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Issue 12 – 2022

AFRICA'S ENERGY TRANSITION

Aspirations versus reality

AFRICA CAN ADOPT RENEWABLE ENERGY

on a massive scale and save billions along the way

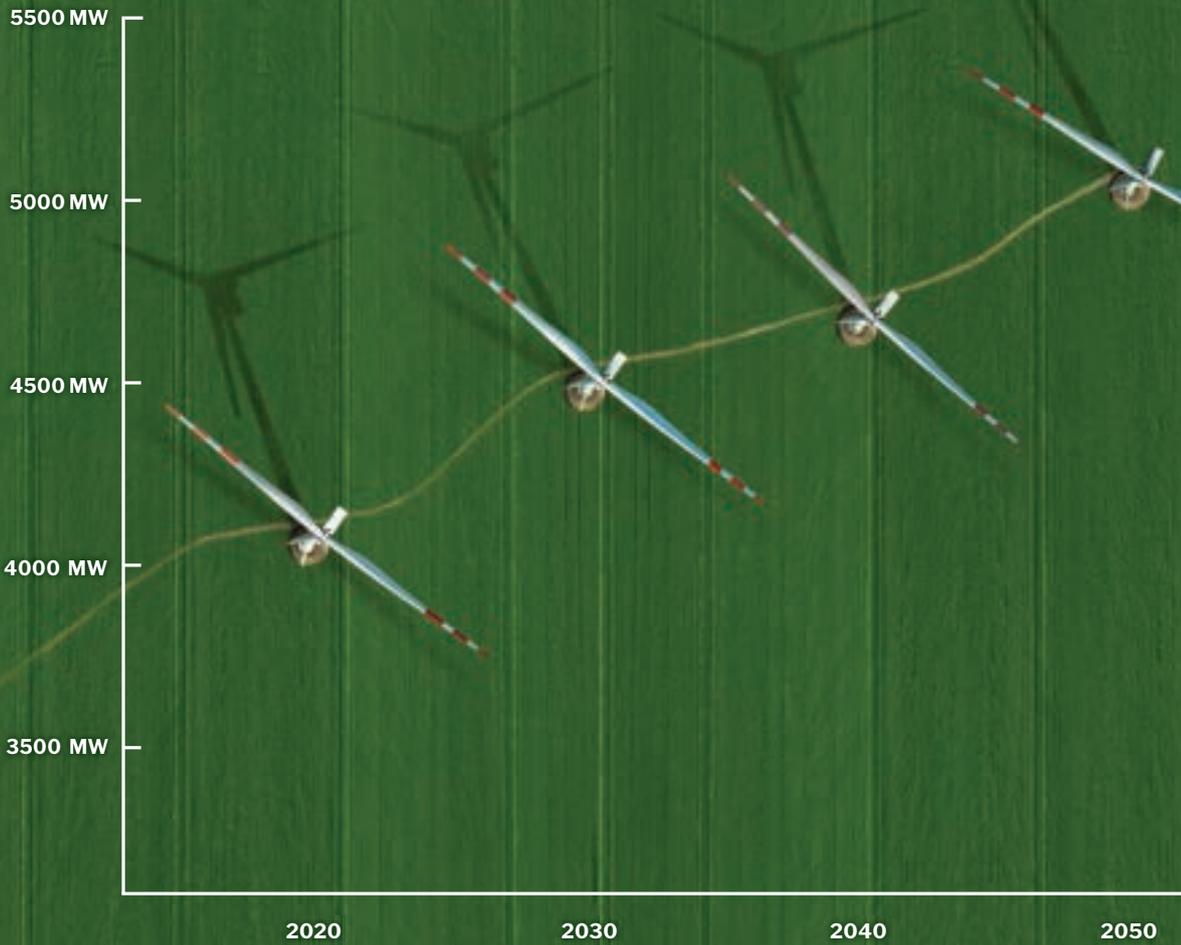
WALK THE ESG WALK

or face significant risk

SOUTH AFRICA'S ENERGY SECTOR

and the just transition





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EDITOR'S NOTE

Why we are looking forward to aef



**Damon Thompson,
Director**

I'm very much looking forward to AEF 2022 in Brussels, which will actually be my by 10th Forum, with AEF 2012 in Berlin being my first, and I have witnessed many really positive changes in the sector in this time. From the hugely successful REIPPP programme in South Africa, which is now in its 6th round, to the development of hundreds of vital solar, wind hydro and off grid projects throughout the continent.

I'm proud to say that as the market and demand has expanded for sustainable

energy solutions, so the Forum has grown in size having just 400 participants in Berlin we are now expecting more than 2,000 to be joining us in Brussels which will make it the biggest AEF in our 23 year history. I can't wait to meet with our sponsors, many of whom such as Absa, Nedbank Siemens, Aggreko, and FMO have supported us from the start, to discuss their hopes and objectives for the next decade.

I'm also looking forward to discussing our plans for AEF 2023 in Nairobi next year, as we are incredibly excited to be hosting the Forum in Kenya for the first time, as well as our exciting new launch Offshore Technology Africa in Cape Town in October. See you in Brussels.



**Howard Yuchetel,
Commercial Manager**

I am very excited about the return of the full format of the africa energy forum this year in Brussels. I have been working for EnergyNet for the past 10 years and I remember my first aef in Berlin, where we had around 750 attendees. Even though the numbers were lower than they are these days, I realized that this meeting was special and crucial to market from those 3 days.

In the time since then I have noticed truly remarkable change in the market and the demand for investment and the building of new power and infrastructure projects increase, whilst the growth and developments in technology has seen remarkable change, such as the use of Battery Storage.

After the last two COVID hit years, it is exciting to be running aef once again in its full format and I am really looking forward to catching up with everyone. ■

“ I'm proud to say ... we are now expecting more than 2,000 to be joining us in Brussels which will make it the biggest aef in our 23 year history ”



AFRICA FOR AFRICA:

Building Energy for the Just Transition



africa energy forum

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21 – 24 June 2022 | Brussels

Bringing Africa's Voice to the heart of Europe... Join us at the 24th annual Africa Energy Forum, as it returns Live and in full capacity from 21-24 June at Tour & Taxis in Brussels

At the COP26 climate summit last year, the just transition was showcased as a critical factor for the unerring and successful shift to a net-zero and resilient economy. The global and incremental focus on this transition has manifested through projects such as the international partnership towards the decarbonisation of South Africa's economy, which will mobilise an initial commitment of \$8.5 billion for the first phase of financing.

With this in mind, this year's Africa Energy Forum [aef] will be focusing on 'Africa for Africa – Building Energy for the Just

Transition' which will be an opportunity for Africa to voice what it needs and wants for energy development and how the international partners will play their part. After extensive research with the sector, the agenda has been created to encourage collaboration and honest productive discussions, enhancing the networking opportunities across the stakeholders.

Over four days, the Forum will bring together investors and industry leaders, in one place, to hear and present its united strategy for its investments into the continent's energy sector.

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AFSIA
Solar Awards



The launch of the Youth Energy Summit [YES!]



4
days of unlimited networking opportunities

aef will deep dive into the most critical topics, through the four-day multi-streamed agenda, including:

- Ministerial Roundtable – Africa for Africa Building Energy for the Just Transition – What Does Africa Want?
- How the EU investments being channelled into Africa’s energy projects are playing a critical role in enabling access to energy;
- South Africa’s Independent Power Producer Procurement Programme on the lessons from BW5 and what’s different for BW6;
- Africa’s voice in the global fight against climate change and how the conversation is changing for COP27?;
- Implementing practical solutions for Africa’s utilities;
- Project preparation and increasing the number of projects reaching financial close;
- The need to accelerate gas on the continent as Africa’s fuel here to stay and more.
- Country spotlights including: South Africa, Nigeria, Kenya, Egypt, Ghana, Morocco, Senegal, Uganda and many more.

For full details on the latest agenda and speakers please visit the website.



H.E. Honourable Ruth Nankabirwa Ssentamu
Minister
Ministry of Energy & Mineral Development,
Uganda



H.E. Honourable Aissatou Sophie Gladima
Minister of
Petroleum & Energy,
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Ministry of Finance,
Ethiopia



H.E. Honourable Kabral Blay-Amihere
Board Chairman
GRIDCo, Ghana



Mandy Rambharos
General Manager: Just Energy Transition
Eskom, South Africa



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Tas Anvaripour
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aef 2021 opening panel session



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EVENT PREVIEW

The Forum is once again being supported by Aggreko [Forum Sponsor], country hosts – European Investment Bank and our global partners IFC and MIGA part of the World Bank Group, amongst 100+ sponsors and exhibitors.

The forum will feature a stream dedicated to interactive hosted boardrooms by our partners including: AfDB - Instruments to Encourage Local Currency Finance of Energy Projects; ALSF: A Just Energy Transition: Balancing the Energy Mix and Integrating Renewable Energy; Finnfund - E-mobility in Africa: Visions for the Future or Already Happening?; Marsh - Mobilising Capital:

How Accurately Quantifying and Mitigating Political Risk can Facilitate Investment for Institutional and Emerging Market Investors;

GWEC - Wind Power Energising a Just Transition's project financing ready to ride the green hydrogen wave? ■



yes!

Youth Energy Summit

At EnergyNet we are always looking to invest in the future of the Energy sector and this year we are proud to announce

that we are launching EnergyNet's Youth Energy Summit [YES!] at aef in Brussels. We're investing and creating a platform and network for early career professionals, entrepreneurs, students, and educators to boost the skills, connections, and business-readiness of a new generation of African energy leaders. We are excited to be partnering with Clean Energy 4 Africa, Power for All and RETTI.



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The Africa Energy Forum is one event not to miss this year, so make sure you clear your schedule and register your place to attend. We looking forward to welcoming you to the Forum.



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Event: Africa Energy Forum
Date: 21-24 June 2022
Location: Tour & Taxis, Brussels
Website: www.africa-energy-forum.com
Contact us: aef@energy.net.co.uk



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AFSIA SOLAR AWARDS



AFSIA has once again teamed up with EnergyNet's Africa Energy Forum (aef) to host the 3rd edition of the AFSIA Solar Awards

The AFSIA Solar Awards is the industry's premier awards ceremony. This annual event is the platform to recognise and celebrate exceptional talent and achievements in the African solar market. The application process is open to everyone, and applicants can choose from 13 award categories.

