

# NATIONAL RENEWABLE ENERGY ACTION PLAN (NREAP), 2016 (2015-2030)

Adopted By  
THE INTER-MINISTERIAL COMMITTEE ON RENEWABLE ENERGY AND  
ENERGY EFFICIENCY (ICREEE)

Approved By  
THE NATIONAL COUNCIL ON POWER (NACOP), July 14, 2016

**Simplified Summary**

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# EXECUTIVE SUMMARY



The National Renewable Energy Action Plan (NREAP) sets out the implementation strategy for the National Renewable Energy and Energy Efficiency Policy (NREEEP) (2015). It provides an overview on concrete policy and regulations, laws, incentives and measures, to be implemented to achieve Nigeria's renewable energy targets and the Sustainable Energy for All (SE4ALL) goals.

This Guide provides a simplified summary of the NREAP primarily for off-grid renewable energy stakeholders. It provides context to the plan, summary of targets, measures for achieving these targets, incentives, support provisions, related policies and regulations, stakeholders, and implementation strategy.

## CONTEXT

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The National Renewable Energy & Energy Efficiency Policy (NREEEP) directs the development of the National Renewable Energy Action Plan (NREAP) within 6-12 months following the approval of the NREEEP in 2015.

The NREAP presents the expected development and expansion of renewable energies to achieve the national target under the ECOWAS Renewable Energy Policy (EREP) and Nigeria's contribution to the overall ECOWAS target of 23% and 31% renewable energy by 2020 and 2030 respectively. It contains existing and currently planned measures with which the national target is to be achieved.

The NREAP includes baseline data and information on renewable energy sources and technologies, various activities and programmes in renewable energy in Nigeria, barriers to the development and promotion of renewable energy in the country, as well as suggested achieved renewable energy targets, including gender disaggregated indicators based on national potentials and socio-economic assessments.

It provides an overview on concrete policy and regulations, laws, incentives and measures to be implemented by the country to achieve these targets as well as the set-out targets under the Sustainable Energy for All (SE4ALL) goals.

The NREAP was developed through collaborative efforts of over 20 Ministries, Departments and Agencies of the Federal Government of Nigeria with input from all 36 states and the F.C.T, private sector, NGOs, civil society, academia and development partners.

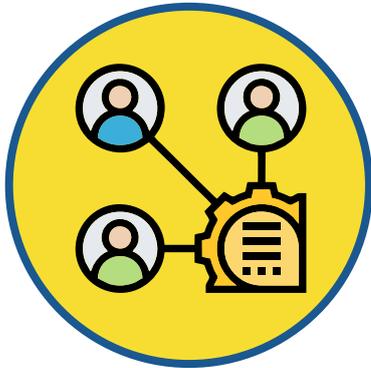
# LEGAL FOUNDATION

The NREAP is a supporting strategy document to the NREEEP and guides its implementation. It currently provides the general framework for Nigeria's renewable energy strategy with reference to other sector-specific renewable energy related documents.

## STAKEHOLDERS

The NREAP involves stakeholders across the value chain of on-grid and off-grid power sector. Specific to the off-grid renewable energy sector, key private sector stakeholders include:

- The Ministry of Power
- Off-grid renewable energy developers, energy efficiency firms, and investors
- Manufacturing, industrial and commercial energy consumers
- Communities utilizing off-grid renewable energy solutions



## TARGET RENEWABLE ENERGY SOURCES



Onshore Wind



Solar (PV, Thermal CSP)



Bioenergy



Hydro



Geothermal



Wave



Tidal

# RENEWABLE ENERGY TARGETS & TRAJECTORIES

## Targets for Grid Connected Renewable Energy



In MW installed Capacity	2010	2020	2030
Renewable energy installed capacity in MW (excluding medium and large hydro)	0	2785	9100
Renewable energy share of the total installed capacity in % (excluding medium and large hydro)	0	27	28
Large and medium scale hydropower capacity installed in MW (more than 30 MW)	916	2540	4700
Large and medium scale hydropower (more than 30 MW) share of total electricity generation in %	21	25	15
Total renewable energy capacity in MW (including large and medium scale hydro)	916	5325	13800
Renewable energy share of the total installed capacity in % (including medium and large hydro)	21	52	45

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## Grid Connected Generation



