Royal Academy for Overseas Sciences

International Conference

Sustainable Energy for Africa

Programme

23-25 October, 2017

Palais des Académies - Paleis der Academiën
Rue Ducale - 1 - Hertogsstraat
1000 Brussels

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

Introductory session

3 keynote speeches (20 min each)

Chair: Prof. Dr. Philippe Goyens, RAOS, Permanent Secretary, and Prof. Dr. Wail Benjelloun, President Mediterranean Universities Union (UNIMED)

10:00 **GeorgesVan Goethem**, welcome message (Conference Chairman, RAOS)

10:15 **Carole Maman, Chief Investment Officer, Belgian Investment Company for Developing countries (BIO),** representing Alexander De Croo, Deputy Prime Minister and Minister of Development Cooperation and Digital Agenda

10:35 **The Demography of Africa: Impacts on Economy, Energy, and Governance**
Prof. John F. May, Dept. International Health, Georgetown University, Washington, DC

10:55 **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

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

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

11:15 **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

11.35 **Financement des énergies renouvelables en Afrique : principaux enjeux et perspectives d'avenir pour les partenariats publics-privés sous l'angle européen**
Paul Frix, Senior Economist, specialized in International Relations and Development, DG Hon. Coopération belge et CDE/CDI, Conseiller CBL-ACP, PROPADEV SPRL

11.55 **Governing decentralised energy provision: exploring the role of local governance in articulating nexus approaches to energy transitions**
Prof. Ed Brown, UK Low Carbon Energy for Development Network, Jon Cloke, John Harrison and Richard Sieff (Dept of Geography, Loughborough University, UK)

12:15 Q/A session (15 min)

Lunch : 12:30 – 14:00

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

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

4 lectures (20 min each) + Q/A session (30 min) + poster presentation (12)

Chair: Prof. Dr. Jan Rammeloo, RAOS, former Director National Botanic Garden in Meise, and Mr. Smaïla Camara, expert in Renewable Energy and Business Development

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

14:40 **Integrating Climate into Strategy for an Oil & Gas Company: focus on Africa**
Valérie Quiniou, Vice-President, Climate - Strategy - Innovation, TOTAL S.A., Paris

15:00 **Sustainable energy mix for African and MENA region countries**
Prof. Idris Eisa El-Tayeb, Ph.D. Univ. of Reading, UK, National Energy Research Center, Khartoum, Sudan, and Prof. Dr. Mustafa El-Tayeb, President Future University, Sudan, Former Director UNESCO, corresponding member of RAOS

Coffee break : 15:20 – 15:50

Chair: Ir Bernard Mairy, expert in Engineering and Materials Innovation, and Dr Ir Pépin Tchouate Heteu, DEECC Consulting (Energy, Environment, Climate change mitigation)

15:50 Q/A session (30 min) and poster presentation in plenary session (140 min)

18:00 Adjourn

Networking reception in the Palace of the Academies + visit to posters : until 20:00

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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 (4)

Chair: Prof. Dr. Nathalie Verbruggen, RAOS, and Prof. Idris Eisa El-Tayeb, , Ph.D. Univ. of Reading UK, National Energy Research Center, Khartoum, Sudan

BACKGROUND

09:00 **Towards a global partnership regarding mineral resources and energy production: contribution to sustainable development with focus on Africa**
Prof. Jean-Pierre Tshibangu, Univ. Mons, Faculty of Eng., Dept of Mining Eng., RAOS

09:20 **Sustainable Energy Transition: An Operations Research Perspective**
Prof. Per J. Agrell, co-director "Center of Operations Research and Econometrics" (CORE), Prof. Anthony Papavasiliou, ENGIE Chair at UCL in Energy Economics and Energy Risk Management, and Ignacio Aravena, senior researcher, all co-authors with CORE - Louvain

09:40 **On Power System Paradigm: Opportunities and Challenges**
Aymen Chaouachi, PhD, EGI (Elia Grid International, Brussels), Power System Operations & Security

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 **Modèle de prospective énergétique avec évaluation des coûts et des effets sur l'environnement pour la République Démocratique du Congo**
Prof. Ndaye Nkanka Bernard, Institut Supérieur de Techniques Appliquées, Kinshasa

11:10 **Renewable energy deployment in Africa: opportunities, challenges & perspectives**
Dr. Ir. Pépin Tchouate Heteu, Managing Director of DEECC Consulting (Energy, Environment, Climate Change Mitigation)

11:30 **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

11:50 Q/A session (20 min) and poster presentation in plenary session (20 min)

