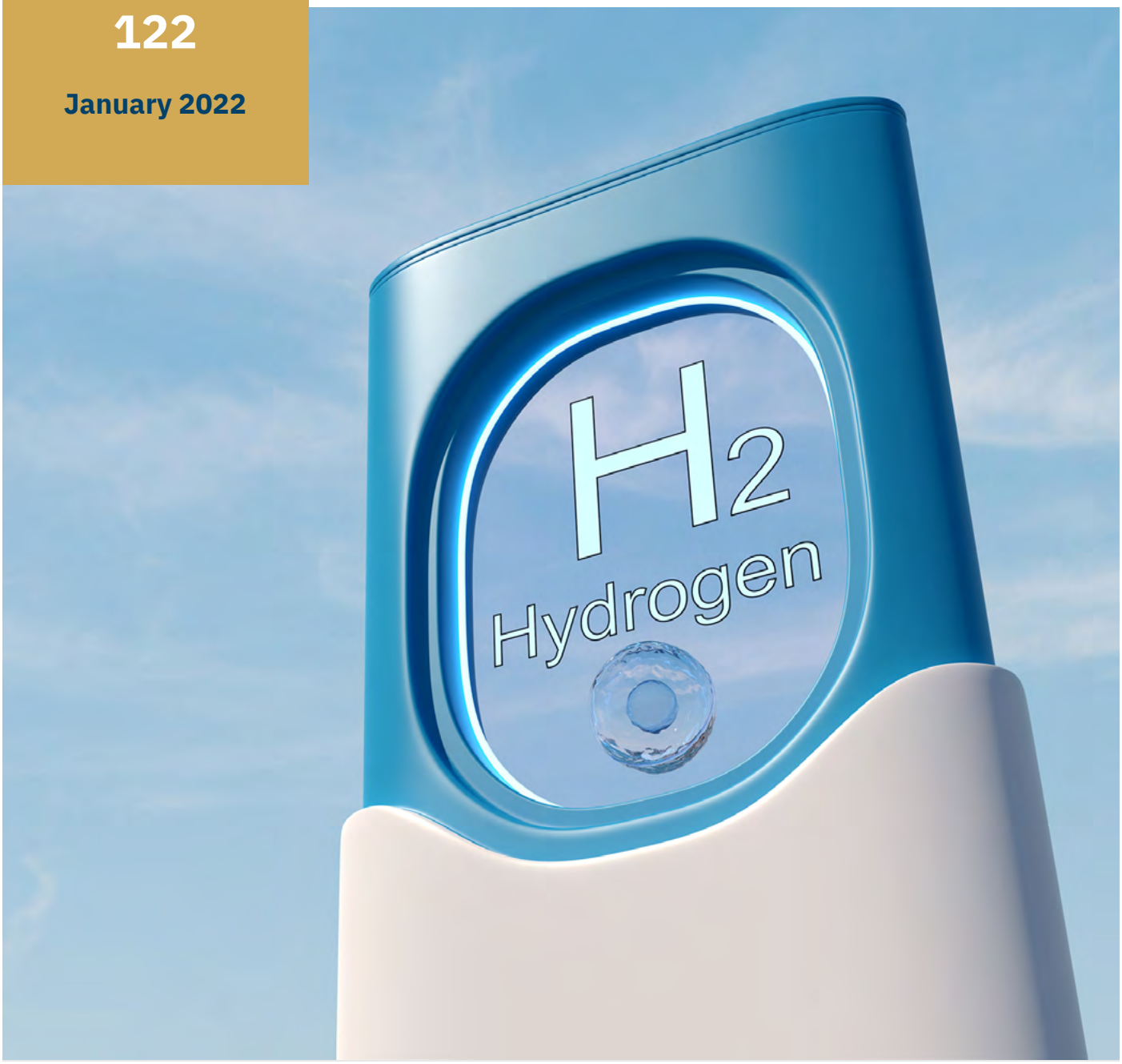
Policy Insights
122
January 2022



Ensuring a Just Energy Transition through Hydrogen: How the G20 can Support Africa

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African perspectives
Global insights

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Executive summary

Africa is well positioned to become a major hub in the global production of green hydrogen. This policy insight explores G20 members' recognition of green hydrogen as a key technology in decarbonising hard-to-abate carbon-intensive industries. Several African countries have begun to explore the potential to produce green hydrogen locally, with feasibility studies underway and some projects in the pre-preparation phase. Africa should harness its existing power pools, port and gas infrastructure, renewable energy potential and the African Continental Free Trade Agreement to fully integrate the green hydrogen value chain. Such an approach will help it to meet its climate, employment and energy-security goals. This policy insight explores how the G20 and Africa might work together to fully develop the continent's potential as a green hydrogen hub.

