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Editorial

Welcome to the first issue of the SENERES Newsletter. SENERES is the project founded in the frames of FP7 Capacities RegPot Programme. The main objective of the SENERES project is to reinforce and develop research and demonstration potential of the Institute of Power Engineering (Poland) and to set up the **Sustainable Energy Research and Development Centre SENERES** focused on high efficient low-carbon energy technologies: energy generation from biomass, clean coal technologies and fuel cells.

The SENERES Newsletter will be a source of periodical information about SENERES project activities. It will disseminate results of SENERES Centre research work and the Centre's development. It will also deliver the most important information about the development of research, events and possibilities of research funding in SENERES thematic area.



Institute of Power Engineering (Poland)

The Institute is the largest energy research institute in Poland currently hiring above 500 employees. It is a state owned R&D centre of commercial nature provided energy research since 1953. IEn includes Central Unit in Warsaw and branches in Gdańsk, Łódź, Białystok, Radom and Rzeszów. IEn carries out research and provides scientific support for the power industry and SMEs acting in the energy sector. Studies of combustion processes, biomass gasification, solid oxide fuel cells, thermal plants, power system planning, high voltage techniques, material technologies, electrical distribution equipment and air pollution control are performed. IEn provides research support regarding energy problems for agencies of the government and actively participates in activities of international organizations. The Institute is a member of the European Energy Research Alliance EERA Executive Committee.

SENERES Centre

The SENERES Centre was established on the basis of the most advanced, experienced and promising research units of the Institute of Power Engineering providing research in the area of energy thermal conversion and solid oxide fuel cells.

The SENERES Centre is composed of the following IEn's units:

- Thermal Processing Department
- Fuel Cells Laboratory
- Ceramics Department CEREL
- Energy Research Integration Centre CENERG

The Thermal Processing Department provides research in biomass and coal combustion, co-firing, gasification, oxy-combustion with CO₂ capture for electricity and heat production (also cogeneration). The Fuel Cells Laboratory carries out research in the area of Solid Oxide Fuel Cells (SOFC) technology. The Ceramics Department CEREL supports the Fuel Cells Laboratory in the research, development and optimization of SOFC ceramic layers.

The Energy Research Integration Centre CENERG is the IEn's unit destined for coordination and integration of the most promising energy research activities in the Institute on the international level. CENERG manages the SENERES project and provides the project secretariat.

SENERES Events

May 15-16, 2012, Warsaw, Poland

SENERES Workshop on energy generation from biomass and clean coal technologies - combustion and gasification problems

The first SENERES thematic Workshop will be organised on the 15th and 16th of May 2012 in the Institute of Power Engineering in Warsaw. Thematic scope of the workshop will cover the following issues:

1. Energy generation (centralized) from biomass with main focus on:

- corrosion, slagging and fouling
- ash quality
- fuel quality
- fuel upgrading

including aspects of R&D and commercialization strategies for new biomass-based technologies

2. Energy generation from biomass with the focus on:

- FB biomass gasification-based CHP
- product gas cleaning
- prime movers
- system efficiencies

3. Clean coal technologies (incl. CCS) with the focus on:

- corrosion, slagging and fouling
- NOx emissions

The workshop speakers will be prof. Jaap Kiel, dr Mariusz Cieplik, dr Lydia Fryda and dr Christiaan van der Meijden (ECN, Petten, The Netherlands).

April 2-3, 2012, Warsaw, Poland

SENERES Workshop on intellectual property protection and management in energy research

The two days SENERES training workshop on protection and management of Intellectual Property in the field of energy generation from biomass, clean coal technologies and fuel cells was held in the SENERES Centre of the Institute of Power Engineering.

The workshop has been organized within the frames of SENERES project realization. About 50 of IEn's researchers and research managers have participated in the event. The workshop speakers were high level experts in the area of IPR: Piotr Bednarek – lawyer of the consulting company AMBER as well Stanisław Rogoziński and Marcin Ciuk - IPR experts of the Wrocław Research Centre EIT+.

Researchers Recruitment

Call for Experienced Researcher - μ -CHP/SOFC systems

Institute of Power Engineering (IEn, Warsaw, Poland) has launched an international call for applications to fill a research and development position in the area of μ -CHP/SOFC systems development. All candidates with excellent R&D achievements record and leadership capabilities will be considered.

