Ministry of Environment, Federal Republic of Nigeria

Simplified Summary

Curated by Clean Technology Hub



Clean Tech Incubation & Acceleration Foundation Energy Innovation Center

EXECUTIVE SUMMARY

Short-Lived Climate Pollutants (SLCPs) are pollutants that last a relatively short period within the atmosphere – between a few days to a decade and a half. They are one of the major contributors to global warming (40% to 45%) right after long -lived Greenhouse Gases (GHGs). The major SLCPs are methane, black carbons, tropospheric ozone and HydroFluorocarbons (HFCs). The major SLCP emission sources, including household energy use, transport, oil and gas, agriculture, industry and the waste sectors, are also major sources of greenhouse gases such as CO2, and other air pollutants, such as PM2.5, organic carbon (OC), nitrogen oxides (NOx), sulphur dioxide (SO2), volatile organic compounds (VOCs), and carbon monoxide (CO).

This plan is an outcome of a multi-sectoral consultative process that took place between 2016 and 2018. The process included the identification of the different sources of SLCPs emissions, their analysis, identification and prioritization of measures tar geted at reducing emissions from major SLCPs such as Black Carbon (BC), Methane (CH4), as well as long-lived greenhouse gases such as Carbon Dioxide (CO2). The plan gives the country the possibility to enhance Nigeria's NDC commitment by expanding them to cover other gases and pol lutants beyond the long-lived greenhouse gases as recommended by UNEP emission gap report 2018.

The LEAP-IBC tool was used to analyze SLCPs, greenhouse gases, and air pollutants emissions from 2010 to 2050. The objective was to analyze the current state of SLCP sources in the country, their future progressions and impacts on human health, agriculture and climate. The assessment formed the basis of the measures proposed for SLCP emissions abatement. This plan was developed and released t o document the major sources of short-lived climate pollution, the priority SLCP mitigation measures and the implementation pathways for the reduction of SLCP emissions in Nigeria.

CONTEXT

Nigeria, a member of the Climate and Clean Air Coalition (CCAC) since 2012, is committed to reducing the emission of Short Lived Climate Pollutants (SLCPs) emanating from activities and processes within its border. This has informed the preparation of this Natio nal SLCP Actions Plan (NAP), purposely set for the mitigation of short-lived climate pollutants in the country.

LEGAL FOUNDATION

As a partner to the Climate and Clean Air Coalition (CCAC), the Federal Ministry of Environment developed this plan, detailing Nigeria's steps towards reducing short-lived climate pollutants, on behalf of the Federal Government of Nigeria

OBJECTIVES

Nigeria's National Action Plan (NNAP) for the reduction of SLCPs is aimed at reducing short -lived climate pollutants in the atmosphere. To achieve this, the plan seeks to:

- Identify the major SLCP emission sources and document them;
- Identify and consolidate the available relevant local data on air pollutants;
- Identify and prioritize relevant SLCP mitigation measures in key source sectors, and quantify the likely benefits from their implementation;



- Ensure the full representation and active participation of all relevant stakeholders; and
- Identify mechanisms to mainstream identified measures into the different sectoral policies.