Covering on all segments of the solar industry, the purpose of the awards is to recognise and celebrate good practice, professionalism, quality, safety and innovation, with the aim of being a marker of the brightest and best that the African solar industry has to offer.

Applications to the AFSIA Solar Awards will be assessed by some of the best experts

in the African solar industry. They will review every application independently and will nominate the outstanding ones in each category.

The awards ceremony is organised in collaboration with the Africa Energy Forum and will be conducted live in Brussels during aef on Thursday 23rd of June 2021 from 5pm till 6.30pm.

Application is free of charge and open to all. Details may be found at - www.africa-energy-forum.com/afsia-solar-awards



Once again this year, the AFSIA Solar Awards hailed as the "industry's highest honor" will gather the biggest and most exciting innovations of the solar industry in Africa. This ceremony aims at celebrating individuals and/or companies that made significant contributions to the African solar industry and to the society.



Ines Dushime, Manager of the AFSIA Solar Awards





aef photo of the year competition returns for 2022

We are excited to bring the photo of the year competition back at aef, as we return to the full scale conference and exhibition on 21-24 June at Tour & Taxis in Brussels.

Celebrating excellence in Africa's transformative impact of energy projects

This year we have introduced three new categories:

- **Energy in action**
[Using energy for work; energy in motion; energy in the community]
- **Energy in landscape**
[Energy as a visible part of the landscape, including hills, rivers, buildings, trees, and plants]
- **Energy and youth**
[Energy connecting and empowering youth, entrepreneurs, early career professionals]

Shortlist Announced for aef Photo of the Year Competition

EnergyNet and the aef team would like to firstly say thank you to everyone that entered the aef Photo of the Year competition. We were inundated with so many inspirational photos sent in for all three categories, a testament to how many transformative energy projects have impacted Africa and its community.

The winners will be announced Live at the Africa Energy Forum on 21st June at Tour & Taxis, Brussels.

All shortlisted photos and winners will be showcased during the 24th annual Africa Energy Forum on 21-24 June 2022 at Tour & Taxis in Brussels. The winning company[s] or individual[s] will receive an enlarged copy of the winning photo, and it will be displayed and credited in the Africa Energy Yearbook, EnergyNet Magazine, aef website and on the EnergyNet homepage for 3 months.

Good luck to all the finalists!

The aef Team

Energy in action



African Infrastructure Investment Managers [AIIM] - Off-grid solar energy solutions to communities without access to a formal electricity supply

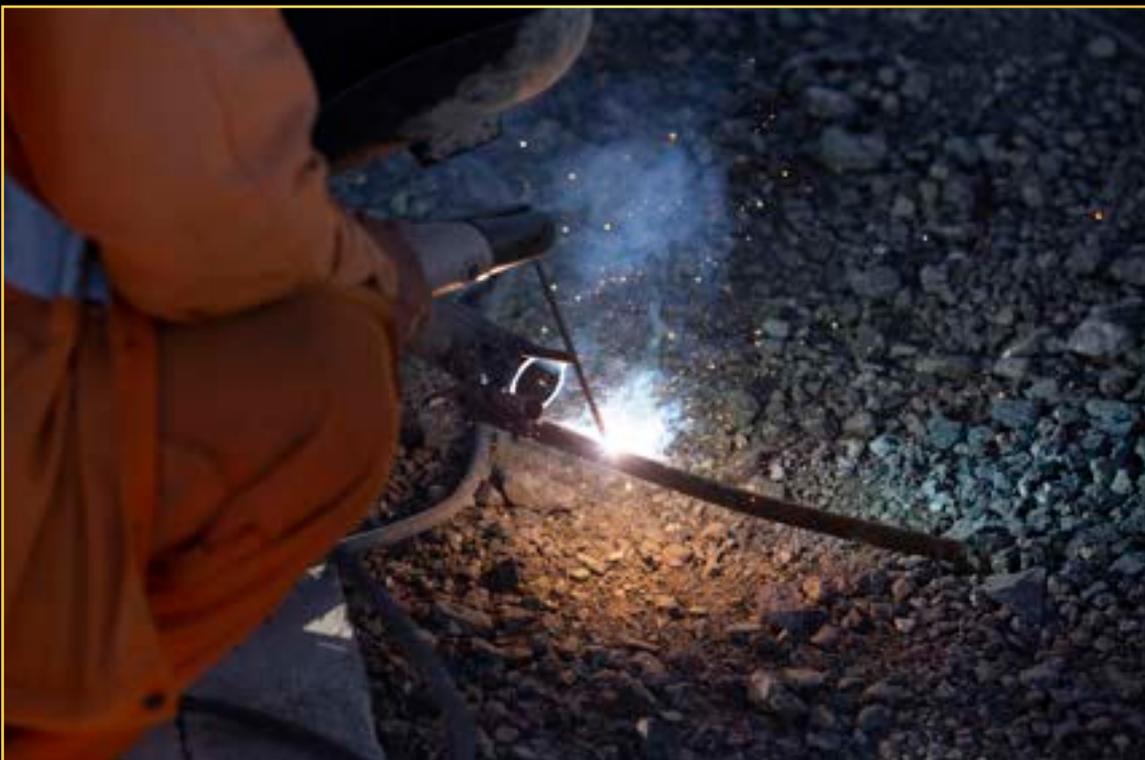


Water flows using solar powered irrigation Senegal

Energy in action



Power Africa - Electricity access is crucial for Avelino Martins carpentry business in Luanda Angola



BTE Renewables - Site construction 100MW

Energy in landscape



Vestas - V52-850kW Kenya Lake Turkana



Juwi - Garob Storm

Energy in landscape



African Infrastructure Investment Managers [AIIM] - Cookhouse Wind Farm



Distributed Power Africa - Tanganda Tea Estate

Energy and youth



Globeleq - Raphael is one of the hundreds of young energy professionals who has progressed through the industrial practical training at the Songas power plant, Tanzania



Solar Giraffe - Young girl charging her phone on the Solar Giraffe in Mangunze Gaza Mozambique

Energy and youth



Kipeto Energy - To support the youth in Esilanke where our wind farm is located Kipeto Energy has employed resident youth



Power Africa - Electricity powers small businesses and creates brighter future for children

WALK THE ESG WALK

or face significant risk

ALLEN & OVERY

Political and public pressure is building on business to fully embrace the fast evolving ESG and sustainability agenda. It's important, argues Gillian Niven, that mining, energy and steel companies act now.

Environmental, Social, Governance (ESG) and sustainability-related matters are undoubtedly now front and centre not only for the extractive and steel industries but for business across all sectors. The last five years have seen significant momentum building in ESG and sustainability, most recently with tumultuous net-zero target setting in various industries.

While environmental and social issues have always been high on the agenda in the mining and energy sectors, as

with any regulated industry forced to meet strict standards to win regulatory approval and license approvals, the challenges are mounting as efforts to tackle the climate crisis intensify. We are now seeing an increasing accent on the "G" as industry seems to become more au fait with "E" and "S" elements within this important agenda.

This focus has been most evident in the substantive discussions that have developed around the integration of ESG and sustainability into day-to-day business



governance. The imperative to identify climate-related risks and opportunities has also come a mainstream preoccupation to ensure action on climate is real and long lasting. More generally companies need to focus on their governance structures and procedures, not least issues such as:

- How ESG matters are scrutinised and policed at board and executive management level
- How decisions around ESG are made and acted upon
- What levels of disclosure are appropriate
- How executives are held accountable for the commitments they make, not just

around meeting statutory requirements, but also around wider climate change related issues.

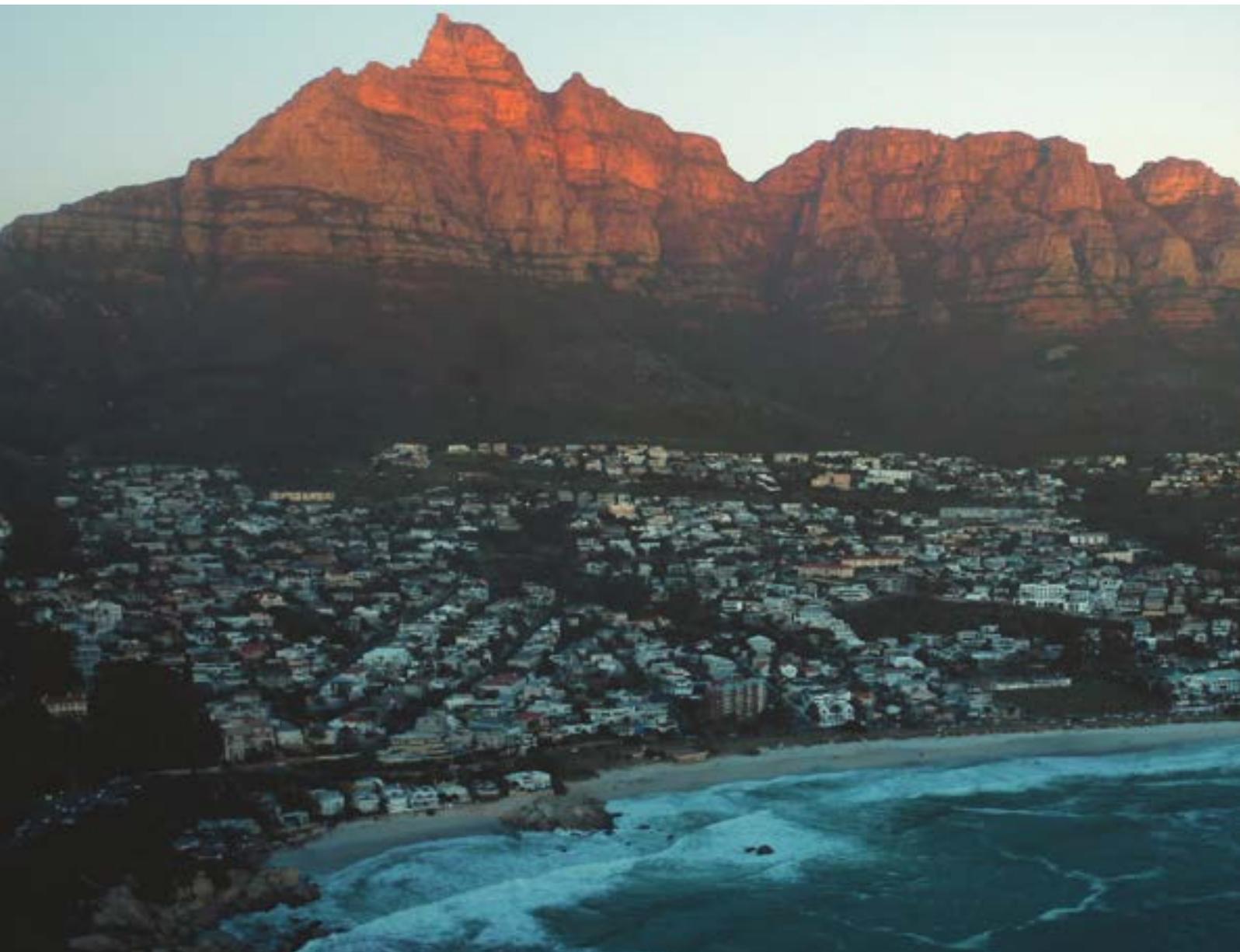
Time is no longer a luxury (if it ever was). The first movers have already bolted from the starting line, convinced they can achieve a significant competitive advantage if they are among the first to get it right.