The experienced researcher will be employed in the FP7 project SENERES Sustainable Energy Research and Development Centre. The researcher will lead and guide team of young scientists and engineers developing the μ -CHP/SOFC system in a cross-functional environment comprised of design, sourcing/selection of components, construction, and testing activities. It is generally expected that the successful candidates after the co-funded initial period would become permanent staff of IEn.

Requirements related to the position:

- ❖ Expertise of a minimum 10 years (combined) in at least one of the following areas:
 - μ -CHP/SOFC (1-2 kWe) system design, construction and testing,
 - control system design and implementation for - the μ -CHP/SOFC,
 - design, construction, sealing and testing of SOFC stacks,
 - components design, construction/selection for the μ -CHP/SOFC,
- ❖ Fluent English (basic knowledge of Polish language is always welcome)
- ❖ PhD degree in the relevant research field
- ❖ Proven track record of professional accomplishment, preferably demonstrated through a strong publications list
- ❖ An enthusiastic team player with the ambition to strengthen and expand the research of the new group.

Detailed information is available on SENERES website.

Call for Experienced Researcher in the area of clean coal technologies

Institute of Power Engineering (Poland) has launched an international call for applications to fill a research and development position in the area of clean coal technologies. The call is open to any candidate that fills requirements for the position. However, only outstanding candidates with excellent R&D achievements record and leadership capabilities will be considered. The Polish nationals having left the country are particularly encouraged.

The experienced researcher will be employed in the FP7 project SENERES Sustainable Energy Research and Development Centre. The researcher will lead and guide team of young scientists and engineers developing at least one of the following areas and topics to oxy-fuel technologies:

- ❖ coal combustion in modified atmospheres (CO₂/O₂/H₂O) in various scales: laboratory (single particle, drop tubes) and semi-industrial (0.5 MWth furnace) in respect to heat transfer, burnout, gaseous emissions, corrosion, slagging and fouling,
- ❖ multicomponent FTIR gas measurements (nitrogen and sulphur compounds, HCl, HF, hydrocarbons),
- ❖ 3D PIV, LIF and ES measurements in semi-industrial facility,

It is generally expected that successful candidates after the co-funded initial period would become a permanent staff of IEn.

Requirements related to the position:

- ❖ Expertise of a minimum 10 years (combined) research in the area of clean coal technologies and industrial demonstrations
- ❖ Fluent English (basic knowledge of Polish is always welcome),
- ❖ PhD degree in the relevant research fields,
- ❖ Proven track record of professional accomplishment, preferably demonstrated through a strong publications list
- ❖ An enthusiastic team player with the ambition to strengthen and expand the research of the new group.

Detailed information is available on SENERES website

Call for Proposals

FCH JU 2012 call for proposals

The Fuel Cells and Hydrogen Joint Undertaking published on 17 January 2012 its 5th annual call for proposals. The call indicative budget is EUR 77.5.

The call covers 31 topics in the following areas:

- ❖ Transportation & Refuelling Infrastructure
- ❖ Hydrogen Production & Distribution
- ❖ Stationary Power Generation & CHP
- ❖ Early Markets
- ❖ Cross-cutting Issues

The deadline for application is **24 May 2012**.

The call information is available on the website:

<http://ec.europa.eu/research/participants/portal/page/cooperation?callIdentifier=FCH-JU-2012-1>

FP7 Energy call for proposals

The next call for proposals in FP7 Cooperation Energy Programme will be launched in June 2012.

Important Events

June 26-29, 2012, 10th European SOFC Forum

The International Fuel Cell Conference, Exhibition, Tutorial and Networking Event will be held on June 26-29, 2012 in Lucerne, Switzerland.

The event will be a highlight of the European high temperature fuel cell year. The event topics area includes Solid Oxide Fuel Cells and Electrolysers, Proton Conducting Ceramic Fuel Cells and Mixed Ionic-Electronic Ceramics – SOFC, SOE, PCFC and MIEC.

Detailed information is available on SENERES website

<http://www.efcf.com/>

EERA Joint Programmes

European Energy Research Alliance EERA was established to accelerate the development of new energy technologies by implementing Joint Research Programmes in support of the Strategic Energy Technology (SET-Plan). Among the 13 launched Joint Programmes there are at least two closely related to SENERES activities: JP Bioenergy and JP on Fuel Cells and Hydrogen.

Joint Programme on Bioenergy

The overall objective of the Joint Programme is to develop the next generation biofuels routes and next-generation conversion technologies.

