co-located events:

- SUPERCAPACITORS EUROPE
- PRINTED ELECTRONICS EUROPE 2013

17-18 April 2013 | ICC Berlin, Germany
16 & 17 April | Masterclasses and Company Visits

- Conference
- Tradeshow
- Masterclasses
- Company Visits

Highlighting:

- Building Integration: The vertical with the biggest deployment of Energy Harvesting and WSN
- Device and Technology Innovation
- Supercapacitors: The future of energy storage

Sponsors Include:

- General Electric
- Shell
- OSRAM
- CONEX
- GE
- CONEX
- ABB
- WiTricity
- idom
- PHILIPS
- SHARP
- kieback & peter
- Hutchinson

Gold Sponsor: Linea Technologies
Other Sponsors: SGS, Almawave, Algra, ST

www.IDTechEx.com/ehEurope
www.IDTechEx.com/supercapsEU
Access all the key technologies and their opportunities in ONE location

Welcome to the IDTechEx Energy Harvesting & Storage and Wireless Sensor Networks & RTLS Europe events, now in their 5th successful year. New for 2013 – co-located with Supercapacitors Europe and Printed Electronics Europe

This fifth annual IDTechEx event provides insight into energy harvesting technologies, case studies and markets ranging from consumer electronics and sensors all the way to vehicles, building and industrial automation.

The market for energy harvesters will grow from US$740 million in 2013 to a US$1.5 billion. Join us at the world’s largest event on the topic and learn from users and system integrators who will cover their experiences and needs first hand, including GE, Shell, Ceram and ABB. The event will bring all aspects of the topic together giving a complete overview of the current landscape. The topic of wireless sensor networks WSN is of course of particular interest, as energy harvesting and low power electronics represent in effect the most important enabling technologies that will help realise the paradigm shift that WSN implementations promise.

Presentations will encompass a wide range of harvesting technologies, including piezoelectric, photovoltaic and thermoelectric harvesting; technologies relating to WSN, active RFID and Real Time Locating Systems (RTLS) as well as the latest progress in wireless power transfer, energy storage and ultra low power electronics.

The Supercapacitors Europe sessions highlight another newly important technology with a blistering 30% compound market growth. Supercapacitors and their associated electronics are increasingly printed and they are enhancing or replacing rechargeable batteries, including the latest lithium-ion ones, because they last longer, are safer and perform better in many important respects. They are now key to several forms of energy harvesting and some supercapacitors are laminated and part of the newly favoured structural components and smart skins.

For the first time, this event is co-located with Printed Electronics Europe – covering devices such as displays and sensors which need power, and could benefit from energy harvesting. End users from consumer electronics, healthcare, transportation and retail will be in attendance as they seek to use these enabling technologies in their products. This co-location will broaden the opportunity to meet more customers and partners with more than 120 exhibitors and 1,600 delegates in attendance.

There really is something for everyone at our 2013 Europe show! As always, alongside the conference and tradeshow there will be optional master classes, visits to local centres of excellence and networking opportunities.

Event Timetable

<table>
<thead>
<tr>
<th>15 APRIL</th>
<th>17-18 APRIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>morning</td>
<td>morning</td>
</tr>
<tr>
<td>Lunch Break</td>
<td>Lunch Break</td>
</tr>
<tr>
<td>Super visits: INTRODUCTION TO PRINTED ELECTRONICS</td>
<td>Super visits: INTRODUCTION TO PRINTED ELECTRONICS</td>
</tr>
<tr>
<td>MC 1: Introduction to Printed Electronics</td>
<td>MC 5: Energy Storage: Batteries and Supercapacitors</td>
</tr>
<tr>
<td>MC 2: Introduction to Energy Harvesting</td>
<td>MC 6: Materials</td>
</tr>
<tr>
<td>MC 9: Creating New Products/End User’s Forum</td>
<td>MC 10: Awards</td>
</tr>
<tr>
<td>all day</td>
<td>all day</td>
</tr>
<tr>
<td>Premium Conference &amp; Trade show</td>
<td>Premium Conference &amp; Trade show</td>
</tr>
</tbody>
</table>

REGISTER AT www.IDTechEx.com/ehEurope
Welcome to the IDTechEx Energy Harvesting & Storage and Wireless Sensor Networks & RTLS Europe events, now in their 5th successful year. New for 2013 – co-located with Supercapacitors Europe and Printed Electronics Europe

This fifth annual IDTechEx event provides insight into energy harvesting technologies, case studies and markets ranging from consumer electronics and sensors all the way to vehicles, building and industrial automation.