Residential Sector

KEY PROVISIONS

SECTORS CONTRIBUTING TO SLCP

Transport Sector

Oil and Gas Sector
Ull allu Gas Sector

A high emitting sector. In 2010, emissions	The majority of Nigerians (75%) rely on solid	The exploitation of Nigeria's petroleum
from road transport accounted for 98.3% of	fuels for cooking and lighting which puts a	resources resulted in a massive influx of
the total transport emissions. The emission	strain on our natural resources and	hydrocarbons, CO, CO2, Nitrogen Oxides
of BC is projected to increase from 28.10	contributes negatively to climate change	(NOx), SO2, and BC into the atmosphere as
kilotonnes in 2010 to 31.28 kilotonnes in	through the high emission of carbon dioxide	well as considerable environmental
2030, an estimated increase of 11.3% and	and Black Carbon into the atmosphere.	problems. Methane is the most released gas
peak in 2040 to 33.35 kilotonnes before	Emissions from the residential sector came	from this sector and it is contributed through
decreasing slightly in 2050 to 32.94	mostly from cooking (the largest source of	gas production, processing and distribution
kilotonnes.	black carbon emissions), lighting and diesel &	(73%) and oil production (27%). The emission
	gasoline generators. The emission of BC is	of Methane is expected to increase from
	expected to increase from 196.06 kilotonnes	439.8 kilotonnes in 2010 to 481.2 kilotonnes
	in 2010 to 326.48 kilotonnes in 2030, an	in 2030, an increase of 9% and peak in 2050
	increase of 66.5% and peak in 2050 with	by 36% to 598.5 kilotonnes.
	507.67 kilotonnes an estimated increase of	
	158.7%.	
Industrial Sector	Waste Management	Agriculture Sector
The major industrial activities in Nigeria	The total amount of domestic waste	The agricultural sector has been shown as a
include leather, textiles, petroleum,	generated every year in the country is put at	significant contributor to anthropogenic
chemicals and allied products, building	about 63 million tonnes. The use of landfill	
motorials pharmacouticals are allied	about 05 minior tonnes. The use of fanumi	GHGs. The GHG emissions of the agriculture
materials, pharmaceuticals, agro-allied	sites, burning and incineration as a means of	activities were composed mainly of methane
products. Emissions from the industrial		_
	sites, burning and incineration as a means of	activities were composed mainly of methane
products. Emissions from the industrial	sites, burning and incineration as a means of disposing waste constitutes a major risk to	activities were composed mainly of methane of which enteric fermentation, manure
products. Emissions from the industrial sector were estimated for iron and steel,	sites, burning and incineration as a means of disposing waste constitutes a major risk to the environment through the release of high	activities were composed mainly of methane of which enteric fermentation, manure management and rice cultivation were
products. Emissions from the industrial sector were estimated for iron and steel, brick kilns, and diesel generators, used in the	sites, burning and incineration as a means of disposing waste constitutes a major risk to the environment through the release of high levels of methane and black carbons.	activities were composed mainly of methane of which enteric fermentation, manure management and rice cultivation were critical sources. The total emission of BC, SO ₂ ,
products. Emissions from the industrial sector were estimated for iron and steel, brick kilns, and diesel generators, used in the manufacturing sector. Primary solid biomass	sites, burning and incineration as a means of disposing waste constitutes a major risk to the environment through the release of high levels of methane and black carbons. Landfills are the major source of emission	activities were composed mainly of methane of which enteric fermentation, manure management and rice cultivation were critical sources. The total emission of BC, SO ₂ , VOC, and CO ₂ comes from the burning of
products. Emissions from the industrial sector were estimated for iron and steel, brick kilns, and diesel generators, used in the manufacturing sector. Primary solid biomass combustion is the major source of BC	sites, burning and incineration as a means of disposing waste constitutes a major risk to the environment through the release of high levels of methane and black carbons. Landfills are the major source of emission from the waste management sector	activities were composed mainly of methane of which enteric fermentation, manure management and rice cultivation were critical sources. The total emission of BC, SO ₂ , VOC, and CO ₂ comes from the burning of agricultural residue, and also acts as the

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in 2010 to 29.27 kilotonnes in 2030	, , , , , , , , , , , , , , , , , , ,	Methane emission, while 96.6% of Nitrogen
increase of 86.12% and peak in 2050		Oxide emission comes from Fertilizer
69.41 kilotonnes, an increase of 341.4%	an increase of 159%.	Application.
Power Sector		
The adoption of diesel-powered generation	itors	
to generate electricity contributed seve	erely	
to the release of SLCPs within	the	
atmosphere. Emissions from the po	ower	
sector were estimated for elect	ricity	
generation fuels of Diesel, Heavy Fuel		
and Natural Gas. The emission of BC		
projected to increase from 0.05 kilotonn		
2010 to 0.09 kilotonnes in 2030, an incr		
of 80% and peak in 2050 with 0.20 kiloto		
an increase of 300%.		
	SLCP ABATEMENT MEASURES (BY INDUSTRY)	
SLCP Abatement Measures	Description	Target
TRANSPORT	Description	laiget
	Elization of Danfa Due flact and works are entry ith	
Renewal of urban bus fleet in Lagos	Elimination of Danfo Bus fleet and replacement with	C .
	5000 cleaner urban buses in Lagos.	replacement begins
		2021 = 5000 new buses in Lagos
		complete and Danfo buses fully
		replaced
Adoption of Compressed Natural Gas	Promoting the conversion of the use of diesel/gasoli	
(CNG) Buses in Nigeria	fueled Buses/Taxis to Compressed Natural Gas (CNG	
		CNG
Introduction of low Sulphur diesel and	Introduction of Diesel and Petrol with sulphur conte	
petrol	of 50 parts per million and 150 parts-per-milli	
	respectively.	150 ppm petrol introduced in 2021
Elimination of high emitting vehicles	This measure would promote the renewal of the	15-year limit on new vehicle imports
that do not meet vehicle emission	vehicle fleet to meet increasingly stringent emission	currently in place
standards	standards by enforcing the 15-year limit on new	Euro III limits met by all vehicles by
	vehicle imports, and thorough inspection and	2023
	maintenance programmes to ensure vehicles meet	



