Carbo2Chem®
Turning emissions into valuable resources.
Carbon2Chem® – CO₂ as a raw material.

The objective of the Carbon2Chem project is to convert steel mill gases into base chemicals – including the CO₂ contained in them. This means that the greenhouse gas is no longer emitted into the atmosphere. And: The energy required for the conversion comes from renewable sources.

This required a small revolution, but it was a success. We have overcome the boundaries between individual industries. The process gases from a steel mill become raw materials for the chemical industry. The fact that thyssenkrupp is represented by 155,000 employees worldwide in many innovation-rich sectors plays a crucial role in the implementation. It means that we have experts in steel working alongside chemical plant builders. This is where the idea behind Carbon2Chem originated. A further 16 partners from basic and applied research as well as from various sectors of industry are involved in the project. The project is being funded by the Ministry of Education and Research.

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Up to now, steel mill gases were combusted in order to produce electricity and heat for the steel making process. Carbon2Chem now places the gases at the start of a chemical production chain. This is possible because steel mill gases contain, among other things, hydrogen, nitrogen and carbon oxides, from which a large number of chemical products can be manufactured.

We have established a cross-industry network to use CO₂ as raw material.

Hydrogen serves as the energy source, which is partly already present in the steel mill gases. Further hydrogen is to be produced via water electrolysis using renewable energy. The processes in the steel mill will be modified so that a part of the steel mill gases will be diverted for the production of chemicals if cost-effective surplus electricity is available from renewable sources.

It is no wonder that the prospects of success for Carbon2Chem are so good, because the fundamental chemical processes and the necessary technologies are well known. The conversion of process gases into ammonia and urea as precursors for fertilizer is technically, but not yet economically, feasible. This process would use part of the CO₂ contained in the steel mill gases. It would also be possible to generate methanol from steel mill gas, a process in which the CO₂ amounts present could be almost entirely used.

You can read about the background to this good news at: https://www.thyssenkrupp.com/en/carbon2chem/