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## Welcome address

Welcome to the fifth issue of the SENERES Newsletter. SENERES is the project founded within 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.

*We would like to wish you a very  
cheerful Christmas  
and a successful New Year!*



**SENERES team**

## SENERES Events

### Exchange of know-how and experience (WP1)

Mariusz Krauz – the experienced researcher from IEN (CEREL) has recently visited the University of Cambridge, Department of Science and Metalurgy. The visit lasted one month, from the 1<sup>st</sup> of October 2012 till the 30<sup>th</sup> of October 2012. Prof Bartłomiej Głowacki was a person responsible for the secondment. The goal of the secondment was to optimize zirconia and zirconia/nickel suspensions and int-jet printer parameters for thin electrolyte and anode layer deposition by means of ink-jet printing method.

The first part of the research concerned the deposition of anode layers by ink-jet printing method. 5 layers of CGO-NiO ink were deposited on sample SS430. The sample was first dried out and sintered at 600°C. Subsequently another 5 layers of CGO-NiO were deposited on samples of SS430L. When the sintering was finished, the samples were bended. Another tested ways for deposition of anode layer were screen printing method – deposition with use of metal mesh and deposition of 8YSZ on anode supports.

The added value for the potential increase of the research capacity of SENERES was a development of method ink-jet printing and ink preparation for solide oxide fuel cells. In the future there is a plan to develop solid oxide fuel cells by the optimization of components and construction of fuel cells layers.

### Recruitment of incoming experienced researchers (WP2)

Recently an experienced researcher – Mr Jan Pieter Ouwleities, was employed on the position of Senior Research Scientist within SENERES project. During his career at the Energy Research Centre of the Netherlands (ECN) he has been active as a materials specialist and scientific researcher with broad experience in important international and multidisciplinary research projects. Here is the summary of Mr Ouwleities' scientific achievements in the field of  $\mu$ -CHP/SOFC systems:



- Broad experience in the development, manufacture and pre pilot production of electrolyte supported and anode supported SOFC cell components
- Broad experience in the manufacture of electrolyte substrates and thin film electrolytes
- Extensive theoretical and practical knowledge on the improvement of SOFC anode with respect to electrochemical performance, oxidation/reduction cycling behavior, sulfur tolerance, and carbon (graphite, tar) tolerance
- Extensive theoretical and practical knowledge on the improvement of the SOFC cathode with respect to electrochemical performance, and chromium poisoning behavior
- Broad experience in setting up, carrying out, and interpreting electrochemical tests under relevant fuels and operating conditions of SOFC cell material by means of lab scale tests, bench scale tests, short stack tests, stack tests, and system tests
- Experience in the design, construction and materials selection of SOFC  $\mu$ -CHP systems

The researcher has been employed for the specified period - until the 31st of August 2014. Mr Ouwleities will carry on the research in the field of high-temperature fuel cells (SOFC).

He will perform his research in the Institute of Power Engineering - in Fuel Cells Department in Warsaw and in the Ceramics Department CEREL in Boguchwala. There is a certain plan concerning the research conducted in the Institute - to design, manufacture test and optimize the performance of SOFC systems.

## Researchers Recruitment

**Two new SENERES Calls** for Experienced Researchers have been launched in the following areas:

### Energy generation from biomass

The Institute of Power Engineering has launched an international call for applications to fill a research and development position in the area of energy generation from biomass. 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.

### **Place of work:**

Instytut Energetyki (Institute of Power Engineering)  
36 Augustówka Street  
02-981 Warsaw, Poland

Dimension of regular post: 1

Number of position of work: 1

Agreement on definite time: up to 20 months

Gross salary: 4 200 Euro/month

### **Characteristics of the positions:**

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:

- Biomass CHPC systems  $\geq 1$  MW in respect to their design, operation, emissions, efficiency and economics
- Biomass firing and co-firing with coal:
  - ✓ biomass pretreatment, e.g. torrefaction,
  - ✓ fouling and slagging processes, chloride corrosion (evaluation, decreasing of negative impact, e.g. chemical additives),
  - ✓ measurements of particulate emissions (PM), NO<sub>x</sub> and other compounds formed during the incomplete combustion of biomass (CO, OGC, PAHs),
  - ✓ numerical modeling of the biomass combustion process.

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:**

- PhD degree in the relevant research fields combined with minimum 3 years of experience or expertise of a minimum 8 years (combined) research in the area of energy generation from biomass and industrial demonstrations,
- Fluent English (basic knowledge of Polish is always welcome),
- 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.

#### Required documents and statements:

- employment application;
- curriculum vitae;
- copy of higher education diplomas, granting a degree or scientific title;
- abstract containing concise information about candidate's scientific research achievements to date and implementation, participation in national and international research projects, foreign languages,
- list of publications,
- other evidence of qualifications of the candidate (for example: certificates confirming knowledge of foreign languages, letters of reference)
- statement by the candidate on the use of full civil rights for the mind and conduct crime indictable offense, or the mind of Treasury;
- a statement of the candidate to consent to the processing of personal data for purposes of this contest.