The need for transparent reporting

Notwithstanding the headway made in relation to some ESG matters, it is widely

acknowledged that there needs to be far greater transparency in corporate reporting to provide clear evidence that ESG risk has been effectively assessed and to ensure that operators do not fall prey to accusations of 'greenwashing'.

It's impossible to understate the importance stakeholders attach to companies adopting a comparable and transparent disclosure framework. And it is equally obvious that companies can no longer produce sustainability reports just to 'keep up with the Joneses' or merely to be seen to be towing the sustainability line.



The information disclosed in these reports, and the commitments made by these companies (such as net-zero targets), should be vigorously interpreted, detailed and approved by companies' Boards of Directors. It is precisely these targets that companies will be held to account for by increasingly knowledgeable and increasingly activist consumers, investors and shareholders and, indeed, by civil society at large.

The Africa context

This has real relevance in South Africa and across the region at large.

On a continent grappling with a poverty crisis and with majority of the population still unable to access electricity, let alone reliable electricity, our challenges are unique. But so is the wealth of resources on this continent, with potential for developing renewable energy solutions that far exceeds most regions of the world. It is this unique positioning that gives Africa the opportunity to make a real difference in responding to the climate change call.

Africa has seen a resurgence of interest in energy related projects, aligning with the push for companies to assess their impacts

on the climate and to provide ambitious decarbonisation targets. With interest in renewable and innovative energy solutions rapidly on the rise, it means that Africa is posed for a boom in development and construction related to these projects. It is already apparent that mining groups will play a significant role here, as they look to develop renewable energy resources, both to meet their own decarbonisation targets, and, in some cases, as an opportunity to diversify and transform themselves into mining/energy supply combinations.

South Africa is not new to this game, having actively procured renewable energy through government incentivised programmes since 2010. What will change the landscape, however, is the overlay of ever more exacting ESG-related requirements on these activities.

We expect the project developers, as key stakeholders in facilitating these decarbonisation projects, to face a similar kind of scrutiny that the financial sector attracted in relation to its impact and influence on climate related matters. It is foreseeable that there will be an increased focus on the management of, often complex, international supply chains to ensure that ESG requirements are being met at every level of operation. If they get this right, it's clear that mining and energy project developers and their associated contractors have an important impact in the global effort to reduce emissions and mitigate climate change.

While developing renewable or innovative energy solutions to help business decarbonise and improve the green credentials of mining and energy companies considerably, it won't in itself be enough in these challenging times. The energy intensive sectors should also expect growing scrutiny of how they are managing their supply chains. In other words, it won't be enough just to be a





renewable energy generator or off-taker - all the components associated with those projects must also speak true to ESG.

Implications for suppliers

As the importance of credible, transparent disclosure grows, we expect project developers to require their appointed contractors and suppliers to address ESG compliance issues in tenders and performance of the contract. It is likely, for instance, that we will see a greater emphasis on contractors displaying their ESG credentials, through measures such as adopting a clear company policy on ESG and creating procedures to detail the company's ESG management philosophy and its ambitions.

But contractors must be careful not to produce ESG credentials just for the sake of bid compliance. Instead they need to

appreciate that greater levels of disclosure must come hand-in-hand with much more sophisticated monitoring and reporting.

Meeting this challenge will require a greater level of administration than in the past – potentially even requiring the appointment of in-house ESG officers and the need to ensure appropriate training for such specialist teams.

At the moment, there remain inconsistencies in ESG compliance and reporting standards, which only add to the complexity and, potentially, to the cost in managing such challenges. There is no one-size-fits all in terms of the standards companies will be held accountable for. So companies need to decide how they allocate risk around these uncertainties and how they integrate this into their day-to-day governance procedures.

They will, for instance, need to consider where they source raw materials and components, whether their solutions actively address ESG and sustainability considerations and even if compliance may offer them a financial benefit in terms of securing premiums by increasing ESG scores and meeting sustainability targets.

The potential increased financial burden of ESG compliance raises the question of whether companies will start looking to invest in jurisdictions where government support and grants are available to speed them on their ESG transition if these additional costs cannot be covered within project budgets.

No time to wait

This is an evolving area and although much remains unclear from project development and risk appetite perspective, one thing is certain - companies cannot wait for lessons to be learnt before taking action.

Civil society is looking for boards and executive management teams to engage critically and authentically with these harder concepts and to be transparent leaders in this evolving area, which will undoubtedly be a central concern for business in future.

Disingenuous representation and shortcuts are only going to attract the attention of the climate change and environmental activists. Such representations have little benefit in the sustainability of companies in low carbon economies or within a society acutely aware of its historical and ongoing impact on the environment and climate. ■

Gillian Niven is a counsel in Allen & Overy's Projects, Energy, Natural Resources and Infrastructure practice. She is based in Johannesburg. Gillian.Niven@allenover.com.



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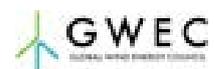
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AFRICA'S ENERGY TRANSITION

Aspirations versus reality

HUNTON
ANDREWS KURTH

Author: Patricia Tiller, Partner at
Hunton Andrews Kurth



Africa is home to one-sixth of the global population, yet the continent accounts for less than 6% of global energy consumption and produces only 2% of global emissions.¹

The continent faces a parallel imperative of providing electricity access to millions of citizens currently deprived of it, and also to align with the global transition to a net zero future.

The global access to electricity deficit is increasingly concentrated in Sub-Saharan Africa with World Bank data estimates suggesting that over half of the region's population remain without access to regular electricity.² A significant proportion of households continue to rely on conventional forms of energy—such as charcoal and firewood—as their primary source of energy for cooking. African businesses—from micro-enterprises to agriculture to industry—are similarly held back by the lack of a reliable, affordable energy supply.

When examining the evolution of human energy use, we have seen gradual shifts rather than sudden transitions. Coal displaced wood and oil displaced coal. In many respects, the aspirations for climate change seen at the 2021 United Nations Climate Change Conference, more commonly referred to as COP26, and the goal of the Paris Accords³ and the UN Framework Convention on Climate Change⁴ have sought to replace fossil fuels with renewable energy on an accelerated timetable rather than a natural shift. For Africa to meet this accelerated timetable, stakeholders must balance the economic and technical changes required to achieve the goals of the Paris Accords. Africa must transform the way it generates and uses energy

¹ <https://www.climatewatchdata.org/ghg-emissions>

² <https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=ZG>

³ <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

⁴ <https://unfccc.int/>

to reduce emissions while also meeting growing energy demand and providing energy access for the poor.

Africa's net zero expectations

African nations have committed to inclusive, sustainable economic growth and development in *Agenda 2063: The Africa We Want*.⁵ Renewable energy targets for West and Southern Africa focus on the power sector. West Africa targeted a 48% increase in the share of renewables in the electricity mix by 2030. In Southern Africa, the target is 39% by 2030. North African countries have joined other members of the League of Arab States in setting a target of a 12% share of renewables in generated electricity. Some countries have already established energy transition programmes. For example, under the leadership of the Economic Community of West African States (ECOWAS), all 15 countries in West Africa have developed National Renewable Energy Action Plans, with clear targets in terms of access and deploying renewable energy capacities by 2030.

Most countries in North and West Africa have integrated some form of renewable energy target into their national energy plans, predominantly focused on the power sector. Central Africa has the fewest countries with rural electrification plans based on renewables. To date, 45 African countries have set targets for, and announced activities to support, renewable energy expansion in their Nationally Determined Contributions (NDCs).

Shortfalls in public and private funding

The practicality of the timeline proposed in the Paris Accords has been brought into question due to the lack of mandated support and financing required to meet

⁵ <https://au.int/en/agenda2063/overview>



the commitments of the Paris Accords for an effective energy transition in Africa.

Wealthy nations have pledged to channel \$100 billion annually to developing nations, to help them adapt to climate change and mitigate further rises in temperature.⁶ The Paris Accords aimed for a balance between mitigation projects (i.e., projects to reduce greenhouse-gas emissions) and adaptation projects designed to assist people in adapting to the effects of climate change; however, only \$20 billion went to adaptation projects in 2019, with under \$10 billion allocated to mitigation projects, indicating a lack of balanced support to date.⁷ Public investments in renewable energy have also been unevenly distributed, with most of the financing directed toward African nations with advanced regulatory frameworks and strong economic environments. The financial promises made by developed nations are vital to Africa's energy transition and the gradual

⁶ <https://www4.unfccc.int/sites/ndcstaging/Pages/Home.aspx>

⁷ Organisation for Economic Co-operation and Development. *Climate Finance Provided and Mobilised by Developed Countries: Aggregate Trends Updated with 2019 Data* (OECD, 2021).

rate at which these promises are being fulfilled is detrimentally affecting Africa's ability to achieve its energy goals.

Overall, the investments required to meet Africa's growing demand for renewable energy are far greater than the funds available from public sources. Present levels of financing for energy access are not enough to achieve universal access by 2030, as targeted by Sustainable Development Goal 7.1, which seeks to ensure universal access to affordable, reliable, and modern energy services.⁸

Private investment in Africa's energy transition has also fallen short of the investment required for Africa to realistically meet its goals. Globally, energy transitions have been financed predominantly by the private sector, with public finance accounting for just 14% of direct investments.⁹ In Africa, however, projects often cannot attract private capital owing to inherent political, legal, and economic risks. Of the \$2.8 trillion invested in renewables globally between 2000 and 2020, only 2%

⁸ <https://www.un.org/sustainabledevelopment/energy/>

⁹ https://irena.org/-/media/Files/IRENA/Agency/Publication/2022/Jan/IRENA_Market_Africa_2022.pdf



went to Africa, despite the continent's enormous renewable energy potential and its need to bring modern energy to billions of citizens still lacking access.¹⁰ Many countries in sub-Saharan Africa have limited or no creditworthy off-takers, and/or constrained government support, which leads to an unavailability of guarantees. Without host government support (guarantees), there is often an inability to obtain requisite insurance (political risk), making private funding for projects even more difficult. Local enterprises continue to face challenges in accessing financing, with investments concentrated in a few companies.

