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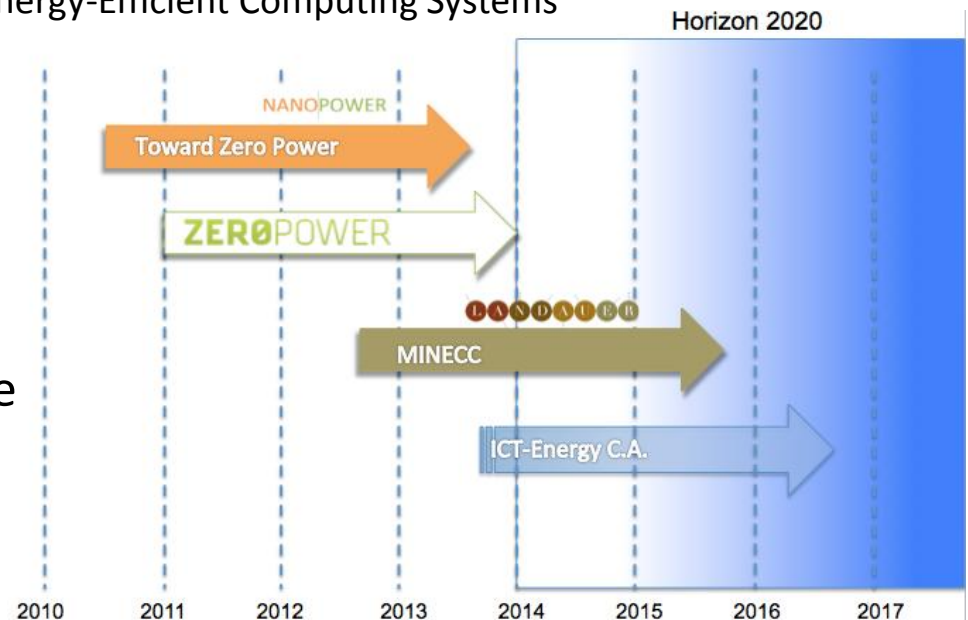
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## We worked to bring together a wide scientific community interested in addressing these issues.

- **Jan. 2008**, Expert Consult. on “Molecular-scale Information Systems”
- **July 2009**, **FP7 CALL 5**, ICT-2009-5 - ICT 2009.8.6 Towards Zero-Power ICT
- **Feb. 2010**, Expert Consult on "Disruptive Solutions for Energy Efficient ICT”
- **1<sup>st</sup> Aug. 2010**, three project started (SiNAPS, GREEN SILICON, NANOPOWER)
- **1<sup>st</sup> Jan. 2011**, ZEROPOWER C.A. started
- **26<sup>th</sup> July 2011**, **FP7 CALL 8**, ICT 9.8 FET Proactive:MINECC
- **12<sup>th</sup> Oct. 2011**, FET Proactive Information Day (MINECC) – Brussels
- **1<sup>st</sup> Sept. 2012**, Starting of the 7 MINEC funded projects (Landauer, ...)
- **1<sup>st</sup> Oct. 2013**, Starting of the ICT-Energy C.A. (10 partners)
- **27<sup>th</sup> Nov. 2014**, HiPEAC –EC Consultation on “Energy-Efficient Computing Systems”

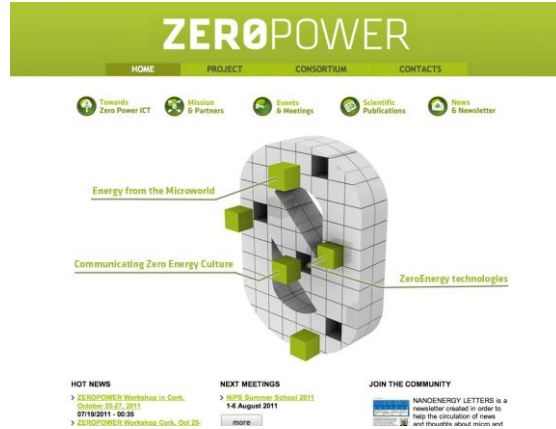


This is part of an on-going effort at European level within the FET scheme



# The Coordination Action

[www.zero-power.eu](http://www.zero-power.eu)



• **NiPS Laboratory**, Università di Perugia (Italy)