	Euro III standards by 2023 and Euro IV standards by 2030.	Euro IV limits met by all vehicles by 2030
Reduction of vehicle journeys by car through transport modal shifts	Promotion of modal shifts from road to rail and water transport systems.	2020 = 500, 000 daily journeys transported by Rail & Waterways instead of road (emission reduction potential not quantified in LEAP-IBC analysis)
RESIDENTIAL		
Increase in the population using modern fuels for cooking (LPG, electricity, kerosene, biogas, solar cookers)	Substitution of traditional biomass cookstoves with modern cooking fuels including LPG, electricity, kerosene, biogas, solar cookers.	2020 = 50% of H/H using modern fuels 2030 = 80% of H/H using modern fuels
Replacement of traditional biomass cookstoves with more efficient improved biomass stoves	Substitution of traditional biomass cookstoves with improved biomass cookstoves. There is a target of 20% of households using improved biomass cookstoves by 2030.	2030 = 20% H/H using improved biomass stoves 2020 = 20 million Cookstoves
Elimination of kerosene lamps	Replacement of all kerosene lamps used for lighting with solar-powered lamps.	All kerosene lighting replaced by solar lamps by 2022
OIL AND GAS		
Elimination of gas flaring	Elimination of gas flaring and recovery and utilization of vented associated gas.	2020 = 100% of gas flaring eliminated
Fugitive emissions/leakages Control	Control of unintended fugitive emissions/leakages from oil production and processing.	2030 = 50% Methane Reduction
Methane Leakage Reduction	Reduction of methane emission from leakage of natural gas transportation and distribution.	2030 = 50% Methane Reduction
INDUSTRY		
Improved Energy Efficiency in the Industrial Sector	Improvement in energy efficiency within the industrial sector.	2020 = 20% improvement in energy efficiency 2050 = 50% improvement in energy efficiency
WASTE MANAGEMENT		
Reduction of methane emissions and open burning of waste at open	Deployment of a box-type digester at waste sites across Nigeria (1-100 tonnes per day capacity).	50% methane recovered from dumpsites by 2030

dumpsites through the adoption of		Open burning of waste: 50% reduction	
digesters at dumpsites		in open burning of waste by 2030	
Septic sludge collection	Promote Septic sludge collection, treatment and recycling.	2030 = 37 Municipalities (States & Federal Capitals)	
Sewerage Systems and Municipal wastewater treatment plants	Establish, expand Sewerage Systems and municipal wastewater treatment plants in Major Urban Centre	In Abuja, Lagos, Kano & Port Harcourt	
AGRICULTURE			
Increased adoption of intermittent aeration of rice paddy fields - Alternate Wetting and Drying (AWD)	Promote intermitted aeration (AWD) of continuousl flooded rice paddies.	y 2030 = 50% cultivated land adopt AWD management system	
Reduce the open-field burning of crop residues.	Replace open-field burning of Agriculture Waste wit Clean-Air Alternatives.	th 2030 = 50% reduction in the fraction of crop residue that is burned in fields	
Anaerobic Digestion (AD)	Promote anaerobic digestion of manure from Livestock and Poultry.	2030 = 50% reduction in methane due to improved manure management practices	
Reduce methane emissions from	Implement actions to reduce emissions from enterio	c 2030 = 30% reduction in emission	
enteric fermentation	fermentation such as improved feed.	intensity	
POWER (ENERGY)			
Expansion of National Electricity	Expansion of National Electricity Coverage particula	rly 2030 = 90% of the population have	
Coverage	in rural areas.	access to the electricity grid	
Increase share of electricity generated in Nigeria from renewables	Generate 30% electricity from renewables by 2030.	2030 = 30% electricity generated using renewable energy	
HFCs			
Elimination of HFC Consumption	Shift to the use of climate-friendly HFC Alternatives	2030 = 10%	
		2040 = 50%	
		2045 = 80%	
IMPACT OF SLCP EMISSION ABATEMENT MEASURES			
Black Carbon Emissions Reduction	Methane Emission Reduction	Fine Particulate Matter (PM2.5) Emission	
Based on the analysis carried out using		Reductions	
LEAP-IBC tool, Black Carbon was expected	· · · · · · · · · · · · · · · · · · ·	The emission of fine particulate matter into	
increase from 345 kilotonnes in 2010 to		the atmosphere in Nigeria was estimated to	
kilotonnes in 2050. With the application		rise from 2708 kilotonnes in 2010 to 6089	
these 22 SLCP emission abater	nent application of these 22 SLCP emission	kilotonnes in 2050. The introduction and	

