



Energy Harvesting Committee (EHC) Minutes 26th Mar 2024

Attendees	Apologies/Non attendees	
John Horzepa, PSMA Matthias Kirn, WTO Lorandt Foelkel, Wurth Joe Horzepa, PSMA Steve Savulak, Collins Aerospace Roberto la Rosa, ST Toshi Yamamoto, Nichicon Vincenzo Pecunia, SFU-SEE Brian Zahnstecher, PowerRox Mike Hayes, Tyndall	Sebastian Bader, MIUN Hani Kanaan, Dracula Tech Cristina Rusu, RISE Ed Spence, Machine Instrumentation Group <i>Prateek Asthana, moved to Wago?</i> Jean-Michel Bidault, ITEN 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	Lisa Horzepa, PSMA Peter Spies, Fraunhofer IIS Denis Pasero, Ilika George Slama, Wurth Renee Yawger, EPC Technologies David Tang, Netbit Michalis Kiziroglou, Imperial College London 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 Maeve Duffy, Univ. of Galway Andreas Beckes, FRABA Dusan Vuckovic, Zvertch John Flannery, Tyndall Thomas Becker, Thobecore

(Co-chairs in bold font) (New/First-time members indicated in GREEN, welcome guest Ed Spence)

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

Agenda for 23rd Apr

1. Welcome any new members/guests.
2. APEC 2024 – quick wrap up
3. EnerHarv 2024.
4. Industry Event Watch & List of EH companies
5. Media activities
6. ‘Treasure Chest’ at end of the minutes.

1. Welcome new members

Welcome, Vincenzo Pecunia!!! Leading School of Sustainable Environmental Engineering (SEE) for Simon Fraser University (SFU).

2. APEC 2024 - PSMA Energy Harvesting Industry Session IS14: "Powering the IoT with Energy Harvesting and Wireless Power Transfer, with Functional Demos"

- EHC being designated a 7 slot session (6 presentations + 1 demo session) on **Wed Feb 28th 1:30-5 pm PST**
 - **POST-EVENT SUMMARY: great talks, lots of demos, collaborations (mostly amongst speakers/ demonstrators). Attendance poor (avg 15-25 folks/talk)...hurt by double room, noticed bump as session overlapped expo closure, APEC OrgComm survey had "50 or less" as minimal answer so even if we considered very popular (avg. 45-50 folks/talk) it would be perceived as fairly insignificant in eyes of APEC. Was there an issue with a schedule/app typo?!?**
 - **Put more thought into session/talk naming in future to draw in more folks with "buzzword appeal" to compete with all else in program.**

3. 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.

- 3rd keynote Joshua Wright, Ambient Photonics confirmed. He will also present at APEC brought demos.
- 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 24-26 June. Will encourage young researchers to attend both where possible. <https://www.niplslab.org/>. EWC discussing options for offering cross-registration support.
- Website updated for '24 and Giacomo enabled with access (thx, Lisa!), mostly basics and updates to main page... **FINER DETAILS TO FOLLOW WITH GIACOMO SUPPORT. REGISTRATION IS OPEN**
- Still looking for commercial sponsors – **Sponsor targets achieved/exceeded (€26.5 k total)!!! PSMA WORKING ON INVOICING SPONSORS.**
- **MIKE/FRANCESCO DRIVING CONTRACTS** between PSMA & UNIPG (overall event contract), PSMA & Hotel Gio...driving terms more favorable for PSMA. VAT still biggest area of concern/variability...already sought guidance from IEEE/PELS since recently experienced, **MIKE WILL REACH OUT FURTHER AS APPROPRIATE. UPDATE 27th March – we are VAT exempt for fees, just need to untangle which event we pay VAT on**
- Requesting marketing support (particularly social media) from PSMA, collaborate with UNIPG Marketing as well. Joe suggests looping in Chris W. & Mkg Comm.

4. Industry Event Watch & List of EH companies (Items 4 onwards not reviewed since Dec 2023)

•Event tracker

- Revisit/update the list of good industry events for tracking.
- Next update target Jun '24. **Make more sense to transition from standalone doc to list in mtg mins...capturing lots of good contributors via current efforts in EnerHarv/RISEnergy/Infracip, etc. MIKE TO LOOK AT LATEST LIST AND PROPOSE SOLUTION HERE.**

• **Company ecosystem** (review quarterly, next due post-EnerHarv '24, supported by APEC/EnerHarv activities)

- **BZ CONTINUES TO UPDATE AS INFO TRICKLES IN.**

5. MEDIA ACTIVITIES

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

- IEEE HIR 2023. HIR = heterogeneous integration roadmap, packaging and system integration focus
 - Effort led by Francesco Carobolante. Possible APEC presentation? **Mike/Brian presented at APEC '24 Packaging IS.**
 - Final draft candidate 8/8/23. **BZ/MH WILL SHARE LINK WITH TEAM WHEN PUBLISHED.** '23 EDITION LINK = <https://eps.ieee.org/technology/heterogeneous-integration-roadmap/2023-edition.html>
- 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 12/15/23 FOR TEAM REVIEW.**
- 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).**
- 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

(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.
- Roberto – we should consider putting together an updated white paper, esp. application focused, with lots of new EHC members, leverage EnerHarv?
- 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 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,
28th Mar 2024.