The market for energy harvesters will grow from US$760 million in 2013 to a US$1.5 billion. Join us at the world’s largest event on the topic and learn from users and system integrators who will cover their experiences and needs first hand, including GE, Shell, Osram and ABB. The event will bring all aspects of the topic together giving a complete overview of the current landscape. The topic of wireless sensor networks (WSN) is of particular interest, as energy harvesting and low power electronics represent in effect the most important enabling technologies that will help realise the paradigm shift that WSN implementations promise.

Presentations will encompass a wide range of harvesting technologies, including piezoelectric, photovoltaic and thermoelectric harvesting; technologies relating to WSN, active RFID and Real Time Locating Systems (RTLS) as well as the latest progress in wireless power transfer, energy storage and ultra low power electronics.

The Supercapacitors Europe sessions highlight another newly important technology with a blistering 30% compound market growth. Supercapacitors and their associated electronics are increasingly printed and they are enhancing or replacing rechargeable batteries, including the latest lithium-ion ones, because they last longer, are safer and perform better in many important respects. They are now key to several forms of energy harvesting and some supercapacitors are laminar and part of the newly favoured structural components and smart skin.

For the first time, this event is co-located with Printed Electronics Europe – covering devices such as displays and sensors which need power, and could benefit from energy harvesting. End users from consumer electronics, healthcare, transportation and retail will be in attendance as they seek to use these enabling technologies in their products. This co-location will broaden the opportunity to meet more customers and partners with more than 120 exhibitors and 1,600 delegates in attendance.

There really is something for everyone at our 2013 Europe show! As always, alongside the conference and tradeshow there will be optional masterclasses, visits to local centres of excellence and networking opportunities.

Raghu Das
CEO, IDTechEx
This year’s Tradeshow will be like no other, as we co-locate for the first time with Printed Electronics, Supercapacitors and Graphene LIVE! Join 100+ exhibitors in the joint Tradeshow area at the ICC Berlin, with a dedicated Energy Harvesting & Storage/Wireless Sensor Networks & RTLS/Supercapacitors area.

Within this dedicated area you will have the opportunity to:

- Meet with manufacturers at the cutting edge of product development and innovation.
- Compare and evaluate all the different forms of energy harvesting: Piezoelectric, Thermoelectric and Photovoltaic.
- View and interact with new innovation and latest developments from exhibitors showing actual demos of energy harvesting in action.
- Understand how these developments can be applied to a range of vertical markets and provide solutions for your business.

Interested in exhibiting in the Tradeshow?
Email Ricky Purnell at: exhibit@IDTechEx.com for a quotation.
Oil and Gas
GE Energy, Germany
Dr Thomas Kafka / Field Application Engineer
"Wireless Sensor Deployments in Industrial Applications"

Shell, The Netherlands
Brian de Vuijst / Frontier Automation Engineer
"Oil and Gas Aseal Integrity Monitoring"

Building Automation and Efficiency
OSRAM GmbH, Germany
Oliver Prietze / Senior Director
"Energy-efficient Lighting Solutions Including Intelligent Lighting Control"

Kieback&Peter, Germany
Hans Symanczik / Sales & Marketing Manager
"The Development of Thermoelectric Powered Radiator Valve"

STMicroelectronics GmbH, Germany
Yvon Gourdou, EMEA MMS, Application and Marketing Manager
"Low Cost NFC / RFID Link with Energy Harvesting in Factory Automation, Building and Health Applications."