Lunch : 12:30 – 14:00

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

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

7 lectures (20 min each) + Q/A session (30 min) + poster presentation (11)

Chair: Prof. Dr. Ir. Eric Pirard, RAOS, Mineral Eng., Materials and Environment, ULg, and Prof. Dr. Izael Pereira Da Silva, Deputy Vice-Chancellor, Strathmore Univ., Kenya

HYDRO

14:00 **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 International Commission on Large Dams

14:20 **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

14:40 **Using small low cost, robust and easily maintained decentralized hydraulic power stations in Central Africa**
Prof. Patrick Hendrick, ULB, École Polytechnique

NUCLEAR FISSION

15:00 **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

Coffee break : 15:20 – 15:50

Chair: Prof. Dr. Pierre Petit, RAOS, former president (2016), and Dr. Emmanuel Kofi Ackom, UNEP, DTU Partnership, Technical University Denmark

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 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, RAOS, Mineral Engineering, Materials and Environment, ULg, and Dr Ir Sandra Belboom, Chemical engineering, ULg

16:50 Q/A session (30 min) and poster presentation in plenary session (70 min)

18:30 Adjourn
20:00-23:00 Walking dinner in Palace of the Academies + visit to posters

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

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

3 lectures (20 min each) + Q/A session (10 min) and poster presentation (9)

Chair: Prof. Emanuela Colombo, UNESCO Chair in Energy for Sustainable Development, Politecnico Milano, Italy, and Jean Albergel, Senior Scientist Coordinator of European Affairs, CNRS-IRD Joint Office in Pretoria, South Africa

BIOENERGY

09:00 **Overview of bioenergy policies for sustainable development in Africa**
Rainer Janssen, PhD, Head of the Biomass Department at WIP Renewable Energies, Munich, Germany

09:20 **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

09:40 **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

Coffee break : 10:00 – 10:30

10:30 Q/A session (10 min) and poster presentation in plenary session (80 min)

Lunch : 12:00 – 13:30

Wednesday 25 October afternoon, 13:30-16:30

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

3 lectures (20 min each)

Chair: Ir Christian De Meyer, RAOS, EPFL and Columbia University, and Prof. Ed Brown, UK Low Carbon Energy for Development Network

13:30 **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)

13:50 **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

14:10 **Sharing knowledge online and improving education using MOOCs**
Prof. Sandra Soares-Frazão and Emeritus Prof. Yves Zech, Génie Civil et Environnemental, UCL Ecole Polytechnique

Coffee break : 14:30 – 14:50

Conclusion session

2 keynote speeches and final panel discussion

Chair: Prof. Dr Ir Jean-Pierre Tshibangu, RAOS and Dpt of Mining Engineering, Univ. Mons, and Dr Ir Georges Van Goethem, RAOS and former EC DG Research (Energy)

14:50 **Measuring sustainable energy projects to orient strategies for access to energy: why does it matter?**
Prof. Emanuela Colombo, Dr Lorenzo Mattarolo, UNESCO Chair in Energy for Sustainable Development, Department of Energy, Politecnico di Milano, Dr Mariano Morazzo, Head of Climate Change and Renewable Energy Policies at Enel - Enel

15:10 Panel with session chairpersons, including brief communications from the floor (representatives of EIB, 3E, etc.)

16:00 Jozef Smets, Belgian Federal Public Service, Foreign Affairs, Director for Africa, representing Didier Reynders, Deputy Prime Minister and Minister of Foreign Affairs and European Affairs

16:20 Concluding remarks by the Scientific Conference Committee

16:30 Closure of Conference

Farewell drink : 16:30 – 17:30

POSTER PRESENTATIONS

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

Monday 23 October afternoon, 15:50 – 18:00

(1) 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)

(2) Our goal: 600 million connected Africans connected to electricity by the year 2025
Smaïla Camara, International manager, expert with experience in finance, green finance, renewable energy and business development, Special Advisor to Jean-Louis Borloo (France)

(3) Collaboration between Northern and Southern organizations with the aim to facilitate and analyse technology impact on society
Prof Dr Ir Jean-Pierre Raskin (UCL Ecole Polytechnique) and Stéphanie Merle (Louvain Coopération)

(4) Barriers to the uptake of renewable energy in the East Africa region: an enabling environment, access to finance, awareness and access to technical support services
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

(5) 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

(6) AGORIA's views and technology contributions for energy and sustainability in emerging countries (in particular, Africa)
Christian Dierick, Lead Expert, Energy Technology Solutions, Agoria ("Development through technology"), Multisector Federation of the Technological Industry, Brussels

(7) 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, and Matteo della Volta, Power & Gas Business Development, Siemens S.A./N.V.

