



KEYNOTE ADDRESS

Power To Power Summit 2022

**THEME: "EXPLOITING BUSINESS OPPORTUNITIES
IN THE POWER INDUSTRY".**

**Hotel Presidential, Port-Harcourt
11 August 2022**

**Engr. (Dr) Emeka Okwuosa, FNSE
Chairman & GCEO, Oilserv Group**

www.oilservltd-ng.com; info@oilservltd-ng.com;
www.frazimex.com; info@frazimex.com



Outline

Preamble

1. **Introduction: Africa's Energy Supply and Demand**
2. **Africa's Energy Mix – Today and By 2040**
3. **African Energy – From the Present to the Future**
4. **Africa's Power Situation: Key Notes**
5. **Powering Africa: What Next?**
6. **Powering Africa: The Opportunities – Oil and Gas**
7. **New Investment Approaches and Opportunities**
8. **Risk Assessment and Financing Considerations**
9. **Conclusion and Recommendations**

About the Oilserv Group



Engr. (Dr) Emeka Okwuosa, FNSE
Chairman & GCEO, Oilserv Group

Good afternoon distinguished ladies and gentlemen. I will stand on all existing protocols to save time, and welcome you to the 2022 Power to Power Summit (P2P Summit). The P2P Summit is an African sustainable energy platform which promotes efficient power systems and sustainable energy advocacy for Africa's development.

Securing efficient power systems and sustainable energy for Africa are ideals that I have dedicated the last 4 decades of my life to and for which the Oilserv Group continue to work to actualize in no distant time. It is therefore my great honor and pleasure to have the opportunity today to share my thoughts on this very important subject.

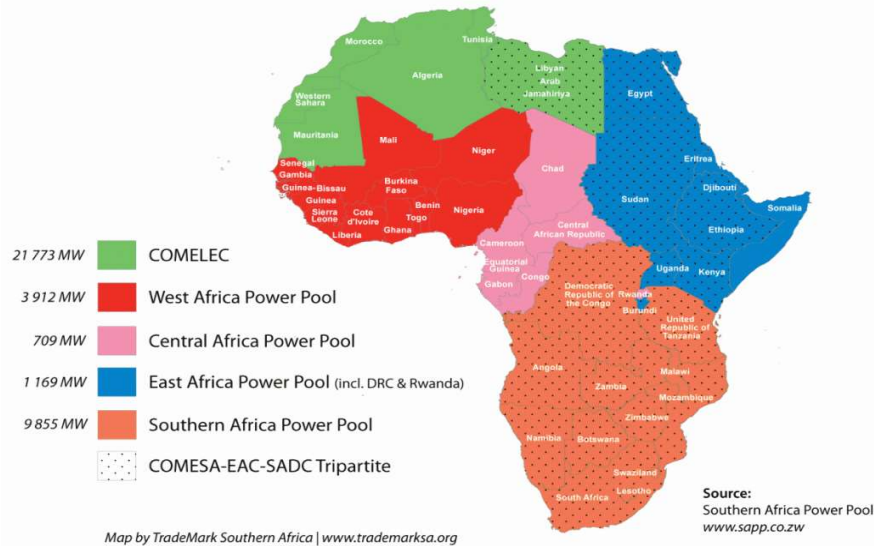
When we talk about P2P, my thoughts center around two distinct but inseparable enabling relationships. On the one hand, power or energy is required to drive our productive activities and by extension our economy. Thus, power in this context is regarded as a resource which should propel Africa's economies from poverty, inefficiency, unemployment and under-development to wealth. This is the *macro-power context*.

On the other hand, industry players require power to operate and grow their portfolios. To achieve this, industry players will require the right combination of investments, financing, technology, human resources and enabling legislation. This is essentially the *micro-power context*.

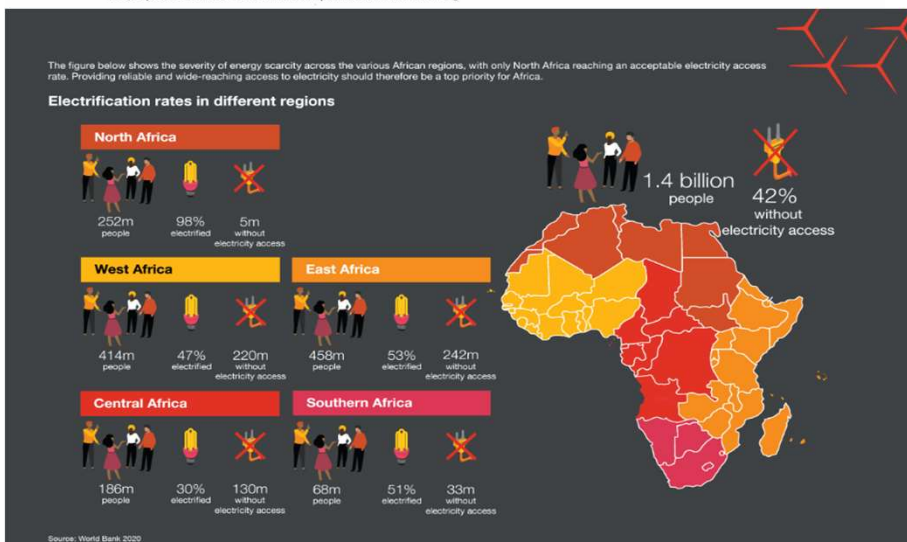
The interaction of both the micro-power and macro-power contexts is without doubt predicated on the availability of the opportunities and the ability to exploit such opportunities in a sustainable manner for the good of all stakeholders. But we have some challenges to resolve first.



