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Fact sheet:

Delivering the sustainable fuels of the future

Copenhagen Airports, A.P. Moller - Maersk, DSV Panalpina, DFDS, SAS and Ørsted have formed a new partnership that has a vision of developing what could become one of the world's largest electrolyser and e-fuel facilities in the Greater Copenhagen Area. To drive down the cost of renewable hydrogen and sustainable fuels to competitive levels, regulatory support and a regulatory framework that enable the demand and production of sustainable fuels will be required as well as commitment, investment, and innovation by industry. If successfully executed, Denmark can become a hub for a new green industry based on Power-to-X technologies with substantial potential for job creation.

Denmark has taken the lead in the fight against climate change by committing to reduce carbon emissions by 70% by 2030 compared to 1990. A critical component in achieving this ambitious target is to replace fossil fuels in heavy transport with sustainable alternatives, such as renewable hydrogen and sustainable fuels produced from renewable energy.

Copenhagen Airports, A.P. Moller - Maersk, DSV Panalpina, DFDS, SAS and Ørsted have joined forces in a new partnership with the vision to develop new innovative solutions to secure a greener future for the partners and society. The vision of the partnership is to develop a new ground-breaking hydrogen and e-fuel production facility as soon as 2023 which, when fully scaled-up by 2030, could deliver more than 250,000 tonnes of sustainable fuel for busses, trucks, maritime vessels and airplanes every year. Production would potentially be based on a total electrolyser capacity of 1.3 gigawatts.

COWI and BCG act as knowledge partners for the project, and the project is supported by the Municipality of Copenhagen in line with Copenhagen's ambitious policies for decarbonisation. However, the partnership hopes that the project can, over time, act as a catalyst for similar projects in other parts of Denmark and internationally.

Denmark's abundant offshore wind resources and diverse supply chain within sustainable solutions have the potential to make Denmark a hub for the development of Power-to-X solutions for which there will be a considerable demand in the future. This can solidify Denmark's position as a green energy leader and create jobs both short and long-term. Denmark is also a leading nation within transport and logistics and thus has a unique starting point to develop new sustainable transport solutions, while also helping to decarbonise core parts of the economy and secure long-term competitiveness.

With swift action from both society and industry, Denmark has the opportunity to develop a leading position within Power-to-X and create a new industrial stronghold which can generate substantial amounts of jobs and create new business opportunities for Danish companies.

As global climate ambitions increase, the position as a hub for sustainable fuels is likely to attract other industries which have a strong demand for hydrogen-based fuels and solutions. Denmark has already

experienced how its large production of renewable power has attracted several large-scale datacentres. In securing a strong profile within sustainable fuels, Denmark could likewise be likely to attract large-scale industry with a demand for clean energy sources, securing further job creation and economic activity.

Bringing down the cost of sustainable fuels

Today, such sustainable fuels come at a higher cost than the fossil-fuel alternatives. To become competitive with fossil fuels, the production of sustainable fuels will need to be matured, built at industrial scale, and go through a cost-out journey similar to what has been seen over the past decade in other renewable energy technologies, such as offshore wind, onshore wind and solar PV. As an example, the cost of offshore wind has declined by approx. 70% in Northwest Europe since 2012.

The recent report from the Danish Climate Partnership for Energy & Utilities estimates that sustainable fuels will need to contribute with a reduction in carbon emissions of 1.9 million tonnes to meet the Danish 70% reduction target by 2030, and that maturing the e-fuels technology in Denmark will require around DKK 5 billion in total support between 2020 and 2030 in addition to substantial private investments. In the transport sectors, the Danish Climate Partnerships for Road Transport, for Maritime Transport and for Aviation all recommend that the Danish government engages in developing new sustainable fuels, as they have the potential to fully decarbonise these sectors.

The sustainable fuels will help reduce domestic Danish emissions and contribute to meeting the 70% reduction target, and it will contribute to reducing emissions from international shipping and aviation.

The partnerships will look to engage in a dialogue with regulatory authorities on the framework and policies needed to support the development of using sustainable fuels at scale in the transport sector in Denmark. Subject to a supportive framework being in place, the partnership could likely take final investment decision on the first phase of the large-scale electrolyser as soon as in 2021.

Powered by renewables

In the partnership's vision, the electrolyser will be powered by renewable electricity from offshore wind and will be built in three stages, comprising a 10MW, a 250MW, and finally a 1.3GW electrolyser installation.

For the second phase, the 250MW electrolyser could potentially be powered by an offshore wind farm at Rønne Banke close to Bornholm in the Baltic Sea. To supply enough renewable power for the full-scale 1.3GW electrolyser, this offshore wind farm would need to be scaled to 3GW by 2030. Establishing an offshore wind farm at Rønne Banke would require an updated build-out plan for offshore wind in Denmark to meet the large demand for renewable electricity required to power the production of renewable fuels.