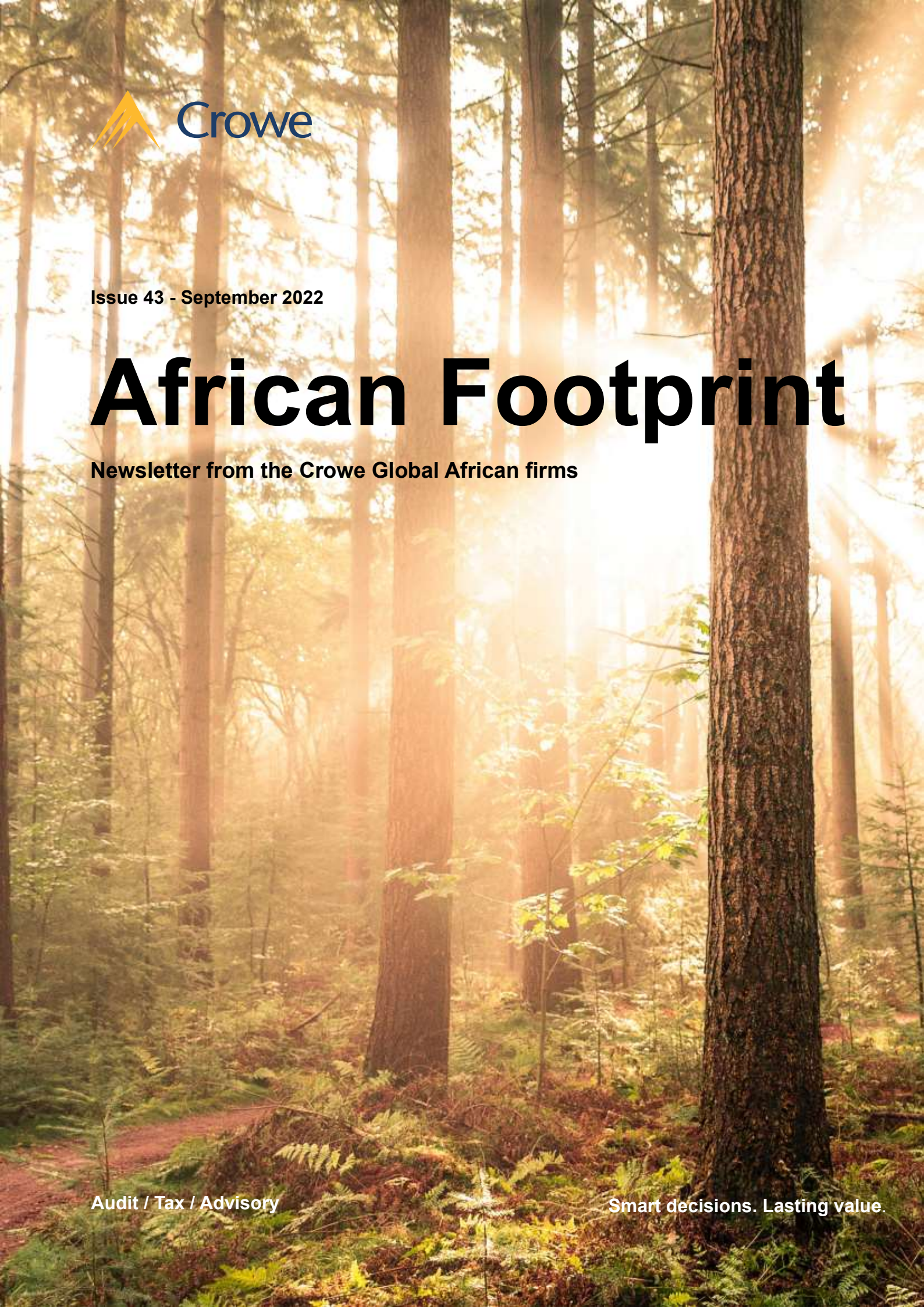

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African Footprint

Newsletter from the Crowe Global African firms

Audit / Tax / Advisory

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Inside this Issue

Investing in Green Hydrogen for Africa

Crowe Infrastructure Africa (Crowe Infra) is a Crowe member firm specializing in infrastructure development in Africa and working with public and private sector clients to structure financially viable and sustainable projects in the energy, transportation, water, information technology, and social infrastructure sectors.

