



Annual ECOWAS-EIS workshop



The Methodology of Data Collection, and the Tools Used in the Elaboration of the National Energy Balance and Indicators in Nigeria

Mohammed Adam Mundu,
Ojo Emmanuel Olukunle,

Energy Commission of Nigeria
Federal Ministry of Power

Mensvic Hotel, Accra, Ghana
29 March - 02 April 2022



Presentation Outline



1

Institutional anchoring of data collection and publication

- Law ? Decree ? Order?
- Institution responsible...
- Institutions involved...

2

Methodology of data collection

- Brief description of the data collection process
- Tools used for data collection
- Description of the main actors

3

Data collected

- Type of data collected and level of dissemination (energy, socio-eco, demo...)
- Survey data ?(date of survey)/ estimates
- Statistical quality assurance process and validation mechanisms...
- Limitations / constraints identified

4

Tools used in the development of the national energy balance and indicators from statistics

- Automated (IT system) or manual (computer spreadsheet) tools...?
- Energy demand planning tools...
- LCP selected at national level for biomass and others

5

Tools used in the dissemination of statistics to the public

- Website ?
- Report and periodicity? (latest report available)
- National validation seminar with data providers and other actors?

6

Status on energy efficiency

- Domestic (household)
- Industrial
- Services
- Transport
-



Institutional anchoring of data collection and publication

- **Statistics Act Chapter S10 Laws of the Federation of Nigeria**

- Establishes the National Statistical System
- Establishes the National Consultative Committee on Statistics – *with four main element*
 - Producers of statistics – Ministries, Departments, Agencies, States and Local Governments
 - Data users, including key users such as policy and decision makers
 - Data suppliers including households and establishment
 - Research and training institutions including higher education institutions
- Establishes the National Bureau of Statistics (NBS)
 - Operationalize the National Statistical System
 - Coordinate the National Consultative Committee on Statistics
 - Develop and promote use of statistical standards and appropriate methodologies
 - Develop and maintain national databank and encourage the development of sectorial databank.