	2010	2020	2030
Renewable energy electricity generation in GWh (excluding medium and large hydro)	0	6864	25402
Renewable energy share in the electricity mix in % (excluding medium and large hydro)	0	13	15
Large and medium scale hydropower generation in GWh (more than 30 MW)	4749	13167	24365
Large and medium scale hydropower generation (more than 30 MW) as share of electricity mix in %	17	25	14
Total renewable energy generation in GWh (including medium and large hydro)	4749	20031	49766
Renewable energy share in the electricity mix in % (including medium and large hydro)	17	38	31

## Targets for Off-grid Applications

	2010	2020	2030
Share of population served by electricity services (%)	40	75	90
Share of population connected to the grid (%)	38	70	80
Share of rural population served by renewable energy and hybrid mini-grids (%)	2	5	10
Share of rural population served by stand-alone renewable energy systems (%)	1.8	4.7	5
Number of RE/hybrid mini-grids.	NA	NA	NA
Mini-grids powered purely by renewables (in MW of installed capacity)	0	180	5314
Mini-grids powered by hybrid systems (MW)	0	4	171
PV and Pico-Hydro rural systems (MW)	0.2	3.5	60
Total off-grid renewable energy installed capacity (MW)	0.2	187.5	5545

## Solar Thermal Water Heating Targets <sup>1</sup>



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	2010	2020	2030
Number of residential houses with solar thermal systems	-	-	-
Share of district health centres, maternities, school kitchens and boarding schools with solar thermal system in %	0	5	7
Share of agro-food industries (preheating of process water) with solar thermal systems in %	0	2	5
Share of hotels with solar thermal systems in %	0	2	5
Total	0	9	17

## Domestic Cooking Energy <sup>2</sup> Targets for 2020 and 2030



	2010	2020	2030
Share of the population using improved cook-stoves in %	0.24	40	59
Share of the charcoal produced using efficient charcoal production techniques in %	2	5	7
Share of the population using modern fuel alternatives for cooking (e.g. LPG, biogas, solar cookers, kerosene) - % of population	97.66	55	34

<sup>1</sup> As sourced from the Federal Ministry of Land, Housing and Urban Development in the NREAP

<sup>2</sup> As sourced from the Federal Ministry of Environment in the NREAP

# MEASURES OF ACHIEVING THE TARGETS

## Overview of policies and measures for grid connected renewable energy

### Name of Measure

Feed-in Tariffs (FIT)

### Type of Measure

Regulatory

### Expected Result

Increase generation of renewable electricity from 1MW to 5MW for PV and biomass; and from 1MW to 10MW for wind, small and medium hydro power plants.

### Target Group and/or Activity

- Primarily medium scale renewable electricity generation by Independent Power Producers (IPPs)
- The Federal Government through the regulator NERC approved the feed-in tariff regulation in November 2015 and it entered into force in February 2016. The FIT regulation targets RE production above 1MW and smaller than 30MW
- The REFIT regulation also expects electricity distribution companies to obtain 50% of the projected electricity generated from renewables and supersedes the Multi-Year Tariff Order (MYTO II) 2012 – 2017

### Existing or Planned

Existing

### Start and End dates of the Measure

Start in 2016, no end date defined



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### Name of Measure

Competitive Procurement Programme

### Type of Measure

Regulatory

### Expected Result

Increase generation of renewable electricity from 5MW and above for PV; and from 10MW and above for wind, small and medium hydropower.

### Target Group and/or Activity

Primarily medium scale renewable electricity generation by energy companies

### Existing or Planned

Planned

### Start and End dates of the Measure

Start in 2016, no end date defined



**Name of Measure**

GIZ- Nigerian Energy Support Programme: Capacity Building Component

**Type of Measure**

Capacity Building

**Expected Result**

Develop professional and technical courses on renewable energy and energy efficiency

**Target Group and/or Activity**

Working with National Power Training Institute of Nigeria and aimed at both public and private institutions of the power sector

**Existing or Planned:** Existing

**Start and End dates of the Measure:** March 2013 - March 2018

**Name of Measure**

National Policy on Public Private Partnership (PPP)

**Type of Measure**

Policy

**Expected Result:**

Develop guidelines, policies, and procurement process for PPP.

