



INDUSTRIALS, MANUFACTURING & TRADE

ALERT

8 DECEMBER 2022



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INCORPORATING
KIETI LAW LLP, KENYA

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A recap of the 2022 developments in establishing a global hydrogen economy and the role of Africa and South Africa

We all understand and appreciate that the climate change crisis is a reality that must be tackled by the global collective, and that a significant part of tackling climate change is reducing green-house-gas (GHG) emissions of so-called hard to abate industries globally by 2030 and reaching net zero by 2050. However, finding a cost-competitive clean fuel molecule that can be used by the heavy industrial, manufacturing and transport industries to transition from the use of fossil fuels (i.e. coal and petroleum products) has been and continues to be difficult.



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A recap of the 2022 developments in establishing a global hydrogen economy and the role of Africa and South Africa

We all understand and appreciate that the climate change crisis is a reality that must be tackled by the global collective, and that a significant part of tackling climate change is reducing greenhouse-gas (GHG) emissions of so-called hard to abate industries globally by 2030 and reaching net zero by 2050. However, finding a cost-competitive clean fuel molecule that can be used by the heavy industrial, manufacturing and transport industries to transition from the use of fossil fuels (i.e. coal and petroleum products) has been and continues to be difficult.

The solution of a clean fuel molecule for hard to abate industries appears to have been found in an element that is the most abundant in the universe: **hydrogen**. Coupled with the renewable energy revolution, this has dramatically brought down the levelized cost of generating clean energy, and producing hydrogen at scale using renewable energy has brought into play the role green hydrogen (i.e. renewable hydrogen) can play over time to reduce GHG emissions from hard to abate industries.

SOUTH AFRICA'S JOURNEY

South Africa has been on a journey to establish a hydrogen economy for more than a decade, with significant government support and public/private investments in the research and development of fuel cells, hydrogen production process, storage and delivery with platinum-group metals as a backbone to the development of this economy. Despite this, the hydrogen economy has not really gained any traction from a commercial perspective.

In early 2021, the discussion around green hydrogen as a potential clean alternate fuel seemed, at that point in time, to be very much an abstract concept. However, what has occurred to date with the significant traction in establishing a clean hydrogen society globally and regionally, and a hydrogen economy in South Africa, has been very encouraging to witness. The endorsement by the largest industrial economies of the world of clean hydrogen as the best route to significantly contribute to the decarbonisation of hard to abate industries – **replacing carbon molecules for zero or low-carbon molecules** – has created a basis to fast-track the commercial production of green hydrogen at scale.

As a direct consequence of this, South Africa and several other jurisdictions in Africa have been identified as an ideal location for the production of green hydrogen on a cost-competitive basis at scale. South Africa with its history in hydrogen research and development



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has all the ingredients to become a leading player to commercialise green hydrogen for its own industrial use, but also to become a global leader in the export of green hydrogen and its derivative products.

HYDROGEN INSIGHT GUIDE

In March 2022, we published the CDH Hydrogen Insight Guide. Our guide highlights:

- Hydrogen as the missing piece of the puzzle for effective decarbonisation of the global economy to address the global climate crisis.
- The enormous opportunities available to Africa generally to be a key player in the clean hydrogen value chain, with several areas on the continent having the potential to be developed into major export hubs for hydrogen and Power to X (PtX) products.

- The important role of South Africa and other African states such as Namibia and Kenya can play in the developing this new and innovative industry for the benefit of all Africans.

The innovation and opportunity that a hydrogen economy presents has perhaps not been seen since the establishment of the renewable energy sector in South Africa. And, ironically, the success of green hydrogen is now intrinsically linked to the learnings from the establishment of the renewable energy sector through the very successful Renewable Independent Power Producer Programme and burgeoning private IPP space which has drastically reduced the levelized cost of electricity generation from solar and wind.

Recapping the developments that have played out over 2022, it would be appropriate to start with acknowledging the South African Hydrogen Society Roadmap (HSRM), published, in February 2022, by the South African Department of Science and Innovation, marking an important milestone in the launch of South Africa's hydrogen economy. The HSRM provides the framework on how existing sectors and proposed energy developments can become part of the value chain of a hydrogen economy.

Should the HSRM be successfully implemented in South Africa, the country could achieve "*just and inclusive net-zero carbon economic growth by 2050*". This requires the adoption of some 70 priority actions that have been identified and classified according to high-level



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outcomes. This success will also be heavily reliant on local and international demand for clean and green hydrogen and the green products produced through the use of this alternate fuel source; compliance and regulation; enabling of infrastructure and policy that supports hydrogen adoption; dis-incentivising of alternatives; creating an attractive investment environment; cost-competitiveness with a focus on the levelled cost of hydrogen and green hydrogen; corporate targets such as carbon budgets; international commitments; and an innovative culture and skilled workforce.

With the release of the Green Hydrogen Commercialisation Strategy (GHCS) on 7 December 2022 with the HSRM, the basis for the commercialisation of South Africa green hydrogen economy can be streamlined.

