The UK Low-Carbon Industry Transition from a Sectoral Innovation and System Failures Perspective

**DEMAND**

**Construction**
Iron & steel and cement are the basic components in most buildings

**Manufacturing**
Iron & steel is an important material for the whole manufacturing sector that used to be an important sector of the British economy

**Other**

Fear of demand shifting towards other industrial powerhouses (e.g., China)

Legislation affecting the regulatory framework

**ACTORS & NETWORKS**

**Large Companies and SMEs**
Steel manufacturers are decreasing in the UK. Nevertheless, large companies are still present especially in the manufacturing sector, such as Rolls Royce

**Federations & Institutions**

- CBI, MAKE UK, Mineral Products Association and Chemical Industries Association
- Oxford University
- Cambridge University
- Imperial College

Knowledge Flow: The processes are enhanced and improved and then used by the actors of the industry

**KNOWLEDGE, LEARNING PROCESSES AND TECHNOLOGIES**

**Dominant Processes in iron & steel, cement and chemicals industries**
- Iron & Steel: BF/BOF (approximately 80%) with coal playing a major role and EAF (17%)
- Cement: Clinker-based production
- Chemicals: Haber-Bosch / Naphtha-Cracking

**Innovations:**
Hydrogen, CCS, BAT

The UK is an important stakeholder in hydrogen research. CCS is also investigated in various applications in the UK. Many installations already comply with BAT standards but there is room for improvement.

**INSTITUTIONS**

**National Legislation**

- **Climate Policies**
  - Climate Act (revised in 2019 for net-zero emissions by 2050 affecting the whole industrial sector)

- **Emission Regulation**
  - Environmental permitting regime (industries must obtain a permit related to land, water, and air emissions in order to operate)

- **UK’s Industrial Strategy**
  - Important funding contributing to decarbonisation and increased productivity

**European Legislation**

- **Climate Policies**
  - Various targets for CO₂ emissions and RES penetration by 2030, 2040 and 2050.

- **Industrial Emissions Directive**
  - Obligatory use of BAT practices - 2014.

- **EU ETS**
  - Prices for CO₂ and other emissions.

*This may not be applicable due to the UK’s exit from the EU*