

**Sustainable Energy for Africa**

**2017, October 23 – 25, Palace of the Academies, Brussels**

**International Conference organized by**

**the “Royal Academy for Overseas Sciences” (RAOS) of Belgium**

**CONFERENCE PROGRAMME**

 **(version of 25/04/2017 - contact: georges.m.vangoethem@gmail.com)**

The conference papers are assigned as either lectures or poster presentations. The lectures (20 minutes each) will be delivered in plenary session in Auditorium Albert II of the Palace of the Academies (no parallel session). If they wish, authors of posters will have a 5-minute time slot for oral presentation in the plenary session. The posters will be displayed in the Marble Room (same building as Auditorium Albert II) where also the Walking Dinner of 24/10 is organised. Later on, lectures and poster presentations will be peer reviewed before publication in a special issue of the Proceedings of the Royal Academy for Overseas Sciences of Belgium. One of the outcomes of the event will be the preparation of a “Massive Open Online Course” (MOOC) or a similar product in the subject domain, based on selected lectures and posters. Expressions of interest to participate in the MOOC project should be sent to the KAOW/ARSOM Secretariat.

**Registration and information:** [**http://www.kaowarsom.be/en/conferences**](http://www.kaowarsom.be/en/conferences).

After a general Introduction (3 keynote speeches, 23 October, early morning), the conference will treat successively three key Topics (39 lectures and 35 posters in total over 3 days):

* Topic 1 - Energy is crucial for achieving the Sustainable Development Goals

(10 lectures, 23 October, late morning and afternoon)

* Topic 2 - Energy mix: towards robust, equitable and socially acceptable energy systems (20 lectures, 24 October, morning and afternoon + 25 October, early morning)
* Topic 3 - Research, innovation and education in support of sustainable energy policies

(4 lectures, 25 October, late morning)

Conclusion session (2 keynote speeches, 25 October, afternoon), including panel session and MOOC discussion (preliminary commitments). Closure of Conference at 16:30.

The registration fees (100 Euros for full participants) include the program folder and conference bag, entry into the conference and exhibit halls as well as the welcome reception of Monday evening. There are no registration fees for plenary speakers and authors of posters. Walking dinner in the Palace of the Academies on Tuesday evening 24/10 costs 40 Euros per person.

**Monday 23 October morning, 10:00 – 12:30**

**Introductory session**

**3 keynote speeches (20 min each)**

10:00 GeorgesVan Goethem, welcome message (Chairman, member of the Academy, RAOS)

10:15 **Alexander De Croo, Deputy Prime Minister and Minister of Development Cooperation, Digital Agenda, Telecommunications and Postal Services**

10:35 **Youssouf Ouédraogo,** *former Prime Minister of Burkina Faso (1992 – 1994), Special Adviser to the President of the African Development Bank, former Ambassador to BE, NL, UK, LUX and EU, leading economist, professor at the Univ. of Ouagadougou*

**“Sustainable energy supply for Africa: what can be done to address the major challenges ?”**

10:55 **John F. May,** *Ph.D., Population Reference Bureau in Washington, DC, Visiting Scholar*

**“The Demography of Africa: Impacts on Economy, Energy, and Governance”**

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**Topic 1 - Energy is crucial for achieving the Sustainable Development Goals**

**3 lectures (20 min each) + Q/A session (15 min)**

11:15 **Sustainable energy mix for African and MENA region countries**

Prof. Dr. El Tayeb Mustafa, President of The Future University, Sudan, Former Director at UNESCO, corresponding member of RAOS, and Prof. Dr. El Tayeb Idris Eisa

11:35 **Energy for sustainable development in Africa: Successes, challenges and possible way forward**

Dr. Emmanuel Kofi ACKOM, E.K., Haselip, J.A and Mackenzie, G.A., UNEP, DTU Partnership (UDP), Technical University Denmark (DTU), Copenhagen