Introduction

Under the Italian Presidency in 2020, the G20 recognised for the first time the inextricable link between climate change and energy, resulting in a series of joint ministerial meetings involving the Climate Sustainability Working Group and the Energy Transition Working Group.[1] The 23 July 2021 Joint G20 Energy-Climate Ministerial Communiqué by these working groups explicitly states that the aim of the meeting was 'strengthening our shared vision and partnership accelerating the clean energy transitions to tackle climate change and achieve SDG [Sustainable Development Goal] 7 in order to build a prosperous, inclusive, resilient, secure, and sustainable society that leaves no one behind'.[2] The joining up of the energy and climate change working groups undoubtedly reflected the need to come to agreement on the two most vexing issues on the energy decarbonisation agenda. These are agreeing on a date to phase out unabated coal and ending public financing of fossil fuel energy generation (coal-powered stations and fossil fuel subsidies).[3] This objective has been given further impetus, although regretfully not with the level of hoped-for ambition, by the outcomes of the COP26 meeting in Glasgow in 2021.[4]

The two most vexing issues on the energy decarbonisation agenda are agreeing on a date to phase out unabated coal and ending public financing of fossil fuel energy generation

1 G20 Italy, "Joint G20 Energy-Climate Ministerial Communiqué: Energy Transition and Climate Sustainability Working Groups", July 23, 2021.
2 G20 Italy, "Joint G20 Energy-Climate".
3 G20 Information Centre, "Presidency Statement towards the G20 Leaders Summit: G20 Energy and Climate Ministerial Meeting", July 23, 2021.
4 UN Climate Change Conference UK 2021, "Cop26 Outcomes".

Importantly, the joint communiqué noted that it was necessary to 'advance on technologies and the commercial scale of zero and low emission hydrogen and ammonia for energy use' in order to transition to net-zero emissions.[5] In the same breath, the declaration also flags the need to explore low/zero emission hydrogen in hard-to-abate sectors, to support new opportunities for equitable economic growth and, finally, to explore the potential of hydrogen trade and use in transport modes.

Article 31 of the G20 Joint G20 Energy-Climate Ministerial Communiqué specifically encapsulates the notion of a just green energy transition. While the Rome Summit declaration does not explicitly mention green hydrogen[6] as a net-zero emission strategy, several articles in the summit declaration state the need for an inclusive and just energy transition, as well as developing an enabling framework for new zero emission technologies to emerge.[7]

Green hydrogen was first mooted as a key enabling energy mode to progress towards net-zero emission targets under the 2019 Japanese G20 Presidency. The International Energy Agency (IEA) produced an in-depth report for the G20 forum exploring the potential to upscale the use of green hydrogen globally as an abatement path.[8] The report contained practical recommendations and a roadmap towards bringing down the cost of hydrogen as an energy source, and laid out its wider-scale applications in the economy. In doing so it emphasised the need for international collaboration. Its key recommendations were to:[9]

- include hydrogen in member states' long-term energy strategies at the national, regional and city level;
- stimulate commercial demand for green hydrogen by developing enabling policy and regulatory frameworks that support stable and sustainable uptake in markets;
- develop appropriate financing instruments and mechanisms to bring down the risk for early investors and crowd in the private sector;
- deploy public sector funding to support research and development to enable the commercialisation of green hydrogen modes at an affordable cost, for example the development of cost-effective electrolysers;
- work on reducing obstructive regulatory barriers and pursue harmonised standards across borders involving diverse stakeholder groups;
- pursue international cooperation to set standards, share good practices and support the development of cross-border infrastructure, including tracking production and use; and

5 G20 Italy, "Joint G20 Energy-Climate".

6 Green hydrogen refers to the production of hydrogen from renewable energy sources, such as wind or solar energy, where the net carbon emissions in producing the hydrogen is effectively zero once the production infrastructure is excluded. See Jason Deign, "So, What Exactly Is Green Hydrogen?", Wood Mackenzie, June 29, 2020.

7 G20 Italy, "G20 Rome Leaders' Declaration", October 31, 2021.

8 International Energy Agency, *The Future of Hydrogen: Seizing Today's Opportunities*, Technology Report (Paris: IEA, June 2019).

9 IEA, *The Future of Hydrogen*.

- identify and exploit existing opportunities to build the business case for investors, including leveraging existing ports and gas infrastructure to support low-emission hydrogen production and transport; convert existing fleets and related transport corridors to support the spatial uptake of green hydrogen; and develop shipping routes to support the development of the hydrogen trade.

The recommendations offered by the IEA fell on fertile ground, with several countries and regions in various stages of developing green hydrogen strategies, including Australia, the EU, Japan and Southeast Asia, the US, the Middle East, Chile, Namibia and South Africa.[10]

This policy insight unpacks global developments around green hydrogen alongside policy discussions within the G20. It also explores the potential for green hydrogen development in Africa. The policy levers and competitive advantage of the continent will be key to its slotting into global green hydrogen value chains. The policy insight concludes with recommendations to the G20 on how to strengthen the hydrogen agenda in African countries, as well as some suggestions on a way forward in Africa in developing an enabling regional framework for green hydrogen.

Moving towards an enabling environment globally for the large-scale adoption of green hydrogen

A few national and regional green hydrogen strategies currently underway globally provide insight into the steps taken to create an enabling environment for the large-scale production and adoption of green hydrogen.