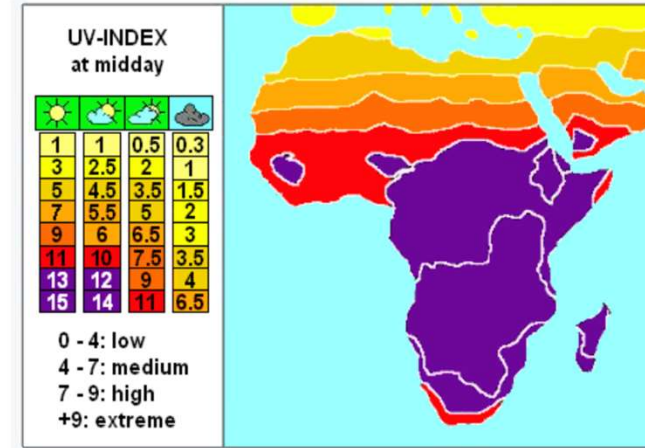
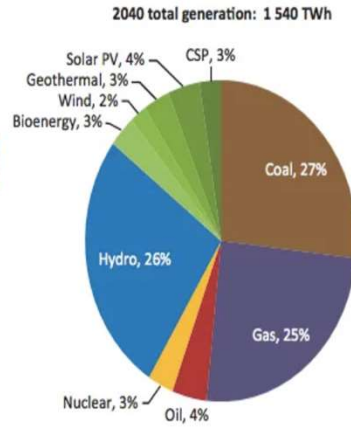
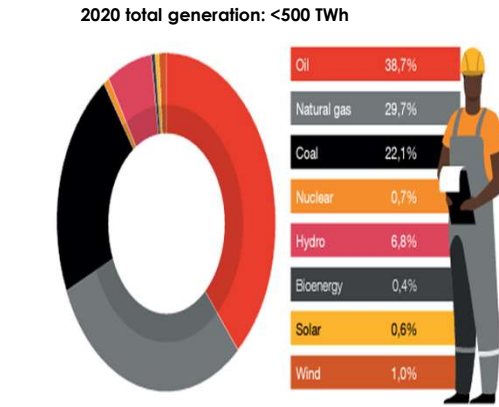
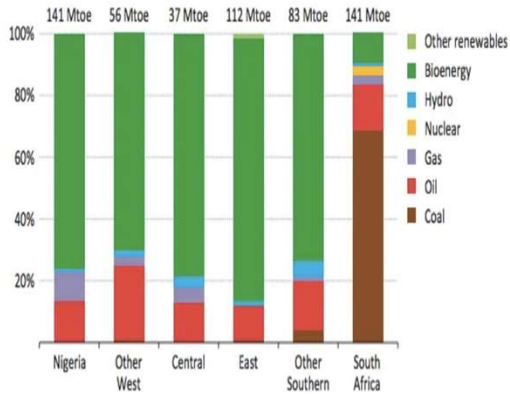
1 - Introduction: Africa's Energy Supply and Demand



- Over 625m people in Africa were without Electricity by end of 2020. Over 93m of them live in Nigeria.
- Today, Africa generates about **60,000 MW** of electricity, but **42%** of the population does not have access to it.
- Most of Sub-Saharan Africa has between **56%-70%** of its peoples without electricity power. In some countries , it is greater than **75%**.
- The average consumption in sub-Saharan Africa is about **317 KWh** per year, less than the electricity a modern fridge consumes in the US in a year.