11:55 **African universities and science diplomacy in favour of alternative sources of energy (based on exchanges with 100 universities during COP22 in Marrakesh)** Prof. Wail Benjelloun, President Mediterranean Universities Union (UNIMED), Former president of the Conference of the University Presidents of Morocco

12:15 Q/A session (15 min)

**Lunch: 12:30 – 14:00**

**Monday 23 October afternoon, 14:00 – 18:00**

**7 lectures (20 min each) + Q/A session (20 min) + poster presentation (max 10)**

14:00 **Centralized and decentralized energy solutions for Africa: cutting edge technologies supported by and co-developed with the African actors**

Bruno BENSASSON, ENGIE, Africa Business Unit, CEO, Paris

14:20 **Making Access to Energy Services the Engine of Sustainable Development in Sub-Saharan Africa**

Dr. Koffi Ekouevi, Senior Economist, The World Bank

14:40 **Governing decentralised energy provision: exploring the role of local governance in articulating nexus approaches to energy transitions**

Ed Brown, Jon Cloke, John Harrison and Richard Sieff (all at Department of Geography, Loughborough University, UK)

*Presenter: Ed Brown*, National Co-Coordinator, UK Low Carbon Energy for Development Network and Senior Lecturer in Human Geography, Loughborough Univ.

15:00 **Performance and Impact Assessment Model: energy planning methodology to orient strategies for scaling up access to energy**

Politecnico di Milano, Italy, Prof Emanuela Colombo, UNESCO Chair in Energy for Sustainable Development, Francesco Romeo, and Lorenzo Mattarolo, Department of Energy; and Mariano Morazzo, Enel Foundation

**Coffee break: 15:20 – 15:50**

15:50 **Industrial Strategy to identify priorities in energy mix policies in Africa as a result of joint discussions about local needs and resources**

André Bouffioux, CEO, Siemens Belgium-Luxembourg (also responsible for the assigned countries: Algeria, Morocco, Tunisia and West-Central Africa)

16:10 **Integrating Climate into Strategy for an Oil & Gas Company: focus on Africa**

Valérie Quiniou, Vice-President, Climate - Strategy - Innovation, TOTAL S.A., Paris

16:30 **Challenges of Climate Change with respect to Energy Policy in Africa**

Dr. Mannava V.K. Sivakumar, Consultant, World Bank; Editor-in-Chief, *Weather and Climate Extremes* (Elsevier); corresponding member of RAOS

16:50 Q/A session (20 min) and Poster presentation in plenary session (50 min => 10 posters)

**18:00 Adjourn - Networking reception in the Palace of the Academies + visit to posters**

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**Tuesday 24 October morning, 9:00 – 12:30**

**Topic 2 - Energy mix: towards robust, equitable and socially acceptable energy systems**

**7 lectures (20 min each) + Q/A session (20 min) + poster presentation (max 4)**

**BACKGROUND**

09:00 **On Power System Paradigm: Opportunities and Challenges**

Aymen Chaouachi, PhD, EGI (Elia Grid International, Brussels), Power System Operations & Security

09:20 **Sustainable Energy Transition: An Operations Research Perspective**

Anthony Papavasiliou, ENGIE Chair at UCL in Energy Economics and Energy Risk Management and Center for Operations Research and Econometrics (CORE)

09:40 **Prospective Énergétique de la République Démocratique du Congo dans un Scénario “Business As Usual” à l’Horizon 2050**

Prof. Ndaye Nkanka Bernard, Institut Supérieur de Techniques Appliquées, Kinshasa

10:00 **Energy poverty in Africa: focus on challenges and solutions related to electric power and to energy for cooking**

Prof Samuele Furfari, Geopolitics of Energy, ULB, École polytechnique

**Coffee break 10:20 – 10:50**

10:50 **Steel: a key resource for a sustainable and circular economy in emerging countries**

Carl De Maré, Vice-President ArcelorMittal, Group CTO, Head of Technology Strategy