measures, it is expected that Black Carbon emissions will reduce from 345 kilotonnes in 2010 to 129 kilotonnes in 2050, a massive decrease of 84%. A considerable amount of BC emission savings came from the residential, transport and, waste sector.	abatement measures, it is expected that methane emissions will reduce from 3726 kilotonnes in 2010 to 2244 kilotonnes in 2050 a 66% decrease by 2050. A significant amount of methane emission saving emanates from the residential, and to a less	implementation of all the selected abatement measures would reduce the emission of PM2.5 from 2708 kilotonnes in 2010 to 1350 kilotonnes in 2050 a decrease of 78% by 2050.
Sulphur Dioxide Emission Reduction Under a 'business as usual' scenario, Sulphur Dioxide emissions are expected to rise from 471.39 kilotonnes in 2010 to 1489.01 kilotonnes in 2050. The reduction of Sulphur Dioxide emission as a result of the implementation of the National SLCP plan abatement measures is expected to be from 471.39 kilotonnes in 2010 to 316.93 kilotonnes in 2050, a 78.7% decrease.	degree, agriculture sector. Nitrogen Oxide Emission Reduction Based on the analysis carried out using the LEAP-IBC tool, Nitrogen oxide was estimated to increase from 2590.05 kilotonnes in 2010 to 4955.52kilotonnes in 2050. With the application of these 22 SLCP emission abatement measures, it is expected that Nitrogen oxide emissions will reduce from 2590.05 kilotonnes in 2010 to 2121.25 kilotonnes in 2050 a decrease of 57.2% by 2050.	Carbon Dioxide Emission Reduction Under a 'business as usual" scenario, Carbon Dioxide emissions are expected to rise from 171.1 kilotonnes in 2010 to 456.7 kilotonnes in 2050. The reduction of Carbon Dioxide emission as a result of the implementation of the National SLCP plan abatement measures is expected to be from 171.1 kilotonnes in 2010 to 375.2 kilotonnes in 2050 a decrease of 18%.

BENEFITS OF SLCP EMISSION ABATEMENT MEASURES

- Health Benefits: Without the application of the SLCP abatement measures, the number of premature deaths resulting from the effect of exposure to PM2.5 could be about 42050 in 2010 rising to about 70880 in 2050. With the implementation of the SLCP emission abatement measures, about 2240 premature deaths would be averted in 2020, rising to about 10860 avoided deaths in 2050. Set in percentage terms, between these periods about 5.1% to 15.3% of premature deaths would have been avoided.
- Agricultural Benefits: Without the application of the SLCP abatement measures, the amount of crop loss to be was estimated to be 4065.16 kilotonnes in 2020 rising to about 4784.07 kilotonnes in 2050. With the implementation of the SLCP emission abatement measures, about 1423.31 kilotonnes of crop loss would be averted, representing a 35% loss avoided. The loss avoided rises to a maximum of 3269.24 kilotonnes in 2030, a 70.2% loss avoided. Overall, the loss avoided is quite substantial.
- **Climate Benefits**: The implementation of all the selected National SLCP Plan abatement measures will reduce Nigeria's emission contribution to global average temperature change. Based on the analysis carried out using the LEAP -IBC tool, it was noticed that the avoided national contribution to global temperature rise is quite substantial.



