



**UNIVERSITÉ
DE GENÈVE**

**INSTITUT DES SCIENCES
DE L'ENVIRONNEMENT**

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CYCLE DE FORMATION ÉNERGIE – ENVIRONNEMENT

SÉMINAIRE 2013-2014

Integration of Wind Power in Power Systems

Ana ESTANQUEIRO

LNEG

jeudi 20 mars 2014 à 17h.15

Auditoire D 185 - Bâtiment D - Uni Battelle

7, route de Drize, 1227 Carouge

PROGRAMME DES PROCHAINES CONFÉRENCES :

Jeudi 27 mars 2014 à 17h15

« *Énergie éolienne : le cas de la Suisse* »

Lionel Perret, Swiss Eole

Jeudi 10 avril 2014 à 17h15

« *Statistique suisse des énergies renouvelables* »

Urs Kaufmann, Eicher+Pauli

Jeudi 8 mai 2014 à 17h15

« *Grey energy and environmental assessment of renewable energy systems* »

Martin Patel, Unige

Jeudi 15 mai 2014 à 17h15

« *Mesurer ce qui n'existe pas : le défi de l'évaluateur* »

Daniel Cabrera, Unige

L'orateur

Ana Estanqueiro received her Power Engineer degree from the Technical University of Lisbon in 1986 where she also did her M.Sc and PhD in Mechanical Engineering (Energy), respectively in 1991 and 1997. Her research interests are broad within renewable and wind energy and include planning methodologies for sustainable deployment, distributed generation, smart/active systems, with a special focus on dynamic models for large integration of wind and other fluctuating renewable sources.

She is nowadays a senior researcher at LNEG (National Laboratory of Energy and Geology of Portugal) where she is head of the Energy Analysis and Networks R&D Unit and coordinator of Wind Energy R&D. She is also an invited Professor at the Science Faculty of the University of Lisbon, a visiting professor at UTN (National Technological University) in Buenos Aires and was an associate Professor at Lusáda University.

She is the Portuguese delegate in IEA (International Energy Agency) Wind IA, TP-Wind Mirror Group, SET Plan EII-Wind, EERA JP Wind, IEC (International Electrotechnical Commission) CEI TC88WG10 and CEN/CENELEC Wind Energy.

She is a Project Expert and Evaluator at the European Commission, the Danish Energy Agency, the Academy of Finland and the Nordic Energy Research.

The recent projects she is working on now are: ESFRI Windscanner.eu; FP7 DEMOFLOAT; FP7 NORSEWInD; IEE 2020 SEANERGY; FCT - Fluct.Wind; FCT - ROADMAP; (FAI REIVE; DEMTEC T.URBAn DEMTEC (ADI n ° 70/206)

La conférence

The capacity of wind power installed all over the world experienced an enormous increase in the past 10-15 years. This increase raise concerns about the impact of these electric power sources on the operation of local grids and, on a larger scale, on the power system operation. This seminar will address the intrinsic characteristics of wind power, namely its continuous fluctuating and non-dispatchable nature and the impacts that large amounts of wind generation (as well as other fluctuating renewables) may have in the design and operation of present and future power systems. The most relevant challenges for power systems with high penetration of wind power will be highlighted (e.g. increase of reserves, wind power forecasting, spatial smoothing, impact on markets structure, etc...) and the existing IEA recommendations to assess their impact on the grid and power system will be presented.

From a point of view of regional grids, the impact of wind generation on local power quality parameters (reactive power flow, voltage profile, flicker emission and harmonics) will also be addressed.