

Energy transition for achieving net-zero emission by 2060

By

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1. Introduction

The copious amounts of greenhouse gases human beings have been releasing into the air ever since the industrial revolution in England (1760 – 1840) are forming a sort of blanket around the planet earth, trapping heat in the atmosphere and causing global temperatures to be rising. Most scientists agree that humanity needs to radically reduce anthropogenic GHG emissions in order to minimize the most severe consequences of climate change, such as rising sea levels, severe droughts, and an increase in extreme weather events.

One of the proposed mitigation strategies is to achieve net-zero GHG emissions from 2030 and beyond. Parties to the Paris Agreement are expected to transition from fossil fuels to clean energy and reach net-zero ambition for GHG emissions. Achieving net-zero emissions means removing an equal amount of CO₂ and other GHG from the atmosphere as we release into it.

The Paris Agreement of 2015 stipulated 5 yearly review and meetings to assess progress. Moreover, at the COP26 Glasgow, Scotland over the period Sunday 31 October – Friday 12 November 2021, the Secretary General of the United Nations, Mr. Antonio Guterres, reiterated that countries must revisit their national climate plans, not only every five years, but every year, until keeping to 1.5°C is assured.

Also at the COP26 President Muhammadu Buhari said, “I do not think anyone in Nigeria needs persuading of the need for urgent action on the environment. Desertification in the North, floods in the centre, pollution and erosion on the coast are enough evidence. For Nigeria, climate change is not about the perils of tomorrow but what is happening today. Nigeria is committed to net-zero by 2060.” President Muhammadu Buhari also said that, we must keep the goal of 1.5 degrees Celsius alive and that this requires greater ambition on mitigation and immediate concrete action to reduce global emissions by 45 per cent by 2030.

But the good news is that there is, still, a path to avoid catastrophic climate change. Science has shown that the world has to reduce emissions to as close to zero as possible by the middle of this century, with the small amount of remaining emissions absorbed through natural carbon sinks like forests, and new technologies like carbon capture. If we can achieve this, global emissions of greenhouse gases will be ‘net-zero’.

Delivering this requires urgent global action, about how we supply and use energy, including ending coal fired power generation,

retiring petrol and diesel engines from all cars, and halting deforestation.

This has to be done at a time when the developed countries of the world are struggling to reconcile the demands of energy security with those of climate security, while the developing countries, like Nigeria, are struggling to reconcile energy access with energy security and climate security. As we were told yesterday more than 30% of the population of Nigeria, lack access to electricity and more than 60% rely on traditional energy sources (fuelwood, charcoal, dung and crop residues) for their cooking and production activities. We all know that this will compromise the social and economic conditions of the users.

Despite all these we are expected to reduce the use of fossil fuels in Nigeria, the fuel types that the world has mastered how to handle, to the one that we are yet to master – renewables. Hence we all need to work towards it. The commitment to reduce climate change must be balanced by the responsibility to meet own domestic development goals.

The objective of this exercise by the Energy Commission of Nigeria is to collate and assess work that has been done in the context energy transition and net-zero emissions in the country, seek input from experts in the field, in order to improve the energy system. There are always rooms for improvement.

2. Nationally Determined Contribution (NDC)

The Federal Government of Nigeria in 2015 submitted an ambitious and transparent INDC, like many other countries. It was however realized that the collective ambition of all INDCs submitted fell short of the Paris Agreement objectives. Therefore, countries were required to revisit their INDC. The updated NDC, represents significantly enhanced climate ambition as compared to the 2015 NDC.

Nigeria's INDC (the first NDC) is emissions reduction plan from a Business As Usual (BAU) to support Nigeria's economic growth by 5% per annum, improve the standard of living and ensure electricity access for oil. The INDC unconditional target emission reduction of 20% from BAU by 2030, and unconditional reduction of 45% from BAU by 2030. The mitigation sectors were power, transport, oil and gas, agriculture and industry. Each mitigation sector has its expected adaptation components.

Nigeria's revised INDC (also known as NDC or NDC2) expanded the mitigation sectors from five to seven. The additional two sectors being waste and water sectors. The revised NDC has an enhancement of the mitigation ambition from a number of factors, including; the inclusion of the waste sector in the GHG mitigation assessment, providing the economy wide GHG analysis; inclusion of mitigation of short lived climate pollutants (SLCPs) including black carbon, methane and HFCs; the substantial expansion and strengthening of mitigation actions beyond those included to achieve INDC mitigation, particularly in oil and gas and residential sectors. There are more than 36 new identified mitigation

measures in the new NDC. The revised NDC still has unconditional contribution of 20% below BAU by 2030 a 47% contribution conditional on international support.

3. Energy Transition Plan

Early this year, the Federal Government approved an Energy Transition Plan (ETP) for the country, and its implementation is being coordinated by the Federal Ministry of Environment.

Key highlights of the Energy Transition Plan (developed by McKinsey & Company) for Nigeria include:

- 250GW installed electricity generation capacity by 2050;
- 90% of this capacity from renewables;
- 80% electric vehicles by 2050;
- Clean cooking technologies for >80% of the population by 2050.

The plan was developed for up to year 2050 before the President announced 2060 as the year that Nigeria plans to achieve net-zero emissions, hence the analysis must be taken up to 2060.

4. Nigeria Energy Calculator 2050

In 2013, the then UK Department of Energy and Climate Change, now the Department of Business, Energy and Industrial Strategy (BEIS) introduced the UK 2050 Calculator to the Energy Commission of Nigeria. The UK 2050 Calculator assisted the UK

Government to strategize on how to meet its emissions obligations to mitigate climate change. The ECN has developed an Energy Calculator for Nigeria, using the framework of the UK 2050 calculator.

The Nigerian version of the model, which we call NECAL2050, is an energy planning tool that relates long term energy demand and supply pathways to greenhouse gas (GHG) emissions up to 2050.

The Nigerian Energy Calculator can be used to explore pathways to achieve net – zero emission targets in Nigeria. It clearly identifies the various technologies required in the different sectors of the economy.

5. Way Forward

The crucial question we want to answer is how does Nigeria transit from the current energy system to achieve net-zero by 2060 without escalating its energy insecurity challenges?

We have identified the following as energy sources that can help mitigate greenhouse gas emissions in the energy sector.

- Renewables – hydro, solar, wind, biofuels;
- Energy efficiency;
- Natural gas;
- Nuclear
- Hydrogen – green, blue.