



# **EnerHarv 2018**



## ***Opening Remarks***

**The Ecosystem: A Global Perspective**

***Mike Hayes, Tyndall National Institute***

**The Ingredients of an Ecosystem**

***Brian Zahnstecher, PowerRox***



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## ***The problem (& the opportunity):-***

- How do we 'self-power' 1 trillion IoT devices?

## ***The solution:-***

- Create an ECOSYSTEM to 'power the internet of things'

***A community of experts to collaboratively develop next generation energy harvesting, energy storage, micro-power management solutions***

- ✓ Share knowledge and best practices, define roadmaps
  - ✓ Foster collaborations and identify synergies
  - ✓ Efficiently use ambient energies where available
  - ✓ Reduce power consumption of IoT devices to minimize component and battery size
- Looking at our ecosystem from different angles.....



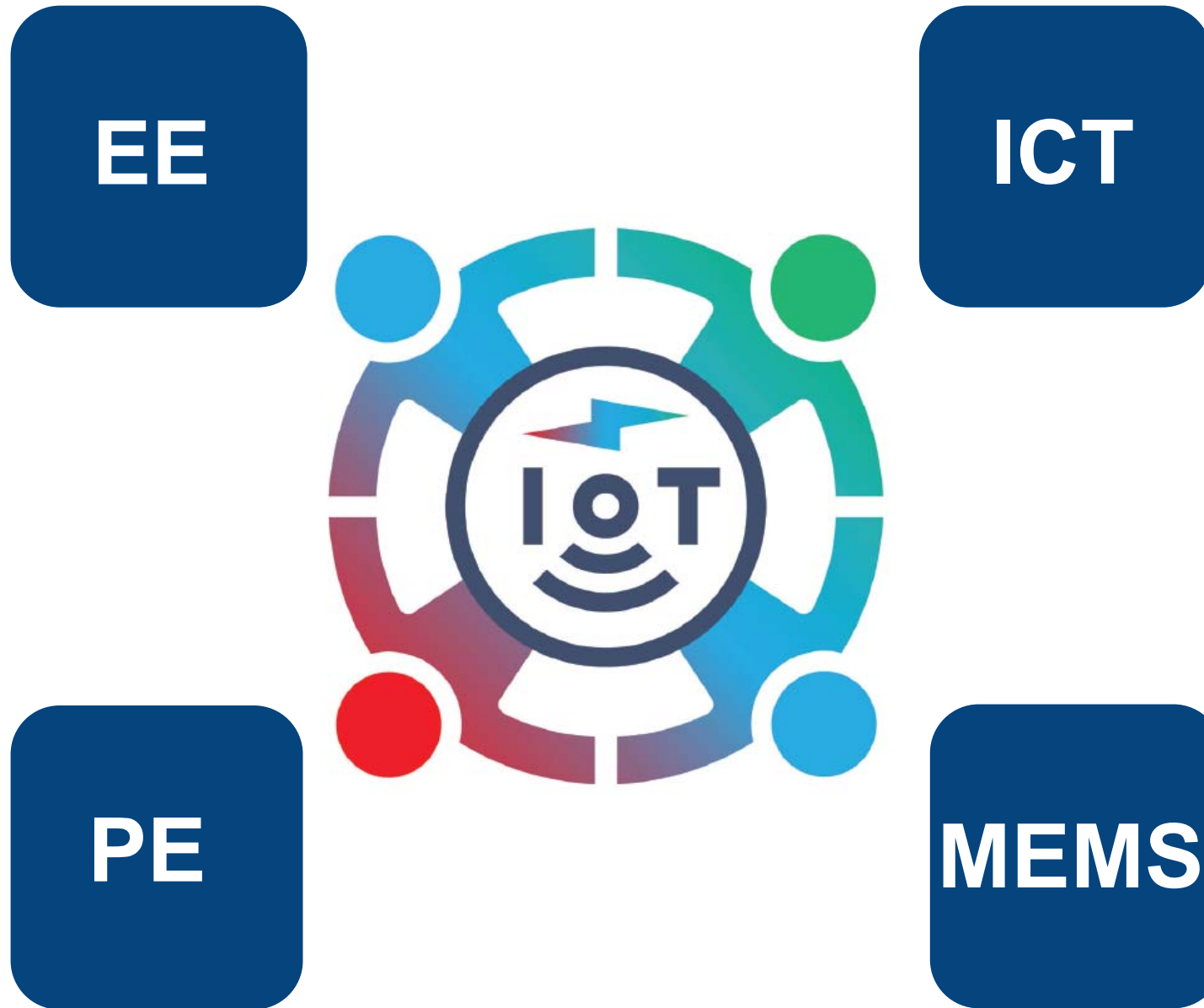
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An **Ecosystem** of Energy Harvesting/Power Management Related Technologies



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An **Ecosystem** of Enabling Technologies



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**Developers**



**Integrators**



**Suppliers**



**Users**



An **Ecosystem** of Stakeholders



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## ***Strategy***

- Use the ecosystem to break silos and get stakeholders to design, develop & integrate optimally for the end system application
- Leverage from Tyndall, PSMA & related ecosystems (technology, expertise, networks, projects, influence....)
- Follow the PwrSoC model

## ***Motivation and Impact***

- Making the world more energy and resource efficient
- Connecting people, equipment, infrastructure to improve health, safety, wellbeing, reliability



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## ***“The Ingredients of an Ecosystem”***

- **Curiosity → Interest → Initiative → Drive Change**
- **Turning Skepticism Into Awareness & Excitement**
  - Common Misperceptions
    - Negligible Power, Academic / Lab Experiment, No Production, Too Expensive
- **Ambition + PSMA Energy Harvesting Committee = “EH Soulmates”**
  - **YEAR 1:** Growth from 10 to 30 People, Particularly from Industry
  - **YEAR 2+:** 2 APEC Industry Sessions, 3 Webinars, & 1 Technology Roadmap later...**HERE WE ARE!**
- **There is a Palpable Shift Out There**
  - Skepticism → Cautious Optimism → Support Requests for Real IoT Applications
- **Marketing Friends Created the Hype and Identified the Major Opportunities**
  - IIoT, Wireless Sensor Networks (WSN), Conditional Monitoring, Factory Automation, Autonomous Vehicles, Smart Medical Devices, etc.
- **Now is the Critical Juncture**
- **Technologists Have the Vision to Make the Ecosystem a Reality**



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- **The world's best and brightest minds in energy harvesting are gathered here in an unprecedented fashion (neither purely commercial nor academic).**
- **Industry & Academia, enablers of the ecosystem sitting at a very unique event that aspires to build the **CRITICAL** synergies that are lacking today.**
- **The program for this workshop was carefully crafted to...**
  - ...give a comprehensive overview of what is out there.
  - ...encourage you to broaden your perspective of what are 'energy harvesting' related technologies and applications.
  - ...outline benefits.
  - ...outline how we can all work together here to cultivate relationships and collaborations into a mature, energy harvesting ecosystem.
- **IoT, IIoT, EH, and 5G...the perfect storm of technologies, financial backing, technical infrastructure, and marketing/consumer interest.**
  - It is our jobs to recognize this golden opportunity and work together to convert optimism to reality.
- **My Challenge to You**
  - Continue to challenge me to help enable you to bring these optimistic projections into tangible realities.





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**Thank you!**

**Enjoy EnerHarv &  
Welcome to Our Ecosystem!!!**

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