



2nd Workshop
**Energy for
Sustainable
Science**
at Research Infrastructures

CERN, 23-25 October 2013



2nd Workshop on Energy for Sustainable Science at Research Infrastructures



CERN, the European Organization for Nuclear Research, ERF, the European Association of National Research Facilities, and ESS, the European Spallation Source organize the second Workshop on Energy for Sustainable Science at Research Infrastructures.

The workshop gathers international experts on energy and representatives from laboratories and future projects worldwide to identify the challenges and best practices in energy efficiency and optimization. Potential technical solutions and tools for effective collaboration will be reviewed.

Organizing Committees

International Organizing Committee

Mike Ashworth (STFC)
Frédéric Bordry (CERN)
Frank Lehner (DESY)
Carlo Rizzuto (ERF)
Thomas Parker (ESS)

Local Organizing Committee, CERN

Giovanni Anelli
Frédéric Bordry (Chairman)
Helfried Burckhart
Jean-Paul Burnet
Fritz Caspers
Matteo Castoldi
Enrico Chesta
Serge Claudet
Vincent Dore
François Duval
Marina Giampietro
Friedrich Haug
Tjitske Kehrer
Philippe Lebrun
Mauro Nonis

Organisation:

Tjitske Kehrer

Evelyne Delucinge

Industrial Exhibition:

Matteo Castoldi

[CERN](#) (The European Organization for Nuclear Research) will host from 23-25 October 2013, in collaboration with [ERF](#) (The European Association of National Research Facilities) and [ESS](#) (The European Spallation Source), the 2nd Workshop on Energy for Sustainable Science at Research Infrastructures.

Volatile energy costs, a tight budget climate and increasing environmental concerns are all inciting large-scale research facilities across the globe to develop mid- and long-term strategies aimed at achieving for the future a reliable, affordable and sustainable energy supply that is carbon neutral.

The workshop will bring together international experts on energy and representatives from laboratories and future projects all over the world in order to identify the challenges and best practice in respect of energy efficiency and optimization, solutions and implementation as well as to review the challenges represented by potential future technical solutions and the tools for effective collaboration.

The first [Workshop](#) was held at Lund, Sweden, 13-14 October 2011.

Main themes

- Campus and building management
- Co-generation
- Computing energy management
- Energy efficiency of the facilities
- Energy management, quality, storage
- Energy management technologies developed in Research Facilities
- Waste heat recovery



Energy Management at Research Infrastructures

In this session representatives from various research laboratories from Europe, Americas and Asia are asked to present in overview talks their strategies, goals and institutional practice to advance environmental sustainability at their research facilities and research campus with particular emphasis on energy savings and energy efficiency measures.

Energy Efficiency, Energy recovery and Energy quality

Practical examples in different domains: computer centre, buildings, accelerators operation, waste energy...

Green Technologies developed at Research Infrastructures

What are the technologies which are developed at a RI and can be transferred in the domain of energy saving and renewable energy

Wednesday, 23 October 2013

11:00	--- Registration ---
14:00	Welcome Speech - Rolf Heuer (CERN)
14:15	ERF Welcome on behalf of ERF - Carlo Rizzuto (ERF)
14:30	Summary of the 1st Energy for Sustainable Science @ RI workshop - Thomas Parker (ESS)
14:45	Introduction of the 2nd Workshop - Frederick Bordry (CERN)
15:00	Plenary Talks - Frederick Bordry (CERN) (until 18:30) (Main Auditorium)
15:00	Renewable Energy in the present and in the future - Dolf Gielen (IRENA)
15:30	EU future strategies and policies - Andreea Strachinescu (EU Commission, Head of Unit New energy technologies, innovation, clean coal of DG Energy)
16:00	Energy management in Japan. Consequences for RIs - Masakazu Yoshioka (KEK)
16:30	--- Coffee break ---
17:00	Research, Education and Innovation Bundling Forces towards a Sustainable European Energy Future - Karl-Friedrich Ziegahn (Karlsruhe Institute of Technology, Chief Science Officer KIC InnoEnergy SE, Chairman of the Supervisory Board)
17:30	Sustaining networks: technologies and people towards new paradigms. - Florenzo Galli (National Museum of Science and Technology Milan)
18:00	Design and efficiency of Data Centres - Eshaan Farsimadan (Romonet)