Both public and private financing will need to increase to reach the funding levels needed to achieve universal access as promised in the Paris Accords.

The role of natural gas in Africa's energy transition

In several African countries, traditional biomass fuels continue to dominate the overall energy supply and natural gas

reserves remain indispensable. As the world pushes towards a net-zero emissions future, natural gas can help bridge the gap and stand in where other fossil fuels have failed. Increasingly, it is becoming evident that gas-to-power may offer the transition that Africa needs in order to ultimately, and realistically, reach its Paris Accord commitments. This approach differs to a sudden and complete switch to other cleaner fuels, such as hydrogen or renewable power.

Gas resources have been identified in 14 countries in sub-Saharan Africa, with Nigeria accounting for 81% of proven reserves. Several undeveloped fields in Mozambique and Tanzania account for 62% of total contingent resources. Other African countries without their own reserves could benefit from developing infrastructure for importing natural gas to support local demand, which will require ongoing investment in natural gas infrastructure.

By transitioning to net zero by using natural gas instead of coal or oil, and focusing on reducing emissions during production and processing of natural gas, African nations may have a more realistic chance at reaching

their Paris Accord commitments. The continued use of natural gas as a transition fuel could be particularly successful in the industrial sector. A switch from coal to gas in the industrial sector has been shown to reduce the net carbon emissions by 25%, without considering further reductions in emissions that will come from more environmentally friendly production and processing methods, and capturing CO₂ emissions from burning off natural gas.

Gas-to-power in Africa is not without its challenges. Gas supply issues and contractual agreements not being honored by producers have affected the commercial viability and operational performance of gas-to-power. In Ghana, for example, the gas-to-power chain is not functioning on an economically sustainable level due to issues including revenue collection at the customer level, and revenue not flowing back up the chain to gas suppliers. Limited capacity and availability of power transmission and distribution systems also present a possible constraint to the success of gas-to-power projects and increasing the availability of energy throughout Africa, even with natural gas, will require investment in the entire value chain.

¹⁰ <https://bioenergyinternational.com/energy-transition-central-to-africas-economic-future-afdb-irena-report/>

Policy constraints

A fundamental cause of the delay in Africa's energy transition centers on the political and regulatory framework needed to support a net zero goal.

For a transition to zero-carbon to succeed, the transition must be tailored to each national and local context. The transition must consider each country's readiness, capacities and needs in partnership with national and regional institutions. Attempts to conduct ambitious electricity sector reforms have sometimes failed because they challenged the political economy or threaten the economic foundation of a nation. In Nigeria, for example, oil production and the supporting activities are vital to the economy. Despite oil production representing a relatively small proportion of the gross domestic product (approximately 9%), crude oil sales made up one-third of the government's budget revenue and about 90% of the nation's export earnings. Nigeria must develop and strengthen other industries to fill the gap left by reduced oil production before it can effectively phase out the production of this fossil fuel.

Africa's energy transition must also consider its varied political landscape. It is crucial that governments demonstrate the political will to overcome these challenges and follow through with comprehensive reform to create an enabling environment for an energy transition. Further regional cooperation may assist to achieve the reforms needed, including initiatives such as the African Single Electricity Market, designed to link the South African Power Pool, the West Africa Power Pool and the East African Power Pool.

Broad regulatory reforms are also needed. Ensuring the reliability of power supply requires predictable tariffs, including affordable end-user tariffs, and a strong governance framework throughout the entire energy value chain to ensure there

is no undue siphoning of revenue at each stage of the process. Several African nations are yet to implement the regulatory reforms needed to achieve these criteria, and a lack of legal and institutional capacity required to implement these reforms will hinder the energy transition. Regulatory reforms that promote access to energy, de-risk private sector investments, and that strengthen and modernize the grid would all support low-cost, low-carbon, climate-resilient electricity sectors.

Africa's economic ability to address energy poverty in an energy transition

The effect of the energy transition on economic activity naturally differs across Africa. A just and inclusive energy transition underpinning Africa's socioeconomic development goals will be incomplete without tackling the widespread access deficit.

In Sub-Saharan Africa, less than half of the population has reliable power at home. Electricity tariffs remain high across the continent, especially when compared with other developing regions. Together with poor reliability, tariffs remain one of the main barriers to achieving universal access in Africa.

Additionally, limited progress on clean cooking has been achieved, with progress mostly in the form of liquid petroleum gas. Charcoal remains the most common fuel in urban areas, while in rural areas the use of firewood prevails. Any energy transition strategy must reckon with the socioeconomic aspect of charcoal. Though unsustainable, the sector provides livelihoods for many millions of Africans.

Many of Africa's public utilities are in financial distress. As they struggle to cover their operational costs, the utilities cannot finance the desired renewable energy projects or maintain and operate

electricity infrastructure. This forces utilities to rely on extensive public subsidies, which may not be sustainable in the long-term. All these factors impede development and economic growth. In many ways, these factors have directly resulted from the organizational structures of the fossil fuel era not properly aligning the cost, price and value dimensions of energy. A comprehensive rethinking of power system structures is needed to avoid misalignment in the energy value chain that will create barriers that hinder Africa's ability to address universal access to electricity.

Moving forward—building functional, competent institutions

Developing and implementing national policies to promote universal electricity access while also pursuing low-carbon development in Africa's power sectors is a dual priority at every stage of the energy transition—one that will require competent institutional support and oversight.

By building stable, predictable enabling frameworks, identifying a pipeline of viable projects and offering targeted de-risking instruments, African governments and their development partners can facilitate the public and private sector investments necessary to achieve Africa's energy transition. Until reliable, affordable, and sustainable modern energy reaches every household, farm, enterprise, school and clinic in Africa, the continent's socioeconomic development objectives under the Paris Accords will remain unfulfilled. ■

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SOUTH AFRICA'S ENERGY SECTOR

and the just transition

 **NORTON ROSE FULBRIGHT**

Authors: Matt Ash, Tina Costas, James Ross and Kelsey Pailman

Continuous engagement by stakeholders crucial in ensuring energy sector is sustainable while also managing social impacts of shift.

While there has been steady progress in the global transition from economies running on fossil fuels to sustainable energy development since the establishment of the UN Framework Convention on Climate Change in 1992, the past decade has seen a significant increase in pace. This rise in intensity is in line with the UN Sustainable Development Goal 7, established by the General Assembly in 2015, which envisions universal access to affordable, reliable and sustainable energy generation.

On a national level, South Africa's energy transition is to be effected as a 'just transition' away from fossil fuel reliance and towards green energy. The term 'just transition' was coined in connection with South Africa's Nationally Determined Contribution (NDC), which outlines the country's post-2020 climate strategy pursuant to its obligations under the ratified 2015 Paris Agreement. South Africa's NDC aims to achieve the "absolute decline of GHGs from 2040". Under the national commitment, GHG emissions



are expected to peak between 2020 and 2025, plateau between 2025 and 2035, and decline thereafter.

On 14 September 2021, South Africa's Cabinet approved a stricter target range for GHG emissions in order to strengthen the ability to meet the overarching targets set out above. The newly approved target range in South Africa's NDC is 350-420 t CO₂e. The previous target range was 398-614t CO₂e for 2025 to 2030.

In summary, the just transition refers to a gradual shift that balances reduction of the country's carbon footprint while mitigating against financial risks to the fossil fuel industry, a delicate process given South Africa's continued reliance on that sector in terms of GDP, employment and energy generation.

The principles of the just transition are reflected in South Africa's 2019 Integrated Resources Plan (IRP), which serves as a roadmap for the development and regulation of energy demand and supply in South Africa until 2030. Although the IRP envisages the continued use of coal through the implementation of "clean coal technologies" such as carbon capture and underground coal gasification, the document is clear in its acknowledgement that the energy mix must be diversified by greater incorporation of renewable energy. As an illustration of this, total installed solar PV and wind generation capacity as at time of publication amounted to 1,474MW and 1,980MW respectively (just under 5pc of the nation's total generation capacity), which represents a fraction of the IRP's long-term plan to procure 8,288MW of solar PV and 17,742MW of wind generation capacity by 2030. Concentrated solar power is also contemplated, but at a smaller scale.

For several years prior to 2019, lack of activity in the South African renewable

energy sector had dampened investor sentiment and led to an erosion in local manufacturing. Recent developments, however, have shown the government's renewed commitment to the procurement and development of renewable energy.

For context, energy procurement in South Africa is implemented through the issuing of ministerial determinations in terms of Section 34 of the Electricity Regulation Act.

Following the publication of one such determination, The Department of Mineral Resources and Energy launched a request for qualification and proposals (RFP) for new generation capacity under the fifth bid submission phase of the Renewable Energy Independent Power Producer Procurement Programme (RE IPP procurement programme) on 12 April 2021. The RFP provides for the procurement of up to 2,600MW of generation capacity from onshore wind and solar PV developments, pursuant

to which successful bidders will, upon appointment, enter into long-term power-purchase agreements with utility Eskom.

The precursor Risk Mitigation Programme has also stimulated procurement of energy-transitional technologies. The requirement for facilities to be dispatchable has resulted in the advancement of hybrid projects involving wind and solar PV generators integrated with large battery energy storage systems that satisfy onerous capacity and availability factors.

Eskom also has commenced the procurement of BESS solutions at various substations where there are multiple connections of renewable energy generators, in order to smooth out the intermittency inherent in such facilities.

In addition to government's various procurement initiatives, there have been significant policy and legislative shifts in South Africa's electricity market design. One of the most significant legislative



developments this year has been the amendment to Schedule 2 of the Electricity Regulation Act, 2006.

The latest amendment, published on 5 October 2021, exempts any generation facility with a capacity of no more than 100MW from obtaining a generation licence. Such generation facilities would only need to register with national regulator, NERSA, a shorter and far less onerous process which would assist in fast-tracking independent electricity generation. Under this amendment, IPPs will be able to sell electricity directly to a single end-use customer for their own consumption, including where such electricity is distributed over a multiple user transmission or distribution grid. This development has been welcomed by the private sector, and in particular by stakeholders in those industries most affected by the uncertainty caused by Eskom's load-shedding woes.

