



Nigeria: Net Zero by 2060 – A Progress Report





NIGERIA: NET ZERO BY 2060 - A PROGRESS REPORT

With the recent announcement by the Federal Government of Nigeria of the [commitment](#) in 2024 of N60 billion (about US\$ 37 million) towards achieving net zero emissions by 2060, we thought it would be a good time to review Nigeria's strategy for achieving net zero, assess progress so far, and discuss how the transition is impacting businesses and households. The roadmap for achieving net zero by 2060 is set out in Nigeria's [Energy Transition Plan](#) (ETP), which stipulates the specific actions the government will take to decarbonize the economy. The plan focuses on eliminating emissions from the largest sources of greenhouse gases, which taken together account for about 65% of Nigeria's CO₂ emissions. In thinking about how effective these strategies will be, the following four questions come to mind:

- 1) How does Nigeria plan to meet its commitments to achieving net zero by 2060?
- 2) Are the commitments laid out in the ETP compatible with the goal of 1.5 degrees Celsius and how well is Nigeria doing in achieving its Nationally Determined Contributions (NDCs)?
- 3) What has been undertaken so far to achieve these objectives, how well is Nigeria doing with respect of meeting its stated objectives, and what more needs to be done?
- 4) What does this mean for the country, specifically for individuals and businesses?

Let's break each of these down.

1) How will Nigeria achieve its ambition of net zero by 2060?

Nigeria has published an ambitious [Energy Transition Plan](#) which outlines the country's approach to reducing harmful greenhouse gases by focusing on the largest sources of CO₂ emissions. Here's a quick overview of the actions outlined in the ETP:

Power: (including on and off grid electricity generation)

Power generation – both on and off grid – resulted in [48 MtCO₂](#) in 2020. In order to achieve economic growth and development for the people of Nigeria, [90 million of whom lack access to power](#), there is a need for continued expansion of access to energy while at the same time dramatically reducing the GHG emissions resulting from power generation. From 2020 through 2050, growth in demand for electricity is expected to more than [quintuple](#), from 76 Twh to 532 Twh. Meeting this demand while also reducing GHG emissions will require an aggressive decarbonization strategy and a shift to renewable sources of energy, including hydrogen, solar PV, biomass, and hydro, with natural gas playing a strong role as a transitional source of energy. The actions to achieve these objectives include:

- Deployment of decentralized renewable energy
- Expansion of transmission and distribution network.

- Upgrade of central generation capacity to achieve 42GW of operation capacity by 2030
- Post 2030, deployment of centralized renewable energy - solar PV and corresponding storage with Hydrogen starting in 2040

Transportation

Transportation accounted for [43 MtCO₂](#) of emissions in 2020, of which approximately 72% resulted from passenger vehicles. To address these emissions, the ETP focuses on mode-shifting from passenger cars to public transportation, the deployment of biofuels, and the installation of charging infrastructure for electric vehicles so that by 2030 the shift to electric cars can accelerate. The ETP sets a goal of 60% of vehicles fully electric by 2050, a further 20% of hybrid vehicles, with the remaining 20% continues as legacy gas and diesel powered passenger vehicles. By 2060, the ETP aims for 100% of passenger vehicles to be fully electric.

Cooking

In 2020, GHG emissions from cooking caused emissions of [40MtCO₂](#), the third largest source of emissions after power and transportation. Emissions from cooking result from the burning of traditional fuels such as kerosene, firewood, and charcoal. Fully [87% of the population](#) in Nigeria (175 million people) lacks access to clean sources of fuel for cooking. The decarbonization strategy for cooking requires shifting urban and rural homes as well as commercial dwellings away from firewood, kerosene, and charcoal by 2030 and replacing these with LPG, biogas, electric stoves, and energy efficient woodstoves. By 2050, the goal is to have phased out LPG so that most cooking is done with electric stoves, with some mix of efficient woodstoves and biogas in rural homes and commercial dwellings. By 2060, the ETP stipulates that 100% of traditional firewood stoves have been replaced, and 100% of households are using electric or biogas stoves.