11:10 **Towards a global partnership regarding mineral resources and energy production: contribution to sustainable development with focus on Africa**

Prof Jean-Pierre Tshibangu, UMons, Faculty of Engineering, Dpt of Mining Eng., RAOS member

11:30 **Renewable energy deployment in Africa : opportunities, challenges and perspectives**

Pépin Tchouate Heteu, Ph.D. in applied sciences from UCL, managing Director of DEECC Consulting (Energy, Environment, Climate change mitigation)

11:50 Q/A session (20 min) and Poster presentation in plenary session (20 min => 4 posters)

**Lunch 12:30 – 14:00**

**Tuesday 24 October afternoon, 14:00-18:30**

**8 lectures (20 min each) + Q/A session (30 min) + poster presentation (max 12)**

14:00 **Vers un nouveau partenariat UE – Afrique avec des modes de financement modernes et responsables pour les grands projets de développement**

Paul FRIX, Senior Economist, DG Honoraire Coopération belge et CDE/CDI, Conseiller CBL-ACP, Manager de PROPADEV SPRL

**HYDRO**

14:20 **Hydro-electricity in Africa : remaining economically exploitable capacity and impact assessment study (including social acceptance)**

Henri Boyé, USAID Electrification Advisor / Electricity Sector Reform Project, and Michel de Vivo, General Secretary of International Commission on Large Dams

14:40 **Grand Inga, le plus grand complexe hydroélectrique du monde : ambition nécessaire mais à mûrir**

François Misser, diplômé de l’École supérieure de journalisme de Lille, chercheur indépendant, spécialiste des relations entre pouvoir et ressources naturelles en Afrique

15:00 **Using small low cost, robust and easily maintained decentralized hydraulic power stations in Central Africa**

Prof. Patrick Hendrick, ULB, École Polytechnique

**Coffee break: 15:20 – 15:50**

**SOLAR**

15:50 **The potential and challenges related to photovoltaic electricity generation and local (DC) microgrids**

Prof. Dr. Ir. Jozef Poortmans, Scientific Director PV@imec, Director R&D strategy@EnergyVille and Part-time Professor at KULeuven and Univ. Hasselt

16:10 **The value of concentrated solar power for developing countries: another look on energy transitions**

Marcel Bial, Secretary General of the European Solar Thermal Electricity Association

16:30 **Development of solar energy in Africa : A challenge in terms of resource availability and recycling**

Prof Dr. Ir. Eric PIRARD, ULg and RAOS member, and Dr Sandra BELBOOM, ULg

**NUCLEAR FISSION**

16:50 **The development of Small Modular Reactors for emerging nuclear countries in Africa**

Prof. Peter Baeten, SCK•CEN & VUB Kernenergie, and Prof. Hamid Aït Abderrahim, Deputy Director-General International Affairs SCK•CEN & UCL Ecole Polytechnique

17:10 Q/A session (30 min) and Poster presentation in plenary session (50 min => 10 posters)

**18:30 Adjourn**

**20:00 Walking dinner in the Palace of the Academies (40 Euros / person) + visit to posters**

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**Wednesday 25 October morning, 9:00 – 12:30**

**Topic 2 - Energy mix: towards robust, equitable and socially acceptable systems (cont’d)**

**5 lectures (20 min each)**

**BIOENERGY**

09:00 **The bio-tech road towards sustainable energy – a possible frame for Africa**

Prof Willy Verstraete (UGent), Center for Microbial Ecology and Technology (CMET), Faculty of Bioscience Engineering at Ghent University

09:20 **Overview of bioenergy policies for sustainable development in Africa**

Rainer Janssen, PhD, Head of the Biomass Department at WIP Renewable Energies (WIP = “Wirtschaft und Infrastruktur GmbH & Co Planungs-KG”), Munich, Germany

09:40 **Wood: an ever-present domestic energy priority for people in emerging Africa**

Jean Noël MARIEN (\*) ; Régis PELTIER (\*\*) ; Emilien DUBIEZ (\*\*) ; Théodore TREFON (\*\*\*)

