



Energy Harvesting Committee (EHC) Minutes 21st May 2024

Attendees	Apologies/Non attendees	
John Horzepa, PSMA Sebastian Bader, MIUN Cristina Rusu, RISE Michalis Kiziroglou, Imperial College London Toshi Yamamoto, Nichicon Maeve Duffy, Univ. of Galway Brian Zahnstecher, PowerRox	Mike Hayes, Tyndall Matthias Kirm, WTO Hani Kanaan, Dracula Tech Prateek Asthana, Wago Jean-Michel Bidault, ITEN Joe Horzepa, PSMA Ed Spence, Machine Instrumentation Group Elias, Norm Elias Model/Sim 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 Pulugurtha Markondeya Raj, (Dr. Raj), FIU Sergiy Tykhonov, FRABA Baoxing Chen, Analog Devices Dinesh Kithany, Wired & Wireless Cem Som, Wurth Lorandt Foelkel, Wurth Roberto la Rosa, ST 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, Zvertech John Flannery, Tyndall Thomas Becker, Thobecore Steve Savulak, Collins Aerospace

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

Next meeting:- **Tue 18th June 9 am CT US** Brian to chair, Mike to type.

Agenda for 21st May

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
- Will be in Perugia 26-28 June. F Cottone = Tech co-chair, R LaRosa = general chair.
- **WE SHALL EXTEND EARLY BIRD TO 10 MAY**. PLEASE HELP PROMOTE!!!!
- **BZ WILL CONTACT HANI OFFLINE ABOUT POSSIBLE DRACULA TECH POSTER/DEMO & PANEL OPPORTUNITIES** – re-use from a recent show. **Hani working to support with team member and demo.**
- Please send suggestions for demos, posters, presenters to any committee member... it is by invite only.
- There will be a sister event - NIPS Summer school **24-25 June**. Will encourage young researchers to attend both where possible. <https://www.nipslab.org/>.

- **MIKE/FRANCESCO DRIVING CONTRACTS** between PSMA & UNIPG (overall event contract), PSMA & Hotel Gio (downpayment being paid)...driving terms more favorable for PSMA. **VAT issue resolved** but **PSMA TO NOTE COMPLEXITIES FOR FUTURE EVENTS**.
- Requesting marketing support (particularly social media) from PSMA, collaborate with UNIPG Marketing as well. Joe suggests looping in Chris W. & Mkg Comm. Ensure **PSMA PROMOTES HEAVILY THROUGH SM CHANNELS. – 1ST AND 2ND WAVE OF SPEAKERS, ETC. MIKE WILL ADVISE OF KEY RELEASE DATES. BRIAN TO CONFIRM WITH CHRIS W. ON DEPLOYMENTS.** Brian asked 3D-PEIM folks to request promo via NREL, then we shall cross-promote 3D-PEIM '25.
- Brian takes roll call for EnerHarv, Matthias & Prateek will have to pass this year. Toshi not expecting anyone from Nichicon to join. Too much of challenge for Michalis/Team this time.

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.
- Lorandt Foelkel, Wurth – 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).**
- Ed (Spence) considering and will revert. **EHC CAN EVALUATE BASED ON APEC '24 IS CONTENT.** Good content at APEC, **NEED TO PING HIM FOR WEBINAR ABSTRACT IF STILL INTERESTED.**
- Any other topics?

(b) Conferences/workshops

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(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.

- Wurth 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 basic ideas and further develop 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,
21st May 2024.**