	ATION ACTION PLAN FOR THE NATIONAL SLCP ABAT	
Activity Mainstream SLCPs into National Development Plan	 Sub-actions The Ministry of Budget and National Planning (MBNP) and SNAP office will engage in collaborative activities on mainstreaming plan into the National Development Plan MBNP/SNAP Office/Sectoral MDAs' collaborative activities on mainstreaming Plan into National Development Plan 	 Organizations Involved Climate Change Division, Ministry of Environment Ministry of Budget and National Planning Sectoral MDAs
Mainstream SLCPs into Climate Planning	 Develop SLCP data and information on the National Climate Change Data Hub Integrate SLCPs into climate reporting (e.g. BURs, National Communications) Align analytical tools for SLCP and climate planning through capacity building and further development of LEAP-IBC for Nigeria Align M&E processes for SLCP Planning with M&E for climate planning 	Climate Change Division, Ministry of Environment
Resource Mobilization	 Work with MDAs towards capturing SLCP activities in their budget proposals for subsequent inclusion by the Ministry of Budget and National Planning Liaise with the Ministry of Budget and National Planning on budgetary inclusion of SLCP activities from MDAs Prepare and submit funding proposals to external donors Prepare and submit proposals and grant applications to external donors. 	 Climate Change Division, Ministry of Environment Ministry of Budget and National Planning Sectoral MDAs

	 Prepare and submit proposals and grant applications to local supporters. 	
Monitoring and Evaluation	 Implement monitoring and evaluation plan for National SLCP Plan Institute biannual reporting and collation of SLCP Implementation activities from implementing MDAs at the SLCP Coordination Office Hold annual stakeholder meetings to report on progress Produce an annual report on National SLCP Plan implementation Ensure that implementation of National SLCP Plan abatement measures are included in MDA's annual progress reports Update National SLCP Action Plan in response to M&E results as context and priorities in Nigeria change 	 Climate Change Division, Ministry of Environment Sectoral MDAs
Communication (Raising Awareness)	 Coordinate capacity building in the health sector to communicate air pollution/SLCP health impacts 	 Climate Change Division, Ministry of Environment Federal Ministry of Health Federal Ministry of Women Affairs & Social Development
	KEY STAKEHOLDERS	
 SLCP Unit, Climate Change Divis Climate and Clean Air Coalition 	sion, Federal Ministry of Environment	
	tion Prevention and Environmental Protection Associa	tions (IUAPPA)
SNAP office		
• STAKEHOLDER MDAs		



Federal Ministry of Budget and National Planning; Federal Ministry of Petroleum Resources; Federal Ministry of Agriculture an d Rural Development; Federal Ministry of Health; Federal Ministry of Science and Technology; Federal Ministry of Power, Works & Housing; Federal Ministry of Environment; Federal Ministry of Transport; Federal Ministry of Women Affairs and Social Development; Abuja Environmental Protection Board; Department of Petroleum Resources; Energy Commission of Nigeria, Sule Lamido University, Nigerian Environmental Society, National Environmental Standards and Regulations Enforcement Agency; National Agency for Food and Drug Administration and Control; Department of Climate Change; FCTA Forestry, Redd+/Forestry; Nigerian Meteorology Agency, New Economic Partnership for African Development, Federal Road Safety Corps, Lagos State; Katsina State, National Primary Health Care Development Agency; Bayero University Kano.

NGOS, CSOS, DEVELOPMENT PARTNERS AND INTERNATIONAL ORGANIZATIONS

Rural Women Energy Security, Economic Community of West African States Commission, European Union, United Nations Development Programme, World Bank FADAMA III AFI, Schrodinger, Clean Energy, Nigerian Erosion Watershed Management Programme, Lympson Leosentino Limited, World Council for Renewable Energy, Environment Seven, Oyster Consulting, Gas to Health Initiative, Ecobank Plc, First Bank of Nigeria, Standard Microfinance Bank, Yola, Power for All, Heinrich Boell Founda tion, UNEP DTU Partnership, Green Tech, Green Work to Air Coalition, Euphrates Renewable Enterprise, Center for Integrated Development and Research, EOTM Support Foundation, Team Coby Nigeria, Solar Sister, Gas to Health, Tiopra Ventures, RHOGIC Global, Oirulge Magazine, Amazoncorp Nig Ltd, Nigerian Televisio n Authority