(\*) Retired (since 1 October 2014) from « Centre de coopération internationale en recherche agronomique pour le développement » (CIRAD) UR Forêts et Sociétés – Montpellier France ; (\*\*) CIRAD UR Forêts et Sociétés – Montpellier France ;

(\*\*\*) « Musée royal de l'Afrique centrale » (MRAC) - Tervuren Belgium

10 :00 **A locally manufactured gasification technology for the valorization of agricultural wastes in West African countries**

Prof Hervé Jeanmart (1), Séverin Tanoh (2), Wilfried Ouedraogo (3), Yohan Richardson (2), Sayon Sidibe (2), Frédéric Bourgois (1) and François Pinta (4)

*(1) Université catholique de Louvain, Louvain-la-Neuve, Belgium; (2) Institut International d'Ingénierie de l’Eau et de l’Environnement, Ouagadougou, Burkina Faso; (3) Institut de Recherche en Sciences Appliquées et Technologies, Ouagadougou, Burkina Faso; (4) Centre de coopération internationale en recherche agronomique pour le développement, Montpellier, France*

10:20 **Examining energy production in Africa from the chemistry viewpoint**

Prof István E. Markó, Laboratoire de Chimie Organique et Médicinale, UCL, Belgium

**Coffee break 10:40 – 11:10**

**Topic 3 - Research, innovation and education in support of sustainable energy policies**

**4 lectures (20 min each)**

11:10 **MOOCs for Africa: Lessons Learned**

Dr Dimitrios Noukakis, program manager, Center for Digital Education (including “MOOC Afrique”), Ecole polytechnique fédérale de Lausanne (EPFL), and Prof. Pierre Dillenbourg, EPFL, academic director of Center for Digital Education (MOOC Factory)

11:30 **E-Learning for Renewable Energy Higher Education in Africa: Challenges, Potential and Outlook**

Dr. Erick Tambo, Lucy Larbi and Joerg Szazynski, United Nations University, Institute for Environment and Human Security (UNU-EHS), Bonn

11:50 **Massive Open Online Courses : an answer to the issues facing higher education in sub-Saharan Africa ?**

Nicolas Roland (responsible of "ULB Podcast"), Eric Uyttebrouck, ULB, Cellule PRAC-TICE (Pédagogie, Recherche-Action & TICE), and Prof. Philippe Emplit, ULB

12:10 **Sharing knowledge online and improving education using MOOCs**

Prof Sandra Soares-Frazão and Emeritus Prof Yves Zech, Génie Civil et Environnemental, UCL Ecole Polytechnique

**Lunch: 12:30 – 14:00**

**Wednesday 25 October afternoon, 14:00-16:30 – MOOC working group and Conclusion**

**Last poster presentation + final panel session**

**+ 2 keynote speeches (20 min each)**

**Conclusion session**

* Poster presentation in plenary session (1 hour)
* Panel session with session chairpersons, including brief communications from the floor

**15:20 Rachel KYTE**, *Chief Executive Officer of the Sustainable Energy for All (SEforALL), and Special Representative of the UN Secretary-General*

**“Affordable, reliable and sustainable energy as the key to combating both poverty and climate change”**

*Separate session in dedicated meeting room (volunteers wanted for MOOC Working Group)*

*14:00 MOOC on “Sustainable Energy for Africa” as outcome of the Conference*

*- brainstorming to share practical experience and preliminary commitments regarding:*

1. *Course team (e.g. course structure, subject experts, technical and multi-media staff)*
2. *Resources (e.g. electronic infrastructure, informatics services, financial support)*
3. *Pedagogy (e.g. target public, role of the teacher, learner participation, assessment)*

**15:40** MOOC rapporteur, preliminary conclusions of above WG meeting in plenary session

**16:00** Scientific conference committee, concluding remarks

**16:10 Didier Reynders, Deputy Prime Minister and Minister of Foreign Affairs and European Affairs, in charge of Beliris and of the federal cultural institutions**