**Target Group and/or Activity**

Collaborate with the states of the Federation to promote an orderly and harmonised framework for the development and market for PPPs.

**Existing or Planned**

Existing

**Start and End dates of the Measure:**

2012 to date



**Name of Measure:** National Renewable Energy and Energy Efficiency Policy (NREEEP)

**Type of Measure:** Policy

**Expected Result**

Promote renewable energy and energy efficiency

**Target Group and/or Activity**

Public and Private sector

**Existing or Planned**

Existing

**Start and End dates of the Measure**

2015 to date



## Overview of policies and measures for off-grid renewable energy

### Name of Measure

Soft Loan

### Type of Measure

Financial

### Expected Result

Assist with soft loans with low interest rates through the Bank of Industry.

### Target Group and/or Activity

Small scale renewable energy generation companies

### Existing or Planned

Planned

**Start and End dates of the Measure:** N/A



### Name of Measure

Renewable Energy Subsidy and Grant

### Type of Measure

Financial

### Expected Result

Provision of subsidy of up to 30% of initial costs of renewable energy utilisation facilities

### Target Group and/or Activity

Communities, enterprises and individuals that embark on renewable energy generation projects

### Existing or Planned:

Planned

**Start and End dates of the Measure:** N/A



### Name of Measure

Rural Electrification Strategy and Implementation Plan

**Type of Measure:** Strategy/Plan

### Expected Result

Promote electricity in rural areas

### Target Group and/or Activity

Public and Private sector.

### Existing or Planned

Existing

**Start and End dates of the Measure:** 2016 to date



## Overview of policies and measures for biofuels

### Name of Measure

National Biofuel Policy

### Type of Measure

Policy

### Expected Result

To integrate the agriculture sector to the downstream section

### Target Group and/or Activity

Petroleum industry

### Existing or Planned

Existing

### Start and End dates of the Measure

2007 to date



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## INCENTIVES



- Under the Renewable Energy Micro Utility (REMU) concept, a green bond issuing system is to be developed for small scale renewable energy technologies especially for rural electrification.
- The Rural Electrification Fund (REF) is to provide subsidies towards the initial capital costs for renewable energy schemes. Funding will be through grants applied to project start-up costs. Grants will not be made for operational or maintenance costs.
- Incentives including tax relief and exemptions, import waivers etc. as a support measure for renewable energy technologies.

## KEY PROVISIONS

### Education, Research, Training, & Capacity Development

- NERC to organise authorising, licensing, planning workshops to increase project developer awareness of national policy and regulations on renewable energy; understanding of different renewable energy technologies and their impacts; and give practical advice on developing local plans for renewable energy in their area
- Strategies to be developed and implemented for training and human capacity development across each of the renewable energy value chains
- Development of renewable energy modules and their integration into the curricula of polytechnics, universities and vocational schools
- The National Power Training Institute of Nigeria (NAPTIN) would broaden the scope of training currently delivered and will further include in its courses, generic training for planners, planning inspectors and councillors on renewable energy policy and technical issues



### Finance

- Nigeria to look into the possibility of a Green Equity Fund and Green Fund to help finance the introduction of renewable energy
- Financial products to be provided to individuals looking to invest in the Nigerian renewable energy market
- Financial/fiscal support for renewable energy sources will differ based on renewable energy technology
- NERC to establish a regulation on funding of incremental cost based on prior levy impact assessment to ensure that levies charged to consumers are reasonable and decline over time. It is envisaged that the Rural Electrification Fund (REF) can be used to fund off-grid capacities
- The Nigerian Electricity Regulatory Commission (NERC) to establish a system of feed-in tariffs for the electricity sector, as well as other incentives to ensure the country's greater ambitions for renewable energy are supported and have the required investment