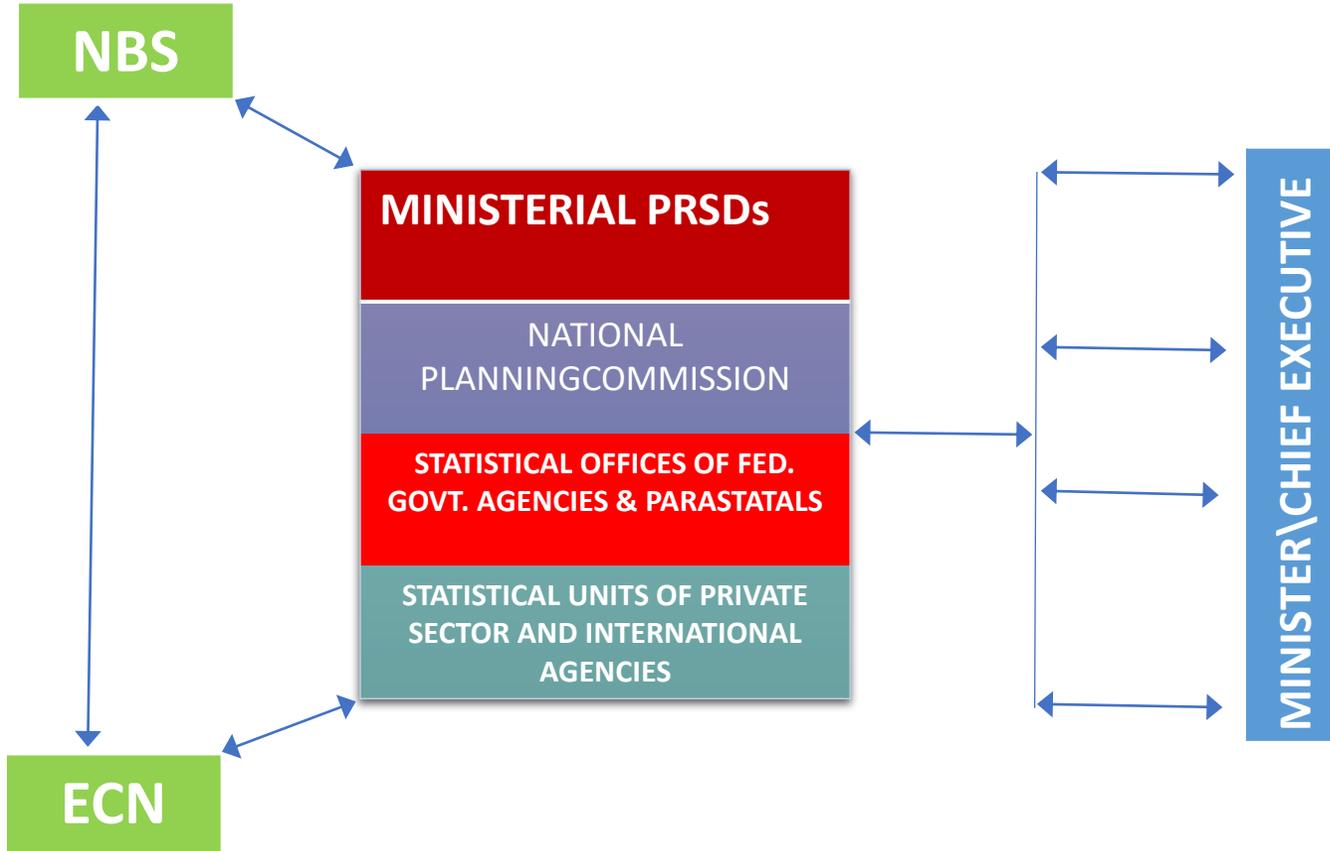


Institutional anchoring of data collection and publication

- **Energy Commission Act Chapter E10 Laws of the Federation of Nigeria**
 - Establishes the Energy Commission of Nigeria (ECN), to amongst other functions
 - Serve as the centre of gathering and dissemination of information relating to national policy in the field of energy development
 - Collates, analyse and publish information relating to the field of energy from all sources.



