Strategy Statement: Dii Desert Energy – Global Energy Solutions

17.04.2022

Following the urgent call for action by the IPCC in April 2022, one of the primary goals of humanity should be to reduce its ecological footprint and especially its CO_2 and other harmful emissions worldwide. This seems to be fundamental for the growing world population to live in prosperity and to preserve its natural environment. Ultimately, the aim is to achieve all Sustainable Development Goals of the UN Agenda 2030. Climate-damaging emissions e.g. from energy generation, industry processes, transportation or residential heating/cooling must, thus, be reduced – ultimately reaching zero. At the same time, supplying the world's population with energy should be reliable and affordable.

As Europe is importing more than 60% of its energy from fossil sources, cooperation between North and South to import energy from renewable sources, should, thus, be further enhanced urgently. Of course this cooperation and trade should take place on equal footing among developing, emerging and industrialized countries. Fair cooperation will offer many advantages and synergies, among others bring prosperity to the regions with abundant green energy sources and lead to energy security and lower costs levels for all countries involved.

The core idea is that green electricity from low cost and secure sources will become the backbone of the regional and global energy

value chains. Green electricity in Europe is already attracting a lot of attention, the aim is to reach the same attention for green power in and from Europe's neighboring MENA region.

Global Energy Solutions and Dii Desert Energy do not only focus on green electricity, but also on its conversion into hydrogen, its derivatives ammonia, methane, and methanol ("green molecules") and in addition, liquid organic hydrogen carriers (LOHC) for transportation and storage processes.

The hydrogen derivatives methanol, and methane, carrying carbon, could also serve as the basis for e-fuels to run the global fleet of vehicles with combustion engines or for other applications where availability of hydrogen is limited, provided the carbon element will be recycled or captured. Also green ammonia seems to be a viable option as energy carrier. Energy carriers must be produced, bottom line, climate-neutral, thus, without harmful emissions along local, regional and international energy supply chains.

There are numerous challenges for the development of climate-neutral supply chains based on hydrogen.

Firstly, climate neutrality must be ensured at system level, e.g. through a water tight mechanism of certification.

Secondly, the supply chains of today are still dominated by fossil energy, green products are expected to aggressively increase their share – both must be handled within one uniform legal framework.

Thirdly, emission and green certificates (with Guarantee of Origin) enable decoupling and thus separate trading of the physical product on the one hand and their related emissions or green properties on the other hand. Thus a distinctive value for each part can be defined and hence, the respective certificates can accelerate the overall energy transition.

Fourth, availability, accessibility and reach of the necessary production, conversion, transport and storage infrastructure must be supported, as well as emerging factors overcome that may hinder the expansion of green systems such as the availability of precious metals and rare earths.

In addition to green electricity, the use of natural gas with carbon capture and usage/storage (CCUS) or via methane pyrolysis is of value as a bridging technology, adding to a fast reduction of CO_2-emissions. Fossil fuels must become part of a flexible carbon recycling program – aiming for as little CO_2 or other harmful

emissions as possible being released into the atmosphere. Whenever possible, CO_2 should be captured and stored in caverns or fed into a technical cycle in combination with climate-neutral hydrogen.

If economically justifiable, negative emission technologies (bioenergy with carbon capture and storage (BECCS), direct air capture (DAC), nature-based solutions (NBS)) could compensate CO_2 emissions in local, regional and international energy supply chains.

The transformation from today's largely fossil-based energy infrastructure to a sustainable, ideally emission-free infrastructure, thus, requires “firing on all cylinders” with pragmatism and full use of all economically viable technologies. A fast energy transition requires meaningful targets for internationally and regionally permissible emissions and green energy and should provide for a trading system with tradable certificates for emissions and green properties, connecting green supply to green demand.

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