Crowe Infra offers a unique and highly competitive delivery strategy built on an unwavering dedication to quality, agility, and responsiveness as a specialized boutique consulting business which is part of a top 10 financial services network.

Green Hydrogen

Hydrogen is a prevalent and energy-rich gas that exists naturally in water and fossil fuels such as natural gas, coal, and petroleum. It is utilized as fuel by isolating it from these sources making it a better alternative for the environment.

Hydrogen and ammonia are envisioned as future replacements for fossil fuels. One of the primary prerequisites for ecologically sustainable energy security is the production of these fuels using renewable energy, known as 'green hydrogen' and 'green ammonia'.

The World Economic Forum 2022 reported that currently, the ammonia-based fertilizer industry and oil refineries in North Africa and Nigeria use highly carbonated hydrogen that is largely derived from natural gas and coal. The combustion of fossil fuels produces carbon dioxide, which contributes significantly to air pollution and global warming. Conversely, utilizing solar or wind energy to power the separation of hydrogen from oxygen in water molecules produces carbon-free green hydrogen and water as the only waste element, making it a better alternative for the environment.

The entire African continent's carbon footprint contributes less than 4% to global greenhouse gas (GHG) emissions. Therefore, the continent should focus on sustainably harnessing its existing resources to meet the growing demand for energy needed for economic development and poverty alleviation within a sustainable path to a net-zero future (Yohannes & Diedou, 2022).

Green hydrogen, according to the UN, is a realistic alternative for revamping Africa's energy industry. The goal is to minimize dependency on fossil fuels, provide access to power to millions of Africans by boosting the use of renewable energy resources, and achieving global climate obligations. To achieve this balance, several African countries are considering green hydrogen as a promising technology.

Technology

Green hydrogen provides a solution that is closer to real sustainability through its production process that uses renewable sources such as wind and solar power rather than fossil fuels to generate electricity. This technology yields a closed loop of sustainable energy with no hazardous gases being generated at any point in the production chain, making it the ultimate goal in the hydrogen fuel sector.

Hydrogen is extensively utilized as a fuel in a variety of applications, including automobile fuel, petroleum refining, metal treatment, fertilizer production, and food processing. When used as a fuel, it produces about three times the amount of energy produced by diesel or gasoline. From hydrocarbon fuels, hydrogen gas may be created using three primary technologies -

- Steam reforming (SR),
- Partial Oxidation (POX), and
- Autothermal reforming (ATR).

However, these technologies emit a considerable amount of carbon monoxide (CO), resulting in a danger to the environment due to air pollution.

Alternatively, an electrolyser produces green hydrogen by splitting water into hydrogen and oxygen using electricity generated by wind turbines, solar panels, or a nuclear reactor, thus eliminating greenhouse emissions. The hydrogen may subsequently be used in factories, power plants, and even jet planes without warming the planet while releasing oxygen into the environment with no harmful consequences.

Limitations and solutions

While green hydrogen is technologically intriguing, it faces economic feasibility challenges of its cost of production that comes with several monetary constraints for African nations. The continent requires private sector investment and public-private partnerships to exploit its immense renewable energy potential and, perhaps, profit on its endowment of the minerals required to construct fuel cells.

Visionary leadership, ambitious policymaking, and large additional investments would also assist to -

- Create collaborative innovation platforms to boost research and development of sustainable technologies in Africa that can be readily maintained to constantly improve the sector's competitiveness;
- Create a hydrogen energy infrastructure to enable hydrogen production, as well as efficient storage, transportation, and recharging facilities;
- Communicate the benefits of green hydrogen and encourage its usage in productive industries;
- Establish or strengthen hydrogen legal frameworks to support the whole value chain.

As green hydrogen technology advances, Africa must provide the framework for being a first mover in the field, which includes developing a skilled workforce and investing in associated infrastructure.