HORATIO GmbH, Germany
Martin Immke / CEO
"Energy Harvesting and Access Control"

IDTechEx, UK
Dr Harry Zervos / Senior Technology Analyst
"Energy Harvesting and Wireless Sensors: Solutions for Building Automation and Civil Infrastructure"

Nanyang Technological University, Singapore
Dr Yen Kheng Tan / Research Scientist
"Energy Harvesting Research for Sustainable Smart Wireless Systems in Built Environments"

EnOcean Alliance, Germany
Frank Schmidt / CTO and Founder
"Long Range Energy Harvesting Radio Sensors for Outdoor Applications"

Connode, Sweden
Michael Westberg / Head of Sales and Marketing
"Using Radio in Large-scale Smart Metering Today and Tomorrow- the Practical Experience from Scandinavia and the Ongoing Transition into Full IPv6 Internet of Things"

Optixtal, USA
Dr Sagar Venkateswaran / President
"Introducing the GreenPatch®: A Flexible Integrated Device to Sense, Advise and Actuate Lighting and HVAC Controls to Reduce Building Energy Use"

Wireless Power Transfer
Nissha Europe GmbH, UK
Yoshhiro Nii / Delegator
"Applying Printing Technologies to Wireless Charging Systems"

WiTricity Corporation, USA
David Schatz / Director of Business Development
"Advances in Wireless Power Transfer Over Distance"

Transportation
University of Freiburg – IMTEK, Germany
Dr Michael Kroener / Group Manager
"Micro Energy Harvesting in Traffic Infrastructure, and as a Chance in Automobile Applications"

Industrial Process Control
ABB, Germany
Dr Kai Koenig / Scientist
"WiTemp Wireless Temperature Transmitter for Process Industry Applications Powered by Thermoelectric Energy Harvesting - Trial Results"

University of Applied Sciences Aschaffenburg, Germany
Ralf Zentgraf / Project Engineer
Eugen Hoerner / Doctoral Student
"Practical Studies of Harvesting Technologies and Data Transmission in Industrial Environments"

Energy-Autonomous Wireless Sensors
CSEM (Centre Suisse d’Electronique et de Microtechnique) SA, Switzerland
Dr Philippe Dallernagne / Project Leader
"Energy-autonomous Wireless Sensor Networks for Critical Applications"

Piezoelectric Energy Harvesting
ALGRA, Switzerland
Sven Mumenthaler / Head of R&D
"Dynapic® Wireless - The Button for a Lifetime"

EnerBee, France
Professor Jérôme Delamare / Researcher, CNRS
Orphée Cugat / Senior Scientist, CNRS
"Ultra-slow Movement Piezo-magnetic Harvesting"

Italian Institute of Technology, Italy
Dr Giancarlo Canavese / Researcher
"Micro and Nano-structured Piezoelectric Materials for Energy Harvesting Applications"

Fraunhofer IPMS, Germany
Dr Ralf Hildebrandt / Researcher
"A Smart UHF RFID Sensor System for High-Temperature Measurements in Switchgears"

GENESI, The Netherlands
Dr Nirvana Meratnia / Assistant Professor
"Green Sensor Networks for Structural Health Monitoring"

AlertMe.com Ltd., UK
Pilgrim Beart, Founder Director
"Humans Don’t Scale: Bootstrapping the Internet of Things"

Linear Technology / Dust Networks Product Group, USA
Joy Weiss, President
"Ultra Low Power, Highly Reliable Wireless Sensor Networks."

Batteries - New Breakthroughs
CEA-LETI, France
Dr Oisain Despesse / Researcher
"Battery Monitoring System Using Switching Battery Cells"

Saft Batteries, France
Wayne Pitt / New Business Development Manager
"Energy Sources and Storage for Sensor Applications"

RF Energy Harvesting
Vectron International, USA
Dr Sabah Sabah / Product Marketing Manager
"Passive (battery-less) Wireless Surface Acoustic Wave Thermometer"

Over 50 speakers
Assessing the merits of technology developments from world leading organisations and research institutes.
Stretchable and Textile Electronics

Ohmatex ApS, Denmark
Christian Dalsgaard / Founder
“Harvesting and Storing Solar Energy in Fibre Form”