Industry

Industry is responsible for approximately 16% of in-scope emissions, which in 2020 amounted to [29MtCO₂](#). Cement production, ammonia production, and industrial heating accounted for [fully 93%](#) of industrial related emissions. [According to the ETP](#), the decarbonization strategy for industry consists of achieving reductions in harmful GHG emissions “through the substitution of clinker with calcined clay and application of Bioenergy with Carbon Capture and Storage (BECCS) in cement production, the replacement of grey hydrogen (Hydrogen produced from fossil fuels) with green and blue hydrogen in ammonia production, and the adoption of zero emissions fuels such as clean electricity and hydrogen for heating instead of natural gas and biomass.” Shifting to lower-carbon processes for ammonia and cement production and to zero-emission technologies for industrial heating will contribute significantly towards achieving Nigeria’s NDCs by 2060

Oil and Gas

The oil and gas sector in Nigeria produced [20MtCO₂](#) in emissions from the production of oil and gas in 2020. These emissions resulted from the following sources:



- Gas fugitives (7%, or 1.4MtCO₂);
- Oil fugitives (24%, or 4.8MtCO₂);
- Venting and flaring (39%, or 7.8MtCO₂);
- Upstream energy emissions (29%, or 5.8 MtCO₂)

The ETP expects that there will be reductions in production-related emissions resulting largely from global declines in demand for oil and gas as the world shifts towards renewable sources of energy and away from petrocarbons.

It's important to note that the ETP factors in reductions in external demand for oil and gas into its progress towards net zero by recognizing reductions in production-related emissions. However, there is also an expectation that there will be a significant increase in domestic refining capacity to replace lost demand in exported raw crude. Refining capacity is projected to increase from zero in 2020 to 273 million barrels of oil in 2030, and 422 million barrels of oil by 2050.

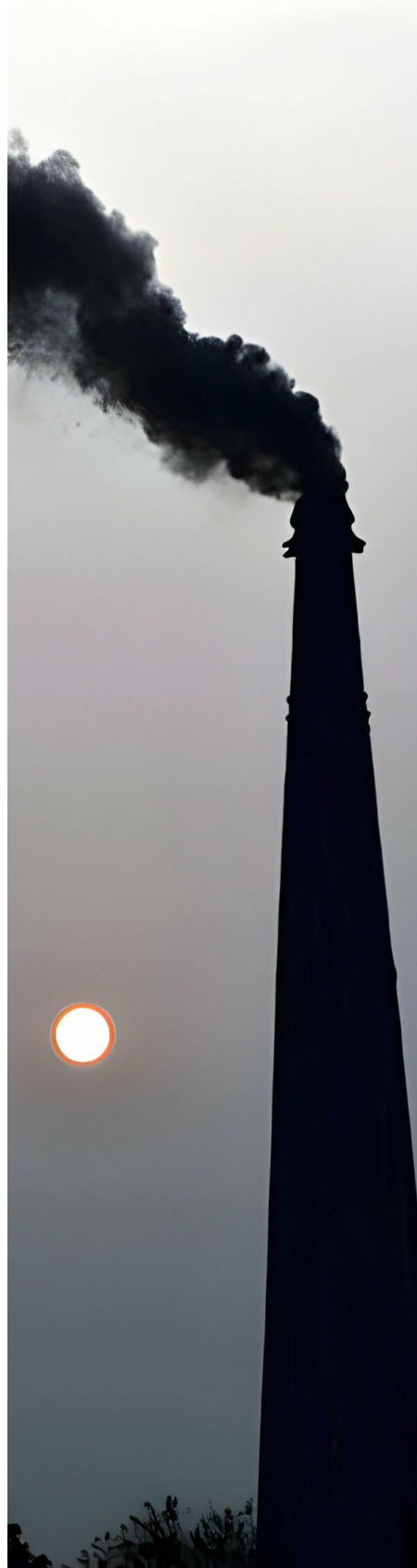
The production, processing, and transport of one barrel of oil results in approximately [100 kg of CO₂ emissions](#). This means that by 2030, Nigeria will be emitting 27.3 million metric tons of CO₂ as a result of oil and gas production, and 42.2 million metric tons of CO₂ by 2050, based on the projections in the ETP. The expectation is that these emissions will be offset by carbon capture and storage. Given that carbon capture and storage capacity [currently lags](#) carbon emissions by 1.2 gigatons per year based on requirements of achieving net zero, there will need to be significant increases in carbon capture and storage capacity to offset these increases in emissions.