16:30 Closure of Conference

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*



**POSTER PRESENTATIONS (35 in total)**

**Reminder: a 5-minute time slot will be allotted to each poster (i.e.: approx. 5 PPT slides each) for being presented orally in the plenary session**

**Topic 1 - Energy is crucial for achieving**

**the Sustainable Development Goals**

**Monday 23 October afternoon, 17:10 – 18:00 / poster presentation (max 10)**

**(1) Our goal: 600 million connected Africans connected to electricity by the year 2025**

Smaïla Camara, ENA/Dauphine and HEC Paris Business School, Special Advisor to Jean-Louis Borloo, President of “Energies for Africa” (Ministre d'État, ministre de l'Écologie, 2007 – 2010, France)

**(2) Mapping of the European Portfolio of Energy Development Cooperation on behalf of the EU Energy Initiative**

Fiona D. Wollensack, EU Energy Initiative - Partnership Dialogue Facility (EUEI-PDF), Brussels, and Niklas HAYEK, Africa-EU Renewable Energy Cooperation Programme (RECP) and EUEI PDF, c/o Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Eschborn, Germany

**(3) AGORIA’s views and technology contributions for energy and sustainability in emerging countries (in particular, Africa)**

Christian DIERICK, Advisor, Agoria (“Development through technology”), Multisector Federation of the Technological Industry, Brussels

**(4) Development of advanced energy technologies in Africa: success stories obtained and challenges left from both technological and managerial points of view**

Peter Koninckx, Director Power Generation & Transmission Systems, Siemens

**(5) Modern energy strategy implementation in Africa: success stories and challenges left in terms of central & decentralised power generation, integration of renewable energies, and power systems interconnections**

Joseph Dubois, Product Director of Tractebel

**(6) Generic lessons from EUROMED Research-to-Innovation projects in the field of Renewable Energy & Energy Efficiency: Innovation, Co-development, Capacity building**

Claude Ayache, Senior Advisor, KIC InnoEnergy, Societas Europaea (SE), Business Development & European Affairs, Brussels

**(7) Collaboration between Northern and Southern organizations with the aim to facilitate and analyse technology impact on society**

Jean-Pierre Raskin (Université Catholique de Louvain) and Stéphanie Merle (Louvain Coopération)

**(8) Growth, energy and climate: squaring the circle**

Philippe Charlez, Mining Engineer, Senior Technical Advisor specialist of Unconventional Resources, former Rock Mechanics Expert in the Oil & Gas industry

**(9) Science and diplomacy in Central and Western Africa : remarkable achievements and challenges**

César KAPSEU, Ambassador of science, University of Ngaoundere (Cameroun) and Liliane D. T. ATOUKAM, Humanities and Social Sciences (same university)

**Topic 2 - Energy mix: towards robust, equitable**

**and socially acceptable energy systems**

**Tuesday 24 October morning, 11:50 – 12:30 / poster presentation (max 4)**

**BACKGROUND**

**(10) Private sector involvement in energy production: experiences of the Belgian Development Agency from Rwanda and Mozambique**

Muriel Lambert de Rouvroit, Frederik Van Herzeele, Benoît Legrand (as unit coordinator) and Paul Verlé (as head of department), all in Infrastructure and Environment Unit, Belgian Development Agency (BTC)

**(11) Industrial waste heat recovery – Innovative solutions for steel industry**

T. Steinparzer, A. Fleischanderl, M. Haselgrübler, P. Trunner / Primetals Technologies, Linz, Austria GmbH / A joint venture of Siemens, Mitsubishi HI and co

**(12) “Mini mill plants” for steelmaking: sustainable production of charcoal as fuel source while taking care of environmental and social issues in forest plantations**

Roosevelt de Paula Almado, Health and Safety, Environment and Forest Research Manager, ArcelorMittal BioFlorestas Ltda., São Geraldo – Martinho Campos - Brazil