Thursday, 24 October 2013

09:00	Energy Management at Research Infrastructures (1) - Parallel session A1 Serge Claudet (CERN) (until 10:30) (Main Auditorium)
09:00	Energy management at KEK, strategy on energy management, efficiency, sustainability - Atsuto Suzuki (KEK)
09:20	Energy management at Fermilab, strategy on energy management, efficiency, sustainability - Stephen Krstulovich (FNAL)
09:40	Energy management at BNL, strategy on energy management, efficiency, sustainability - Edward Murphy (BNL)
10:00	Energy management at DESY: strategy on energy management, efficiency, sustainability - Helmut Dosch (DESY)
10:30	--- Coffee break ---
11:00	Energy Management at Research Infrastructures (2) - Parallel session A2 Serge Claudet (CERN) (until 12:30) (Main Auditorium)
11:00	Energy management at CERN, strategy on energy management, efficiency, sustainability strategy - Helfried Burckhart (CERN)
11:20	Energy management at ESS, strategy on energy management, efficiency, sustainability strategy - Thomas Parker (European Spallation Source ESS AB)
11:40	Heat Recycling at PSI, a project to cover up to 75% of the campus's heat consumption - David Reinhard (PSI)
12:00	Energy management at GSI and FAIR, strategy on energy management, efficiency, sustainability strategy - Jan Lindenberg (GSI)
12:30	--- Lunch ---
14:00	Energy Efficiency in Computing Centres - Parallel session A3 MikeAshworth (STFC) (until 15:30) (Main Auditorium)
14:00	A Comprehensive Approach to Energy Efficiency in Data Centers for High-Performance Computing - Thomas C.Schultness (CSCS)
14:20	Exploiting mobile phone technology to build energy efficient supercomputers: the Mont Blanc project - Simon McIntosh-Smith (University of Bristol)
14:40	Roadmap towards Ultimately-Efficient Datacenters - Bruno Michel (IBM)
15:00	Energy Savings in CERN main Data Centre - Wayne Salter (CERN)
15:30	--- Coffee break ---
16:00	Energy Quality and Operation - Parallel session A4 Jens-Peter Jensen (DESY) (until 17:30) (Main Auditorium)
16:00	High temperature cooling of cryoplant and klystrons - JohnJurns (ESS)
16:20	Three years of operation of the Elettra tri-generation plant - Roberto Visintini (Elettra - Sincrotrone Trieste)
16:40	SMES usage and power grid applications at RIs - Hans-Joerg Eckholdt (DESY)
17:00	Advanced Simulation tools in support of the design of the Power System architecture of the European Spallation Source (ESS) - Antonello Monti (RWTH Aachen)
19:00	--- Workshop Buffet ---

Friday, 25 October 2013

09:00	Energy Efficiency Examples -Parallel session B1 Mike Seidel (PSI) (until 10:35) (Council Chamber)
09:00	Boosting accelerator electrical efficiency at the ESRF - Jean-François Boutelle (ESRF)
09:20	Valorization of low-grade waste heat - Felix Ziegler (TU Berlin)
09:40	From eV to TeV: the Green ILC - Denis Perret-Gallix (Centre National de la Recherche Scientifique (FR))
10:00	Use of electricity at high-field magnet laboratories - Geert Rikken (LNCFM)
10:30	--- Coffee break ---
11:00	Energy Efficiency at Research Infrastructures -Parallel session B2 MikeSeidel (PSI) (until 12:30) (Council Chamber)
11:00	Energy efficiency of particle accelerators - a network in the European program EUCARD-2 - Mike Seidel (PSI)
11:20	Cryogenic waste heat utilization for DESY and European XFEL - Jens-Peter Jensen (DESY)
11:40	Development of high-power IOTs as an efficient alternative to klystrons - Morten Jensen (ESS)
12:00	Energy reduction: example of a test facility upgrade with pulsed magnets instead of DC magnets, saving 90% of energy consumption - Konstantinos Papastergiou (CERN)
12:30	--- Lunch ---
14:00	Sustainable Campus Development and Management - Parallel session B3 Thomas Parker (European Spallation Source ESS AB) (until 15:30) (Council Chamber)
14:00	Sustainability on Campus: Overview, Implementation and Outlook - Oliver Opel (Leuphana University)
14:20	The Green Campus project at University of Copenhagen -Tomas Refslund Poulsen (University Copenhagen)
14:40	Experience In Implementing and installing co-generation and energy-saving schemes - Dr. Pittra (Studio Vio)
15:00	CERN campus: mapping of the building versus energy consumption and example of design and construction of a green building - Luigi Scibille (CERN)
15:30	--- Coffee break ---
16:00	Green Technologies developed at Research Infrastructures - Parallel session B4 Fritz Caspers (CERN) (until 17:30) (Council Chamber)
16:00	Superconducting Links for the LHC machine - Amalia Ballarino (CERN)
16:20	ORC process for reducing power consumption at the energy recovering electron cooler system for FAIR - Kurt Aulenbacher (Johanne University Mainz)
16:40	Development of new high slew-put and high energy-efficient supplies for J-Parc upgrade - Yoshinori Kurimoto (J-PARC)
17:00	The High Efficiency SRB Solar Thermal Collector: A by-product of CERN Accelerator Technologies - Cristoforo Benvenuti (SRB)

