DECARBONIZATION SOLUTIONS FOR ENERGY-INTENSIVE INDUSTRY AND OPPORTUNITIES FOR CHEMICAL INDUSTRY

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The de-fossilization of our energy system and energy intensive industries is a process which is equally driven by science, by political will, by industrial economics and bankability of the investments. Due to mass production and the associated learning curve photovoltaic (and wind) became the cheapest source for energy in most places of the world. Extrapolation indicates it could feed the majority of energy need we have. Due to the volatility of renewable generation, a stabilization of the system, distribution of the energy and storage at short term (batteries) and long-term (molecules) are the topics to solved. A significant rise of electrical energy production is expected. This is due to the electrification / decarbonisation of industrial processes as well as to the increasing energy need flowing towards the generation of green molecules as raw materials for the chemical industry and energy storing molecules for fuel. Water electrolysis to H_2 is a natural entry point of electricity in the chemical sector and needs to be scaled immensely. This needs to be combined with capture of CO_2 (also from air) or the use of NH_3 and improved thermochemical reactions. The direct electrochemical CO_2 conversions comes up and will compete with existing technological route, to be combined with bioprocesses and photochemical technologies.
There are existing technologies to start with and surely major further development needs, to come up with economic solutions for all topics. A joint effort bringing together all relevant players is mandatory. SUNERGY/Suner-C will serve as ideal platform to deliver this and execute the development work.