EU

The aim of the EU Hydrogen Strategy is to decarbonise hydrogen production and expand its use in sectors where it can replace fossil fuels. While it focuses on green hydrogen, it does make a case for all forms of hydrogen being critical in decarbonising the world economy.[11]

The path set by the EU Hydrogen Strategy is divided into three phases with specific objectives to be achieved within the relevant phase (see Table 1).

10 According to the International Renewable Energy Agency (IRENA), over 20 countries have set zero emission targets in various policy documents and many of them are exploring green hydrogen as an abatement strategy. IRENA, *World Energy Transitions Outlook: 1.5°C Pathway* (Abu Dhabi: IRENA, 2021).

11 F Maximilian Boemke, "The European Hydrogen Strategy", Watson Farley & Williams, February 3, 2021.

TABLE 1 EU HYDROGEN STRATEGY	
Phase	**Objectives**
Phase 1 (2020–2024)	At least 6GW of renewable hydrogen electrolysers should be in use in the EU by 2024, with a focus on decarbonising existing hydrogen production for current uses such as the chemical sector, while also promoting it for new applications.
Phase 2 (2024–2030)	40GW of renewable hydrogen electrolysers should be in use in the EU, alongside an additional 40GW electrolyser capacity target in the eastern and southern 'neighbourhoods' of Europe, for example Ukraine. These neighbourhoods would then be positioned as priority partners for cross-border trade in hydrogen. The aim is to make hydrogen an intrinsic part of an integrated energy system.
Phase 3 (2030–2050)	Renewable hydrogen technologies should reach maturity and be deployed at large scale to reach all hard-to-decarbonise sectors where other alternatives might not be feasible or have higher costs.

Source: F Maximilian Boemke, "The European Hydrogen Strategy", Watson Farley & Williams, February 3, 2021

To support this development trajectory, the EU Hydrogen Strategy foresees the establishment of a European Clean Hydrogen Alliance, with the aim of identifying and building up a pipeline of viable investment projects bringing together public and private stakeholders. In addition, support schemes are likely to be required for some time to enable renewable hydrogen to become cost effective on the scale envisaged. This may require an amendment of the EU Emissions Trading System, such as the Carbon Border Adjustment Mechanism (CBAM) proposed by the European Commission in July 2021. The CBAM is a carbon price on imports for a targeted selection of products to prevent 'carbon leakage' and to incentivise the use of green hydrogen.

Australia

The Australian government recently announced a 'practically achievable' path to reach its target of net-zero emissions by 2050. Its aim is to pursue a 'technology not taxes' approach – preferring technological solutions to reduce emissions over policies such as carbon taxation.[12] A recent report posits that Australia could create 395 000 new jobs and generate AUD[13] 89 billion ($63.4 billion) in new trade by 2040 through investment in clean energy exports. Central to the plan is the development of Australia's fledgling hydrogen industry, particularly green hydrogen produced using renewable energy.

The National Hydrogen Strategy, published in late 2019, aims to make Australia a world leader in hydrogen production. Under the most optimistic scenario, it predicts Australia's hydrogen industry could be worth AUD 26 billion ($18.5 billion) by 2050. While problematic

12 John Mathews, "Australia's Clean Hydrogen Revolution Is a Path to Prosperity – But It Must Be Powered by Renewable Energy", *Evening Report*, October 27, 2021.

13 Currency code for the Australian dollar.

in some quarters as it relies on a fossil fuel, natural gas, the Australian plan also considers blue hydrogen[14] a 'clean' technology, and an important part of the country's energy transition.

The plan accepts that, to bring down the cost and improve the competitiveness of green hydrogen, it must be manufactured at scale. Fortescue Future Industries recently announced that it would build a green energy manufacturing centre in central Queensland. The first step in the $1 billion-plus investment will involve hydrogen electrolysers, before the project expands to other green industry products such as cabling and wind turbines. It also intends to build a $1.3 billion gas- and hydrogen-fuelled power plant at Port Kembla in New South Wales and a plant in Brisbane producing green ammonia for use in fertilisers.[15]

Chile

Chile has launched a long-term green hydrogen strategy as a way to exploit surplus renewable energy capacity, diversify its export-oriented economy and meet its emissions goals.[16] The country aims to produce 25 million tonnes of green hydrogen a year, and earn $30 billion a year from liquefied exports. According to Chile's Energy Minister Juan Carlos Jobet, the country aims to capture 50% of the Japanese and South Korean markets and 20% of the Chinese market with this approach.[17] If its projected 2030 production comes to fruition, it will represent 5% of the global green hydrogen market. Jobet has identified more than 20 pilot projects on the drawing board in Chile, including a green methanol and gasoline initiative and working with Chile's Andes Mining & Energy, Italy's Enel Green Power, and Germany's Siemens and Porsche.

How does Africa fit into the broader global green hydrogen context?