Market opportunities

Precedence research estimates the global green hydrogen market to reach over US$ 89 billion by 2030 with a registered CAGR of 54% from 2021 to 2030. According to Goldman Sachs, hydrogen may provide 25% of the world's energy consumption by 2050, creating a US$ 10 trillion addressable market.

China is currently the world's leading hydrogen producer and consumer, with the world's largest solar-powered facility as part of its attempts to cut carbon emissions. Canada, Chile, France, Germany, The Netherlands, Norway, Portugal, Russia, Spain, and the European Union all adopted hydrogen strategies by 2020. France had already adopted a plan for deploying hydrogen for the energy transition in 2018.

In a bid to seek ways to meet Africa's massive energy demands and develop a robust green hydrogen ecosystem, six African countries, namely Egypt, Kenya, Mauritania, Morocco, Namibia, and South Africa, founded the Africa Green Hydrogen Alliance in May 2022 at the first-ever Green Hydrogen Global Assembly which was held in Spain. This alliance aims to advance collaboration to accelerate green hydrogen development in Africa in addition to encouraging other African countries to join the alliance.

According to a UN study, Egypt and Zimbabwe have already deployed over 100 megawatts of electrolysers, and other green hydrogen projects are planned in Egypt, Mauritania, Morocco, Namibia, and South Africa.

Investing in green hydrogen

Private sector investment in green hydrogen can help associated initiatives succeed. Blending public and private finance can make hydrogen projects bankable and financially feasible; but certain considerations must be addressed, such as putting renewable energy generation and hydrogen manufacturing facilities together for better integration.

As governments develop policy and regulatory frameworks to attract investment, private sector investment in capacity building and technical assistance to governments, particularly in emerging markets and developing economies, is critical to developing these regulations and ensuring their enforcement and compliance.

With nations like Japan signalling their plan to purchase large amounts of carbon-free hydrogen and Europe rushing to lessen its dependency on fossil fuels, the green hydrogen export market is ripe for picking.

The World Bank Group is working to move green hydrogen projects in developing countries from the pilot stage to the industrial scale by providing technical assistance to foster enabling policy, regulatory, and fiscal frameworks; developing innovative financing that catalyzes concessional and climate finance resources; integrating risk mitigation and credit enhancement instruments to mobilize private capital; and transferring knowledge to support a just transition.

Through the Partnership for Market Readiness, the World Bank has built a program for green hydrogen financing facilities, developed methods to authenticate green hydrogen along the value chain, and set carbon pricing. However, there is still a need for increased private sector involvement, particularly to play a significant role in the development of the hydrogen plan.

Harnessing green hydrogen technologies in Africa through private sector investments

Green hydrogen is the next-generation solution for Africa's growing energy demands. Forbes predicts that investment in green hydrogen generation will exceed $1 billion per year by 2023. Africa must accelerate the rate of connections to 90 million households per year to attain the goal of universal access to affordable energy, according to the Energy Information Administration (EIA). Africa will only succeed in establishing a low-carbon economy with the appropriate alliances, targeted initiatives, and private sector assistance.

Crowe Infrastructure Africa is making a significant stride to support the transition to Net Zero. Crowe Infra's alignment towards a Net Zero future is evident in our current engagements that increasingly involve providing transaction advisory support to clients who are inclined towards a net zero strategy and can clearly provide measurable carbon emissions data and reports throughout their project cycles or operating assets.

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About Crowe Global

Ranked eighth largest accounting network in the world, Crowe Global has over 200 independent accounting and advisory firms in 130 countries.

For more than 100 years, Crowe has made smart decisions for multinational clients working across borders.

Our leaders work with governments, regulatory bodies and industry groups to shape the future of the profession worldwide. Their exceptional knowledge of business, local laws and customs provide lasting value to clients undertaking international projects.

Crowe provides global reach on a personal scale. Crowe firms focus on the future, the client experience and working with clients to build something valuable, substantial, and enduring. Close working relationships are at the heart of our effective service delivery.

At Crowe, our professionals all share one commitment, to deliver excellence.