

China-Poland-Czech republic-Germany workshop_of the chemical use of coal and renewable sources for the creation of the circular coal economy

organised by the Fraunhofer Institute, Berlin the 15-17 th April 2019

Calamites Ltd has participated as invited guest speaker on the workshop.

During the 2 days in Berlin 15 presentations were held on the latest technology developments.

On the 17 th April in Zabrze the ICHPW's activity was presented and a visit to the experimental laboratories took place.

The german presentations were also dealing with the impacts of the carbonless energy strategy.

They have stated openly, that the ambitious plans of the German government for giving up the nuclear and coal based energy production are presently not backed up with appropriate technologies for the realisation, however they consider the creation of those technologies as a challenge. It had become clear, that over the capacities needed for the decarbonisation of the electricity generation at least a similar renewable capacity would be needed by the German chemical industry for the neutralisation and transformation of CO₂.

The presentation from Poland has clearly stated, that there will be a trend to decarbonise the electricity production, and parallelly increase the efficiency, but still about 50% of the energy production in Poland shall be coal based by 2050. (By this date Germany plans to phase out the coal based energy production completely.)

As far as the technology solutions are concerned the German presentation has reported their results on the field of physical and digital modelling of flame burning and gasification. The essence is the fast digital modelling, which has shortened the earlier computation need of several days into a few minutes, with an error of within 10 %.

The Czech presentation has reported on the biological (algae) transformation CO₂ research.

The Chinese presentations has mainly given an insight to a few fields of research in the Shanghai Institute of Advanced Materials of the Chinese Academy of Science. For the batteries the solid electrolyte and graphen layers are one area of the research. It was mentioned, that with the technologies known today 16 year world production of lithium would be needed to store 1 TWh of electricity. For transforming the CO₂ for every targeted product different type of catalysts were tested, and the suitability of the different material was analysed (i.e. olefins, methanol, ammonia etc.) In a separate dialog it was mentioned that the composition of hydrogen and CO₂ can be solved technologically, while the cost of technology in the process is about 20% and the cost for CO₂ and hydrogen makes up 80% of the total cost.

It was presented that the electric energy needed for the water splitting can be decreased by 5% if the water is heated to 150 °C, and by 10% for around 500 °C, which was not tested yet.

In the second part of Calamites presentation the Odysseus program was outlined, while in the first part the listing and preparation of the different resources and their following integration for the production of different known products was discussed.

During the visit to the ICHPW headquarters in Zabrze the activities of the institute were introduced, which is ranging from the testing of solid fuel ovens, to the testing of synthesis gases from coal and coal based material even to the utilisation of the oven gases from the cockery ovens. Specially mentioned should be the important building containing the small scale models for different gasification technologies. Naturally there are a lot of analytical laboratories and testing equipment to test of the raw materials and the finished products.

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