**REPORT ON A COMMUNITY OF PRACTICE SESSION:**

**PARTICIPATING IN THE GLOBAL HYDROGEN ECONOMY**

**SUMMARY**

This submission reports on the proceedings of a Community of Practice session held on 8 October 2020, which explored the potential for South Africa to position into the future global trade of renewable, carbon-neutral energy, as a producer and net exporter of green hydrogen. The session was attended by sixteen TCTA and fourteen external delegates, from the CSIR, E-Science, the Western Cape Provincial Government, the Department of Science and Innovation, the Water Research Commission, the Development Bank of Southern Africa, GreenCape and Eskom. Three presentations were made: One by TCTA, setting the context, one by E-Science, dealing with hydrogen as an energy carrier, and one by CSIR, unpacking the economics of green hydrogen, and hence the opportunity for South Africa. Delegate evaluation of the session returned a score of 4.5 out of a possible 5.

The advent of the global hydrogen economy will arguably be the most prominent development within the water-energy-climate nexus for several decades to come; it is driven by the commitments made by a majority of nations in the 2015 Paris Accord to reduce carbon emissions, and the subsequent strategies by these nations to transition from fossil-based hydrocarbons (oil, gas and coal) to green hydrogen (that is, hydrogen produced with renewable energy) as an energy carrier in their economies.

The rationale for the transition has two parts: One, hydrogen can be used in fuel cells, internal combustion engines, furnaces, turbines and more, without releasing any harmful emissions at the point of consumption; this will bring tremendous improvements in air quality and public health in congested cities, and allow hard-to-mitigate sectors such as cement manufacture, aviation and long-distance road transport to de-carbonise. And two, green hydrogen can be produced in parts of the world endowed with an abundant potential for renewable energy, like South Africa and a few other places, and be conveyed to industrialised countries who have insufficient renewable energy potential to power their economies, and hence are unable to meet their emission reduction commitments.

This presents an industrialisation opportunity for South Africa to become a provider of renewable energy to countries such as Japan, South Korea and Germany and others, who have declared their strategic intent to import green hydrogen. This will require the local development of significant and dedicated new capacity in desalination, renewable energy generation, electrolysis and hydrogen handling infrastructure. TCTA has potential entry points through the financing and development of the required mega-projects, as well as advisory support on the desalination components.