<http://www.nipslab.org>

project **Nanopower** [www.nanopwr.eu](http://www.nanopwr.eu)

• **Tyndall National Institute**, University College Cork (Ireland)

<http://www.tyndall.ie/>

project **SiNAPS** <http://www.sinaps-fet.eu/index.html>

• **Universitat Autònoma de Barcelona** (Spain)

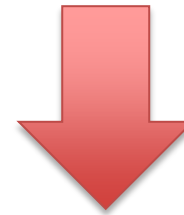
[www.uab.cat/departament/enginyeria-electronica/](http://www.uab.cat/departament/enginyeria-electronica/)

**NANERG LAB** <http://grupsderecerca.uab.cat/nanerglab/>

• **University of Glasgow** (United Kingdom)

<http://www.gla.ac.uk/departments/electronicseletricalengineering/>

project **GREEN Silicon** <http://www.greensilicon.eu/GREENSilicon/index.html>








[www.ict-energy.eu](http://www.ict-energy.eu)

To bring together the existing "Toward Zero-Power ICT" community organized within the ZEROPOWER C.A. and the novel "MINECC" (Minimising energy consumption of computing to the limit) community



## ICT-Energy consortium/community

Partner	Group	Project
UNIVERSITY OF PERUGIA COORDINATOR		
ROSKILDE UNIVERSITET		
RUPRECHT-KARLS-UNIVERSITAET HEIDELBERG		
BARCELONA SUPERCOMPUTING CENTER - CENTRO NACIONAL DE SUPERCOMPUTACION		
ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE	  	

Partner	Group	Project
AALBORG UNIVERSITET		SENSATION
HITACHI EUROPE LIMITED		TOLOP
UNIVERSITY OF BRISTOL		EACO
UNIVERSITY OF GLASGOW		GREEN SILICON
UNIVERSITY COLLEGE CORK		MANPOWER, SiNAPS SQWIRE, PowerSWIPE DEEPEN

# The MINECC call was successful and 7 project have been funded

- ✓ **LANDAUER** – Operating ICT basic switches below the Landauer limit
- ✓ **ENTRA** – Whole-Systems Energy Transparency
- ✓ **EXA2GREEN** – Energy-Aware Sustainable Computing on Future Technology – Paving the road to Exascale Computing
- ✓ **PARADIME** – Parallel Distributed Infrastructure for Minimization of Energy
- ✓ **PHIDIAS** – Ultra-Low-Power Holistic Design for Smart Biosignals Computing Platforms
- ✓ **SENSATION** – Self Energy-Supporting Autonomous Computation
- ✓ **TOLOP** – Toward Low Power ICT



Energy required to operate  
computing devices

They both sit on a common scientific ground:

## Micro and nano scale **energy management**

Energy available from  
the environment



“battery-free” devices

## The coordination activity is aimed at:

- ✓ assessing the impact of the research efforts developed in the groups involved in the different consortia
- ✓ proposing measures to increase the visibility of ICT-Energy related initiatives to
  - the scientific community
  - targeted industries
  - to the public at large through exchange of information, dedicated networking events, science books and media campaigns.
- ✓ inspiring more research projects in this emerging area
- ✓ facilitating broader interaction and feedback among the consortia members and stakeholders
- ✓ realizing a benchmarking system, i.e. a set of tools and prescriptions that will be used to compare the efficiencies of different ICT devices

# Free/open Vibrations database

<http://realvibrations.nipslab.org>

The screenshot shows the homepage of the Real Vibrations database. At the top, there is a green header with the site name 'Real Vibrations' and a navigation menu with links for Home, Signals, DAQ Kits, Info, Policy, and Contacts. Below the header is a search bar. The main content area is divided into several sections: 'Get Full Access!', 'User login' with fields for Username and Password, and a 'Log in' button. There are also links for 'Create new account' and 'Request new password'. The 'Latest Signals' section features four small plots labeled Tredici, Dodici, Undici, and Zzz. A 'Popular Tags' section lists 'Bridge', 'Car', 'Diesel', 'door', 'Focus', 'Ford', 'machine', 'Man', 'Note', 'road', and 'seat'. The main text area contains sections for 'Home' (welcome message), 'What is Real Vibrations?' (description of the database), 'What are these data for?' (application of vibration data), and 'How to take part in the project?' (instructions for scientists, students, and volunteers). An image of a hand holding a vibrating glass is shown with the caption 'There's a vibrating world around us'. At the bottom, there is a photo credit and a copyright notice.