The African continent is energy scarce, and its electricity access rate is assessed at around 56% of its population.[18] Moreover, while the continent produced over 856 000GW of electricity in 2020 for its 1.4 billion people,[19] nearly half of this came from fossil fuels.[20]

In the same vein, it is globally recognised that Africa's abundant sun exposure also presents it with enormous potential to become a reliable source of renewable energy. This fact has

14 Blue hydrogen is produced by steam methane reformation. This process is not emission free and roughly half of the carbon emissions produced are reduced through carbon capture and storage. See Deign, "So, What Exactly Is".
15 Mathews, "Australia's Clean Hydrogen Revolution".
16 Patricia Garip, "Chile Spearheads Green Hydrogen Strategy", *Argus*, October 14, 2021.
17 Garip, "Chile Spearheads Green Hydrogen".
18 IEA, *World Energy Outlook 2021* (Paris: IEA, 2021).
19 IEA, *World Energy Outlook 2021*.
20 IRENA, *World Energy Transitions Outlook*.

It is globally recognised that Africa's abundant sun exposure also presents it with enormous potential to become a reliable source of renewable energy

been recognised in a detailed mapping study – H2ATLAS-AFRICA – currently underway in a partnership between the German federal government, the SADC Centre for Renewable Energy and Energy Efficiency and the ECOWAS Centre for Renewable Energy and Energy Efficiency.[21] This work shows that Africa has the potential to produce green hydrogen in a sustainable and cost-effective fashion. With an appropriate enabling policy environment, the decreasing cost of electrolysers and supportive technology, it should be able to exploit its vast renewable energy potential.

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Africa also has an underpinning framework – represented by its regional power pools[22] – allowing it to build a cooperative inter-regional approach to the production and use of green hydrogen. This would ensure that green hydrogen production in the region is not focused only on extra-regional green hydrogen exports. While such exports are a key investment attraction for industrialised countries seeking to mitigate their carbon emissions, Africa must also develop its own industrial sector to meet its Nationally Determined Contribution targets, decarbonise its regional and global value chains (in the face of looming carbon border taxes in major markets such as the EU) and move towards energy self-sufficiency. In this respect, Africa's regional power pools could benefit from the use of green hydrogen as both an important source and a buffer in bringing more stability to the continent's energy grids. Other cooperative physical and regional policy frameworks should also be leveraged to support the development of a regional green hydrogen economy in the long term.

21 SADC Centre for Renewable Energy and Energy Efficiency, "H2ATLAS-AFRICA: Atlas of Green Hydrogen Generation Potentials in Africa".

22 There are five African power pools: the Southern African Power Pool, Eastern Africa Power Pool, Central African Power Pool, West African Power Pool and North African Power Pool.

Competitive advantage for Africa

Africa's potential to become a key hub in the production of green hydrogen production is located in the following competitive advantages:

- Location, port, and gas infrastructure – Africa's location gives it easy shipping access to markets in Europe, the Middle East, Southeast Asia and East Asia.
- Renewable energy potential – the continent's abundant sun exposure, alongside other sources of renewable energy, is a vast untapped resource.
- Established power pools – the existing regional power pools provide an anchor for the expansion and deepening of cooperative energy frameworks across the region.
- African Continental Free Trade Area (AfCFTA) – maximising the full potential of the AfCFTA to facilitate trade in goods and services in the region could be a powerful enabler in the production, use and trade of green hydrogen in Africa and with the rest of the world.

Location: Port and gas infrastructure

Africa is strategically located, geographically speaking, next to all the major global shipping lanes, giving it easy access to all major international markets. Africa's 26 000km-long coastline has more than 100 ports, of which just over 50 have the capacity to handle cargo and containers.[23] The largest of these, with adequate gas infrastructure, are spread across all the different regions of the continent.[24]

TABLE 2 MAJOR AFRICAN PORTS

Port	Country	Port	Country
Port of Durban	South Africa	Port of Djibouti	Djibouti
Port of Richards Bay	South Africa	Suez Canal Container Terminal	Egypt
Port of Ngqura	South Africa	Lagos Port Complex	Nigeria
Saldanha Bay	South Africa	Walvis Bay	Namibia
Port of Mombasa	Kenya	Tanger-Med Port	Morocco
Port of Dar es Salaam	Tanzania	Port Louis Harbour	Mauritius
Port of Beira	Mozambique	Port of Abidjan	Côte d'Ivoire
Port of Maputo	Mozambique		

Source: SABT, "Some of Africa's Most Vital Ports"; K Kundani and A van Eeden, *Gas Infrastructure Development in Sub-Saharan Africa – A 20-Year Horizon* (Cape Town: Clean Power East Africa, 2015)

23 SABT, "Some of Africa's Most Vital Ports"; K Kundani and A van Eeden, *Gas Infrastructure Development in Sub-Saharan Africa – A 20-Year Horizon* (Cape Town: Clean Power East Africa, 2015).

24 SABT, "Some of Africa's Most Vital Ports"; Kundani and Van Eeden, *Gas Infrastructure Development*.

In addition to this port infrastructure, Africa already has gas pipeline infrastructure that connects several countries (Figure 1), supporting the continent's proven natural gas reserves of about 18 trillion m^3.[25] These assets, together with its renewable energy potential and power pools, can be leveraged and repurposed to support a green hydrogen revolution.