2 - The Energy Mix – Today and By 2040

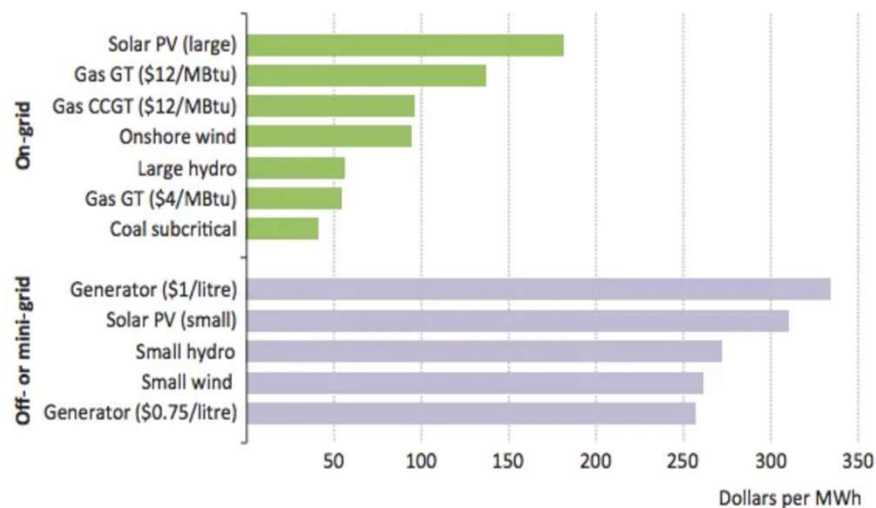


(International Energy Agency)

Source: BP Energy Outlook 2020

- ❑ The most popular energy source, by far, is bioenergy — mainly the burning of wood and charcoal for cooking which produces a lot of indoor air pollution, and is currently killing millions yearly and leads to rapid deforestation.
- ❑ It is believed that the most promising areas of growth in the future are in natural gas and large-scale hydropower.
- ❑ **Energy experts have argued that a great way to provide power to rural Africa is through "off-grid" solutions (solar panels, direct gas-generated energy, and other green energy forms).**
- ❑ **A greater part of Africa has very good UV Index which can be tapped for solar energy generation.**
- ❑ The World Bank estimates that Africa needs some **\$93bn** in infrastructure spending annually, nearly **50%** of which - or about **\$40.8bn** - must be dedicated to increasing power generation capacity required to boost its economic development.

2.1 – Africa’s Energy Mix – Indicative Cost of Power



Notes: Costs are indicative and figures for specific projects could vary significantly, depending on their detailed design. GT = gas turbine; CCGT = combined-cycle gas turbine; MBtu = million British thermal units.

(International Energy Agency)

- ❑ Of the green energy sources, Gas is the cheapest at just above **\$52** generation per MWh versus **\$335** for generator-powered electricity. It therefore offers very attractive propositions and opportunities.
- ❑ It costs (all-in) African homes and businesses between **7x-23x** of the cost grid-powered to generate electricity with generators. Just developing Africa’s power infrastructures (natural gas, generation, transmission, distribution) will reduce this cost significantly.
- ❑ The market is there and is even willing to pay more, more than the current average gas-powered grid electricity cost (given that they already pay **7x-23x**) to have more stable energy to power their businesses and homes.



3 - African Energy – From the Present to the Future

Africa's Natural Endowment

- Africa is richly endowed with natural resources with almost **half** of its **55** countries known to have proven natural gas reserves.
- Across Africa, natural gas reserves amount to a total of more than **800 trillion cubic feet**, with BP predicting that the production of natural gas in the continent will expand by 80% by 2035.
- This will contribute immensely to increasing the respective country Gross Domestic Product (GDP) and national wealth if earnings are managed to benefit its citizens.

The Challenges

- Africa scarcely can generate the electricity to power its huge population.
- The energy development initiatives across Africa are urgently required and should encourage investors to explore the huge opportunities across the continent.
- However, these initiatives are coinciding with the campaign to abandon fossil fuels and transit to renewables and cleaner sources of energy,
- These are worthy goals, but they do not consider Africa's particular situation and poverty.

The Opportunity

- Africa needs a lot more energy to lift itself out of poverty. And, right now, fossil fuels are still the cheapest way to do that in grid-connected areas; with coal plants and gas turbines costing just one-third of what solar panels do;
- Oil & gas producing countries have focused their efforts to significantly develop their gas industry in the next decade to fully harness the huge potentials.
- This drive has been taken more seriously since the outbreak of the **Russo-Ukrainian War** in late February 2022.
- Following the sanctions on Russia and high global energy prices, Africa is poised to not only benefit from stepping in to provide the needed gas supplies Europe, but also giving herself more Power.

4 - Africa's Power Situation: Key Notes



- Based on situation on ground, Africa is already behind the 2050 global energy transition commitments as a result of poverty, insecurity, and old infrastructures.



- For Africans, energy transition is beyond addressing just climate change as doing so without consideration for Africa's peculiar situation would be unfair and detrimental to Africa's wellbeing.
- The question for African policy-makers and industry players is therefore slightly different. The roadmap is not just to address climate change, but also to solve the problem of extreme poverty as well as provide access to energy for homes and industries .