And most importantly – this doesn't account for the CO₂ emissions resulting from when the oil is combusted. When one barrel of oil is combusted, it results in [approximately 400 kg](#) of CO₂ emissions. This means that the increased refining capacity that Nigeria plans to introduce will result in an additional 176.8 million metric tons of CO₂ emissions by 2050, in addition to the increased emissions resulting from production.

2) Are the commitments laid out in the ETP compatible with the goal of 1.5 degrees Celsius and how well is Nigeria doing in achieving its Nationally Determined Contributions?

In reviewing Nigeria's progress to date, it's worth considering the country's baseline carbon emissions, what targets have been set for reducing carbon emissions, and how well aligned these goals are with the global objective of limiting emissions to 1.5 degrees Celsius above pre-industrial levels. In 2010, the baseline year set for establishing Nigeria's NDCs and evaluating the achievement of reductions in overall GHG emissions, Nigeria's [total emissions](#) amounted to 271,563 kilotons of CO₂ equivalents. In 2021, Nigeria made a firm [commitment](#) to reductions of 20% by 2030 from this baseline, and set a more ambitious target of reducing greenhouse gases by 47% with assistance provided by the international community.

In 2020, the most recent year for which data is available from the World Bank, Nigeria's [total greenhouse gas emissions](#) amounted to approximately 322,337 kilotons of CO₂ equivalents. While this number did reflect a drop in overall emissions from a 2019 high of 332,247 kilotons, this is consistent with declines





seen globally as a result of the Covid-19 pandemic. Achieving reductions of 20% from the 2010 baseline indicates total GHG emissions of approximately 217,000 kiloton equivalents by 2030, or a reduction of approximately 54,000 kilotons of CO₂ equivalents. Achieving that target now will require reductions from the 2019 peak of approximately 115,000 kilotons of CO₂ emissions, a decline from 2019 emissions of about 35%. Put simply, the hole is only getting deeper. Course correction now to achieve 2030 targets will be extremely difficult.

The website climateactiontracker.org assesses a country's Nationally Determined Contributions (NDCs) and determines whether collectively they will be sufficient to meet the UN's goal of limiting global temperature rises to 2 degrees Celsius above pre-industrial levels at most, or preferably to 1.5 degrees Celsius, in order to avoid the most calamitous impacts from climate change. Climate Action Tracker looks at "Policies and Action", as well as "Planned Policies" alone. Policies and Action reflects the degree to which a country is actively implementing its stated policies towards achieving its NDC. Based on this assessment, it assigns one of the following ratings to both Planned Policies and Policy and Action:

- 1.5 degree compatible, which indicates consistency with maintaining global temperature rises to 1.5 degrees Celsius
- Almost sufficient, which indicates consistency with maintaining global temperature rises to 2 degrees Celsius
- Insufficient, which means a greater than 2 degree Celsius temperature rise
- And two additional ratings of Highly Insufficient and Critically Insufficient

Based on [modelled domestic pathways](#), Nigeria's Planned Policies are deemed to be Almost Sufficient, which means that Planned Policies (what the government has stated it will do, as laid out in the ETP and other national directives to reduce GHG emissions) is deemed to be consistent with limiting global temperature rises to 2 degrees Celsius above pre industrial levels. Policies and Actions however (an indication of the degree to which stated policies are actually being implemented) are deemed to be Insufficient for limiting global temperature rises to 2 degrees Celsius or less. Based on [Fair Share](#), which is a separate measure looking at what a country's contributions should be to achieving the Paris Climate Accord goals, Nigeria's Policies and Actions, as well as its Unconditional NDC target (the 20% reduction from 2010 levels by 2030) are both deemed to be 1.5 degree compatible.

3) What progress has been made towards achieving the activities set out in the ETP?