Figure 1 Potential natural gas infrastructure, 2015–2035

KEY TAKEAWAY

Sub-Saharan Africa plans to set up six liquefied natural gas (LNG) facilities for LNG export and import, two new gas-to-liquid (GTL) facilities and two additional LNG trains at existing LNG facilities.

Four ring networks distributing gas within cities are expected to be set up, to establish domestic gas economies.

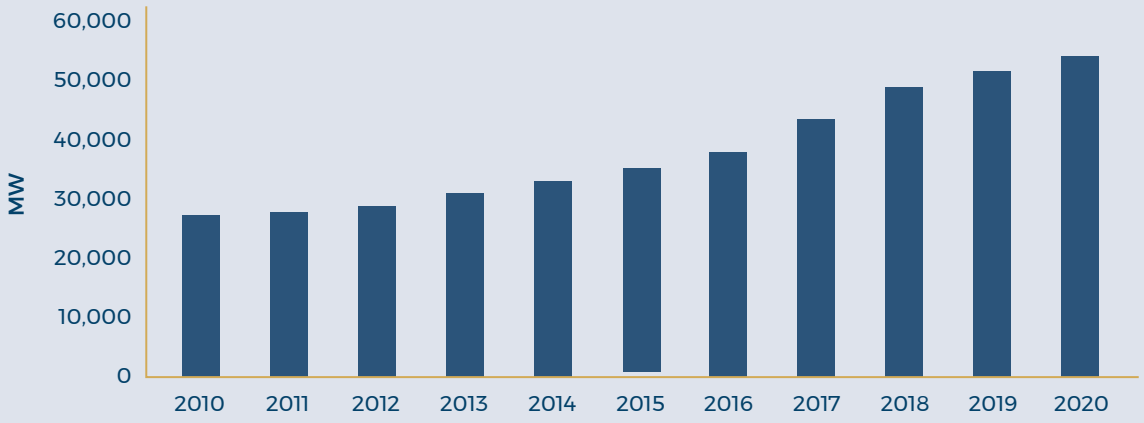
Source: K Kundani and A van Eeden, *Gas Infrastructure Development in Sub-Saharan Africa – A 20-Year Horizon* (Cape Town: Clean Power East Africa, 2015)

25 Statista, "Natural Gas Reserves in Africa as of 2020, By Main Countries".

Renewable energy potential

Africa currently has over 53GW installed capacity (Figure 2) in renewable energy,[26] out of a generally accepted combined renewable energy potential of over 1TW.[27] This potential, made up of various sources such as photovoltaic, concentrated solar power, hydro and bioenergy, and combined with Africa's existing power pools, make the region a potentially dominant player in the global green hydrogen market.

Figure 2 Africa's installed renewable energy capacity (2010–2020)



Source: International Renewable Energy Agency, *World Energy Transitions Outlook: 1.5˚C Pathway* (Abu Dhabi: IRENA, 2021)

Power pools

In Africa, the development of power pools was spurred by the New Partnership for Africa's Development (NEPAD) initiative in the power sector, based on the development of regional power markets that allow economies of scale by pooling resources through interconnected national power systems.[28] Power pools are essential for ensuring energy security, diversifying energy sources, and optimising the use of available resources. In addition, they are a critical element in cementing political and trade relations between states and between regions. A power pool is simply defined as a group of organisations that operate their power systems jointly (in the case of Africa, across sovereign borders) to obtain net benefits for each organisation. These benefits include:

- economies of scale, which help address the significant infrastructure investment costs for consumers, especially in small markets;

26 IRENA, *World Energy Transitions Outlook*.

27 AM Sebastian Hermann, "Estimating the Renewable Energy Potential in Africa: A GIS-Based Approach" (IRENA-KTH Working Paper, IRENA, Abu Dhabi, 2014).

28 Lawrence Musaba and Pat Naidoo, "Power Pools in Africa", *Energize* (July 2015): 41.

- increased system reliability and security of supply;
- optimisation of the generation mix, especially in drought-prone areas where there is a heavy reliance on hydropower;
- lower planning and operating reserves for individual members because they can rely on the buffer provided by partners in the pool; and
- improved delivery to customers.