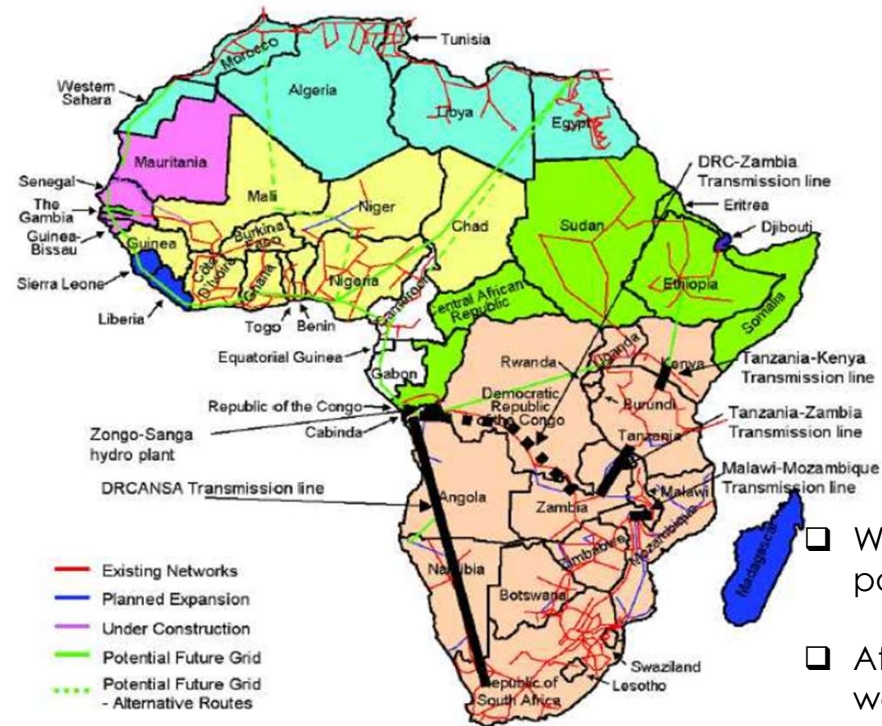


- Energy generated in Africa is grossly insufficient due to the historical lack of investments in energy infrastructures, aged infrastructures and poor governance and regulatory frameworks.
- Power shortages and interruptions amount to **5%** in income losses for African enterprises, and lead to up to **1-2 percent** decline in GDP overall for individual nations.



- **1 in 3** households in Nigeria do not have access to electricity.
- Electricity is expensive at an average of **\$0.52/kwh** due to the high cost of generators and diesel/fuel.
- An estimated **30 million** homes and businesses generate an average of between **40GW** daily using generators.
- Despite having 12.5GW installed generating capacity (approximately **80%** of which is gas-fired and **20%** hydro-powered), only **4GW-5GW** is generated daily.
- **Off-grid solutions generate 10x what the on-grid infrastructure generate. We need to reverse this scenario by boosting investments on grid power generation, transmission and distribution.**
- Nigeria's situation mirrors other African countries.

5 - Powering Africa: What Next?



* Figures based on total 2015 forecast consumption for study countries only
 + Source: "Africa-Europe Electrical Interconnection and Prospects of Worldwide Interconnections", CIGRE Keynote Address, August 1994

Africa's Gas Potential

The proven gas reserves in Africa (shown below) is huge and significantly still untapped.

- Nigeria: 10th largest Natural Gas reserves in the World, i.e. ~ 206 Tscf as at 2021, and 1st in Africa and produces ~8 bscf/day.
- Algeria: 11th largest Natural Gas reserves in the world, 2nd in Africa, with ~159 Tscf
- Senegal: ~120 Tscf
- Mozambique: ~100 Tscf
- Egypt: ~77 Tscf and
- Tanzania: ~57 Tscf

- ❑ With Africa's huge but significantly still untapped energy sources, its existing power networks can be potentially expanded significantly.
- ❑ Africa has the people and market to consume any amount of energy that would be generated as it needs it to power its economies.
- ❑ Huge opportunity for the hydrocarbon-endowed countries (especially North Africa, Nigeria and Southern Africa) to develop and extend their power grids to other African countries.
- ❑ Added advantage for African countries and investors to balance their revenues by exporting some of the energy produced.

6 - Powering Africa - Recommendations and Implications

Must be based on paying the right price and tied to Poverty elimination

- Generating the energy needed by Africa must be tied to empowering her peoples and addressing its poverty issue.
- Energy generated must be supplied at the right price sufficient to sustain investment and economic development.
- Must be a unique strategy blend (off-grid, on-grid, gas, crude oil, pipelines, storage facilities, renewables and technology) that should allow Africa to continue to develop fossil fuels in a more responsible way given that the continent emits about **3.6%** of global greenhouse pollutants
- Africa needs **\$2.8 trillion** for its energy transition to net-zero by 2050, but such transition would result in the loss of more than **\$15.2 trillion** revenues from fossil fuels although an estimated **5 million jobs** would be created ultimately.

