS.

3. Industry Event Watch & List of EH companies – on hold till August

•Event tracker

- Revisit/update the list of good industry events for tracking.
- Make more sense to transition from standalone doc to list in mtg mins...capturing lots of good contributors via current efforts in EnerHarv/RISEnergy/Infrachip, etc.
- Company ecosystem** (review quarterly, next due post-EnerHarv '24, supported by APEC/EnerHarv activities)
- BZ CONTINUES TO UPDATE AS INFO TRICKLES IN.**

4. MEDIA ACTIVITIES – Any updates?

(a) Webinars/ PTR? **PERPETUAL OPEN CALL TO EHC FOR WEBINAR SUGGESTIONS.**

- Toshi Yamamoto, Nichicon – LTO Battery Tech. Possibly leverage material related to Sensors Converge (already has ~50% of required content)? Upgrade & share overview with team by next meeting (early-'24). **TOSHI TO PROVIDE PROPOSAL/ABSTRACT/DRAFT PPT BY JUNE MTG FOR TEAM REVIEW.** Still working with Ed Spence on white paper (targeting completion by next EHC mtg), perhaps better content/collaborate with him. **Will follow up after Sensors Converge.**
 - Ed (Spence) considering and will revert. **NEED TO PING HIM FOR WEBINAR ABSTRACT IF STILL INTERESTED.**
- Lorandt Foelkel, Würth – EH Tech Update. **LORANDT SHARED PREVIOUS DIGIKEY WEBINAR FOR REFERENCE.** Mike & Brian feel it is good but needs higher % of new material – under review. **LORANDT WORKING TO CREATE A NEW PPT FOR '24 WITH ~90 % NEW MATERIAL BY END-JUL (post EnerHarv).**
- Any other topics?
- Look out for webinar derivatives from EnerHarv.

(b) Conferences/workshops

(c) Publications

- Jean Michel – ITEN working on a white paper for release in Dec. Let us know if we can help with preparation, distribution, promotion, etc. Resource issue – delayed but still being planned, hopefully Sept. possible webinar.
- Roberto – we should consider putting together an updated white paper, esp. application focused, with lots of new EHC members, leverage EnerHarv?
- **Toshi/Ed – working on white paper for Sensors Converge '24**
- Also looking at cross promotions for IPC – industrial automation, Industry 4.0, smart mobility, etc.
- Any material you want to re-cycle.... once not too much of a sales pitch?
- New suggestions
Hoping to mine upcoming events (APEC, EnABLES, APEX, EnerHarv, etc.)

(d) Virtual conferences, articles, etc.

- Suggestions please

TREASURE CHEST

Approach these items one at a time in future meetings as people raise them.

8A. Sponsorship of a program where students build demonstrators.

- Lorandt has a budget to supply kits
- Help with education links – Qualcomm 'High Tech High'. Francesco will follow up.
- Green story. International dimension. Technology and applications dimensions.
- Würth running design challenge.
- Keep simple, easy to use
- Competition or roadshow?
- PSMA has money to support.

- Action:- write ½ page strawman for student engagement mechanism **NEED A CHAMPION TO LEAD EFFORT FOR COMM**

“Here are Katherine’s thoughts on the competition:

There are two main styles of the competition that could be developed:

1. Engineering-Style Competition

- planning committee chooses specific EH devices that can be used and the target load
- planning committee also specifies energy input conditions (lighting setup, vibrational input, etc) for testing
- specifications are announced and teams would develop the power converter solution based on the specification
- teams can submit videos and/or reports on their team and proposed idea
- final teams are selected and they test their prototypes on site at an event competition (could be a conference)
- judging is based on technical criteria measured during the test (size, weight, efficiency, etc.)
- implementation is the most important aspect for this style of competition
- over different years, the specification and scenarios would focus on different technologies with the same basic format
- more similar to the International Future Energy Challenge run by PELS

2. Design-Style Competition

- planning committee could choose a theme based on a technology or application (e.g. smart homes, wearables, building monitoring, etc.)
- planning committee may want to specify some constraints or scenarios for the competition
- teams come up with complete EH design ideas (transducers, circuitry, load) and develop a prototype
- teams can submit videos and/or reports on their team and proposed idea
- final teams are selected and they present and demonstrate their prototypes on site at an event competition (could be a conference)
- judging is based on mostly qualitative and some quantitative judging criteria (so balanced judge selection will be important)
- this style of competition is more focused on the idea and design, but implementation is also important

There should probably be some discussion on which style the committee would like to see. The engineering-style requires a lot of prep work before even announcing the competition, while the design-style is more work for the judging and evaluation. I could see either being good for students. I hope someone can take these basics ideas and further development them into a competition.”

7B. Updated Goals

- Open to suggestions.
- We should try to forge links with other groups/sessions, e.g. capacitor, magnetics, packaging. – addressing this via “Tiger Team” effort within PSMA (multiple focused initiatives with small teams from various committees).

7C. Forward-looking Thoughts

- Software? Packaging/industrial design? Modelling? Hackathon?
- Incorporate some kind of student competition as part of EnerHarv (Best Student Demo/Poster) or otherwise.

**Mike Hayes & Brian Zahnstecher,
18st June 2024.**