There are currently five power pools in Africa. The Southern African Power Pool (SAPP) was the first to be created in August 1995 through a SADC treaty. This was followed by the West African Power Pool created by ECOWAS, the Central African Power Pool and the East African Power Pool (which includes the Nile Basin Initiative). In North Africa, cooperation between utilities started with the Comité Maghrébin de l'Electricité (or North African Power Pool), but the driving initiative is now the Euro-Mediterranean Ring, which interconnects all the North African countries to European and Middle East power systems.[29] Europe's Hydrogen Strategy already views the huge renewable energy potential of North Africa as a key potential enabler of a cost-efficient supply of green hydrogen to European markets.[30]

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G20 members have made several commitments over the years to support investment in productive infrastructure development in Africa. In the post-pandemic recovery phase there is a renewed commitment to ensuring that infrastructure solutions are inclusive and climate-friendly, and support a just transition.[31] Support for African initiatives that are underway to provide green and sustainable infrastructure would materially aid the continent's development. The 2020 World Bank report on the development of green hydrogen in developing countries should thus be welcomed in this context.[32] Furthermore, the NEPAD-AU Development Agency is currently spearheading the adoption of appropriate

29 Global Energy Network Institute. (2017). Retrieved November 2021.

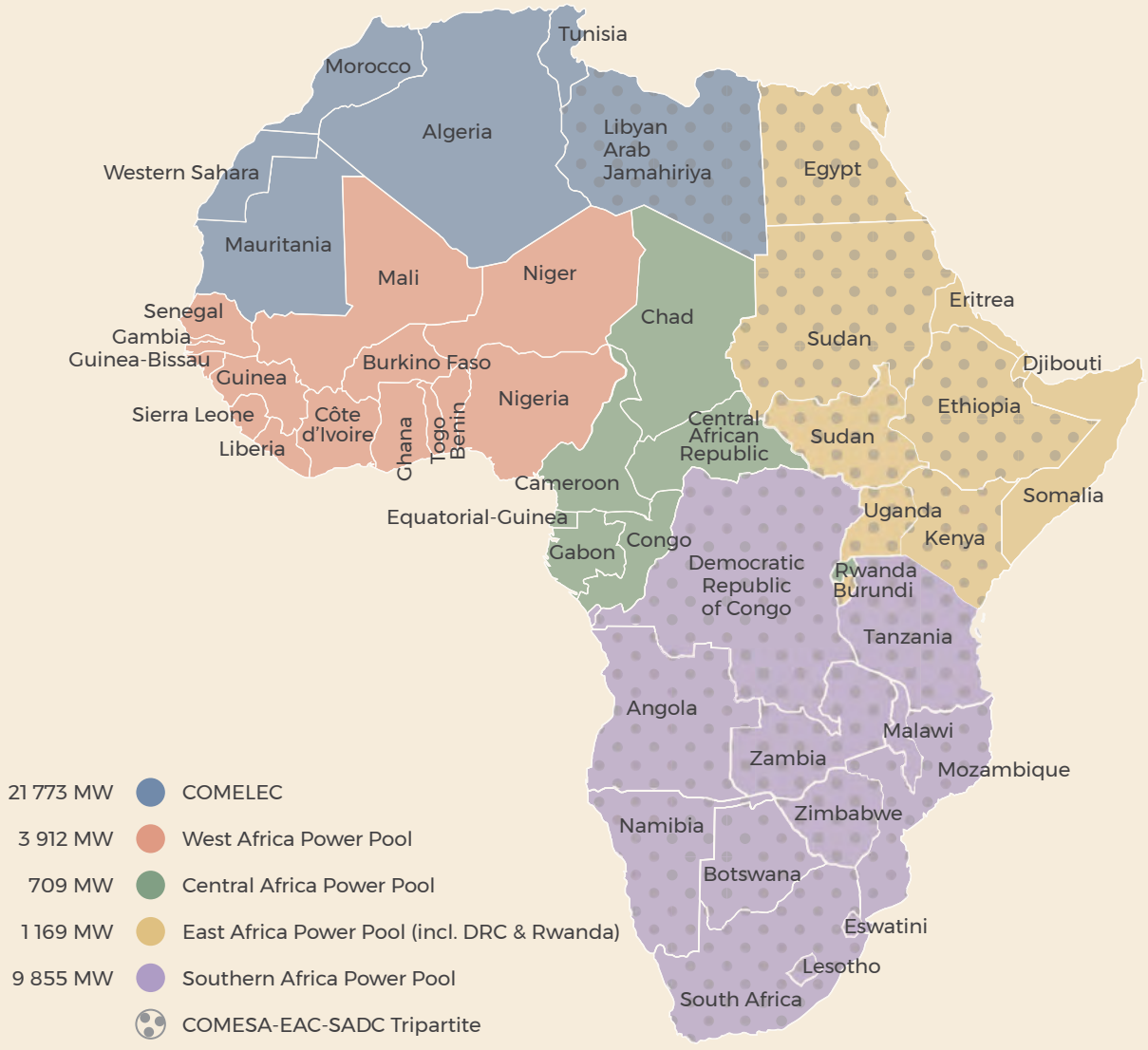
30 European Commission, "Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Hydrogen Strategy for a Climate-Neutral Europe" (EUC, Brussels, July 8, 2020).

31 Iskandar Abdullaev et al., "Building a New Sustainable Economy: Investing in Infrastructure for Distribution and Well-being" (T20 Policy Brief, Italian Institute for International Political Studies, Task Force 7, Infrastructure Investment and Finance, Milan, September 2021).