This relaxation of regulatory restrictions can be viewed in connection with President Cyril Ramaphosa's 2020 announcement—and the subsequent amendment to the Electricity Regulations on New Generation Capacity—to the effect that municipalities in good financial standing would be able to purchase electricity directly from IPPs. Generators which intend to sell to Eskom, distributors (such as municipalities) or traders for on-sale,

exporters and importers will continue to require a generation licence. Furthermore, Eskom's unbundling into separate entities in respect of generation, distribution and transmission represents a step in the right direction for creating a more competitive electricity market and enabling renewable IPP participation. The legislative framework for the unbundling of Eskom is currently underway, as the Electricity Regulation Amendment Bill (ERA Bill) was published in the Government Gazette on 10 February 2022 for public comment. The ERA Bill provides for the establishment of the Transmission System Operator to provide a competitive multi-market structure for the electricity industry.

Network rules

While the legislative changes may facilitate more renewable IPP participation, network rules will have to be developed in respect of IPP generation forecasting and offtake loads to take imbalances into account. The ERA Bill provides for a multi-market, whereby a trading platform day ahead market and a single buyer co-exist. It states that a balancing mechanism will be implemented to account for the differences between the day ahead positions.

Moreover, the sector requires harmonised municipal tariff frameworks for municipalities, which are already in significant debt, to recover their costs in order to enter into PPAs with IPPs. On

the same day as the publication of the ERA Bill, Review of the Electricity Pricing Policy of South Africa 2008 was published for public comment which the DMRE has stated seeks to find a balance between affordable electricity tariffs as well as cost reflectivity depending on the consumer of electricity.

Given the importance of maintaining the just transition, South Africa will need to exploit 'transitional' energy sources which have a lower environmental impact than traditional fossil fuels. Once such source is natural gas, which the IRP identifies as providing "the flexibility required to complement renewable energy", and in respect of which development of the onshore and offshore extraction industries has been identified as a priority.

While these procurement and legislative developments represent a positive show of intention by government in its quest to meet South Africa's NDC, the pace of development must not be allowed to relax. On the contrary, both the public and private sectors must be prepared to increase investment into the stabilisation and growth of all aspects of the energy sector necessary to implement South Africa's just transition. Continuous engagement by stakeholders will be crucial in ensuring progress towards an energy sector which is environmentally sustainable while managing the social impacts of this shift.

As to social impacts, it is to be noted that the energy transition is to be 'just'. This takes account of the massive impact on employment and associated industries and business as the country transitions away from coal as a primary energy source. Government must be deft in balancing the imperative to transition to a carbon-neutral environment against the necessity to preserve livelihoods directly affected by reduced coal production and use. ■





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RED ROCKET

Leading Africa into a clean energy future

RED ROCKET

Since 1999, the African Energy Forum has led engagements between stakeholders around creating energy on the planet.

So much has evolved in those twenty-three years. Alternative energy sources such as hydrogen, solar and wind began gaining traction, growing from fringe considerations to cost-effective and mainstream opportunities. Hydropower technology innovation delivered more compact and focused breakthroughs. Modular energy choices started to appear alongside industrial-scale generation, prompting new choices and paradigms for energy generations. As the world grapples with growing energy needs, energy technologies, business models, and project delivery can step up to deliver lasting change and investment.

Modern society's appetite for power is tremendous. At the start of the 20th century, global energy consumption sat at 12 128 terawatt-hours - primarily split between coal and biomass sources (Our

World In Data). By the 1950s, that figure had more than doubled to 28 516 terawatt-hours, and the planet increased its reliance on coal, as well as oil, gas and hydropower.

Thirty years later, generation capacity reached 87,599 terawatt-hours, and in 2019 it stood at 173 340 terawatt-hours. This latter figure is even more astounding when considering the efficiency gains of the past two decades. For example, major economies have reduced their oil imports between 2000 and 2018 by 165mtoe (million tonnes of oil equivalent) - the combined annual primary oil demand of Germany, Australia and Belgium (IEA).

Yet African countries have not benefited as significantly from this growth, a sobering argument laid out in the IEA's Africa Energy Outlook 2019. The continent represents only 4 percent of global energy supply



Roggeveld Wind Farm

investment and in 2018 generated around 850 terawatt-hours. This picture is set to change as African populations increase rapidly, outpacing even China's growth during the late 20th century.

This is the opportunity Red Rocket pursues. The globe is witnessing growing African expansion and the rise of a sleeping energy giant. It represents a window to create more energy generation capacity through renewable sources and a just transition away from fossil fuels. The future of energy is in Africa, which is why Red Rocket is focused on becoming a significant contributor to the continent's future and is a proud sponsor for the African Energy Forum.

Meet Red Rocket

Red Rocket has an established and growing presence in Africa. It emerged from Building Energy, founded in Italy in 2010, and a decade later in 2020, Building Energy co-founder Matteo Brambilla led a management buyout that created Red Rocket, an African-focused independent energy producer group.

"The management buyout was completed in September 2020," explains Brambilla. "We are now a Pan African integrated IPP. We do development, we make all the arrangements in sponsoring roles and setting up deals, we do asset management, O&M and construction."

Headquartered in Cape Town, Red Rocket inherited Building Energy's African sites, such as the Kathu Solar in South Africa and Tororo Solar North site in Uganda. It has since expanded to 985 megawatts of capacity and was recently awarded preferred bidder for three wind projects (364 MW) under South Africa's Round 5 of the Renewable Energy IPP Procurement Programme and two Private PPA wind project awards for international Blue Chip mining houses.



Kruisvallei Hydro

Red Rocket does not niche itself to one corner of energy generation or business development. It has established solar, wind and hydro sites, working alongside investors to fund, manage and operate them. Sustainability is at the heart of Red Rocket's vision - not only sustainable energy but also forging local community relationships that ensure the sites deliver on indigenous needs while still creating continual returns on investment. Where possible and feasible, Red Rocket maintains control over ownership and operations, rather than only representing one link in the energy delivery chain.

"We prefer an integrated approach to projects," explains Matteo Brambilla. "By controlling the stakes and operations in our projects, Red Rocket remains profitable and de-risks projects. Development of energy infrastructure projects is a long-term game where delays are inevitable. You need resilience, especially in African markets where greenfield opportunities compete and align with established capacity. Our control in projects is spread across multiple areas, allowing us to create value from construction, operation and maintenance, and asset management. Red Rocket uses a blended IRR, ensuring very low tariffs with utility type of equity returns that please our shareholders while still delivering reliable and affordable energy to local consumers."

Red Rocket has staff situated across Africa, supporting a broad network of

development, implementation, and funding partners.

"Collaboration is fundamental to Red Rocket's approach and management. We've earned the experience of what it takes to compete in and develop African energy markets," says Sharief Harris, Red Rocket's Head of Development.

Established Sites

Red Rocket's portfolio covers 985MW of project capacity in operation, under construction or at financial close. It operates clean energy sites across a range of technologies, including solar, wind and hydro generation, and four sites represent its current flagship assets:

Kathu Solar

Kathu Solar, also known as the REISA (Renewable Energy Investments South Africa) solar farm, is based in South Africa's Northern Cape province. Located near the towns of Deben and Kathu, this 75MW began commercial operations in late 2014 and provides 179 000 MWh of clean, renewable energy every year to roughly 73 000 middle-income homes. The nearby communities of Kathu, Olifantshoek, Dibeng, Siyathemba, Babatas and Mapoteng derive power and socio-economic benefits from the site, utilising enterprise development programmes.

Capturing sunlight through 306 553 polycrystalline mono facial photovoltaic



Kathu Solar

modules with a single-axis hydraulic tracking system, Kathu Solar had by the end of 2020 generated 1 130GWh of solar energy.

Roggeveld Wind Farm

Straddling the boundaries between the Northern and Western Cape provinces in South Africa, Roggeveld Wind Farm has an installed capacity of 147MW and a current contracted capacity of 140MW. The wind farm is majority owned by Red Rocket. Located near Laingsburg, Matjiesfontein and Sutherland, the wind farm satisfies the energy needs of nearly 50 000 households and avoids 502 900 tons of CO₂ emissions. Roggeveld Wind Farm was developed under the South African Renewable Energy Independent Power Producer Procurement Programme (REIPPPP). It sells its output to Eskom, the country's primary power producer.

Roggeveld Wind Farm utilises 47 wind turbines generating approximately 613 GWh per year.

Tororo Solar

Tororo Solar (formally called the Tororo Solar North Photovoltaic Power Plant) is a 10MW photovoltaic plant located in eastern Uganda, in the Tororo district near the border with Kenya and 240 km east of Uganda's

capital Kampala. Tororo Solar was built with funding from Financierings-Maatschappij voor Ontwikkelingslanden (FMO) to cover the US\$14.7 million construction costs, which syndicated 50 percent of the debt to the Emerging Africa Infrastructure Fund (EAIF) through a Participation Agreement. With a capacity of 10MWp, Tororo Solar generates approximately 16 GWh of clean energy per year. Red Rocket is the majority owner, and the site has a 20-year power purchase agreement.

This key solar plant utilises 32 240 photovoltaic panels over 14 hectares, helping satisfy the energy needs of 36 000 people and saving more than 7 200 tonnes of CO₂ per annum.

Kruisvallei Hydro

Located along the Ash River between Clarens and Bethlehem in South Africa's Free State Province, Kruisvallei Hydro is a small-hydro site with a 4MW capacity. It generates approximately 24GWh of energy annually, catering to the energy needs of more than 1 916 households in the nearby Clarens and Kgubetswana rural communities. Red Rocket Energy revitalised the project after failed attempts by previous operators, completing construction and starting operations in 2021. The site's operators

work closely with local communities to ensure fair pricing and development, and employment opportunities.

Kruisvallei Hydro will operate for 20+ years, after which a refurbishment project will extend its lifespan. The site covers around 15 hectares, diverting some of the Ash river's flow without destabilising the local environment.

Red Rocket's future

Red Rocket is blazing into the future, supporting and leading energy development opportunities across Africa. As the continent's population grows and its economies industrialise and digitise, Africa will become a linchpin in 21st-century development and progress. From manufacturing to agriculture, urbanisation to massive data centre growth, energy demand continues to grow as Africa expands.

