**REMAGHIC Project objective:**
Development of new technologies and improvement of existing ones:
Magnesium recycling + **Rare earth elements (REE) recovery**

**Mg+REE alloy** (for automotive, aeronautical, biomedical industries)

**Poster objective:**
Discussion on managing uncertainty in LCA of innovative REEs recovery processes:
- **No Life Cycle Inventories** (LCI) in the available LCA databases (ecoinvent and GaBi Professional) of some chemicals used
- **Extrapolation** of material and electricity consumption to higher TRL (Technology Readiness Level)

**Materials & Method:**
- **Recovery of Yttrium, Cerium and Lanthanum**
- **Technologies:**
  - Hydrometallurgical (Relight)
  - Pyrometallurgical (Tecnalia)
  - Ionometallurgical and solvometallurgical (KUL)
- **Procedures:**
  - Partners with higher TRL support those with lower TRL, (knowledge and experience) in extrapolating their process
  - Use of Software that optimizes process manufacturing (e.g. for chemical and energy, such as AspenTech) – ongoing activity
  - Unavailable LCIs created on literature research
  - Every decision regarding extrapolation/estimation of data was supported by partner experts

- Processes developed in lower TRL (e.g. calcination step):
  - Electricity consumption was then extrapolated with support of partners working with higher TRL equipment and information gathered with machinery suppliers
  - Production of oxalic acid, wollastonite (calcium silicate), calcium aluminate, and other chemicals:
    - LCI created on literature, preferably industrial processes
  - Consideration of credits (i.e. reduction of environmental impact due to replacement of primary source by secondary one):
    - Literature research of hydrochloric acid (HCl) recycling process → higher CO₂ emission for HCl obtainment from secondary source

- **Reduction of uncertainties** around inputs with the approach used to create LCI of some of chemicals and electricity consumed
  - Having managed these uncertainties in the first part of the project will allow the assessment of the up-scaling process of Mg+REE alloying ingots while still assuring data quality
  - Consideration of credits in LCA modelling for chemicals that can be re-used / recycled - ongoing activity

- Discussion with 23rd SETAC LCA 2017 audience → share ideas and experiences