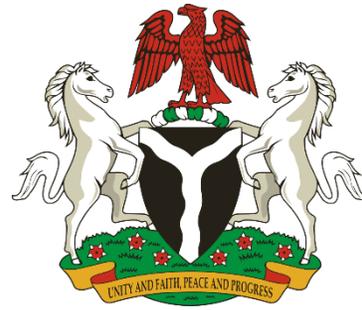
Institutional anchoring of data collection and publication



Energy Data and Information Management Model at the Federal Level



Methodology of data collection



- **National Statistical System**

- System of Administrative Statistics

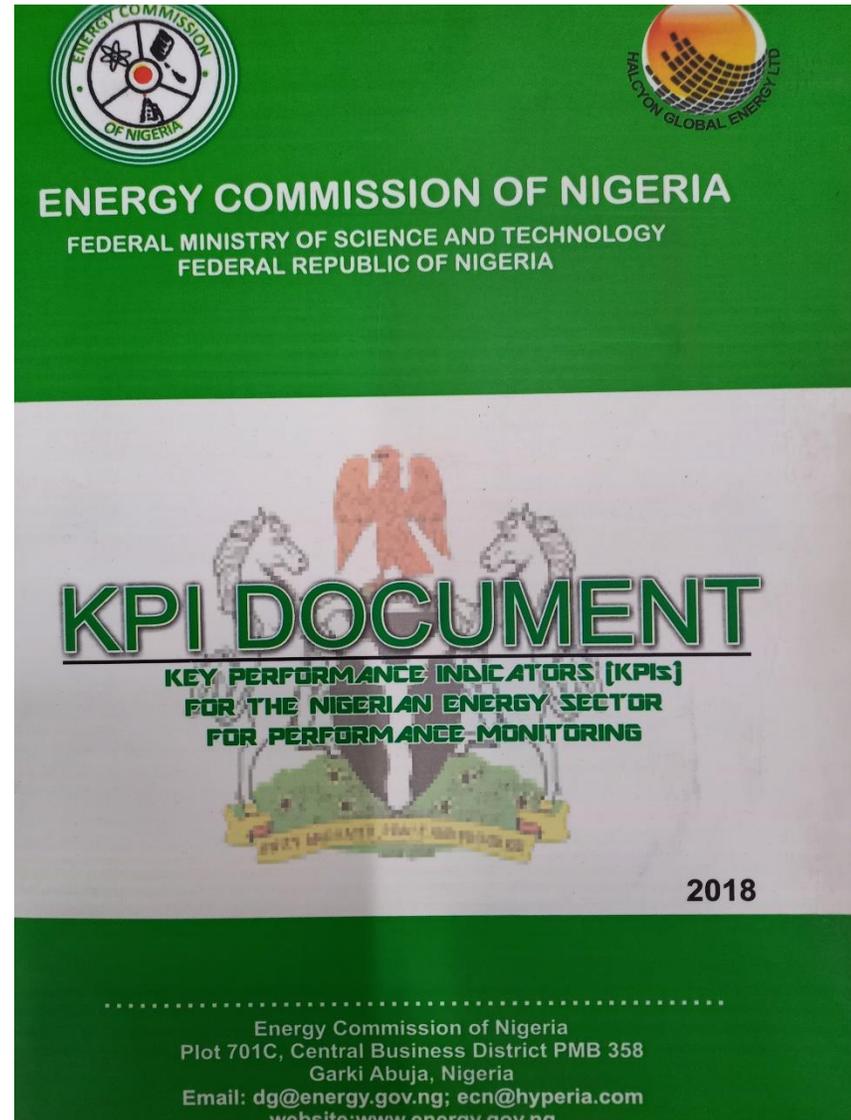
- is **the data that organizations collect about their operations**. It includes data for routine operations, such as production and disposition of energy commodities