**Applications** must be submitted in paper before:  
**31st of December, 2012**

Place of documents submission:  
Instytut Energetyki - Instytut Badawczy  
Mory 8  
01-330 Warsaw, Poland  
postscript: Call for Experienced Researcher - Biomass

#### The evaluation procedure:

The applications will be assessed by an independent evaluation commission, whose responsibility will be to rank the different candidates for a given position according to their merits and potential. The selected best candidates will be invited for an interview at IEn. Based on this assessment, and on interviews conducted with the best candidates, IEn will sign the corresponding contract with a successful candidate. Authors of rejected applications will not be notified.

#### Additional information:

<http://www.ien.com.pl/pl/praca.php>  
<http://seneres.pl/news/items/new-calls-for-experienced-researchers-23>

#### 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  $\mu$ -CHP/SOFC development. 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.

#### Place of work:

Instytut Energetyki (Institute of Power Engineering)  
36 Augustówka Street  
02-981 Warsaw, Poland

Dimension of regular post: 1

Number of position of work: 1 or more

Agreement on definite time: up to 20 months stay

Gross salary: 4 200 Euro/month

#### Characteristics of the positions:

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  $\mu$ -CHP/SOFC system in a cross-functional environment comprised of design, sourcing/selection/fabrication 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:

- PhD degree in the relevant research fields combined with minimum 3 years of experience or expertise of a minimum 8 years (combined) research in one of the following research area:
  - ✓  $\mu$ -CHP/SOFC (1-2 kWe) system design, construction and testing,
  - ✓ catalytic systems for  $\mu$ -CHP/SOFC applications
  - ✓ control system design and implementation for the  $\mu$ -CHP/SOFC,
  - ✓ design, construction, sealing and testing of SOFC stacks,
  - ✓ components design, construction/selection for the  $\mu$ -CHP/SOFC,
- Fluent English (knowledge of Polish language is always welcome and Polish nationals having left the country are encouraged to apply),



- 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.

#### Required documents and statements:

- employment application;
- curriculum vitae;
- copy of higher education diplomas, granting a degree or scientific title;
- abstract containing concise information about candidate's scientific research achievements to date and implementation, participation in national and international research projects, foreign languages,
- list of publications,
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#### The evaluation procedure:

The applications will be assessed by an independent evaluation commission, whose responsibility will be to rank the different candidates for a given position according to their merits and potential. The selected best candidates will be invited for an interview at IEn. Based on this assessment, and on interviews conducted with the best candidates, IEn will sign the corresponding contract with a successful candidate. Authors of rejected applications will not be notified.

#### Additional information:

<http://www.ien.com.pl/pl/praca.php>  
<http://seneres.pl/news/items/new-calls-for-experienced-researchers-23>

## Call for Proposals

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### MARIE CURIE CAREER INTEGRATION GRANTS (CIG)

On the 18th of October 2012 the call was published with the following identifier FP7-PEOPLE-2013-CIG, belonging to the Specific Programme PEOPLE. The call indicative budget is EUR 40 million. The funding scheme covering the action MARIE CURIE CAREER INTEGRATION GRANTS is to support for training and career development of researchers.

The deadline for application is **7th of March 2013** at 17.00, Brussels local time.

The call information is available on the website:  
<http://ec.europa.eu/research/participants/portal/page/p/peoples?callIdentifier=FP7-PEOPLE-2013-CIG>

### Call for proposals for ERC Synergy Grant

ERC-2013-SyG Call has been published on the 10th of October 2012, belonging to the Specific Programme IDEAS. The call indicative budget is EUR 150 million of the 2013 budget.

The grant's aim is to enable small groups of investigators bringing together complementary skills, knowledge and resources to address research problems in a better way than they would do it individually. The deadline for application is **10th of January 2013** at 17.00, Brussels local time.

The call information is available on the website:  
<http://ec.europa.eu/research/participants/portal/page/id/eas?callIdentifier=ERC-2013-SyG>

## EU International Strategy for Research and Innovation

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The European Commission has recently presented a new strategy for the cooperation development in the field of research and innovation. The main objective of the new strategy is to keep concentrated on the EU strategic priorities, while maintaining open to participation of third countries in the research. The goal of mentioned is to increase the attractiveness of EU as a research place and increase the industry competitiveness.



The European Union is one of the world's leading regions in research and innovation, with its research programmes open to scientists from the whole entire world. The general opening of the Union is proved by 6% share of participants from the Third Countries in the 7<sup>th</sup> Framework Program.

Horizon 2020 - the financial instrument implementing the Innovation Union, will be the main mean for implementing the Union's international cooperation actions.