Implication

- Gas as a transition fuel not just for its industries, but also as a pathway to move households from cooking with firewood and all sorts of pollutants which today are even more expensive than clean gas.
- For African households to do clean cooking, and for businesses and industries to have cheaper and adequate energy, Africa will need to ramp up its development of LPG and CNG infrastructures as well continue to exploit its hydrocarbons much longer than 2050 howbeit in a more responsible and clean manner.
- Additionally, Africa needs to develop its renewable energy rapidly to boost its ability to meet with its adjusted net-zero emissions timelines.

6.1 - Powering Africa: The Opportunities – Oil and Gas

Given the unique transition pathway, new investment approaches should be taken by African governments to meet its own power needs having the 2063 Net-Zero-Emissions goal in mind:

- ❑ Domestic Gas Market Expansion. Example is the Eastern Nigeria Pipelines which Oilserv is driving.
- ❑ Development of Liquefied Natural Gas Projects.
- ❑ Conversion of Gas to Liquids & Natural Gas Liquids
- ❑ Development of technology and storage facilities (both existing and new).
- ❑ Revival of moribund energy storage facilities to boost off-grid solutions
- ❑ Building of gas export pipelines and terminals such as **Nigeria's Tran-Saharan Gas Pipeline (TSGP)** and the **East African Crude Oil Pipeline – EACOP**).

Key Projects:

- TSGP is a **\$13bn 4,128KM** pipeline with an annual capacity of **30 billion** cubic meter that would terminate in Hassi R'Mel, Algeria. TSGP will connect into the **\$2.6bn 614KM AKK** project in Nigeria. Oilserv is heavily involved in AKK and will be in TSGP.
- EACOP is a **\$3.5bn 1,443Km** oil pipeline which will have a **216Kbd** flow rate and connect all future oilfields in Uganda to Tanga in Tanzania and will be supported by a **\$10bn** drilling project with first export targeted for 2025.
- Mozambique also has a **\$20bn** development project which is on track to deliver LNG in **2024**. Mozambique's LNG development is planned to recover approximately **65 trillion cubic feet** of natural gas and could deliver 43 million tonnes per annum (MTPA).
- Mozambique has also embarked on a **\$2.5bn** LNG floating Coral South facility, the first of its kind to be deployed in deep waters on the African continent, and the third in the world.

7.1 - New Investment Approaches and Opportunities – Oil and Gas

A large number of oil and gas projects in Africa are expected to start operations from 2021 to 2025. Upstream and midstream sectors are expected to witness the highest number of project starts, mostly linked to projects recently stalled or cancelled due to COVID-19. This trend is more evident in the gas sector.


Projects that were suspended in 2020, but have resumed in 2021 include:

- TotalEnergies' Zinia Phase II in Angola came on stream in May 2021. It is expected to reach production of 40,000 bbl/d by mid-2022.
- Aker Energy aims to approve a revised plan for developing the Pecan oilfield off Ghana by the end of 2021.
- The partners of the Lake Albert development project in Uganda concluded the final agreements required to launch the Tilenga project in April 2021.

Senegal and Mauritania
The Greater Tortue Ahmeyim gas megaproject (BP project) is expected to produce its first gas in 2023.




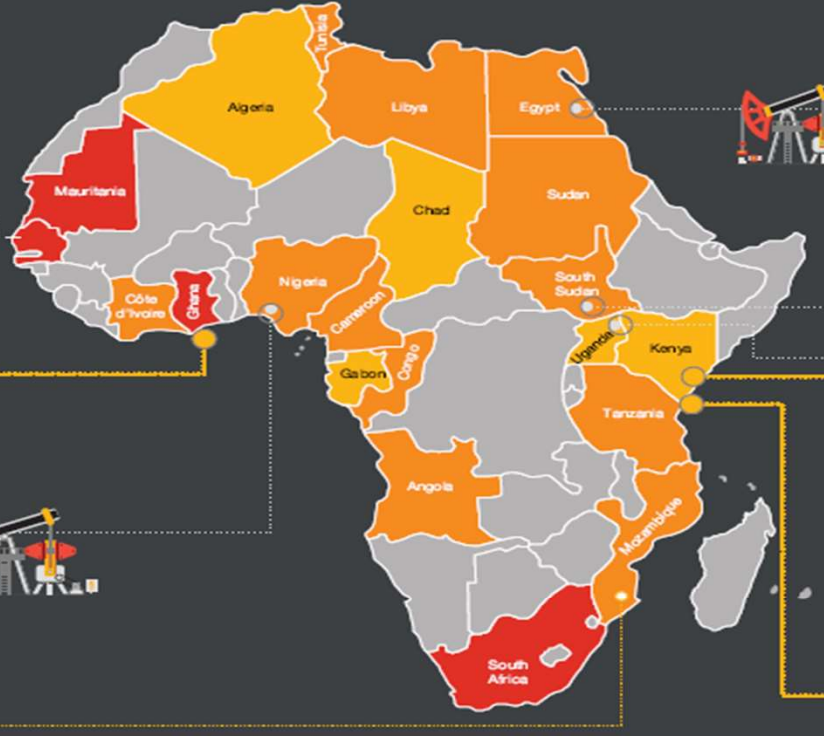
Ghana
Ghana is set to open sub-Saharan Africa's first liquefied natural gas-to-power project.



