

One-page expertise description

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Type of partner	University, Research Centre, Large Company
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Position	Research engineers

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Topic(s) of interest:

WATER-2-2015: Integrated approaches to water and climate change

_ develop integrated strategies and approaches, at different spatial scales (regional, national, continental, global), integrating resource efficient land use, agricultural productivity improvements, sustainable water management and low carbon energy transition and analysing interactions with the existing regulatory frameworks in these areas and the potential barriers to implementation.

Headline:

Water footprinting in general and in particular for electricity generation

Potential contribution:

Laborelec/GDF SUEZ has knowledge on the currently existing water footprinting methods and is also involved in the WULCA initiative, together with CRIGEN/GDF Suez. This initiative aims at developing an internationally common accepted methodology for water footprinting and includes universities, research centres as well as industrial partners. Apart from knowledge on the existing methods, Laborelec has **operational expertise in water treatment and management** in general and in particular for **electricity generation**, and possess **data** related to water quantity and quality of different electricity production sites. Of particular interest to us is the development of water footprinting methodologies that include **thermal** and **chemical composition changes** that may change water 'quality' as it is used in industrial processes.

In previous studies, Laborelec also used intensively the **LCA** methodology to assess the **environmental footprint** of different assets of electricity production and this in collaboration with Universities (VUB, Ulg) and private research companies (eg. TREEZE)

References to the current and previous work are presented below.

Partners: ETH, Quantis, WULCA, Crigen, TREEZE, ..

References:

Papers in International Peer-Reviewed Journals

- Mertens, J., D. Corbisier, A. Prieur-Vernat and G. Boon, 2014. Water footprinting of electricity generated by Combined Cycle Gas Turbines using different cooling technologies: a practitioner's experience. *Journal of industrial ecology*, in preparation
- Oliveira, L., M. Messagie, J. Mertens, H. Laget, T. Coosemans and J. Van Mierlo, 2014. Life Cycle Assessment of Energy Storage Systems for Grid Applications. *Applied Energies*, in review
- Messagie, M.; F. Boureima, L. Oliveira, J. Mertens, C. Macharis, and J. Van Mierlo, 2014. The hourly life cycle carbon footprint of electricity production in Belgium. *Applied Energies*, in review
- Messagie, M., F. Boureima, J. Mertens, J. Sanfelix, C. Macharis, and J. Van Mierlo, 2013. The Influence of Allocation on the Carbon Footprint of Electricity Production from Waste Gas, a Case Study for Blast Furnace Gas. *Energies*, 6, 1217-1232

Presentations At International Congresses, Symposia, and Workshops: Abstract only or not published

- Mertens, J., H. Huynh and A. Prieur-Vernat, 2013. Water footprinting of electricity produced by a Combined Cycle Gas Turbine: effect of cooling technology, gas supply chain and power plant location. 19th SETAC Europe LCA Symposium, Rome, Italy.
- Prieur-Vernat, A., J. Mertens, 2013. Water availability footprint of electricity production. Oral presentation at the SETAC Europe 23rd Annual Meeting, Glasgow, United Kingdom, 12-16 May 2013
- Mertens, J., R. Frischknecht and H. Huynh Thi Ngoc, 2012. Life cycle assessment of amine based post combustion carbon capture. 18th SETAC LCA Case Study Symposium, Sustainability Assessment in the 21st Century - tools, trends and applications, 26-28 November 2012, Copenhagen, Denmark.

Presentations At International Congresses, Symposia, and Workshops: Full paper in proceedings

- Mertens, J., R. Frischknecht and H. Huynh Thi Ngoc, 2012. Life cycle assessment of amine based post combustion carbon capture. 18th SETAC Europe LCA Symposium, Copenhagen, Denmark.
- Mertens, J., H. Huynh and S. Colle, 2012. Life cycle assessment of water demineralization in power plants. International Water Association (IWA), Dublin, Ireland.