Friday, 25 October 2013

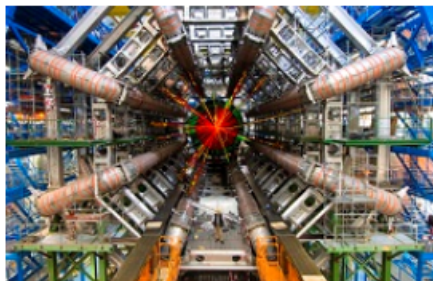
09:00	Plenary Talks - Carlo Rizzuto (ERF) (until 10:00) (Main Auditorium)
09:00	Sustainability and Energy Efficiency in the Automotive Sector - Dr. Georg Stephan Barfuss (Technische Hochschule Ingolstadt)
09:30	Use of cooling-temperature heat for sustainable food production - Anders Klesling (Swedish University of Agricultural Sciences)
10:00	Plenary Session - Carlo Rizzuto (ERF)(until 12:00) (Main Auditorium)
10:00	Report on parallel session A1 - A2 - Helfried Burckhart (CERN)
10:30	--- Coffee break ---
11:00	Report on parallel session B1 - B2 - Erica Lindström (ESS)
11:20	Report on parallel session A3 - Mike Ashworth (STFC)
11:30	Report on parallel session A4 - Roberto Visintini (ERF)
11:40	Report on parallel session B3 - Frederik Indebetou (ESS)
11:50	Report on parallel session B4 - Frithiof Jensen (ESS)
12:00	Joint conclusions (until 12:30) (Main Auditorium)

Buffet organized at the Globe of Science and Innovation on Thursday evening from 19h



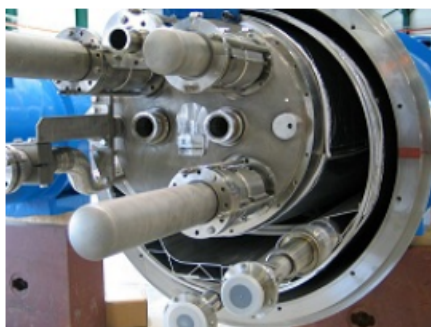
Visits

Possibility of visits on Friday afternoon (25th October): ATLAS; SM18; Computer Centre. Participants may select one visit point. The maximum number of visitors per point is limited.



ATLAS

ATLAS is one of the two big multi-purpose experiments at the Large Hadron Collider. The visit will include both the control room and the detector – a cylindrical structure of 45 m length and 25 m diameter situated some 90m underground and designed to reconstruct fully the collisions of protons with energy 7+7 TeV.



SM18

In order to reduce investment costs (compactness due to higher fields or gradients with great impact on civil engineering) and operating costs (energy efficiency) for large scale accelerators, superconducting magnets and accelerating cavities are considered as enabling technologies. Performance and quality of prototypes or series units have to be assessed. The **SM18** test facility is the place at CERN where these elements can be tested, with dedicated infrastructure for cryogenics, powering and measurements. You will be able to see this unique large scale infrastructure as well as some technology with real size internal parts of the superconducting magnets or accelerating cavities.



CERN computer centre

The **CERN computer centre** hosts 3.5MW of IT equipment in 3 large distinct rooms. 2/3 of the IT equipment in the Centre is air cooled by a legacy ventilation system that was recently optimised. The remaining equipment is cooled in modern water-cooled racks that were installed during the past years. During the visit, you will have the opportunity to see the computing rooms hosting the servers and the tape libraries and to discuss how the Computer Centre is operated and cooled down.



Industrial Exhibition

An industrial exhibition is organized during the workshop to encourage contacts and possible collaboration between industry and research infrastructures in the field of energy efficiency and optimization.

Exhibitors will showcase their best practices and latest technologies in CERN's "Salle des Pas Perdus".



BIOS IT



First plenary session

15:00 **Renewable Energy in the present and in the future**

Speaker: Mr. Dolf Gielen (International Renewable Energy Agency - IRENA)

15:30 **EU future strategies and policies**

Speaker: Andreea Strachinescu (EU Commission, Head of Unit New energy technologies, innovation, clean coal of DG Energy)

16:00 **Energy management in Japan. Consequences for RIs**

Speaker: Dr. Masakazu Yoshioka (KEK)

16:30 Coffee break 30' (61-1-201 - Pas perdus - Not a meeting room -)

17:00 **Research, Education and Innovation Bundling Forces towards a Sustainable European Energy Future**

Speaker: Dr. Karl-Friedrich Ziegahn (Karlsruhe Institute of Technology, Chief Science Officer KIC InnoEnergy SE, Chairman of the Supervisory Board)

17:30 **Sustaining networks: technologies and people towards new paradigms.**

Speaker: Prof. Fiorenzo Galli (National Museum of Science and Technology Milan)

18:00 **Design and efficiency of Data Centres**

Speaker: Dr. Ehsaan Farsimadan (Romonet)