## Support Policies, Plans, and Framework for Implementation

- In order to facilitate the effective administration of approved electricity generation and trading licencing by NERC, state and local governments should have defined roles in authorising, certifying and licensing renewable energy installations and spatial planning
- Minimum levels for the use of renewable energy for buildings in the country to be integrated into the building code, as well as development of a national Monitoring, Reporting, and Verification (MRV) system
- The Federal Government to make an Annual Energy Statement to the Federal Executive Council to set strategic energy policy and guide investment in all forms of energy including renewables
- Establishment of an independent organisation by the federal government who will be responsible for the provision of free advice and information for people across the country looking to save energy, conserve water and reduce waste
- Creation of a network of renewable energy clusters by the National Council on Power. Each renewable energy cluster will be unique and different, building on the strengths of the region in which it is based. The federal government will also promote community-owned renewable energy schemes
- Development of policies and directives on the installation of small scale renewable energy technology and solar thermal water heating on buildings. Such directives shall make it mandatory for all lighting, heating and cooling systems to require planning permission under the new building code
- Targets per year per grid connected renewable energy technology to be set by a policy directive and integrated into NERC's Feed-in-Tariff (FiT) Regulation, and the competitive bidding framework. FiT will be guaranteed for 20 years and the tariff-level ruled by the NERC or established by competitive bidding will be fixed for the same period
- Development of measures and strategies to promote modern fuel alternatives for cooking (LPG, biogas, solar cookers, etc) with the National Energy Efficiency Action Plan (NEEAP); as well as a supportive framework and standards for improved cook-stoves involving regional/international development partners

## Regional & Global Collaboration

- Nigeria to push for greater leadership strategy at the ECOWAS level in tackling international climate change by supporting an increase in the ECOWAS emission reduction plans to a minimum level by 2030
- Development of measures at regional/local levels for integrating renewable energy into buildings

# IMPLEMENTATION

## Key Stakeholders involved in NREAP Implementation

Federal Ministry of Power, Works & Housing  
The Federal Ministry of Environment  
Inter-Ministerial Committee on Renewable Energy  
Nigerian Bulk Electricity Trader (NBET)  
Nigerian Electricity Regulatory Commission (NERC)  
Rural Electrification Agency (REA)  
Federal Ministry of Lands, Housing, and Urban Development  
Electricity Distribution Companies  
Transmission Company of Nigeria (TCN)  
System Operators  
The National Council on Power  
The Ministry of Petroleum Resources  
Nigeria National Petroleum Cooperation (NNPC)  
Energy Commission of Nigeria (ECN)  
The Nigerian Electricity Management Services Agency (NEMSA)  
Standards Organization of Nigeria (SON)  
National Power Training Institute of Nigeria  
National Board of Technical Education  
Development & Donor Partners  
National Research Institute for Chemical Technology  
Federal Ministry of Water Resources  
National Biotechnology Development Agency (NABDA)  
Private Companies & Investors  
Research Institutions  
Energy Consumers & Communities

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## Role of National Public Institutions involved in NREAP Implementation

### **Federal Ministry of Power, Works and Housing**

Coordinate and monitor implementation of the NREAP

### **National Council on Power**

Responsible for further development of renewable energy resources, working with stakeholders in developing a strategy for delivering this national renewable energy commitment

### **An Inter-ministerial Committee on Renewable Energy**

to coordinate the issues, policies and incentive on renewable energy. NERC, NBET, and TCN will form part of this committee to ensure best practices in the process of obtaining decisions for all authorisation, certification and licensing applications for renewable energy installations

**Federal Ministry of Petroleum Resources** with **Nigeria National Petroleum Cooperation (NNPC)** and the **Energy Commission of Nigeria** to handle all matters relating to bio-fuels in Nigeria

The **Federal Ministry of Lands, Housing and Urban Development** responsible for legislation on buildings

The **Rural Women Energy Security (RUWES)** responsible for awareness raising and training programmes for women on the benefits and practicalities of developing and using energy from renewable sources

**States and Local governments** responsible for many of the mechanisms to help deploy greater levels of renewable energy. States and local government should play an active role towards increasing the use of renewable energy in their states and meeting the overall national renewable energy target

### **Rural Electrification Agency (REA)**

Responsible for providing guidance for rural developers, micro-credit financial institutions, NGOs and agribusinesses to properly consider the use of renewable energy sources for powering rural micro-enterprises and homes

### **Nigerian Electricity Regulatory Commission (NERC)**

- Administering renewable energy support instruments
- Provision of information and guidance for distribution and generation companies, and interested investors seeking to take advantage of different renewable energy support incentive.
- The Federal Ministry of Power, NBET, and other relevant agencies to collaborate with NERC in this regard

The **National Research Institute for Chemical Technology**, the **National Biotechnology Development Agency**, the **Energy Commission of Nigeria**, the **Sugar Council of Nigeria**, and other relevant government agencies to exercise their mandates for the re-use of biomass from agricultural waste

The **Energy Commission of Nigeria (ECN)** and the **National Biotechnology Development Agency (NABDA)** responsible for the calculation and methodology of assessing biomass use

## **The Nigerian Electricity Management Services Agency**

Empowered to serve as the administrator for the Micro-generation Certification Scheme (MCS) as well as provide information on approved products and certify installer companies through a testing and certification mechanism.

