LIFE CYCLE ASSESSMENT OF ANTHROPIC WATER

S. GROSLAMBERT and A. LÉONARD
Department of Chemical Engineering - PEPs
University of Liège, Belgium
www.chimapp.ulg.ac.be – s.groslambert@ulg.ac.be

Introduction
In its Regional Policy Statement for 2009-2014, the Walloon Government (Belgium) undertakes to make Walonia a model of good governance. Applying this principle in the field of the environment needs to be based on a continuous, objective and strict evaluation of the evolution of the state of environmental components (air, water, soil, biodiversity, etc.), the pressures to which they are subjected, the resultant impacts and the measures taken to improve living conditions within our Region. Within this framework, the General Operational Direction of Agriculture, Natural Resources and Environment (DGARNE) realises reports on the state of the environment in Walonia, in close collaboration with universities and research centres. A chapter is dedicated to the efficient use of water resources, including a life cycle assessment of anthropic water.

Materials and Methods

Goal definition
The aim of this study is to assess environmental impacts of anthropic water consumed by Walloon citizens, from its collection to its discharge and treatment. The study also includes the collection and consumption of 6.4% of rainwater in addition of the tap water.

Methods
- Life Cycle Assessment methodology, ILDC 2011 [1]
- ReCiPe 2008 (European hierarchist version, v1.11 update 2014) [2]
- This study is done in accordance with the ISO standards 14040 [3] and 14044 [4].
- SimaPro 8.0.3 software (Pré-Consultant)
- Ecoinvent 3.1 database [5]

The functional unit (FU) is 1 m³ of water for the Walloon citizen’s consumption (including both tap water and 6.4% of rainwater).

Results and Discussion

Main results of this study are presented in Figure 2 and 3 for 1 FU.

Electricity corresponds to the Walloon regional mix in 2010 (Nuclear: 67.0%, Natural gas: 23.6%, Renewable sources: 8.5%).


Conclusions
The life cycle assessment of anthropic water points up how the water consumption by Walloon citizens affects globally the environment. The most impacting steps of the process are highlighted as well as the most affected impact categories. The survey of the way each step influences negatively ecosystems provides some approaches to improve the global environmental impact of human water consumption in the future (e.g. intensive treatment systems / wetlands to complete the equipment in MWTP).

Remark: Sanitary and health improvements for humans and environment are not taken in account because no measurement of toxic pollutants or pathogenic microorganisms is made in routine and included in the inventory data. These essential benefits that we owe to (waste)water treatment are then underestimated in this LCA.

References