Nigeria
Nigeria is expected to have 100 oil and gas projects commencing operations across the value chain between 2021 and 2025.



Mozambique
Total Energies declared force majeure on the 13.2 mtpa Mozambique LNG project in April 2021.

Egypt
Egyptian companies are planning more than \$1bn in investments in the oil and natural gas sector in the Western Desert region.




South Sudan
The Ministry of Petroleum of the Republic of South Sudan announced the launch of the country's first oil licensing round.




Uganda
TotalEnergies signed key deals for Uganda's Lake Albert project and also confirmed that the first crude exports are planned for 2025.



Kenya
MGT received a \$23m loan from the World Bank's private lending arm to build an LPG terminal in the Port of Mombasa.



Kenya and Tanzania
Kenya and Tanzania have signed a \$1bn gas pipeline deal.



■ Offshore fields
■ Onshore fields
■ Offshore and onshore fields

 Oil project
 Gas project

Source: PwC (2021) Africa Energy Review 2021.

About the Oilserv Group

We are an indigenous Nigerian Integrated Oil and Gas EPCIC Company operating for the past 25 years, playing a leading role in the midstream Oil & gas value chain, with distinctive capabilities in the design and execution of Pipelines up to 48-Inch and associated stations/facilities, using world-class technology and Innovations.

We have contributed immensely and currently involved in the actualization of the Nigerian Gas Master plan via our Engineering, EPCIC, HDD services of the midstream transmission/distribution pipelines, processing & treatment facilities & storage facilities.

We support the Government, IOCs, NOCs & our customers achieve their plans and development objectives.

Oilserv Limited – Capability

Projects executed in Nigeria are:

- 105 projects** of various complexity.
- 515km** cumulative installed pipeline of various sizes on various terrain (swamp, onshore, etc.).
- 25** facilities construction (Above Ground Installation)
- 75** Pipeline Leak repairs
- 18** HDD executed
- 84** Horizontal Thrust boring

Other members of the Oilserv Group who play a significant role in the Gas Development in Nigeria are:

- Frazimex Engineering Limited
- FrazPower.

Contributions of Oilserv to Nigeria's Oil and Gas Development

Major Notable contributions Oilserv has made and is making to most strategic Gas Development in Nigeria include:

i: Gas Pipeline Transmission Networks across Nigeria:

Middle Belt through Abuja to North – Ajaokuta – Abuja- Kaduna-Kano (Segment 1)

40" x 303.4km + 24" x 15km spur Inc. 2nos Gas Terminal/Metering Stations, 1no IPS and 12nos BVS (**Ongoing – planned completion in year 2023**) – **Longest pipeline in Nigeria.**

South-South Pipeline – Ukanafun-Calabar-Mfamosing (to Unicem – Cement Company)
18" x 130km Pipeline (Completed).

South-South Pipeline OBiafu-OBrikom- OBen (OB3)– (Feeds into AKK)

48" x 64km (lot B) Incl. GTP capacity 2bcf/day and IPS (Engineering & Construction completed, commissioned).

ii: Gas Distribution Network – Support Industrialization

West Lagos Distribution Network - (Ikeja-Ilupeju-Iganmu-Ijora-Apapa-Victoria Island-Tin Can Island Port –Amuwo Odofin-Illasamaja), Greater Lagos Phase 1, II, III, & IV

iii: Gas supply Systems to Nigeria Independent Power Plants (NIPPs)