To help meet current and future demand, Red Rocket has a pipeline of 10GW in projects. It's additionally committed to finding and delivering energy sites in the rest of Africa and will continue to grow its track record of working with funders - ensuring returns on investment while supporting the requirements and capacity of local communities. If energy is Africa's 21-century success story, Red Rocket is helping write that narrative.

"We want to establish ourselves as one of the largest independent power producers on the continent," says Matteo Brambilla. "Our objective is to reach two gigawatts of projects by 2025 and help Africa take its place in a clean energy future. As we expand our focus, we can take our funding, design, construction, operational and development expertise to every corner of Africa. What started in 2011 as an ambition to be a part of the African energy landscape is transforming Red Rocket into one of Africa's leading independent power producers." ■



THE SKY'S NOT THE LIMIT

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AFRICA CAN ADOPT RENEWABLE ENERGY

on a massive scale and save billions along the way



Oped by Kenneth Engblom Vice President, Wärtsilä Energy, Europe and Africa



Africa's energy future at a crossroad

When it comes to building the future of energy in Africa, the decisions facing the continent's leaders today are nothing less than of historical importance. More than anything else, energy systems are the very fabric of business and society. Countries across Africa want to make good on their objective of building huge amounts of new generation capacity to anticipate on vast increases in energy demand and set the continent on the path of growth and development it deserves.

Africa knows where it needs to go. The big question is how. And more specifically: what is the most cost-effective energy mix that can be built to deliver all the new electricity capacity that is needed? Wind, solar, gas turbines, coal, gas engines... numerous options are available, but there is only one sweet spot.

For the past decade and more, world-class engineers and analysts at Wärtsilä have tapped into their deep bench of experience in the African energy sector to answer these very questions, country by country. We have mobilized state-of-the-science, technology-neutral energy modelling techniques, and took all local technical constraints, all technologies, and natural resources into account. Multiple energy mix scenarios have been developed and compared. We ran the models rigorously and the numbers have spoken. They reveal cost differences of mind-boggling magnitude between the various energy strategies possible.

Billions of dollars are at stake

When it comes to the choice of energy technologies, keeping an open mind, free from preconceptions, is paramount. Technologies that can be right for Europe considering its existing infrastructure, population density, or natural resources,



can be wrong for others. Each country, each region, must find its own optimal way to building its energy system. Many African countries have however one important point in common: maybe more than anywhere else, the models indicate that the best path to building the most cost-optimal energy system is to maximize the use of renewable energy.

One fact must be established once and for all. The cost of renewable energy equipment has decreased very rapidly in recent years, and when this equipment runs on Africa's massive solar and wind resources, what you have is a cost per KW/h produced that beats all other electricity technologies hands down. If you add to this the fact that most electricity

grids on the continent are relatively underdeveloped, favouring renewable energy over traditional power generation like coal or gas turbine power plants becomes a no-brainer.

Although relatively ambitious renewable energy targets have been set by governments across the continent, it does not always go far enough. Contrary to what some industry and political leaders may believe, maximizing the amount of renewable energy that can be built in the system is by far the cheapest strategy available, while at the same time ensuring a stable, reliable network.

In Africa, renewables must become the new baseload. And yes, renewables are



intermittent. But combining them to flexible power generation capacities will guarantee the stability of the grid and save billions of dollars along the way.

The intermittency of renewables: an issue we can cope with

It would be misguided to consider the intermittency of renewables as a showstopper. It is not, provided they are paired up with highly flexible forms of electricity generation like gas engine power plants.

To maintain a balanced system, flexible back-up and peak power must be available to ramp up production at the same rate that wind or solar production fluctuates, but also to match the fluctuating energy demand within the day. The systems must be able to respond to huge daily variations in a matter of seconds or minutes.

Gas engine power plants are the only source of backup generation that is designed to do just that. They will keep the system safe, while allowing the grid to accommodate huge amounts of cheap

renewable energy. For Senegal alone, to take only one example, the studies reveal a \$480 Million difference in total system cost over the next 15 years between a system incorporating lots of renewables combined to flexible gas engines, and a system built around inflexible thermal generation and minimal renewable capacity.

Renewables and flexible gas: the two pillars of a winning energy strategy

Renewables and flexible gas are the two pillars of a winning energy strategy for Africa. Similar studies conducted on other African countries indicate that this energy mix strategy will provide efficiencies worth billions of dollars continent-wide over the next few decades.

Highly ambitious renewable energy objectives in Africa are not only achievable, but they are also the soundest and cheapest strategy for the successful electrification of the continent. Making the smart strategy decisions will lead to more resilient electricity systems and offer vastly superior whole-system efficiencies. ■



Moving forward together in changing energy markets



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AllIM invests in Starsight's distributed generation solutions

A II M

Interview with Damilola Agbaje – AllIM Investment Director



African Infrastructure Investment Managers (AllIM) develops and manages private equity infrastructure funds designed to invest long-term institutional unlisted equity in African infrastructure projects.

AllIM actively manages investments in East, West and Southern Africa and has equity under management of USD 2.0 billion with a track record extending across seven African infrastructure funds.

What is Starsight?

Starsight is West Africa's leading commercial and industrial solar power supplier, both in terms of sites and the amount of electricity it produces. Founded in 2015, the company has delivered energy solutions at over 630 sites and installed more than 63 megawatts of generating capacity across Nigeria, Ghana, and Kenya, and is further expanding into the east African market. Customers include banks, gas stations, schools, and other commercial, industrial and agribusiness customers.

The company delivers an end-to-end service from the initial assessment of a client's energy needs, to the installation and maintenance of a clean energy solution, with ongoing technical support. The company's proprietary smart technology optimises energy consumption enabling customers to significantly reduce their energy costs and boost their profitability, while at the same time delivering a substantial reduction in carbon emissions.

Why did AIIM decide to invest in Starsight?

AIIM is a long-term investor in Africa's energy sector with experience in executing several large-scale Independent Power Producer (IPP) projects in Nigeria and Ghana. Aware of the delays in the IPP development process and the chronically undersupplied grids in the region forcing businesses to generate their own electricity, often from diesel generators, AIIM spotted a scalable opportunity directly contributing to improved economic output. In Nigeria, for example, the available operational generation capacity stands at five gigawatts, but demand is estimated to be 20 gigawatts.

The AIIM team wanted to invest in distributed generation solutions which make electricity on site, rather than transmitting it over an electric grid from a centralised facility. While undertaking detailed market research, the team came across Starsight, a small company which had run a limited pilot at 10 sites in Nigeria, installing 300 kilowatts. In February 2018, AIIM invested an undisclosed amount for a 37.8 per cent stake in the company via AIIF3 and has since supported it with follow-on commitments.

What is Starsight's social impact on the countries in which it operates?

In Nigeria, 95 million people lack access to electricity and those who are connected to the grid suffer from regular power outages. An estimated 41 per cent of Nigerian businesses are forced to rely on diesel generators, which are expensive, inefficient and damaging to the environment. As an alternative, the cost of solar PV components has declined sharply over the past few years, so the technology is now more affordable and solar tariffs are lower than ever before.



In Ghana, where the national grid provides a more consistent power supply, switching to solar is not so much about supplementing an unreliable supply, but more about driving down energy costs. Starsight's solution addresses this by lowering energy consumption, while clients do not pay any upfront costs and are instead charged an all-inclusive monthly fee for an end-to-end service.

What makes Starsight stand out from its competitors?

Unlike its competitors, who often charge customers a per-kilowatt hour fee for simply installing solar panels, Starsight charges no upfront fees. Instead, its unique energy efficiency approach uses smart technology and data to measure its clients' energy needs and supply power efficiently. It works with customers to reduce their energy consumption, testing to find the most efficient alternating currents, adding shades to windows, changing light bulbs for energy efficient versions and putting timers in. All these small, incremental changes translate into real cost savings. Starsight estimates that its clients reduce their electricity consumption by an average of 20 to 40 per cent. In total, this has saved its customers US\$2.7m and 9,474 megawatts as of October 2021.

How has AIIM added value during the holding period?

Since AIIM invested in Starsight the company has been able to scale significantly. Its team has grown from a few employees in 2017 to 150 as of October 2021, of which 97.5 per cent are Nigerian as well as 84 per cent of its management. The business has grown from less than one megawatt installed across 30 locations in Nigeria to more than 63 megawatts in more than 630 sites in Nigeria, Ghana, and Kenya.

The company has also acquired the most extensive databank in Sub-Saharan Africa for client consumption patterns. It has constituted a data analytics team responsible for translating learnings into actionable improvements in the company's value proposition. With a clear understanding of client needs, Starsight has been able to streamline its client engagement process and reduce its sales conversion timeline.

Finally, AIIM designed a framework for evaluating new markets and helped Starsight screen potential targets. Starsight initially added Ghana to its coverage in 2019 and in May 2021 it announced the acquisition of a 50 per cent stake in the East Africa operations of commercial and



industrial-focused Premier Solar Group, which is active in Kenya and will be building a pipeline in Uganda, Tanzania and Rwanda over the next 12 to 18 months.

What other benefits has AIIM's involvement brought Starsight?

AIIM has invested much more than just money into Starsight. It helped the company hire an ESG Officer and implement the International Finance Corporation's sustainability reporting standards to measure and report on the company's environmental impact.

Using Starsight's clean energy solutions, businesses are able to reduce electricity consumption by 20-45 per cent as well as decrease carbon emissions and fossil fuel use by 30-50 per cent.

To date, Starsight estimates that it has reduced carbon emissions at its sites by 41,394 tons. One example is Nigeria's Nile University located in Abuja, where Starsight designed and installed a 876-kilowatt solar system on the rooftop in February 2022. Starsight estimates it will ultimately help the company offset 14,888 tons of carbon dioxide over the project's lifetime.

What's Starsight's end game?

Ultimately, Starsight wants to become the largest distributed generation provider in Africa. National grids across the continent are notoriously unreliable and electricity is more expensive than it needs to be. AIIM is working with Starsight to expand and diversify. One idea in the pipeline is to build plants to supply commercial and industrial clients and use the excess generation capacity from those to supply residential customers nearby.

How can C&I solar improve the future energy fortunes of Africa?

