Green Energy Transition at Vinci Technologies Pilot Plant Division

Manufacturing scientific equipment to develop new processes or improve industrial one has been part of Vinci's DNA since its foundation in 1968. Vinci's scientific equipments are focused on improving chemical engineering parameters and catalysis field to reach higher efficiency and performance.

Vinci Technologies is extremely proud to have recently applied this 50+ years of knowledge and experience to current development on **Green Energy Transition** with different project of **Plastic Waste Recycling, CO_2 Capture & utilization, Biofuel production and Green Ammonia production**

Plastic to Liquid technology PtL is a very promising field to take advantage of wastes that are nowadays mainly burn or ends up in a landfill. Vinci technologies has designed very versatile **PtL pilot plants** based on thermal-catalytic conversion to convert a large range of material, even **unsorted plastic waste** straight from waste management plant, into **valuable liquid hydrocarbon** to be fed back to polymer plant as **carbon negative raw material**.

In addition, Vinci Technologies is developing a pyrolysis pilot plant to process & recycle another promising feedstock **waste tyre**.

Vinci's pilot plant for Hydrothermal Liquefaction HTL of biofeed

Co-feeding liquefied biomass (**Bio-crude**) with conventional feedstock in existing refineries, also known as **Co-processing**, is a promising option for efficient and smooth energy shift as it allow **reducing CO_2 emission** with minimum technical change to running industrial plant. Bio-crude is produced by pyrolysis and Liquefaction processes, however its viscosity, level of impurities and oxygen atom make is challenging to handle (fast & severe catalyst deactivation).

In addition to covering technical improvement to meet bio-crude specificity (viscosity, chemical compatibility, stickiness) Vinci's Technologies pilot plant for **biomass co-processing** is handling

Vinci's Co-Processing pilot plant with Slurry-Phase Reactor

catalytic activity investigation to develop & demonstrate high activity catalyst for bio-crude. Vinci Technologies Biomass co-processing pilot plant are based on **Fluid Catalytic Cracking process (FCC)** and Hydrocracking processes: **Slurry phase reactor & Ebullated bed Reactor.**

Vinci Technologies design and manufactures tailor made pilot plants for **Carbon Dioxide Utilization** to produce added-value chemical methanol, DME, etc. or liquid hydrocarbons gasoline, jet fuel, diesel, etc.

Feeding Vinci's technologies pilot plant with **green H_2**, generated by electrolysis using renewable electricity, and **Captured CO_2** from an industrial emission leads to sustainable & carbon neutral **E-chemical** and **E- fuel**.

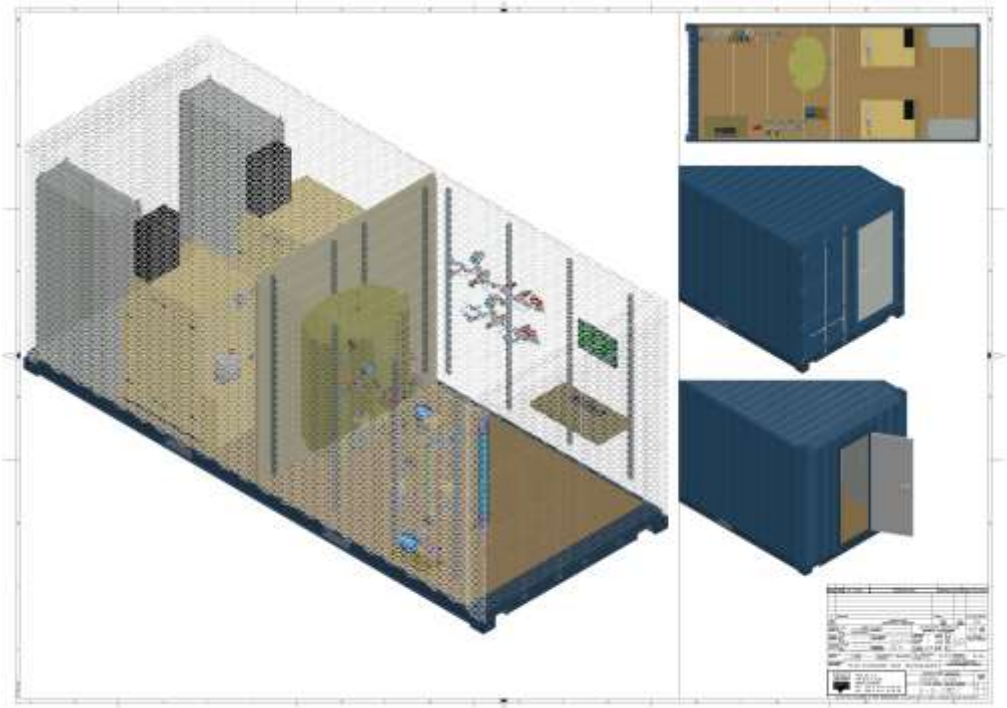
Vinci Technologies provides state of the art modular equipment to investigate & demonstrate performance of CO_2 hydrogenation technology.

Vinci's E-Fuel pilot plant by CO_2 Utilization

In addition, Vinci Technologies is developing a pilot plant focused on the 1st step of **CCU Technology: Carbon Capture.** Vinci Technologies design is based on **Calcium looping** technology, a process very suitable to large carbon dioxide emitter such as cement industry.

Ammonia is produced in large quantities worldwide by agrochemistry industries but uses **natural gas or other fossil fuels** to provide both the hydrogen feedstock and the energy to power the synthesis process. As a result, ammonia production by these methods releases almost 1.5% of global CO_2 emissions. Vinci Technologies design and manufactures tailor made **pilot plants devoted to Green Ammonia formation** to demonstrate that when produced sustainably from renewable source (wind,

solar, water & air) ammonia can become an **emission-free green fuel** or be used as **energy storage** and **carrier** (practical hydrogen energy vector).



Schematic representation of Vinci's container built Green Ammonia pilot plant