The GHCS sets out the following important frameworks:

- strategic objectives for a green hydrogen sector vision;
- assessment of demand drivers;
- technical value chain definition and related delivery supply chain options;
- opportunity to embed local manufacturing and local content; and
- creating an attractive and enabling investment environment.

CONFERENCES AND PRIVATE SECTOR ANNOUNCEMENTS

This year has also seen a myriad of conferences focused on the hydrogen economy, with the take away from these being that the hydrogen economy presents significant opportunity; Africa and South Africa will be role players; and although subject to significant research, planning and development, a hydrogen economy is achievable. Insights from these conferences attended by international

delegations and companies confirm that a lot is happening behind the scenes and on the ground in the private sector. Further outcomes from these conferences have been announcements by major South African and multinational companies with a presence in South Africa and their contribution towards establishing the hydrogen economy through pilot projects and partnerships. One of these landmark announcements is the partnership between Sasol and ArcelorMittal South Africa to decarbonise and reindustrialise the Vaal and Saldanha through green hydrogen.

There has also been confirmation by the German Government, that it will inject €12,5 million to fund South Africa's green hydrogen development initiatives and the announcement of South Africa's first green ammonia project, a R75 billion export plant in the Nelson Mandela Bay precinct. Hydrogen exporting has been highlighted in the HSRM as having the potential to make a profound impact on the economic

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development of the continent, with a value chain that can be expanded through regional co-operation with many cross-border and local strengths that will benefit. The role of our neighbour Namibia as a potential major exporter of green hydrogen in its own right, and the ripe opportunity for collaboration with South Africa, can be anchors for regional development, subject to the development of uniform policy and regulatory frameworks.

KEY TAKE AWAYS FROM THE INAUGURAL GREEN HYDROGEN SUMMIT

The recent inaugural Green Hydrogen Summit: South Africa by Infrastructure South Africa that was officially opened by President Cyril Ramaphosa on 29 November 2022 brought together stakeholders from governments and various industries to discuss and unpack the potential that green hydrogen holds for South Africa,

and other African countries such as Namibia, Kenya and Egypt. The discussions during the summit by industry leaders, international and regional investment institutions and governments representatives from several jurisdictions re-affirmed the fact that South Africa has the right ingredients to be a leading player in green hydrogen.

The key take aways from the summit, attend by several of our experts, included:

- Collaboration between all stakeholders to realise a hydrogen economy in South Africa can benefit all stakeholders.
- The need for Government support in the form of clear policy, regulatory frameworks and incentives to streamline investments into projects.
- The development of innovative funding products by financial institutions for the funding of green hydrogen projects in South Africa with the Just Energy Transition Investment Plan unveiled at this year's COP27 in Egypt will set the basis for the investment roadmap for green hydrogen, including the broader investment roadmap on how South Africa needs to spend the funds pledged at COP26 in 2021 to transition away from its current primary source of electricity generation, being coal.
- The need to more aggressively invest in the skills development and training required for a transition from coal to clean energy – with no one being left behind.



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- The creation of integrated approaches in developing infrastructure required for green hydrogen with the first steps being to establish a hydrogen corridor in the Western Cape and Northern Cape, as well as between South Africa and Namibia (in particular focused on the regions around the Orange River).
- The localisation of the production of various manufacturing inputs required for the green hydrogen economy through beneficiation of minerals such as platinum-group metals that are material to hydrogen fuel cell technology, and creating valued added manufacturing based around various components and/or finished products required for solar and wind facilities and batteries that supplies the entire Southern African region. As part of this, to also ensure the retention and ownership of intellectual property for innovative developments in the entire value chain of the green hydrogen economy.

There has been exponential growth in the interest and potential of green hydrogen during 2022, further catapulted by the global energy crisis caused by the Russia-Ukraine war. There is still a long road and significant work required to be done and committed to by all stakeholders in the global economy in order for us to achieve the various goals envisioned of making green hydrogen and its derivative products the clean fuel of the future. However, that said, it does seem that by all accounts clean hydrogen presents an incredible opportunity to contribute towards the economic growth and development of South Africa. There is also an opportunity for the adaptation of industries to meet South Africa's own decarbonisation goals and a lifeline to sustainably development South Africa. No one should be left behind in this journey.

2022 brought green hydrogen to the lips of many of us and as we transition into 2023, we know there will be a need to provide more insights on the various legal and regulatory nuances relevant to a rapidly evolving future industry. We will continue to bring thoughtful insight on the most important issues around the development and establishment of the hydrogen economy in Africa to you during 2023, which is set to be the year to more aggressively give effect to many of the commitments made to streamline the production of green hydrogen.

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BBBEE STATUS: LEVEL ONE CONTRIBUTOR

Our BBBEE verification is one of several components of our transformation strategy and we continue to seek ways of improving it in a meaningful manner.

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