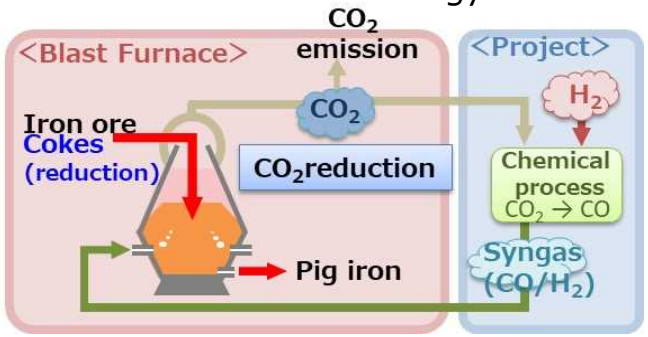
Project Title : International collaboration on CCU for circular carbon in steel making (2021～2024)

Entrusted Parties : SEKISUI CHEMICAL CO.,LTD./The University of Tokyo

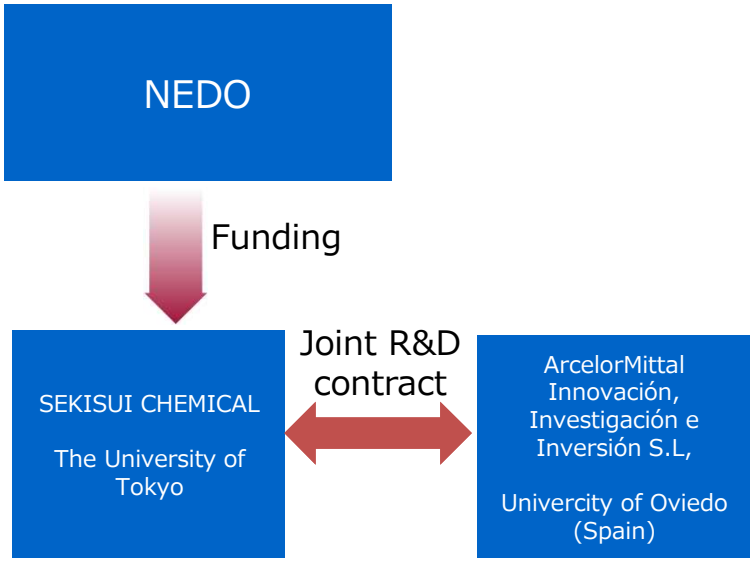
Outline of the Project

・**Background :** CO_2 emissions from the steel industry account for 43% of the entire manufacturing industry. Above all, a blast furnace (BF) producing pig iron from iron ore accounts for about 70% of the CO_2 emissions of steel industry, and the reduction of CO_2 emissions in the BF process is a major issue.

・**Purpose・R&D tasks :** After separating and recovering CO_2 from BF gas, it will be converted to syngas (CO and H_2 mixture) by a novel chemical process. The syngas could be injected back into the BF as a reducing agent which substitute coke. In this project, We will develop fundamental technologies to utilize CO2 that leads to reduce CO2 emissions. In parallel, we are developing methods to evaluate the efficacy of the CO2 reduction technology.



Project Scheme



Significance of International R&D

Significance and merit: By jointly developing CO_2 reduction technology with European steel makers, which have strict demands for CO_2 reduction, it is possible to establish fundamental technologies for CO_2 reduction that are globally accepted.

Collaboration with International partners: ArcelorMittal is one of the largest steel manufacturers in the world and has a track record of investigating many CO_2 reduction technologies for the steel making process. The University of Oviedo has a track record of doing LCA for steel making processes and new CO_2 reduction technologies in collaboration with European steel manufacturers.

Expected Outcomes

Images of commercialization beyond 2030

Syngas (CO and H_2) produced from CO_2 will be introduced into existing blast furnaces as an alternative reducing agent for coke, reducing coke and CO_2 emissions.

CO_2 reduction potential

Assuming that the conversion technology (from CO_2 to syngas) is applied to 10% of ArcelorMittal and Japanese blast furnaces, CO_2 emission reduction is expected to be 4.5-9 million tons-CO_2 / year.