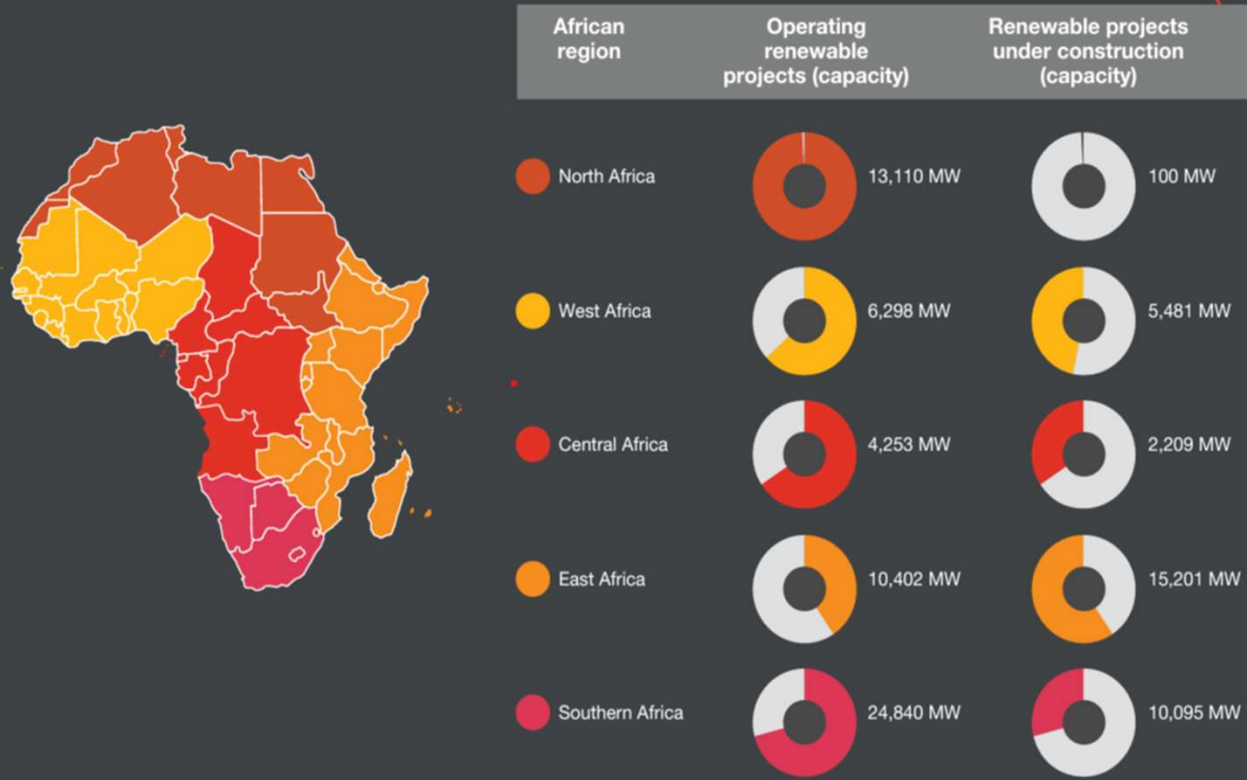
Ihovbor Power Plant – Edo State
Gbaran Power Plant – Bayelsa State
Alaoji Power Plant – Abia State
Calabar Power Plant – Cross River State
Egbema Power Plant – Imo State
Akute Power Plant – Lagos State

The Oilserv Group's future development plan in addition to our involvement in EPCIC, is in the space of **EPC+F** and **Build-Own-Operate and Transfer (BOOT)** models in midstream Oil & Gas value chain as well as a heavy play in renewable energy development (Methanol, Ammonia and Hydrogen).

7.2 - New Investment Approaches and Opportunities – Renewables

The following map displays renewable energy projects split by African region for current operating projects and projects under construction.

Renewable projects in Africa, 2021 (MW)



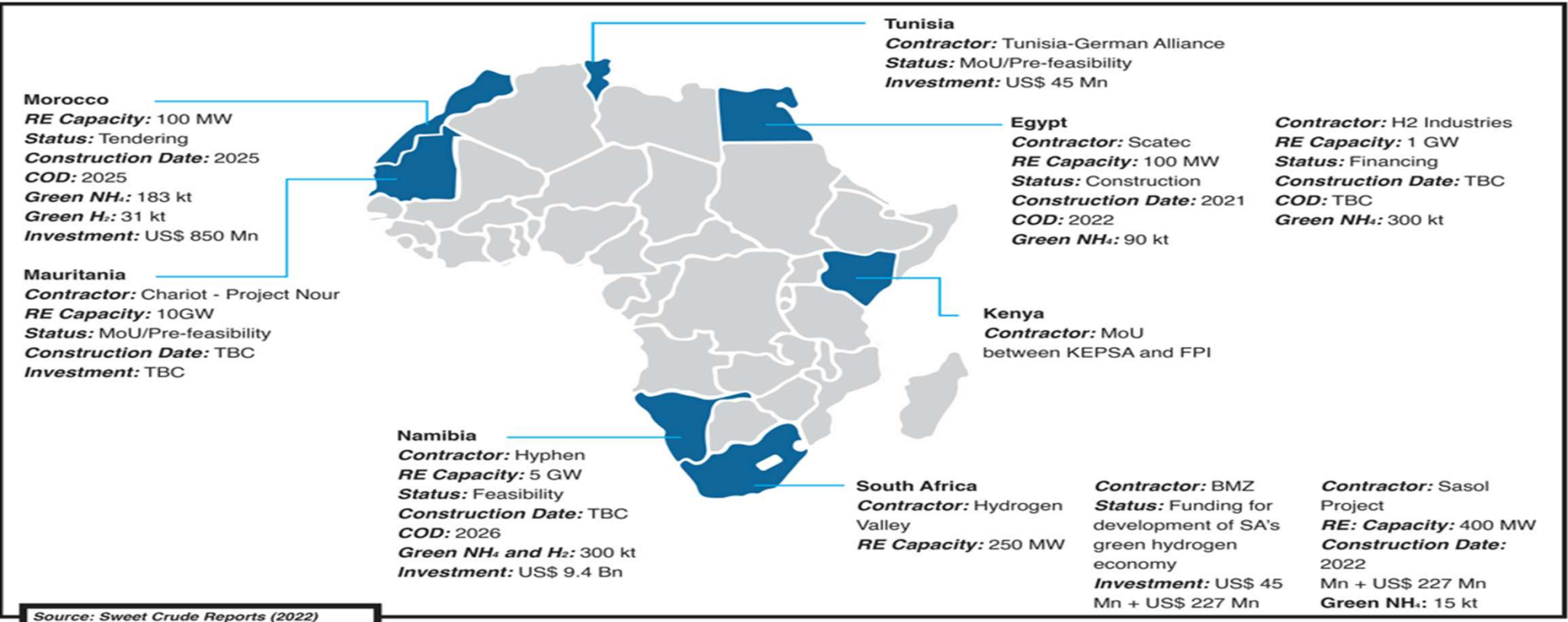
Source: PwC (2021) Africa Energy Review 2021.