Philips Research, The Netherlands
Dr Konigunde Cherenack / Human Interaction & Experiences Dept
“Intelligent Textiles: Bridging the Gap from Technology Development to Product Manufacturing”

The Hong Kong Polytechnic University, China
Prof Xiaoming Tao / Chair Professor of Textile Technology
“Soft Fabric Strain and Pressure, Sensors and Applications”

University of Southampton, UK
Dr Steve Beebey / Reader
“Screen Printing for Energy Harvesting: from Aeronautical to Textile Applications”

Auckland Bioengineering Institute, New Zealand
Dr Thomas McKay / Research Fellow
“A Walk Towards Wearable Energy Harvesters”

Ultra Low Power Electronics

Microsemi, USA
Reghu Rajan / Technical Marketing Manager
“Medical Wireless Sensors and Energy Harvesting from Human Body”

Canova Tech, Italy
Dr Alessandro Ingrassia / General Manager

Wroclaw University of Technology, Poland
Dr Daniel Lewandowski / Researcher
“Electro Power and Digital Data Interface through Ultrasonic Vibrations using Magnetostriective Actuators and Harvesters.”

Idom, Spain
Eduardo Diaz Marcelo / Telecommunication Engineer
“Towards Smart Viticulture: a Decision Support System for Optimizing Pesticide use in Vineyards Based on WSN”

Bi-Stable Displays

Philips Corporate Technologies, The Netherlands
Dr Kars-Michiel H Lenssen / Director / Principal Scientist
“Bright Zero-Energy e-Skin”

Solar Harvesting

Sonnenrepublik, Germany
Dr Oliver Lang / Director
“Novel Solar Based Modular Device Platform „Clicc“ for Energy Harvesting Applications”

New Applications

LAAS-CNRS, France
Prof Jean-Marie Dihla / “Supercapacitors for Battery-free Wireless Sensor Networks Deployed in Airliners”

IDTechEx, UK
Franco Gonzalez / Technology Analyst
“Supercapacitors Replace Batteries”

Cap-XX, Australia
Anthony Kongats / CEO
“Supercapacitors in Micro-Hybrid Vehicles Improve Performance and Reduce Battery Size and Cost”

Skeleton Technologies, Estonia
Taavi Madiberk / Chief Executive Officer
“Supercapacitors and Customer Requirements: Shift in Farad-driven Paradigm”

Safety

HEL Ltd, UK
Jasbir Singh / Founder and Managing Director
“Thermal Management Data for Supercapacitors and Batteries, to Avoid Thermal Runaway”

Hutchinson GmbH, Germany
Michael Müssler / Team Leader Product Management High Pressure
Dr David Ayme-Perrot, E-Green Project Manager
“Safer Supercapacitors for Automotive Applications”

Improving Performance

Fraunhofer IPA, Germany
Ivica Kolaric / “Graphene and Carbon Nanotube Supercapacitors”

Market Analysis

IDTechEx, UK
Reghu Das / CEO
“Lessons, Profitability and What is Coming Next”

TRW Conekt, UK
Roger Hazelden / Technology Leader Sensors & Optoelectronics
“Hype versus Reality: What Makes an Energy Harvesting Device Genuinely Useful in the Real World?”

Sentec Ltd, UK
Edward Taylor / Technology Developer
“Finding Energy Harvesting Applications and Getting Them to Market”

Clean Capital, UK
Stephan Decher / Partner
“Venture Financing for Technology Companies”

NEW SUPERCAPACITORS

Market

Cap-XX, Australia
Anthony Kongats / CEO
“Present and Future Markets for Thin, Prismatic Supercapacitors and Supercabatteries”

IDTechEx, UK
Dr Peter Harrop, Chairman
“Markets for Supercapacitors 2013-2023”
The 14 optional expert-led masterclasses are interactive consultancy sessions. At each masterclass you will have the chance to handle many samples, and take away printed copies of presentations. They will ensure you get the most from the conference and leave with answers to your questions.