Nigeria's planned policies for decarbonizing its economy and achieving its National Determined Contributions is set out in its Energy Transition Plan. Prior to COP27 in 2022, the government of Nigeria published an [investors prospectus](#) which identified some specific actions to be accomplished in the near term towards achieving the objectives as set out in the ETP. These included:

- 1) Securing at least \$10 billion in financing commitment to implement the transition plan. This would be a "down payment" towards the estimated \$1.9 trillion required to achieve net zero by 2060, which represents \$410 billion above and beyond regularly projected spending.

- 2) Original equipment manufacturers to commence local manufacturing and assembly of key technologies
- 3) Implement technical assistance for skill development and knowledge transfer for the deployment of electric vehicles
- 4) Play a leadership role by promoting a just, inclusive and equitable energy transition
- 5) Support a conducive business and investment environment

Progress towards achieving these objectives has been mixed. Let's break each of these down to assess what achievements have been made and where progress has lagged what is needed.

1) Raising the necessary capital

To date, Nigeria has issued two separate Green Bonds to raise funds to support the activities set out in the ETP. Nigeria issued its first Sovereign Green Bond in 2017, becoming the first African country to do so. The first bond raised N10.69 billion to finance various green projects associated with the country's achievement of its NDC goals. Some of the projects funded include the deployment of 12.5W of renewable energy generation, and programmes to oversee the afforestation / reforestation of more than 2,000 ha of land.

A second Green Bond issued in 2019 raised N15 billion. A third bond [planned for 2023](#) was delayed because of difficulties in implementing some of the sustainability initiatives funded by the previous two green bonds. The [website](#) for the Nigerian Debt Management Office provides information on green bond issuances.

On February 20 of this year in a meeting of the Inter-Ministerial Committee on Climate Change (ICCC) on the Green Bond Programme, the Minister of State for Environment, Dr. Iziak Salako, [announced](#) a commitment of N60 billion towards achieving the country's stated objective of net zero by 2060. This represents an initial issuance in 2024 of what is intended to be an annual green bond issuance through 2027.

It's also worth noting that after the successful launch of the first sovereign green bond in 2017, several corporate green bonds were subsequently issued, [including](#) a N15 billion 5-year bond issued by Access Bank of Nigeria Plc, and a N8.5 billion 15-year bond issued by North South Power Company.

2) Relocation of OEM to Nigeria

While there doesn't seem to be any indication of large scale solar manufacturing facilities relocating to Nigeria, the country has taken active measures to put in place the necessary [policy framework](#), and secured market participation for some [major industry players](#), including Engie SA, TotalEnergies SE, Starsight Energy, and Enel S.p.A.

3) EV charging network and adoption of electric vehicles

Progress towards electrifying passenger vehicles across Nigeria has been mixed. The first [solar powered electric vehicle charging station](#) was installed in Sokoto State in 2021, and was followed by three additional charging facilities, all at different academic institutions around the country.





In 2020, Hyundai began manufacturing its fully electric Kona model in Nigeria, but as of 2022, [fewer than 200 vehicles](#) were sold. In order to encourage passengers to adopt electric vehicles, policy makers and auto manufacturers must work together to overcome [range anxiety](#). This means producing vehicles with longer battery life, and ensuring the widespread availability of rapid EV charging stations.

4. Leadership role in ensuring a just energy transition

Nigeria can make a strong claim to playing a leadership role in fighting for a just energy transition. This is reflected in the creation of the ETP, the [emphasis](#) on the role of natural gas as an transitional fuel to alleviate energy poverty, support for the industrialization of African economies, and encouragement of sustainable development across the continent. Nigeria also has taken a leadership role in mobilizing finance to address climate change, as evidenced by the issuance of the first green bond in 2017.

5. Support a conducive business and investment environment

Providing long-term predictability in regulatory frameworks is essential for attracting the capital needed to drive investment in things like distribution networks for renewable energy installations. Investors need assurances that capital deployed for long periods of time will attract predictable and attractive returns once tied up in long-term investments. Nigeria has gone a long way towards addressing these concerns by publishing the Energy Transition Plan and the [Renewable Energy Roadmap](#) which taken together provide clear guidance on the government's intended transition plans to renewable sources of energy.

Government also is providing [tax incentives](#) towards the purchase of solar panels, inverters, and other renewable energy equipment, as well as incentivizing the drive towards onshoring the manufacture and assembly of these devices. This ensures that there will be sufficient equipment available for renewable installations as the funds become available for their deployment.

