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Climate-Tech Case Study:

South Korea Plans to Build Three Hydrogen Powered Cities by 2020

At the COP21 meeting in Paris in 2015, 195 countries agreed to keep global warming below 2°C above preindustrial levels. To reach this target, the world will need to cut energy-related carbon dioxide (CO2) emissions by 60% by 2050 even as the population grows by more than two billion people. This requires a dramatic increase in energy efficiency, and a transition to renewable-energy sources and low-carbon energy carriers. In 2019, the Hydrogen Council—a consortium of 18 companies in the automotive, oil and gas, industrial gas, and equipment industries—presented their vision on how hydrogen can contribute to achieving ambitious climate targets. The council considers hydrogen as an enabler for the transition to a renewable-energy system, and a clean-energy carrier for a wide range of applications. If serious efforts are made to limit global warming to 2°C, the council estimates that hydrogen could contribute around one-fifth of total abatement needs by 2050.

South Korea is vying to win the race to create the first hydrogen-powered society. It wants to build three hydrogen-powered cities by 2022 to position itself as a leader in green technology. In December 2019, the Ministry of Land, Infrastructure, Transport, and Tourism in South Korea announced that they chose the cities of Ansan, Ulsan, Wanjua, and Jeonju as candidate cities for the hydrogen economy, and Samcheok to specialize in research and development of hydrogen technology. The government plan calls for an investment of US$ 25 million for each of the three candidate cities, half of which will be paid by regional governments.

Ansan (one hour South of Seoul) will become an eco-friendly city by linking tidal power generation to hydrogen production, and installing three hydrogen charging stations to operate two hydrogen buses and ten hydrogen forklifts. In addition, a manufacturing innovation entrepreneurship town will be established, and 232 homes will be supplied with hydrogen.

Ulsan (one of the centers of Korea's (petro) chemical industry) will build a pipeline network to utilize byproduct hydrogen generated in petrochemical complexes for buildings and charging stations in the city center based on accumulated experience in hydrogen town, which has been operating since 2013. It decided to build a hydrogen city in connection with local specialized industries such as a demonstration project for hydrogen fueling for ships.

Wanju (about two hours South of Seoul) is expected to develop into a regional hydrogen production and supply base; and Jeonju (just 10km from Wanju) will serve as a hydrogen utilization and publicity city. In the transportation sector, hydrogen-electric buses will be introduced in the second half of 2020 to run the bus route between Wanju and Jeonju, as well as shuttles and city tours in Jeonju Hanok Village.

Multi-unit housing complexes and individual buildings in the pilot cities will use hydrogen as an energy source for cooling, heating and electricity. The strategy is part of a wider vision to power 10% of the country's cities, counties and towns by hydrogen by 2030, growing to 30% by 2040.

References

1) https://www.yna.co.kr/view/AKR20191229012000003?input=1195m
2) http://www.kyeonggi.com/news/articleView.html?idxno=2220110
3) http://www.electimes.com/article.php?aid=1577673048192199097
4) https://www.nocutnews.co.kr/news/5265284
5) https://www.pressian.com/pages/articles/271750?no=271750&utm_source=naver&utm_medium=search
6) https://www.weforum.org/agenda/2019/11/south-korea-green-energy-hydrogen-future-city-fossil-fuel-renewables/

7) https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/hydrogen-the-next-wave-for-electric-vehicles#
8) https://fuelcellsworks.com/news/korea/korean-govt-announces-its-selection-of-worlds-first-hydrogen-cities/#:~:text=On%20Sunday%2C%20December%2029th%2C%202019,(R%26D)%20of%20hydrogen%20technology.