More than 500 records of:

- Aquarium
- Air conditioner
- **Aircraft**
- Bathroom tap
- Bath tub
- **Bridge**
- **Bicycle**
- **Bus**
- **Car**
- Cell Phone
- Copier
- Flush toilet

...







Home | ICT-Energy

www.ict-energy.eu

Home Project Consortium News Events Publications Contacts Login

# ICTenergy

SEARCH

## Prof. Luca Gammaitoni invited at the "FET and Innovation" workshop



### Welcome to the ICT-Energy project website!

The goal of the project is to create a coordination activity among consortia involved in the ICT-Energy field with specific reference to bringing together the existing "Toward Zero-Power ICT" community organized within the ZEROPOWER project and the novel "MINECC" (Minimising energy consumption of computing to the limit) community recently funded under the FET Proactive Call 8 (FP7-ICT-2011-8) Objective 9.8. The coordination activity is aimed at assessing the impact of the research efforts developed in the groups involved in the different consortia and proposing measures to increase the visibility of ICT-Energy related initiatives to the scientific community, targeted industries and to the public at large through exchange of information, dedicated networking events and media campaigns.

Please visit the website to stay informed on our news and initiatives. We hope you find the information in this website interesting and stimulating. If you want to know more about the project or its topic, please do not hesitate to contact us.

### ICT-ENERGY SUMMER SCHOOL

ICT-Energy: Energy management at micro and nanoscales for future ICT  
Perugia (Italy) - July 14-18, 2014

### ICT-ENERGY LETTERS

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#### ICT-ENERGY Letters

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## Welcome



ICT-ENERGY LETTERS is a newsletter created in order to help the circulation of news and thoughts about micro and nano energies.

But... what are micro and nano energies?

With these terms we intend to address the many different tiny energies present in micro and nanoscale physical systems. The role of micro-energies, indeed is more and more frequently evoked in fields as diverse as nano-electronics, computer science, micro-robotics, wireless telecommunications and it is believed that in general they could play a role in powering the future generations of Information and Communication Technology (ICT) devices. In this newsletter we would like to discuss about these energies, about their role and potential applications together with the physical foundation of this discipline. This newsletter is open to the contribution of all the interested readers and is specially aimed at reaching those readers involved in industry and innovative SMEs as an humble attempt to bridge the gap between Academia and Industry.

Please feel free to send us your comments and/or contribution for future issues, by addressing a message to: [submission@ict-energyletters.eu](mailto:submission@ict-energyletters.eu)

ICT-ENERGY Letters acknowledges the financial support of the [Future and Emerging Technologies \(FET\)](#) programme within the [ICT theme](#) of the [Seventh Framework Programme for Research](#) of the European Commission.



# Micro-Energy day

<http://www.microenergyday.eu>

This initiative aims at spreading the initiative through Europe as an opportunity to increase awareness among the specialist and also among the general public of the role of energy consumed by small electronic devices.

During this day the ICT-Energy partners will organize science communication events in their locations.





# Educational activities

**2010**



**2011**

Summer School "Energy Harvesting at micro and nanoscale"  
Workshop "Energy management at micro and nanoscale"  
Perugia (IT), Aug. 1-6, 2011



**2012**



**2013**

**Summer School "Energy management at micro and nanoscales"**  
Perugia (IT), July 8-10, 2013



**2014**

**Summer School ICT-Energy**  
Perugia 14-18 July 2014

**2015**

**NiPS Summer School**  
**"ICT-Energy: energy consumption in future ICT devices"**  
Fiuggi, Italy – July 7-12, 2015

[www.nipslab.org/summerschool2015](http://www.nipslab.org/summerschool2015)



# To know more...

## Save the dates

- **Micro-Energy Day**, June 20<sup>th</sup>, 2015
- **NiPS Summer school**: Fiuggi, Italy, July 7-11, 2015  
([www.nipslab.org/summerschool](http://www.nipslab.org/summerschool))
- **ICT-Energy Academia-Industry Clustering/  
Networking workshop**, Bristol, UK, Sept. 14-16, 2015
  - Sept- 14<sup>th</sup>, One-day training course
  - Sept. 15-16, Workshop research/industry



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