32 Energy Sector Management Assistance Program, *Green Hydrogen in Developing Countries*, Report (Washington DC: World Bank, 2020).

integrated cross-corridor infrastructure development projects for the second Priority Action Plan of the Program for Infrastructure Development in Africa (PIDA PAP2). This plan is both sensitive to employment creation and climate friendly.[33] It creates an important opportunity to consider how integrated corridor infrastructure might be used to support the development of green hydrogen in the region.

Figure 3 African energy summary



Source: Global Energy Network Institute, 2017

33 AU, "PIDA Priority Action Plan 2 Brochure" (Department of Infrastructure and Energy, AU Commission, Addis Ababa, 2021; PIDA, "About PIDA and PAP 2".

AfCFTA

Essentially, the AfCFTA aims to improve intra-continental trade, with the ultimate objective of improving growth and the continental gross domestic product. Among others, the AfCFTA focuses on liberalising tariffs on goods and services trades, and enabling the free movement of capital and people.

In practical terms, the AfCFTA can support a continental hydrogen economy by, for example, facilitating the easy movement and mobility of engineering and financial sector professionals and other critical support services. This will enable the exchange and sharing of skills and expertise to support the rapid growth of the green hydrogen economy. Landlocked countries would benefit from cheaper access to the continent's various ports for both the import and export of goods connected to the green hydrogen economy.

Hydrogen projects underway in Africa

South Africa

South Africa is assessing several hydrogen projects that are well positioned for the export of both green hydrogen and green ammonia, while also supplying the SAPP with electricity. These projects include the following:

- Hydrogen Valley Project: This project has kicked off with a Hydrogen Valley Feasibility Study Report[34] by the Department of Science and Innovation (DSI) and partners Anglo American Platinum, Bambili Energy, and energy and services company ENGIE. The Hydrogen Valley will serve as an industrial cluster, bringing together various hydrogen applications in the country to form an integrated hydrogen ecosystem. The initiative is part of work being done to support the implementation of the National Hydrogen Societal Roadmap (HSRM), which is expected to be launched soon. The HSRM will provide the policy for an enabling framework for the development of the hydrogen sector in South Africa.
- Boegoebaai 'green hydrogen' development: The Boegoebaai project is one of a number of hydrogen, ammonia and power-to-X opportunities[35] that Sasol is assessing as part of its new strategy. Sasol has partnered with the Industrial Development Corporation, which will provide joint funding for the feasibility study.
- Prieska Power Reserve: This is one of the six South African flagship renewable energy projects selected for showcasing at COP26. It is being developed by Mahlako a Phahla Investments and the Central Energy Corporation, and is a catalytic project that will start producing green hydrogen and ammonia in 2025. The construction of the ammonia production facility will begin in 2022.

34 South Africa, Department of Science and Innovation, *South Africa Hydrogen Valley: Final Report* (Pretoria: DSI, October 2021).
35 Power to X refers to the conversion of electricity (primary energy) into an energy carrier, heat, cold, product, or raw material.

Namibia

At COP26, the president of Namibia announced bold plans for the country's venturing into green hydrogen, with the news that HYPHEN Hydrogen Energy had been named the preferred bidder to develop the country's first large-scale vertically integrated green hydrogen project in the Tsau //Khaeb National Park.[36] The project, worth an estimated $9.4 billion, will ultimately produce 300 000 tonnes of green hydrogen per year for regional and global markets, either as pure green hydrogen or as green ammonia. This will give HYPHEN the right to construct and operate the project for 40 years following the conclusion of the feasibility study and sign-off from the government. The first phase is expected to enter production in 2026, creating 2GW of renewable electricity, at an estimated capital cost of $4.4 billion. This project could also support the SAPP, given the existing regulatory frameworks.

Mauritania

Mauritania has signed a memorandum of understanding with CWP Global for a $40 billion green hydrogen project called AMAN.[37]

Morocco

Morocco has announced plans to enter the green hydrogen market, with an ambitious plan to capture 4% of the global market for green chemicals.[38]

Recommendations to develop the green hydrogen economy in Africa: The role of the G20

While Africa's contribution to global carbon emissions is less than 4%, its climate vulnerability and limited ability to mitigate the adverse effects of climate change are well documented.[39] The region is also facing the paradox of energy scarcity against the backdrop of a wealth of coal, oil and gas resources that may well end up as stranded assets in the drive to keep the 1.5˚C target within reach. The need to move rapidly to a green economic model has to be weighed against ensuring a just energy transition and securing inclusive economic opportunities for Africa.

36 The Commonwealth, "Cop26 Commonwealth Pavilion", *YouTube*, November 3, 2021.
37 Petya Trendafilova, "$40 Billion Green Hydrogen Project Announced in Mauritania", *Carbon Herald*, June 1, 2021.
38 "Green Hydrogen: Morocco to Focus on Green Hydrogen in the Coming Years", *Moroccan Telegraph*, August 23, 2021.
39 Patrick Dupoux et al., "Building a Climate-Resilient, Low-Carbon, Job-Rich Africa", Boston Consulting Group, November 12, 2021.

The G20 could support Africa's desire to meet these two goals in the following ways.