- ❑ In 2020, **9%** of all energy generated in Africa was from renewables.
- ❑ In 2021, African countries captured **11%** of the globally announced **163GW** of green hydrogen projects.
- ❑ In Nigeria, there are a number of exploratory discussions with EU partners to further develop hydrogen production in Nigeria after successful prototype tests.
- ❑ All these indicate renewables projects are starting to gain traction in Africa.

Question:

Why is West Africa not developing its power through renewables like East and Southern Africa?

7.3 - New Investment Approaches and Opportunities – Renewables



- ❑ Eastern Africa and Southern Africa are Africa's current leaders in renewable energy capacity.
- ❑ North Africa and Southern Africa continue to lead the pack in new renewable energy projects.
- ❑ When all projects under-construction from 2021-2022 are completed, both East Africa and West Africa's capacity is set to double.

8 - Risk Assessment and Financing Considerations



- The opportunities to develop more environmentally-friendly energy is huge but challenged by the huge expenditure requirements for research and development, new technologies and equipment replacement and long gestation.
- The funds required to develop these alternative green energy sources are scarce and there is competition as to where and what they would be deployed.
- Africa's challenged business environment (insecurity, corruption, lack of access to energy) has meant that financiers and investors constantly have to embark on deeper risk assessments with significant guarantees and policy reforms demanded to be put in place before funds are provided.
- Development finance institutions (DFI) and research institutions (RI) are the principal financiers of green energy-driven projects in Africa because they have green energy investment mandates they must deliver.
- Other financiers like export credit agencies (ECAs) and green energy-promoting corporates will increasingly get involved with local partners providing certain minimum capital contribution.

SOURCE OF FUNDING	AVAILABILITY	COMMENT
Intl. E&P Companies	+	Limited number of companies - given Nigeria risk, but several "strategic" players
Private Equity	+	Limited - given country risk, minimum IRR Criteria
Hedge Funds	+	Limited but playing an increasing role in mid-stream gas
Equity Markets	+	Limited - given equity trading values & prevailing NPVs (i)
International Banks	++	Interest in well structured transactions, credible sponsors (ii)
Domestic Banks	++	Interest in supporting core domestic clients
Commodity Traders	++	Historically focused on oil only but moving into gas (e.g. LPG, LNG)
Service Companies	+	Provide \$ linked to provision of oilfield services
Infrastructure Funds	++	Limited interest in upstream oil, focus on gas midstream/downstream
Bilateral Funds	+++	Funding for structured transactions, increased focus on gas and infrastructure
ECAs	++	Significant players in major gas infrastructure projects






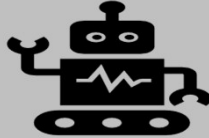
Notes:

(i) Major institutional investors restricting investments in oil & gas companies due to Climate Action 100+ and broader ESG policies

(ii) Increasingly linking credit/lending decisions based on adherence by sponsors to The Equator Principles and ESG policies

Source: Ashurst (2022)

9 - Conclusion and Recommendations

		
<p>Africa needs well-developed gas, renewable energy and electricity legislation and development Frameworks to boost investments and participation</p>	<p>All key stakeholders must encourage investment in natural gas (production, transmission and distribution) by providing both short-term and long-term funding</p>	<p>Adequate gas/power Infrastructures and Transmission pipelines/Corridors or grids for gas export and energy supply to the final users.</p>
		
<p>Collaboration to boost training and skills development and to continually grow internal capacity, including improvement in R&D</p>	<p>Accelerated development of renewables to commercially upscale renewable energy plants (Solar, Hydrogen, Ammonia and Methanol) build export terminals</p>	<p>New and improved technologies, better exploration, precision and efficiency in extraction, asset protection, asset integrity testing, monitoring and management</p>

I am looking forward to much deeper and very fruitful discussions on the above and other subjects bordering on the theme by the panelists and throughout this summit.

*Thank
you*