**16 April - Morning**

**MASTERCLASS 1**
Introduction to Printed Electronics
This masterclass will arm you with the latest knowledge of the applications and technology developments involving printed electronics. Led by experts, it is the ideal time to voice your questions as part of the interactive session and learn of the technologies that are available and emerging.

**MASTERCLASS 2**
Introduction to Energy Harvesting
Energy harvesting is the generation of electricity from the environment, which can be used to power electronic and electric devices. Different technologies can be employed depending on the energy source. This masterclass covers all the technologies involved, how they work, and appraisal of their strengths and weaknesses, relative costs and development paths. Case studies and paybacks are referenced.

**MASTERCLASS 3**
Printing Technologies for Electronic Applications
This masterclass assesses the range of printing and non printing manufacturing and handling options for the new printed, organic and flexible electronics.

**MASTERCLASS 4**
Electric Vehicles: Markets, Opportunities, Energy Storage and Infrastructure
This masterclass addresses the latest progress with electric vehicles and includes the relevance of small and mid scale energy harvesters and storage with vehicles. Commercial and academic activities are covered as are the impediments and opportunities.

**16 April - Afternoon**

**MASTERCLASS 5**
Energy Storage: Batteries and Supercapacitors
This masterclass assesses the options for energy storage, looking at the range of batteries, their relative strengths, weaknesses, costs and roadmaps.

**MASTERCLASS 6**
Materials
The new electronics world uses many materials including organic semiconductors, inorganic semiconductors, metallic conductors, nanoparticles, nanotubes, conductive organic materials, dielectrics and more. This technical masterclass looks at the full range of these different materials, comparing for each one the available chemistries, performance, cost, printability, lifetime, suppliers, applications and multiple other parameters.

**MASTERCLASS 7**
Printed Electronics - Materials & Technologies (German)
The new electronics world of printed electronics can utilize any solution-based material including organic semiconductors, inorganic semiconductors, metallic conductors, nanoparticles, nanotubes and more. This technical masterclass looks at the full range of these different materials, comparing for each one the available chemistries, performance, cost, printability, lifetime and multiple other parameters. The impact of using different print techniques (inkjet, gravure, etc) and substrates (paper, plastic, glass, etc) are also considered from the materials perspective.

**MASTERCLASS 8**
Wireless Sensor Networks, Real Time Locating Systems, and RFID
This masterclass covers the technology and markets for Active RFID in all its forms, and where they are going over the next ten years. It addresses: different types of Active RFID system, their cost structure and advantages and disadvantages for each choice; traditional Active RFID, RFID enabled cellphones, Smart Active Labels/ Battery Assisted Passive tags, Real Time Locating Systems (RTLS) and Wireless/ Ubiquitous Sensor Networks (USN): technology choices, markets, and standards.

**MASTERCLASS 9**
Creating New Products / End Users Forum
This class will feature early adopters and successful suppliers and will cover: how lack of creativity is holding the market back, key vertical industries and how they could benefit from the technology, and the strategy your company should look at to go to market and assessment of timelines to market.

Visit our website for complete masterclass information: [www.IDTechEx.com/EH/masterclass](http://www.IDTechEx.com/EH/masterclass)

**See the direct result of your sweat and toil.**
A USA chain of gyms is already powering its facilities through electricity generated by the static bikes used by its members. That’s energy harvesting in action!
Register for a two day pass and you will have access to ALL co-located events and the tradeshow area. For online discounts and further information go to: www.IDTechEx.com/EH

19 April - Morning

MASTERCLASS 10
Graphene and Carbon Nanotubes - Science, Technology and Markets
This masterclass will review the science, technology and markets for graphene and carbon nanotubes. For both materials, the following topics will be addressed: the overall electronics and mechanical properties, the basic physics, manufacturing techniques, and assessment of target markets.

MASTERCLASS 11
Flexible Substrates, Transparent Conductors & Barriers for Flexible Electronics
This technical Masterclass explains the needs, the options and the future trends for the chemical structure and processing of flexible materials that are required to enable flexible electronics. In particular, it will look at flexible substrates, barrier films, and transparent conductive films for displays, lighting, PV, touchscreens, logic and sensors.

