



## International Organization for Chemical Sciences in Development

### Press Statement

#### **IOCD Launches Working Group on Materials for Energy Conversion, Saving and Storage (MATECSS)**

IOCD is pleased to announce the formation of the Working Group (WG) on Materials for Energy Conversion, Saving and Storage (MATECSS). The goal of this WG is to enable local-scale energy conversion, energy storage and energy savings in targeted regions in low and middle-income countries (LMICs) through new materials at the forefront of renewable energy technologies. In cooperation with local researchers, the WG will work towards identifying specific energy needs and developing solutions, with a focus on inexpensive adaptive technologies that do not require significant investments in capital equipment and infrastructure and that can make use of local/regional resources.

The existing global infrastructure for power generation and delivery is largely entrenched in a paradigm of centralized production in power plants, with delivery to customers through a network of transmission lines and transformers. While this model is reliably implemented in most industrially developed nations, LMICs often lack reliable electricity delivery services. The reasons for this often relate to a lack of local fossil fuel supplies, and a dependence on costly fuel imports that keep electricity prices high and prevent a critical mass of consumers necessary to implement delivery infrastructure. The International Energy Agency (IEA) estimates that 1.3 billion people lack basic electricity, and that 2.7 billion still rely on burning biomass to cook their food [1].

Recent materials- and process-driven advances have led to a considerable maturation, and significant price drops, in technologies for harvesting and storing energy from renewable sources. In contrast to fossil fuels, the geographic distribution of renewable energy resources (sunlight, wind) favours many LMICs. Advanced technologies that capitalize on these resources are key to enabling energy self-sufficiency in regions not currently served by reliable large-scale power infrastructure. These renewable energy sources have the additional benefit of being highly scalable: they are cost-efficient even in very small implementations, which makes them amenable to use in local-scale distributed electrical systems.

The need for growth in this sector is pressing. The 2011 edition of the IEA's *World Energy Outlook* estimates that to meet the goal of universal access to electricity by 2030, at least 55% of new electricity generation should be local-scale (isolated off-grid or part of a local energy grid) [1]. Since renewable energy sources lack the constancy of traditional fossil-fuel power generation, energy storage (batteries, etc.) is a critical aspect of local-scale energy production. Finally, it is essential to develop advanced materials that minimize energy consumption in everyday processes, such as diode-based light bulbs or high-efficiency building insulation.

The newly formed Working Group Materials for Energy Conversion, Saving and Storage (MATECSS) has two objectives. First, it aims to expedite technology transfer in the areas defined by MATECSS by connecting experts from around the world with local scientists, engineers and students in LMICs. This process will involve working with locals to identify specific needs in targeted regions.

In a second subsequent phase, an internet-based platform will be used to create a flow of knowledge and know-how to the local stakeholders. This virtual interface will be supported with face-to-face meetings in the form of on-site short courses and regional workshops or symposia aimed at defining specific and concrete actions as a follow up on the virtual platform.

The second goal of the Working Group is to foster the development of low cost, adaptive technologies [2] based on materials for energy conversion, saving and storage that fit within the paradigm of local-scale energy systems and that use local resources. For example, a recent meeting of the African Materials Research Society highlighted the potential for fabricating dye-sensitized solar cells using dyes extracted from papaya leaves [3].

The Group will be co-chaired by Mohamed Chaker ([chaker@emt.inrs.ca](mailto:chaker@emt.inrs.ca)) and Federico Rosei ([rosei@emt.inrs.ca](mailto:rosei@emt.inrs.ca)), Professors and Canada Research Chairs holders at the Centre Énergie Matériaux Télécommunications of Institut national de la recherche scientifique ([www.emt.inrs.ca](http://www.emt.inrs.ca)).



**Profs. Rosei (left) and Chaker (right) will co-Chair the newly-established IOCD Working Group on Materials for Energy Conversion, Saving and Storage (MATECSS).**

- [1] International Energy Agency, *World Energy Outlook 2011*.
- [2] F. Rosei, L. Vayssieres, P. Mensah, *Materials Science in the developing world: Challenges and perspectives for Africa*, *Advanced Materials* 20, 4627–4640 (2008).
- [3] M. Chaker and F. Rosei, *Rising from the Falls*, *Nature Materials* 11, 187-188, 2012.

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Registered in Belgium and with an affiliate in the USA, IOCD was established in 1981 under the auspices of UNESCO, as the first international non-governmental organization devoted to enhancing the role of the chemical sciences in development and involving chemists in low- and middle-income countries, including those in Africa, enabling them to contribute to key science and technology areas for development. Over a number of years it has conducted work in environmental analytical chemistry, plant chemistry, biodiversity, medicinal chemistry and chemical education. It has also supported the development of analytical chemistry capacity in low- and middle-income countries, especially in Africa. IOCD's President is the French Nobel Laureate, Jean-Marie Lehn, honoured for his work in supra-molecular chemistry. Professor Alain Krief was appointed Executive Director of IOCD in 2010. A Belgian chemist at the University of Namur, his fields of work include synthetic organic chemistry and knowledge-based computer systems for enhancing chemical education and practice.

Further details of IOCD and its programmes can be found at [www.iocd.org](http://www.iocd.org)

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