**Tuesday 24 October afternoon, 17:10-18:30 / poster presentation (max 12)**

**HYDRO**

**(13) Variable-speed pumped hydro energy storage: bringing flexibility to the South African grid in order to accommodate future developments in nuclear energy and renewables**

Thomas Mercier, PhD student & Research Assistant (Université Laval and Université catholique de Louvain)

**(14) Archimedean screw turbine: opportunity for rural electrification in D.R. Congo ?**

**Prof. Jean Paul Katond Mbay,** Université de Lubumbashi, DR Congo, and Prof. Patrick Hendrick (ULB - Belgium)

**(15) Small hydropower development in Burundi**

Jean Bosco Niyonzima (1), Patrick. Hendrick (1\*),

(1) Université Libre de Bruxelles, Aero-Thermo-Mechanics, (ULB Polytechnic School), Belgium, and (1\*) Promoter and Head of Department Aero-Thermo-Mechanics (ULB)

**(16) Turbulent Hydro - Decentralized low-head micro-hydro power for Africa, inspired by nature**

Geert Slachmuylders and Wim Verheirstraeten, Turbulent Hydro, Innovator Under 35 EU 2016, Best start-up in Start-up Nations Summit 2015

**SOLAR**

**(17) Development of energy efficiency and passive technologies in buildings for improving users' comfort: experience of the Belgian Development Agency in Uganda, Senegal and Palestine**

Benoît Legrand (as unit coordinator) and Paul Verlé (as head of department), both in Infrastructure and Environment Unit, Belgian Development Agency (BTC), and Jan Van Lint, BTC- Uganda

**(18) Penetration of solar energy in Kenya and prospects for the next 10 to 15 years**

Prof. Izael Pereira Da Silva, B.Sc. (Eng), MSc., PhD in Power Systems Engineering from the Univ. of Sao Paulo (Brazil) Deputy Vice Chancellor, Strathmore University in Kenya

**(19) Affordable Mobile Solar Water Pumps for Small Farmers**

Ahmed Abbas, SunCity Energy / The American University in Cairo, Egypt

**(20) Solar thermal energy and molten salt storage (CSP+): a solution for dispatchable solar electricity generation**

Michel LALMAND, Vice President Solar, Sales & Marketing, Cockerill Maintenance & Ingénierie (CMI)

**(21) Concentrated Solar Power (CSP) technologies for electricity generation in Harare, Zimbabwe: comparison of two options, Solar Tower (ST) and Parabolic Trough (PT)**

Luckywell Seyitini, Great Zimbabwe University, Department of Physics, Geography and Environmental Science

**NUCLEAR FISSION**

**(22) Nuclear Energy and Sustainable Development in Africa: Challenges and Ways Forward**

Vincent Lukanda Mwamba, François Kazadi Kabuya (1) and Petrus Bompere Lemo (2)

(1) Commissariat Général à l’Energie Atomique, PO BOX 868 Kinshasa XI, DR Congo

(2) Comité National de Protection contre les Rayonnements Ionisants, Kinshasa, DR Congo

**(23) How the IAEA uses nuclear science and technology to help countries meet their development goals and keep nuclear technology in peaceful use**

Gerd Dercon, joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture,

Head of the Soil and Water Management & Crop Nutrition Laboratory, Department of Nuclear Sciences and Applications (NA), IAEA, Seibersdorf, Austria

\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**Wednesday 25 Oct afternoon, 14:00-15:00 / poster presentation**

**BIOENERGY**

**(24) Electricity and heat generation solutions from renewable energy sources for remote households in Central Africa**

Maarten VERGOTE, Dr Ir, Major – Associate Professor, Department of Physics, Ecole

Royale Militaire - Koninklijke Militaire School

**(25) The cogeneration in sugar mill: an energetic deposit opportunity for sustainable development in Sub-Saharan Africa**

