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Abstract: "CO2 use in and for the circular economy: the industrial dimension"

The chemicals sector has been very successful in the last twenty years to decouple economic growth from CO2 emissions. However, what is now needed to comply with the even stricter benchmarks are real "game changer" that go beyond the existing level of industrial integration. Such a "game changer" would be if CO2 could be turned from an environmental problem into a business solution.

Industrial symbiosis between energy intensive industries, energy suppliers and chemicals industries go far beyond industrial integration and make possible to use CO2 and other gases as feedstock. CO2 use may therefore only be economically viable under very specific conditions, namely where energy intensive industries meet chemical companies that can benefit from low energy prices to "store" excess renewable energy in chemical substances.

CO2 use will be for the chemicals industry both a threat and an opportunity. It is a threat as an energy intensive industry it is a typical CO2 emitter subject to climate change regulations limiting the amount of CO2 to be emitted. But at the same time it is an opportunity as CO2 is also a feedstock alternative to oil and natural gas and can be valorised to produce chemical substances.

The challenges are:

- First, other energy intensive industries and chemical companies should team up and be linked together by appropriate pipelines, connections and related infrastructure.
- Second, there are several technological solutions available or being developed to facilitate the use of CO2, but many of them still need to demonstrate their technological maturity and economic viability under real-life conditions.
- Third, in order to support the economic viability of CO2 use, incentives may be required as also offered for the use of other renewable energies, which requires the legal recognition of CO2 in EU regulations such as the Emission Trading Directive, the Renewable Energy Directive, the Fuel Quality Directive and the Waste Framework Directive.
- And fourth, given the avoidance and reduction of direct CO2 emissions by its use, energy intensive industries that supply CO2 could benefit from a different way of emissions calculation and allowances granted.