RELATED REGULATORY AND POLICY DOCUMENT

- National Determined Contribution, Sustainable Energy for All Action Agenda (SE4ALL-AA),
- National Renewable Energy and Energy Efficiency Policy (NREEEP),
- National Domestic Biogas and Manure Program (NDBMP),
- National Science, Technology and Innovation Roadmap (NSTIR),
- Petroleum Industry Governance Bill, 2017,
- Rural Women Energy Security Initiative (RUWES),
- Sustainable Environmental Management Program (SEMP),
- National Energy Efficiency Action Plan (NEEAP),
- Renewable Energy and Energy Efficiency Agenda and Better Air Quality Agreement.

IMPLEMENTATION STATUS

Transport

- Urban transport Molue banned in CBD and Lagos Island, 820 secured and arrived as at 2020, but there is a gap in funding for the outstanding estimated 4180
- CNG Buses 8 CNG fueling stations already developed in Edo State by NIPCO to serve the state's CNG buses and taxis
- The Nigeria Industrial Standard for Petroleum Products (NISPP) has been implemented for the implementation of low Sulphur

Residential

- Standards Organisation of Nigeria (SON) has approved the Nigeria Industrial Standards (NIS) for biomass type clean cookstoves
- National Clean Cooking Scheme was launched. Funding was approved for 750,000 clean cookstoves and 18,000 wonder bags (the goal is to distribute 20 million clean cookstoves)
- National Training Centres were established to test Cookstoves. However, there are inadequate standards and efficiency testing facilities in Nigeria

Oil and Gas

- National Gas Flare Commercialisation programme has been endorsed by the president and gazette. Funding needs to be secured to finance flare down programmes
- The Petroleum Industry Governance Bill establishes the National Petroleum Regulatory Commission (NPRC) however, the NPRC has not begun executing its activities

Industry

- Inter-Ministerial Committee on Renewable Energy and Energy Efficiency (ICREEE) has been set up.
- The National Energy Efficiency Action Plan has been developed and contains actions to achieve national energy efficiency goal s

Waste Management

- National Policy on the Environment outlines the policy to reduce emissions from solid waste
- Strategy and implementation plan for initial 2016 2020 pilot phase already developed for waste to wealth plan
- There is an availability of Septic sludge collection by private companies for final disposal however, the government needs set up regulation for mandatory septic sludge collection

Agriculture and Livestock

- FMARD conducted field studies in 15 states showing conservation agriculture which avoids crop residue burning with positive outcomes
- FMARD in collaboration with the International Fertilizer Development Centre had performed pilot demonstrations of Urea Deep Placement (UDP) of rice

Energy

- The Rural Electrification Strategic Implementation Plan (RESIP 2015), which outlines the implementation steps needed to achie ve 100% access to electricity by 2040, has been developed and adopted.
- There is a need for improved funding on energy access projects given the high costs of modern energy access infrastructure

Conclusion

Overall, the implementation of this plan (the NAP SLCP) is limited across Nigeria. For example, several attempts and dead lines have been set for the importation of clean petrol and diesel in Nigeria however, the petrol and diesel currently being imported across the country contain sulphur content above 1000 ppm (which is significantly greater than the safe limits). In additi on, through the Bus Rapid Transit (BRT) scheme, the Lagos Government have made attempts to replace the Danfo Yellow Buses with Blue Buses however, it has been one ye ar (February 2021) since the Lagos Government emphasized that Danfo buses will be replaced yet no significant implementation has been discovered. The plan also stipulated the elimination of Gas Flaring by 2020 in Nigeria yet, according to Nigerian National Pe troleum Corporation's monthly oil and gas reports, Nigeria flared 193.1 billion cubic fe et of natural gas into the atmosphere in 2020 (while this is a substantial reduction from the 2019 value of 244.36 billion cubic feet of flared gas, it is a long way off the country's targ et).¹ There is also limited information around the distribution of box-type ingester across waste sites in Nigeria.

¹ https://www.dataphyte.com/latest -reports/climate/nigeria -reduces-gas-flaring-to-lowest-in-5-years-but-still-a-long-way-to-climate-change-commitments/