First, appropriate financing is needed to secure a just and inclusive transition, by targeting investments in supportive infrastructure for the development of green hydrogen in Africa. This implies significant investments in the renewable energy sector and related grid infrastructure (power transmission grids, water infrastructure, pipelines, ports and bunkerage and storage facilities) to enable the production of green hydrogen not only for export but also for local industrial development. Development finance institutions should actively support African countries' endeavours to grow the green hydrogen economy in the region, given its decarbonisation potential and societal benefits.[40] The climate financing deal that was recently struck with South Africa[41] at COP26 may provide the outlines of a replicable approach. South Africa also offers a rich case study through its Renewable Energy Independent Power Producers Programme on how finance deals may be structured to ensure longer-term investors' confidence and the provision of energy at affordable and increasingly competitive rates.

Development finance institutions should actively support African countries' endeavours to grow the green hydrogen economy in the region, given its decarbonisation potential and societal benefits

Second, in ensuring rapid progression towards meeting zero emission targets, special attention should be paid to mutually beneficial technology exchanges, transfers and collaboration. While the H2ATLAS-AFRICA project is a laudable example of scientific collaboration to explore the potential of green hydrogen exports, it is equally important to recognise Africa's desire to use its resources to ensure local value addition. This implies not only importing capital equipment and skills to support the production of green hydrogen but also considering broader local upskilling requirements. This will allow the continent to fully benefit from the green hydrogen sector and see the local development and production of fuel cells, for example. Focusing on these two dimensions of local skills development will also support a just labour and energy transition as African countries opt to move away from fossil-fuel dependency and related industries.

Third, and related to the above, the green hydrogen market is still in its infancy. While there are signals globally by key trading partners of Africa – from Europe to Japan – that point to the

40 The World Bank's 2020 *Green Hydrogen in Developing Countries* report makes a strong case for supporting green hydrogen projects in developing countries as an important decarbonisation strategy with significant socio-economic benefits. See Energy Sector Management Assistance Program, *Green Hydrogen in Developing Countries*, Report (Washington DC: World Bank, 2020).

41 Emily Tyler, "Climate Finance for a Transition Away From Coal: A Chance to Change History in South Africa", *The Conversation*, November 12, 2021.

potential of green hydrogen to support lower emissions in especially hard-to-abate sectors such as steel production, aviation fuel, shipping and long-haul transport, the growth of the sector will depend on stable offtake agreements. Agreement on standards and certification is critically important, as is progress towards equitable access to stable developed markets. In this context it is vital that international trade agreements do not come at the cost of securing zero-emission energy security for developed countries, and so deepen energy insecurity in Africa. Furthermore, the volatility associated with the international oil market should be avoided as far as possible to ensure an even playing field for both producers and consumers. That is the only way in which the green hydrogen economy can secure a rapid and affordable energy transition with the associated planetary benefits of zero emissions.

It is vital that international trade agreements do not come at the cost of securing zero-emission energy security for developed countries, and so deepen energy insecurity in Africa

Finally, the harmonisation of regulatory frameworks and safety and compliance standards should aim to support cross-border and international cooperation, not undermine it. On the one hand, certification of origin is an important goal for African policymakers. On the other, efforts by African leaders to enable stronger regional collaboration through the adoption of the African Continental Free Trade Agreement require a sober and practical assessment of how G20 members might support African efforts to develop the green hydrogen economy to support decarbonisation goals both regionally and globally. In this respect it might benefit Africa to develop a regional green hydrogen strategy, emulating the European Hydrogen Strategy, as an additional supportive framework. However, it should be noted that the EU Hydrogen Strategy as an important element of the European Green Deal has significant implications for African exports to Europe and presents both an opportunity and a challenge that requires a pro-active response from African policymakers, investors and traders.

As African countries finalise the development of the new African Climate Change Strategy, it is essential to recognise that working towards lower carbon emissions in the region requires a long-term perspective that embraces a multi-faceted sectoral approach in which green hydrogen would be an important pillar. It is also an area in which Africa may enjoy a competitive advantage if it judiciously harnesses its locational advantage (access to global shipping lanes, renewable energy potential), existing regional cooperative infrastructure frameworks (power pools, connective port and gas infrastructure) and policy frameworks (AfCFTA and PIDA PAP2) to support the development of green hydrogen. Other regions and countries are rapidly embracing green hydrogen as a decarbonisation approach in hard-to-abate sectors. However, in the case of Africa it could also be an important path to achieve additional strategic socio-economic development goals domestically – aside from decarbonisation goals – and to do so not exclusively through a green hydrogen export lens.

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Acknowledgement

SAIIA gratefully acknowledges the support of the Konrad Adenauer Stiftung for this publication.

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SAIIA is an independent, non-government think tank whose key strategic objectives are to make effective input into public policy, and to encourage wider and more informed debate on international affairs, with particular emphasis on African issues and concerns.

SAIIA's policy insights are situation analysis papers intended for policymakers, whether in government or business. They are designed to bridge the space between policy briefings and occasional papers.

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African perspectives.
Global insights.

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