19 April - Afternoon

MASTERCLASS 12
Thin Film Photovoltaics: Principles, Technologies, Markets
This masterclass is designed to give an overall picture of photovoltaic technologies, from basic principles all the way to current advances, in addition to commercial trends and considerations and forecasts.

MASTERCLASS 13
Displays & Lighting
Displays will be one of the largest market segments in printed and organic electronics. OLEDs, electroluminescent, electrophoretic, and electrochromic displays with unique benefits are being commercially used now. Conventional lighting is being replaced with lighting that is laminar and flexible. This masterclass will guide you through the full range of technologies, market opportunities and challenges and issues to be resolved.

MASTERCLASS 14
RFID and Its Progress Towards Being Printed
This masterclass covers the technology and markets for Active RFID in all its forms, and where they are going over the next ten years.

16 & 19 APRIL, 2013

Company Visits

INNOZ
Founded in 2005, the InnoZ specialises in qualitative and quantitative analyses of transport, mobility and related areas. They generate a wide range of methodologically sound market and environmental analyses and forecasts covering the complex interactions between mobility and changing societies. Working closely with decision makers from businesses as well as politics and public administrations, they develop innovative solutions within the field of mobility.

PVCOMB
PVcomB is a new center for technology transfer in Thin-Film-Photovoltaics, founded by the Helmholtz-Zentrum Berlin (HZB), Technische Universität Berlin, and the University of Applied Sciences Berlin. PVcomB’s main goal is to support world-wide growth of thin-film photovoltaic technologies. In a baseline process, two dedicated research-lines produce thin-film PV modules with an area of 30 x 30 cm2 (Si and CIGS).

PVcomB has created a unique PV-cluster in Berlin-Adlershof, supported by many of the important international photovoltaic companies. In 2009, PVcomB was awarded a 15 million € grant from the federal government and the State of Berlin.

17 APRIL, 2013

Awards Categories 2013

The IDTechEx Awards recognise company development and success in all energy harvesting technologies and applications including the pertinent wireless sensor networks and real time locating systems (RTLS) fields. The awards will be presented in the keynote sessions on 17 April.

To enter your company for an award please visit: www.IDTechEx.com/EH/awards

CATEGORIES ARE:

- Best Technology Development of Energy Harvesting
- Best Application of Energy Harvesting
- Best Application of WSN
- Best Poster Session
Opportunities
Europe uses 25% of the world’s supercapacitors but has only 6% of the world’s supercapacitor manufacturers. The market is rocketing up at 30% compound – just look at the company results. Learn more at this event.

Market trends and forecasts
We have passed into a period where electrical engineering applications have become more important than electronic ones. In 2013, 51% of the value market for supercapacitors and supercabatteries will be electrical engineering, this figure rising to 61% in 2023. More market trends and forecasts will be heard.

Technology and application innovation
Find out the latest developments - Improved aqueous electrolytes replacing flammable, toxic ones with fewer penalties. Graphene electrodes are among the most promising ways of improving energy and power density – theoretically to lithium-ion battery levels and beyond. Flexible laminar film, cloth or paper construction will get supercapacitors in many more locations.

End user applications: Electric vehicles, transportation, mobile devices, industrial
Bridging the gap between capacitors and batteries, supercapacitors deliver high power and energy densities increasingly closer to rechargeable batteries. From instant flashlight power in mobile phones to instant acceleration power, fast charging and fast regenerative braking in electric vehicles to temporary energy sources in applications where immediate power availability may be difficult such as UPS systems. Hear how they are substituting and supplementing the functions of rechargeable batteries.

Why supercapacitors?
In comparison with rechargeable batteries they endure higher number of cycles, can be charged and discharged a hundred times faster and reach at least 20 years of useful life. Supercapacitors were almost always bought for better performance such as starting a truck at minus 40°C. They are very rarely bought because their upfront price is attractive compared to alternatives but they increasingly give lower cost-over-life of a system, less maintenance and more reliability. Through the coming decade, up-front costs and energy density will be ever more competitive, opening up many new applications.