Furthermore, support from the [World Bank](#) and other multilateral institutions helps to de-risk private investments and drives further capital towards green projects. In November of last year, the IFC [announced](#) a commitment of \$500 million to support the Nigerian Sovereign Investment Authority in the development of renewable energy projects in Nigeria, providing further evidence of market confidence in the long-term prospects of renewable energy projects in the country.

4) How is the transition to net zero affecting businesses and individuals?

In implementing the ETP, the primary objective is to achieve the reductions in CO₂ emissions specified in country's NDCs so that collectively we can limit global temperature rises to the limits as set out in the Paris Climate Accord. Apart from the avoidance of the worst impacts from climate change, there are significant secondary benefits to be gained by many of the initiatives included in the ETP such as opportunities for continued sustainable development and improvements in the quality of life for all Nigerians. Let's look in more detail at some of the secondary benefits associated with delivering on the ETP.

Better use of scarce resources

Use of increasingly scarce resources like water and arable land will become increasingly contentious as populations grow and as the impacts from climate change accelerate. Implementing the ETP and pushing towards achievement of the UN's Sustainable Development Goals will allow for continued economic growth while also ensuring that scarce resources are conserved, used wisely, and available for their most critical applications.

Overall improvements in health and well-being

Better use of natural resources can provide significant benefits to the overall health and well-being for households, communities, and the country as a whole. For instance, more responsible use and treatment of water and waste can provide improvements in community health. The use of clean electric stoves for cooking can provide significant health benefits as well. And the improvements in air quality resulting from reduced emissions from industry, oil production, and transportation can also be significant, leading to lower rates of respiratory illness and cardiovascular disease.

Address energy poverty in a sustainable way

Providing access to energy to every Nigerian is essential to ensuring long-term sustainable economic growth. Doing this in a sustainable way is essential to ensuring the long-term health of the planet. Nigerians have the opportunity to solve this challenge by accelerating the adoption of the full range of renewable energy solutions, including hydrogen, solar PV, and biomass. By addressing energy poverty in a sustainable way, Nigeria can benefit from stable sustainable growth.

Become advocates and experts in next-generation technologies

The world is moving towards entirely new forms of energy generation to power communities and drive entire economies. Nigeria is uniquely positioned to benefit from this transition by pushing for the adoption of the full range of renewable energy solutions. With a push towards domiciling these critical industries in Nigeria, the country can benefit for gaining the skills and insights that will fuel economic growth in the 21st century.

Conclusion

The transition from a carbon based economy to one powered by renewables is not without risk, particularly for an economy as heavily dependent on revenues from the oil and gas industry as Nigeria's currently is. The IFC [reports](#) that income from oil and gas account for approximately half of the government's revenues, and contribute to around 90% of export earnings. In assessing the country's progress towards its stated goals of net zero by 2060, it's essential to understand the country's plans as currently set out, to understand and assess the adequacy of these plans, and to review the degree to which those plans are being successfully implemented.

It's also important to understand how these plans are likely to impact individual businesses and households across the country. The plans put forward in the ETP provide reasons to be optimistic about the country's goals and ambitions, and while achievement of those objectives has been mixed, the commitment of the country's leadership demonstrates an appetite for tackling the more intractable challenges associated with addressing climate change. Taken together, we get a better picture of



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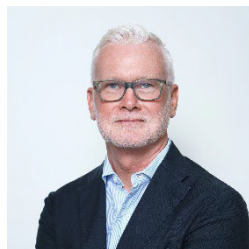
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how Nigeria intends to meet its NDCs while continuing to play a leadership role in the region in addressing climate change, delivering sustainable growth for the country, and providing improvements in the quality of life for all Nigerians.



Brent Barnette leads on the development of ETK's sustainability initiatives. He writes about access to finance, ESG reporting, economic development, sustainable agriculture, and climate change adaptation and mitigation, as well as spearheading ETK's ESG reporting service offering. He is passionate about sustainable development in the global south, and is currently based in São Paulo, Brazil. To talk about how ETK can help your organization with any of these issues, please get in touch by writing to brent.barnette@etkgroup.co.uk.

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