

SHIFT YEAR MISSION 2022/2023

Study of a selection of ferro-
alloys & other raw materials for steel industry:
Current state, future opportunities and challenges in the
perspective of various sustainability related dimensions

Who is this tasks for?

A des étudiants actuellement en M1, M2 (ou équivalent à voire en post M2 dans différentes disciplines en particulier à titre indicatif et non limitatif : ingénierie, économie, droit aménagement et développement des territoires...

Une équipe pluridisciplinaire de 4 à 5 étudiants sera constituée pour la mission à bien.

Le donneur d'ordre : ArcelorMittal Global R&D

Context :

Among others, the Steel industry is undergoing a major shift to achieve the Net Zero targets not only along its manufacturing processes but also throughout its entire supply chain. Other ESG related KPIs may need to be considered as well. Thus, a clear understanding is required of the current constraints and future opportunities regarding various sustainability related dimensions of key raw materials used in steel manufacturing.

Objectives :

Support the development of supply chain ESG-related and decarbonization strategy at ArcelorMittal by creating a “sustainability overview” of various raw material supply chains – from current state ESG risks, resource scarcity and carbon impact, to the opportunities linked to the use of future decarbonized technologies.

Mission :

- Evaluation of the current state of all types of ESG risks (i.e.environmental impact, social risks, governmental constraints,...)
- Evaluation of raw material scarcity and future risks

- Evaluation of decarbonization potential by looking at the current manufacturing technologies, technological path towards decarbonization, and the potential constraints linked to the access to raw material

Important elements to consider for the approach:

- Formalization of the criteria allowing the prioritization of the list of elements studied (volume, rarity, specific extraction and refining process, etc.), in order to focus on a reduced list of important elements that will be studied in detail rather than just a summary overview
- Documentary analysis of academic work (via CentraleSupélec access)
- Interviews with professionals belonging to companies that are part of the product's value chain (combining CentraleSupélec and ArcelorMittal channels to get access to the right contacts)
- Use of various models to go beyond simple carbon-oriented LCA, in order to take into account the maximum number of ESG dimensions (absolute and relative availability of resources, social and societal impact of the processes used throughout the chain of value, etc.) (combination of tools and references currently worked out by ArcelorMittal and by the CentraleSupélec community (school and alumni))

Disciples / Qualifications :

engineering, communication, political sciences/law, sociology