(8) 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, Tractebel

(9) 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

(10) 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

(11) 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

(12) Building sustainable partnerships in EU-Africa Research and Innovation Energy 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

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

Tuesday 24 October morning, 11:50 – 12:30

BACKGROUND

(13) "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 Bio-Florestas Ltda., São Geraldo – Martinho Campos – Brazil

(14) 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

(15) Hydrocarbon resources in the Democratic Republic of Congo – a potential source of development for the country?
Bernard Respaut, Chief Executive, European Copper Institute, Brussels

(16) Cartographie de l'énergie électrique en République Démocratique du Congo (de l'époque coloniale à nos jours)
Prof. Liassa Nkoy, Département de Génie Electrique, faculté Polytechnique, Vice Doyen chargé de la Recherche, Université de Kinshasa

Tuesday 24 October afternoon, 16:50-18:30

HYDRO

(17) 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)

(18) 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)

(19) Small hydropower development in Burundi
JJean Bosco Niyonzima (1) and Patrick Hendrick (2)
(1) Université Libre de Bruxelles, Aero-Thermo-Mechanics, (ULB Polytechnic School), Belgium, and (2) Promoter and Head of Department Aero-Thermo-Mechanics (ULB)

(20) 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

NUCLEAR FISSION

(21) 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

FUEL CELLS

(22) Fuel cells in emerging countries: a flexible device for the production of electricity from 1 W 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"

SOLAR

(23) Concentrated Solar Power, Battery Storage for Solar photovoltaic (PV) flexibility, Solar PV for Water pumping, and Biomass: solution for sustainable and flexible power
Michel Lalmand, Vice President Solar, Sales & Marketing, Yoshie Yonekura, Marketing & Business Development Manager, and Marianne Noel, Sales Manager, Cockerill Maintenance & Ingénierie (CMI) Energy

(24) 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

(25) 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

(26) 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

(27) Affordable Mobile Solar Water Pumps for Small Farmers
Ahmed Abbas, SunCity Energy / The American University in Cairo, Egypt

Wednesday 25 Oct morning, 10:30 - 12:00

BIOENERGY

(28) The cogeneration in sugar mill: an energetic deposit opportunity for sustainable development in Sub-Saharan Africa
P. Kana-Donfack, Prof. César Kapseu and D. Tcheukam-Toko, University of Ngaoundere, Cameroon

(29) ECOmakala: meeting energy needs, fighting poverty and protecting the forests of the Virunga National Park, eastern Democratic Republic of Congo
by Mone Van Geit, World Wide Fund for Nature, WWF-Belgium, International Programs Manager (Brussels)

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"MISCELLANOUS"

(30) Science and diplomacy in Central and Western Africa: remarkable achievements and challenges
César Kapseu, Ambassador of science, and Liliane D. T. Atoukam, Humanities and Social Sciences, University of Ngaoundere, Cameroun

(31) Zero Emissions Energy in an African context
Tim Berckmoes, CEO / Gedelegeerd Bestuurder of Anglo Belgian Corporation (diesel engines for shipping, railways and power generators)

(32) Use of Distributed generation to improve operation of overloaded grids in Africa
Okana M.N., Kitoko L.S., Kamabu T., Atundezi A. G., Laboratoire de Génie électrique, Département d'Electricité, Faculté Polytechnique, Université de Kinshasa, R.D. Congo

(33) 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

(34) Sustainability of Solar Mini-Grids in Nigeria
Adedoyin Adeleke and Chuks Diji (1) and Debora Ley (2)
(1) Centre for Petroleum, Energy Economics and Law, University of Ibadan, Nigeria,
(2) 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 (1) and Benjamin Bender (2)
(1) FERDEDSI / IPEED (« Institut Populaire de l'Eau et l'Energie pour le Développement »)
(2) PhD student, Univ. of Kassel & Baobab e.V. (training centre and cultural encounter)

(36) EU-Africa Research & Innovation partnership on climate change and sustainable energy – a RINEA technical paper for priorities
Guischet A. (1), Sellami M. (2) and Albergel J. (1)
(1) IRD, French Research Institute for Sustainable Development,
(2) MESRS Ministry of Higher Education and Scientific Research

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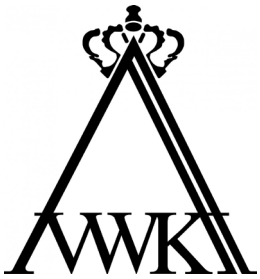

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