The commercial and industrial (C&I) solar sub-sector, which sits in the flexible space between large utility-scale solar and smaller, domestic solar, accounts for three quarters of power demand in Africa. It is essential to improving the current and future energy fortunes of the continent. Since 2010, there has been a near fifteen-fold increase in solar generation capacity across the world. But Africa only produces one per cent of global solar power generation when it has the potential to contribute 40 per cent of that supply. We have only just scratched the surface of the C&I solar opportunity here.

Looking to South Africa, what impact will the lifting of the self-generation limit have on the expansion of C&I solar across the country?

In June 2021, we saw the South African government lift the restrictions on the amount of electricity private companies are allowed to generate without a licence from one megawatt to 100 megawatts. They are also allowed to use the grid to transmit their electricity. This has paved the way for IPPs to meet the growing electricity demands of South Africans.

The shortfall in South Africa's current energy supply to the grid is an issue the government has sought private sector intervention to resolve. Private companies can help bridge that gap and supply clean and cost-effective energy through renewables like solar. We anticipate growth of at least 500 megawatts per year for distributed solar capacity in South Africa and we expect additional capacity from wind and other renewable sources.

Here at AIIM, we plan to use our longstanding IPP development track record and our customer-facing experience through Starsight to help build the next generation of C&I solar platforms across the country and wider continent.

What role does the private sector need to play in unlocking the C&I solar opportunity across the continent?

As of 2014, 21 countries in sub-Saharan Africa had state-owned utilities with no private sector participation. This aversion to private sector involvement is waning but has led to sclerotic state systems and driven up the cost of energy production.

Investors are, however, gaining a better understanding of the continent's investment topography, more accurately assessing risk and awakening to the development potential public-private partnerships (PPPs) can create. This is reflected in the effective tripling in the value of PPPs in the decades between 2000 to 2009 and 2010 to 2019.

We must temper the optimism of progress with the tonic of the challenge ahead. Funding the US\$55 billion investment gap in African energy infrastructure requires an effective, robust regulatory framework across the board, attracting private capital and closing the gap in access to energy. South Africa is banging the drum for the continent to march to its beat. ■

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Innovation,
future fuels and
greener solutions
are the keys to
decarbonising our
planet.



POWERING AFRICA SUMMIT: COUNTRY SPOTLIGHTS



Summaries of country-focused sessions that took place at the Powering Africa Summit (PAS), last March in Washington DC.



Zimbabwe

The electricity demand in Zimbabwe is high as the country continues on a growing path. Currently, 40% of the population has access to electricity, but they all reside in major towns.

The country's daily electricity demand fluctuates between 1000-1700 MW against the current capacity of 1400 MW, leaving the country in a deficit. Zimbabwe uses pay through agreements with South Africa and Mozambique to furnish its electricity deficiency, retrieving its 400 MW demand.

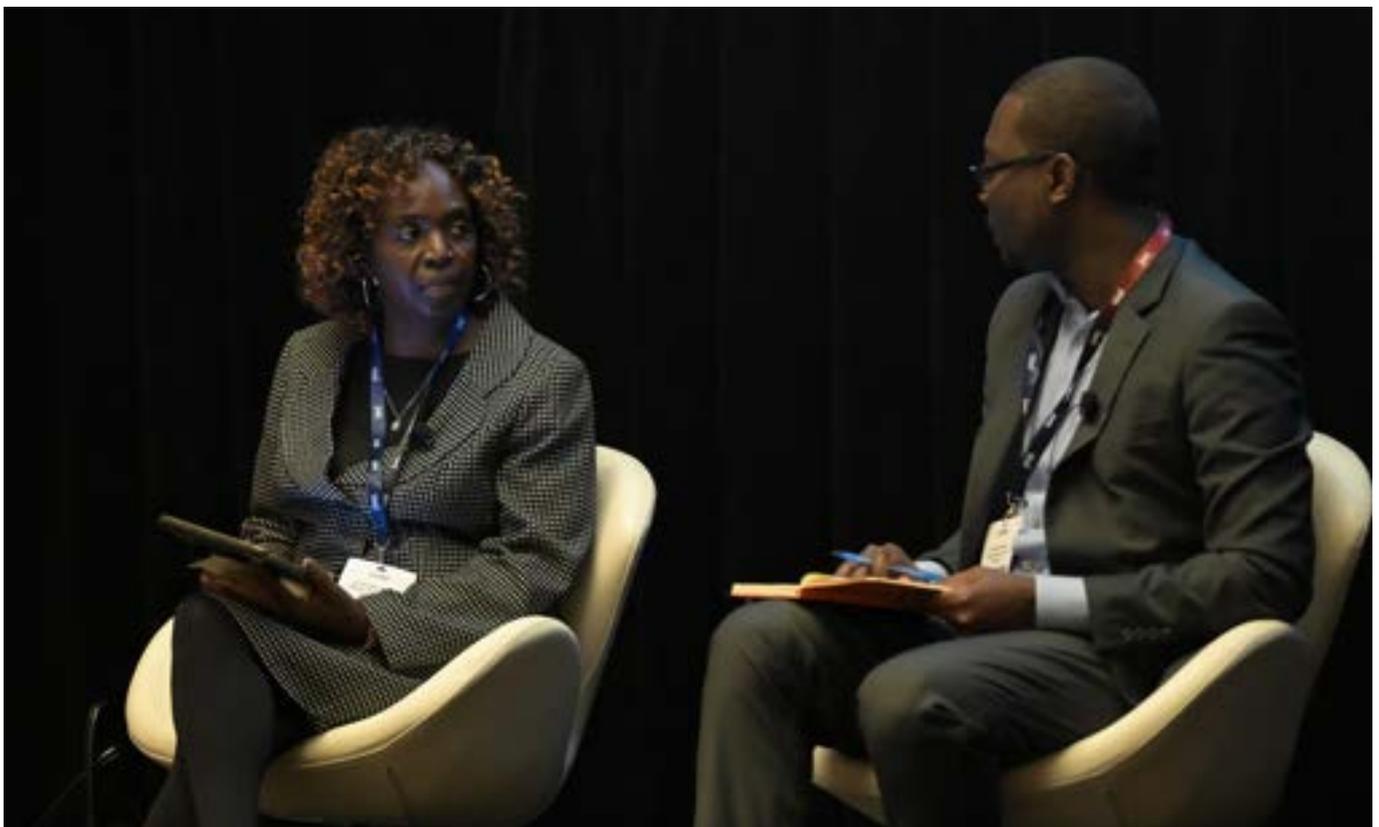
Zimbabwe's current strategy to satisfy its electricity deficit is four parts. The first is to update their water supply infrastructure as they mainly rely on hydrogen power. The second is to maintain a cost-effective tariff to stimulate the economy and protect the assets lost via pay through agreements. The third is to integrate a

national energy resource plan that would encompass grid extension, solar power plant development, and adopt mini-grid utilization. And the fourth is to review the democratization of power to ensure a fair and swift transition of renewable energy for all 100% of their population.

While their strategy is sufficient, Zimbabwe encounters the effect that climate change has on its major energy source. Water levels have declined significantly in recent years. Thus, the nation seeks investors to aid the transition to solar energy.

Zimbabwe has engaged the African Development Bank to draft agreements and documents required to launch the competitive bidding process for investors and developers.

Though Zimbabwe prioritizes impact areas [schools, hospitals, and clinics], their goal is to provide electricity to 90% of their population.





Nigeria

Nigeria's population is 214 million with only 55% of them with grid electricity access. Their rural population accounts for 48% of the nation's population.

Nigeria signed the Climate Change Act of 2021 and equally adopted the energy transition plan of achieving decarbonization. In addition, Nigeria's climate change agenda entails a reduction of greenhouse gas emissions pursuant to the recommendations of COP26.

Nigeria conceives to utilize its natural resources by operating on gas and hydrogen power. Nigeria has the largest gas reserve in Africa and the 9th largest in the world; comprising 2.7% of the global gas reserve. While the country sits ready to procure resources, they face systemic issues regarding distribution companies. Nigeria wants to deter from abandoned capacities, so they are looking for meaningful and intentional financiers and developers.

Currently, Nigeria is prepared to trade in the wholesale market and is looking for legacy purchase agreements. While the market is not creditworthy, when the market matures, generation investors can comfortably invest.



Egypt

In the summer of 2014, there was a massive electrical power outage in Egypt. The electricity deficit in Egypt led the country to set a new strategy for electricity—resolving the lack of electricity supply and the problem of transmission.

Egypt considers energy a matter of national security and has added much more power generation facilities, and many are under construction. Simultaneously, Egypt has upgraded and strengthened

Green hydrogen is fuel for the future, and Egypt is preparing a national hydrogen strategy

the national grid to keep pace with increasing generation capacities, including upgrading transmission lines, establishing high voltage networks, and adding more substations. Egypt is now working on upgrading the distribution system by incorporating smart grid systems for efficient energy management. Integrating cybersecurity solutions to the smart grid should be followed.

Egypt is also focusing on the potential of wind and solar power. Egypt plans to integrate sustainable energy, form an energy mix, and exclude COAL from the energy source. Investments from the private sector will play a major role in achieving the target. Regarding solar energy, Benban Solar Park is the biggest power station in the middle east and African region. There are also wind energy projects and hydro projects that would increase renewable energy generation.

Green hydrogen is fuel for the future, and Egypt is preparing a national hydrogen strategy. Egypt is cooperating with international companies, and there is a pilot project with Siemens with a capacity of 100 MW. There are other future projects, including water desalination from renewable energy and pump storage power plants.

Egypt is ready to participate in global interconnection and plans to be an energy hub in the region, including Libya, Sudan, Jordan, and Saudi Arabia. Also, Egypt is cooperating with Cyprus and Greece, and energy exchange among the three countries will strengthen Egypt's position as an energy hub.



Morocco

Currently, Morocco has a diversified portfolio in the energy mix—38% of the portfolio is renewable energy, and hydropower accounts for more than 60% of the renewable energy. In addition, Morocco has an energy value chain consisting of production, transmission, and distribution.

In Morocco, Autorité Nationale de Régulation de l'Electricité (ANRE) is a national electricity regulatory authority, an independent legal body with budgetary authority created and governed by public law. ANRE keeps its eyes on new technologies and is plays a crucial role in green hydrogen energy development in Morocco.

Morocco is actively seeking international bilateral cooperation and preparing to be a hub for energy in Africa. There are huge opportunities in Morocco in energy production/generation and may export energy to other countries. Morocco has a plan to have green hydrogen account for 60-70% of its renewable energy portfolio, and a carbon tax that will be enforced in 2023 in Europe will bring an opportunity for Morocco to export energy to countries in Europe, especially Spain.