Mandated to provide information to support consumers on the performance and efficiency of micro-generation technologies.

Required by law to put in place competencies and approved training for the installation of clean technology systems working with the National Power Training Institute of Nigeria (NAPTIN) and the National Board of Technical Education (NBTE).

In collaboration with the National Power Training Institute of Nigeria National Board of Technical Education, and Nigerian Electricity Regulatory Commission set up and authorize certification/ qualification schemes by 2014 for installers of small-scale biomass boilers and stoves, solar photovoltaic and solar thermal systems.

In collaboration with the SON to carry out due diligence and inspection of renewable energy equipment installed across the country.

## **RELATED REGULATORY & POLICY DOCUMENTS**

- National Electric Power Policy, 2001
- The ECOWAS Energy Protocol, 2003
- Nigerian Petroleum Act, 2004 (as amended)
- Electric Power Sector Reform Act (EPSRA), 2005
- Standard Organization of Nigeria Conformity Assessment Programme (SONCAP), 2005
- The Rural Electrification Policy, 2005
- The National Forest Policy, 2006
- Nigerian Bio-fuel Policy and Incentives, 2007
- Sustainable Energy for All Initiative, 2011
- Nigerian Renewable Energy Roadmap, 2012
- The ECOWAS Bioenergy Strategy Framework, 2012
- Multi Year Tariff Order (MYTO II), 2012 - 2017
- National Renewable Energy & Energy Efficiency Policy (NREEEP), 2015
- ECOWAS Renewable Energy Policy (EREP), 2015
- The ECOWAS White Paper on Regional Policy for Increasing Access to Energy Services, 2006
- National Energy Efficiency Action Plans (NEEAP), 2016
- Rural Electrification Strategy and Implementation Plan (RESIP), 2016
- The ECOWAS Revised Generation and Transmission Master Plan, 2019 – 2033 (updated from the previous 2012 – 2025)

# NEEP IMPLEMENTATION STATUS



## Projects

- Signing of PPAs in July 2016 between the Nigerian government and 14 utility scale PV project developers for a total generation capacity of 1,075MW. These projects are however currently being stalled by tariff re-negotiations between both parties.
- Increased focus on driving rural electrification through the use of off-grid renewable energy solutions such as mini-grids and solar home systems by the federal government through the REA. Through its Energizing Economies and Energizing Education Initiatives, the REA plans to deploy 10,000 mini-grids across the country by 2023. This is supported by development partners like the World Bank and African Development Bank through the Nigeria Electrification Project (NEP).



## Regulatory

- Feed-in Tariffs (FIT): Approval of feed-in-tariff regulation for renewable energy in November 2015 which supersedes the Multi-Year Tariff Order II (2012 – 2017), going into force in November 2016.
- Competitive Procurement Programme: The REA with technical support from development partners including the World Bank and GIZ has developed a competitive procurement and project implementation system for rural off-grid electrification projects.



## Capacity Building

- Developed professional and technical courses on renewable energy and energy efficiency with the GIZ in collaboration with National Power Training Institute of Nigeria and private training centers.



## Finance

- Soft Loans: The Bank of Industry in collaboration with institutions such as All-On is providing soft loans to renewable energy companies in the country. Other financiers including foreign and local impact investors, development funds, and local commercial banks are also increasingly providing debt and equity finance to renewable energy companies in the country.
- Green Bonds: Nigeria has issued a sovereign green bond and Climate Bonds Certified Sovereign Bond. The fund has been allocated to finance three government renewable energy projects – the Renewable Energy Micro-Utilities Programme, the Re-Energizing Education Programme, and the Afforestation Programme. It comprises a 5-year N10.6 billion (\$25 million) facility with coupon rate of 13.48%. The Nigeria Debt Management Office has listed the country's Sovereign Green Bond on the Nigerian Stock Exchange.



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