KANA-DONFACK P., Prof. KAPSEU César and TCHEUKAM-TOKO D., University of Ngaoundere, Cameroon

**(26) Bio-economic potential of alternative biofuel trees: an alternative liquid biofuel production model based on oily seeds of native tree species**

Floris Dalemans, PhD student KUL, Prof. Dr. Ir. Bart Muys, Forest Ecology and Management, Division Forest, Nature and Landscape, Department of Earth and Environmental Sciences, University of Leuven (KU Leuven), Michael Jacobson, Professor at Pennsylvania State University, and Christine Magaju, World Agroforestry Centre (ICRAF)

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**VARIOUS (i.e.: beyond key Topics 1, 2 and 3)**

**(27) Role of renewable energies in the fight against global warming: the context of Africa**

Prof Yezouma Coulibaly, PhD INP Grenoble, Institut International d'Ingénierie de l'eau et de l'environnement (2iE), Ouagadougou

**(28) Hydrocarbon resources in the Democratic Republic of Congo – a potential source of development for the country?**

Bernard RESPAUT, Chief Executive, European Copper Institute, Brussels

**(29) Zero Emissions Energy in an African context**

Tim Berckmoes, CEO / Gedelegeerd Bestuurder of Anglo Belgian Corporation (diesel engines for shipping, railways and power generators)

**(30) Distributed generation systems as a solution to reduce load shedding in central Africa**

Okana M.N., Kitoko L.S., Kamabu T., Département d’Electricité, Faculté Polytechnique, Université de Kinshasa, R.D. Congo

**(31) Linking Sustainable Energy with Soil Health and Carbon Sequestration through Frugal Innovation**

Venkata Ramayya Ancha, Professor of Mechanical Engineering & Sustainable Energy Engineering, Institute of Technology, Jimma University, Ethiopia

**(32) Building sustainable partnerships in EU-Africa Research and Innovation Initiatives: Experiences from a Finnish University Network**

Eva Kagiri, Finnish University Partnership for International Development (UniPID), Senior Planning Officer FinCEAL Africa, University of Jyväskylä, Finland.

**(33) Fuel cells in emerging countries: a flexible device for the production of electricity from 1W to tens of MWs**

Dr. Jean-Luc Delplancke, Ecole Polytechnique - 4MAT, Université Libre de Bruxelles, former Programme Head of Unit of EU Joint Undertaking “Fuel Cells and Hydrogen”

**(34) Sustainability of Solar Mini-Grids in Nigeria**

Adedoyin Adeleke and Chuks Diji (Centre for Petroleum, Energy Economics and Law, University of Ibadan, Nigeria) and Debora Ley (Central America Regional Clean Energy Initiative, Guatemala City, Guatemala)

**(35) Historical path of sustainable energy promotion in African rural areas: case study with the FERDEDSI Network (« Forum Énergies Renouvelables pour le Développement Durable par la Solidarité Internationale »)**

Dr Marthe Djuikom Vandenbergh - FERDEDSI / IPEED (« Institut Populaire de l'Eau et l'Energie pour le Développement ») and PhD student Benjamin Bender – University of Kassel & Baobab e.V. (training centre and cultural encounter)

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**Contact persons at RAOS:**

* Prof. Dr. Philippe GOYENS, Permanent Secretary (kaowarsom@skynet.be)
* Prof. Dr. Jan RAMMELOO (rammeloo@telenet.be)
* Dr. Ir. Georges VAN GOETHEM (georges.m.vangoethem@gmail.com)

Conference organiser: “Royal Academy for Overseas Sciences” (RAOS) of Belgium

*“Promoting scientific knowledge in overseas regions”*

Avenue Louise - Louizalaan 231 / 1050 Brussels, Belgium

 Tel.: +32 (0)2 538.02.11 / Fax : + 32 (0)2 539.23.53

Website: [http://www.kaowarsom.be/en /](http://www.kaowarsom.be/en%20/) E-mail: kaowarsom@skynet.be