Gas is abundant in Africa, and Morocco is also exploring many possibilities in current gas energy. Morocco has many gas projects and plans to develop/utilize pipelines connecting Morocco-Spain and Morocco-Nigeria. ■



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A SPECIAL TRANSITION

From National Oil Companies (NOC) to National Energy Companies (NEC)

The panel discussed the energy transition path taken by NOCs so far, and the differences between NOCs and international oil companies.

NOCS play a very important role in the energy transition, especially considering NOCs are responsible for about half of the world's oil production, and 18 of the top NOCs produce over half the upstream greenhouse gas emissions in the energy sector. Having NOCs transition successfully is paramount to the concept of energy transition and is globally important if countries meaningfully addressing climate change.

The panel discussed a study that benchmarked top NOCs and identified emerging trends. First, NOCs are not identical monoliths; the nature of the company depends on its context, the fiscal situation of its country, and the role the company plays in the national economy. Next, country-level mandates relating to climate goals do not always correlate to the company's own goals, some NOCs may outpace country in climate commitments. Third, a greater resource and asset quality generally corresponds with less aggressive climate

goals, though not always. Finally, NOCs necessarily play a key role in the energy security, employment, and wealth of a country. The demands of these roles may overshadow climate goals.

The panel also discussed whether the construct of a National Energy Company is realistic considering the continued need for oil and gas. The fiduciary duties of NOCs makes them naturally risk adverse, conservative, and vulnerable to an energy transition. NOCs have large, monetized resources, are vital to economies, and need to balance climate change aspirations with the monetization of resources. Panelists stressed that NOCs should not abandon their oil and gas legacy, because no one can preclude the use of oil and gas for the foreseeable future.

Countries that do not already have an NOC may have the opportunity to create an NEC by building in energy diversity from the start. For example, Guyana may



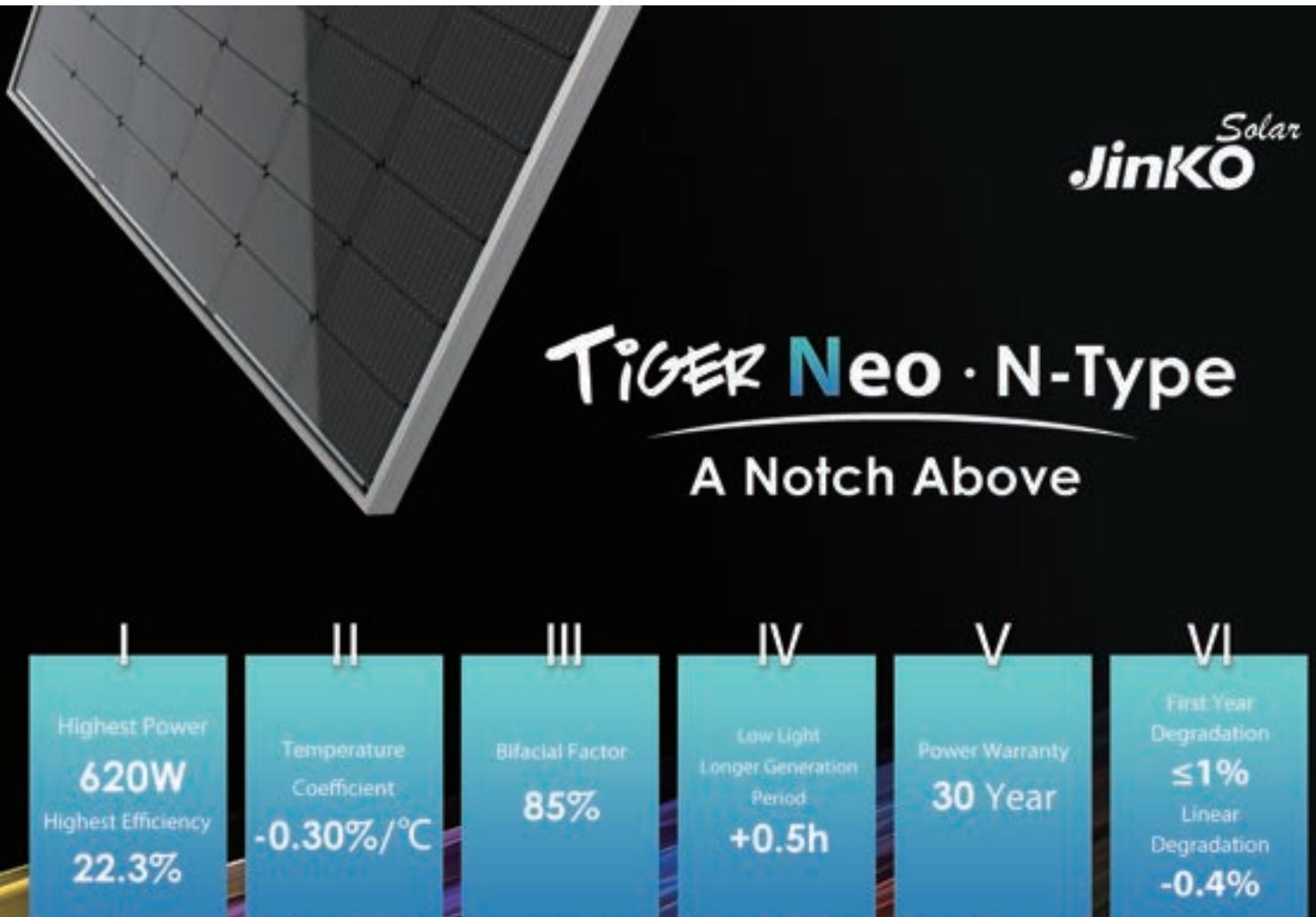
a test case of the possibilities for a new national energy company.

The panel stressed that strong governance is an enabler of energy transition. Colombia's Ecopetrol offered a relevant example, because it has made aggressive carbon neutral goals, invested in personnel to handle energy transition, committed to grow oil and gas production alongside a diversification policy to increase low emission generation. The panel acknowledged the need for independence from the government to avoid choices and changes based on political pressure or administration changes. Shareholders are concerned with independence and corporate governance. The stability of the country is crucial to the development of NOCs. When a country is stable, the NOC has more flexibility, freedom, and future planning ability.



Finally, the panel acknowledged that education on the demand side is necessary to an energy transition and to incentivize the switch to renewable energy sources. For example, because currently there is no understanding of green hydrogen

on the consumer level, it is a supply-driven initiative. Providing a narrative and education for consumers will be crucial for the success of the hydrogen sector, or else there may be investment in new technology without corresponding demand. ■



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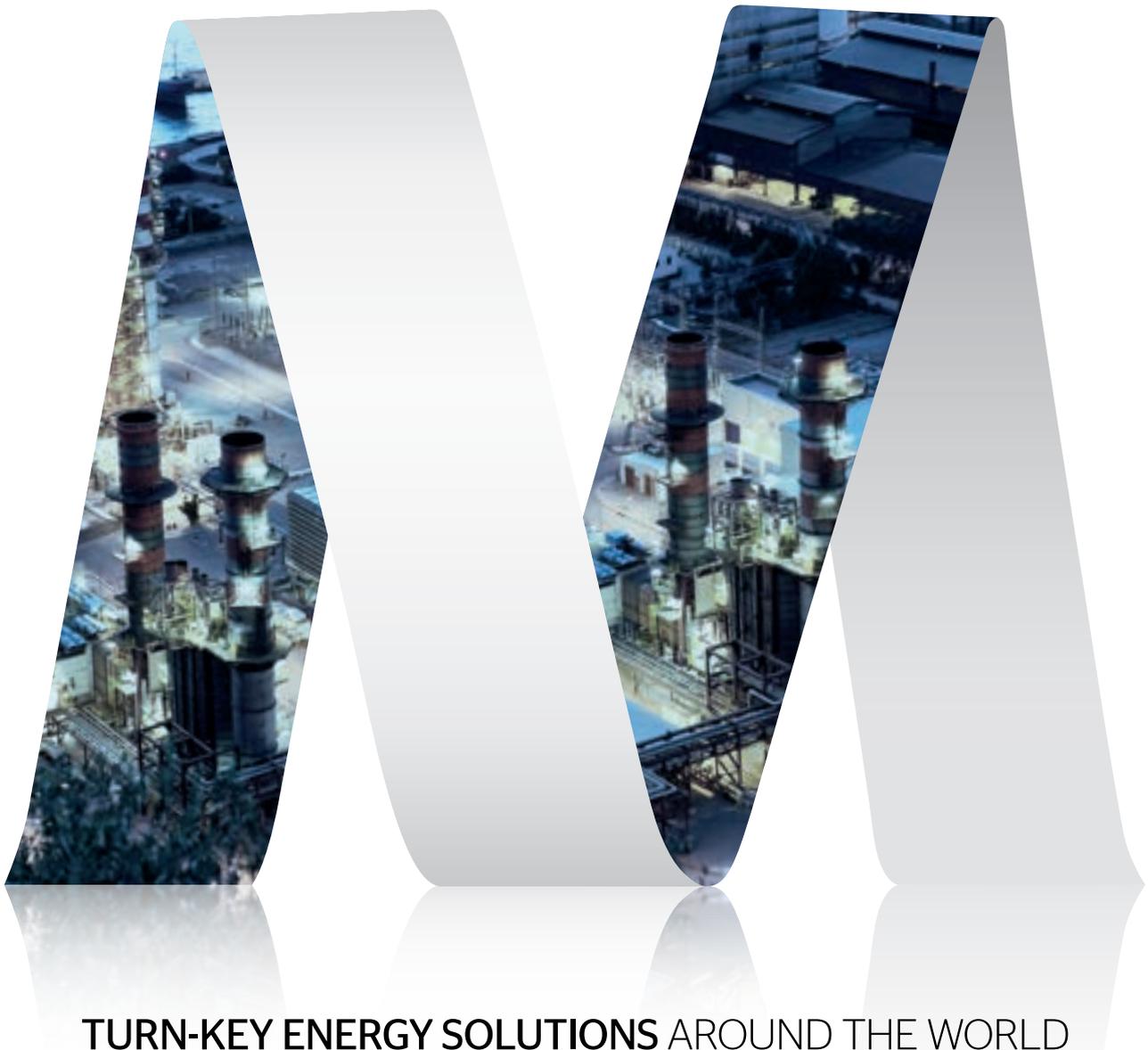
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