The EERA Bioenergy JP is divided on the following sub-programmes:

- ❖ SP1 Thermo-chemical processing
- ❖ SP2 Sugar platform
- ❖ SP3 Algae based biofuels
- ❖ SP4 Cross cutting topics – e.g. raw material supply, energy systems, sustainability

The JP coordinator is Kai Sipilä, VTT, Finland.

Joint Programme on Fuel Cells and Hydrogen

The Joint Programme on Fuel Cells and Hydrogen aims to accelerate research on fuel cells and electrolyzers.

The EERA Bioenergy JP is divided on the following sub-programmes:

- ❖ SP1 Electrolytes
- ❖ SP2 Catalysts & Electrodes
- ❖ SP3 Stack Materials and Design
- ❖ SP4 Systems
- ❖ SP5 Modelling, Validation and Diagnosis
- ❖ SP6 Hydrogen Production and Handling

The JP coordinator is Angelo Moreno, ENEA, Italy.

Recently Published

- ❖ René Bindig, Saad Butt, Ingo Hartmann, Mirjam Matthes and Christian Thiel, *Application of Heterogeneous Catalysis in Small-Scale Biomass Combustion Systems*, *Catalysts* 2012, 2, 223-243
- ❖ Rabou, L.P.L.M.; Balegedde Ramachandran, R.P.; Hoeben, W.F.L.M.; Jong, W. de; Kersten, S.R.A.; Leijenhorst, E.J.; Kumar, K.; Mourao Vilela, C.F.; Nanou, P.; Oijen, J.A. van; Pemen, A.J.M.; Rindt, C.C.M.; Rossum, G. van; Verhoeven, L.M., *EOS-LT Consortium Biomass Gasification and Gas Cleaning Final Report 2007-2011*, ECN-E--12-010
<http://www.ecn.nl/docs/library/report/2012/e12010.pdf>
- ❖ Stralen, J. van; Uslu, A., *The role biomass can play in 2020 & 2030 - Deviations and consistency with NREAPs*, ECN-L--12-005, Presented at: Final workshop Biomass Futures at the European Parliament, Brussels, Belgium, March 20, 2012.
<http://www.ecn.nl/docs/library/report/2012/l12005.pdf>
- ❖ Pucker, J.; Zwart, R.W.R.; Jungmeier, G., *Greenhouse gas and energy analysis of substitute natural gas from biomass for space heat*, *Biomass & Bioenergy* (Elsevier), 2012, Vol.38, p.95-101
- ❖ Jonas Feys, Pieter Vermeir, Petra Lommens, Simon C. Hopkins, Xavier Granados, Bartek A. Glowacki, Michael Baecker, Elke Reich, Susagna Ricard, Bernhard Holzapfel, Pascal Van Der Voort and Isabel Van Driessche, *Ink-jet printing of YBa₂Cu₃O₇ superconducting coatings and patterns from aqueous solutions* *Journal of Materials Chemistry*, **22** (9) 3717 (7 March 2012)
- ❖ I. Fasaki, K. Siamos, M. Arin, P. Lommens, I. Van Driessche, S.C. Hopkins, B.A. Glowacki, I. Arabatzis, *Ultrasound assisted preparation of stable water-based nanocrystalline TiO₂ suspensions for photocatalytic applications of inkjet-printed films* *Applied Catalysis A: General*, **411-412** 60-69 (16 January 2012)
- ❖ J. M. Porras-Vazquez, T. F. Kemp, J. V. Hanna and P. R. Slater, *Synthesis and characterisation of oxyanion-doped manganites for potential application as SOFC cathodes*, *J. Mater. Chem.*, 2012, 22, 8287-8293
- ❖ Anne-Katrin Huber, Mareike Falk, Marcus Rohnke, Bjoern Luerßen, Luca Gregoratti, Matteo Amati and Jürgen Janek, *In situ study of electrochemical activation and surface segregation of the SOFC electrode material La_{0.75}Sr_{0.25}Cr_{0.5}Mn_{0.5}O_{3±δ}*, *Phys. Chem. Chem. Phys.*, 2012, 14, 751-758
- ❖ BIOMASS Multi-Year Program Plan, U.S. Department of ENERGY, Energy Efficiency and Renewable Energy, April 2012
http://www1.eere.energy.gov/biomass/pdfs/myp_p_april_2012.pdf