**More information about the new strategy is available on the following website:**

[http://ec.europa.eu/research/iscp/index.cfm?lg=en&pg=fag\\_4](http://ec.europa.eu/research/iscp/index.cfm?lg=en&pg=fag_4)

## Important Events

### January 23, 2013, Brussels, European Infoday on IEE

The Intelligent Energy – Europe (IEE) programme is giving a boost to clean and sustainable solutions. It supports their use and dissemination and the Europe-wide exchange of related knowledge and know-how. Targeted funding is provided for creative projects putting this idea into practice.

These projects help to further the three main objectives:

- Promoting energy efficiency and encouraging the rational use of energy sources;
- Increasing the use of new and renewable energy sources as well as encouraging energy diversification;
- Stimulating energy efficiency and renewables in the field of transport.

**More information is available on the website:**

<http://ec.europa.eu/energy/intelligent/>

### January 30, 2013, Brussels: ENERGY & SUSTAINABILITY SUMMIT at the EUROPEAN PARLIAMENT – Seminar

The seminar is a global event, involving the participation of international speakers, partners and visitors. The seminar will be held in the form of a discussion, which will be run simultaneously in three stages. The discussion will cover broadly understood energy and sustainability aspects. 400 professionals are going to be presented during the event.

**More information is available on the website:**

<http://www.agrion.org/brussels/>

### February 24-25, 2013, Rome: 3rd International Conference on Future Environment and Energy - ICREE 2013

The goal of the ICREE 2013 is to promote research and development activities from the field of Future Environment and Energy. The conference will also promote the knowledge transfer between researchers. The conference will be organized every year to serve as a platform of experience sharing. English will be the official language of the event.

**More information is available on the website:**

<http://www.icree.org/>

### February, 24-25, 2013, Rome: 1st Journal Conference on Environmental Science and Development (JCESD 2013 1st)

The goal of the JCESD 2013 1<sup>st</sup> is to provide a forum for researchers and professionals from the industry, academia and government. The conference will be one of the leading international events presenting innovation in the environmental science and development.

**More information is available on the website:**

<http://www.ijesd.org/jcesd/1st/>

## Recently published

❖ Motelica, A.; Bruinsma, O.S.L.; Kreiter, R.; Exter, M.J. den; Vente, J.F.; „Membrane Retrofit Option for Paraffin/Olefin Separation - A Technoeconomic Evaluation” ECN-W--12-036 EN Oktober 2012; 11 pag.; Published in: Ind. Eng. Chem. Res. (), 2012, Ed.51, p.6977-6986. .

❖ Motelica, A.; Bruinsma, O.S.L.; Kreiter, R.; Exter, M.J. den; Vente, J.F.; „Retrofit with membrane the Paraffin/Olefin separation” ECN-M--12-059 EN Oktober 2012; 25 pag.; Presented at: Euromembrane 2012, Queen Elizabeth II Conference Centre, We, 23-27 September 2012.



- ❖ Kurz, D.; Schnell, U.; Scheffknecht, G.: „CFD simulation of wood chip combustion on a grate using an Euler–Euler approach Combustion Theory and Modelling”, Volume 16, Issue 2, Pages 251-273; DOI: 10.1080/13647830.2011.610903; 2012
  
- ❖ Wei, X.; Guo, X.; Li, S.; Han, X.; Schnell, U.; Scheffknecht, G.; Rasio, B.: „Detailed Modeling of NO<sub>x</sub> and SO<sub>x</sub> Formation in Co-combustion of Coal and Biomass with Reduced Kinetics Energy Fuels,” Vol. 26 (6), Pages 3117–3124; DOI: 10.1021/ef201729r; 2012
  
- ❖ Meesters, A.G.C.A.; Tolk, L.F. ; Peters, W.; Hutjes, R.W.A.; Vellinga, O.; Elbers, J.A.; Vermeulen, A.T.; Laan, S. van der; Neubert, R.E.M.; Meijer, H.A.J.; Dolman, A.J.; Inverse carbon dioxide flux estimates for the Netherlands ECN-W--12-038; September 2012; 42 pag.;
  
- ❖ Staelens, J.; Kos, G.P.A.; Weijers, E.P.; Jonge, D. de; Frijns, E.; Berghmans, P.; Matheeussen, C.; Roekens, E.; „Environmental monitoring of ultrafine particles in NW Europe (Joaquin project)” ECN-M--12-043 EN september 2012; 1 pag.;
  
- ❖ Ristic, Dragisa: „Feasibility and NO<sub>x</sub> Reduction Potential of Flameless Oxidation in Pulverised Coal Combustion,,; Dissertation Universität Stuttgart, 2012
  
- ❖ Wei, X.; Guo, X.; Li, S.; Han, X.; Schnell, U.; Scheffknecht, G.; Rasio, B.: „Detailed Modeling of NO<sub>x</sub> and SO<sub>x</sub> Formation in Co-combustion of Coal and Biomass with Reduced Kinetics”; Energy Fuels, Vol. 26 (6), Pages 3117–3124; DOI: 10.1021/ef201729r; 2012