- National Survey of Household

- National Survey of Establishment

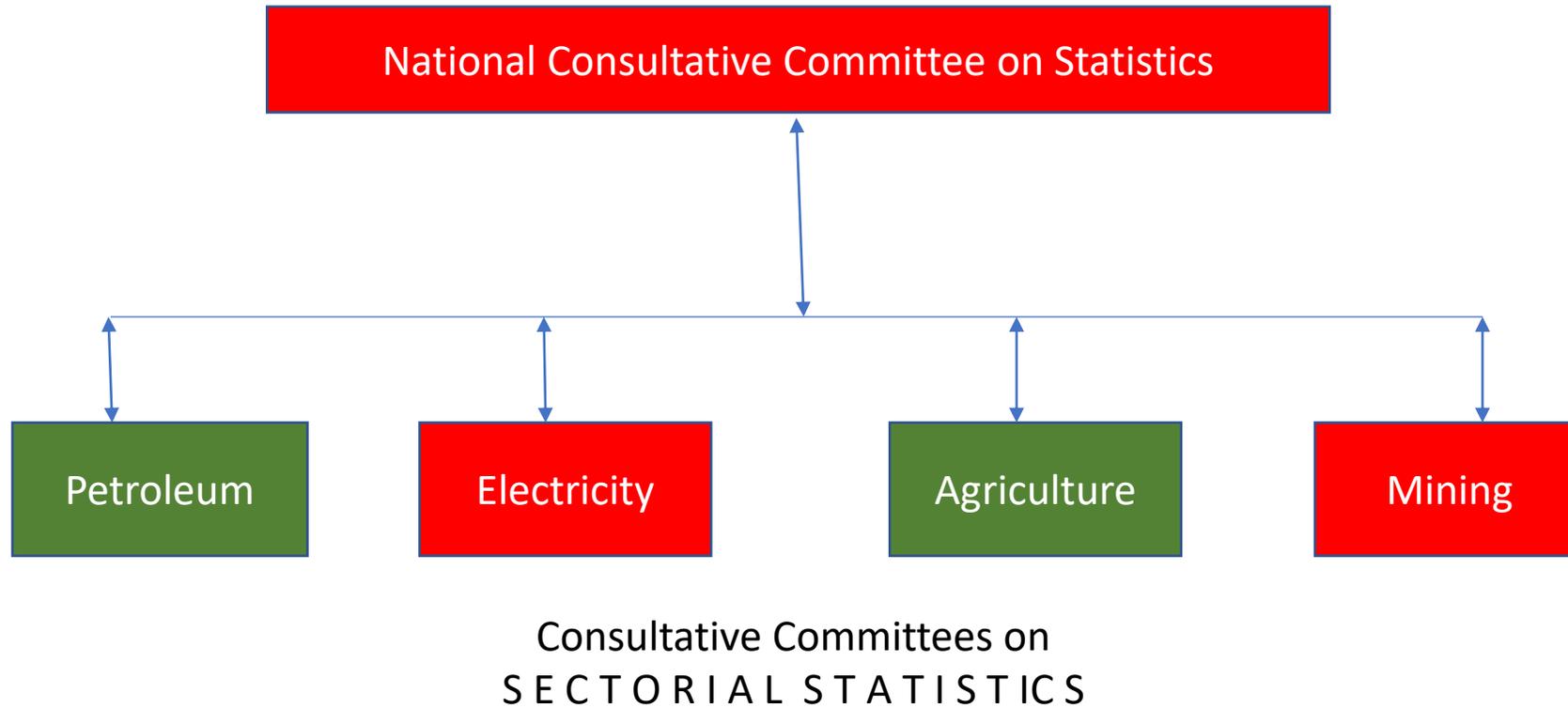


Methodology of data collection





Methodology of data collection





Methodology of data collection

Consultative Committee on Petroleum Statistics



Ministry of Petroleum Resources

Nigeria Upstream Petroleum Regulatory Commission

Nigeria Midstream Downstream Petroleum Regulatory Authority

Nigeria National Petroleum Corporation

Petroleum Technology Development Fund

Nigerian Nuclear Regulatory Authority

Nigeria Customs Services

Ministry of Trade and Industry

Central Bank of Nigeria

Energy Commission of Nigeria

National Bureau of Statistics



Methodology of data collection



Consultative Committee on Petroleum Statistics

Meet quarterly hosted by members on rotational basis

Held its 49th Meeting on 29th – 30th March 2022
harmonize and validate 2021 data

The Committee uses the OPEC platform for its statistical activities



Methodology of data collection

Consultative Committee on Petroleum Statistics



OPEC Annual Questionnaire 2021

[Filling instructions](#)

[General Notes](#)

[Geographical coverage](#)

Section I - Oil balance

[Definitions](#)

[Table 1 Balance](#)

[Table 1.1 Crude](#)

[Table 1.2 NGL](#)

[Table 1.3 Other primary oil](#)

[Table 1.4 Products](#)

[Table 1.5 Imports by origin](#)

[Table 1.6 Exports by destination](#)

Section II - Oil infrastructure

[Definitions](#)

[Table 2.1 Upstream](#)

[Table 2.2 Future upstream projects](#)

[Table 2.3 Refining](#)

[Table 2.4 Refinery and Petrochemical expansions](#)

Section III - Natural gas

[Definitions](#)

[Table 3 Balance](#)

[Table 3.1 Trade](#)

[Table 3.2 Upstream](#)

Section IV - Others

[Definitions](#)

[Table 4.1 Conversion factors](#)

[Table 4.2 Energy balance](#)

[Table 4.3 Macroeconomics](#)

[Table 4.4 Gas Flaring](#)



Data collected



Oil Balance

	B	C	D	E	F	G	H	I	J	K	L	M	N	O
3	Table 1 Oil balance													
4			unit 1,000 b/d											
5			Crude oil	Condensate blended into Crude oil	NGL	Other primary	Total							
6	+	Production	1,323.40	80.70	326.83	19.21	1,750.15							
7	+	From other sources				0.00	0.00							
8	+	Imports	0.00	0.00	0.00	0.00	0.00							
9	-	Exports	1,228.35	63.10	300.88	17.66	1,609.99							
10	+	Products transferred /Backflows				0.00	0.00							
11	-	Direct use	0.00	0.00	0.00	0.15	0.15							
12	-	Stock change (1,000 b)	10.98	0.00	-3.98	0.42	7.42							
13	-	Refinery intake	4.51	0.00	0.00	0.00	4.51							
14	=	Statistical difference	90.52	17.60	25.96	1.40	135.48							
15		Closing stocks (1,000 b)	661.06	0.00	190.04	16.58	867.68							
16		Memo: Refinery losses	0.02	0.00	0.00	0.00	0.02							
17														
18			Ethane	LPG	Naphtha	Gasoline	Kerosene	Of which Jet fuel	Gas/diesel oil	of which Automotive diesel	Fuel oil	Lubes	Bitumen	Other products
19	+	Gross refinery output	0.00	0.00	1.08	0.00	0.42	0.00	1.54	1.36	1.51	0.00	0.00	0.00
20	+	Receipts	0.00	12.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	+	Imports	0.00	0.00	0.00	140,978.83	6,374.62	6,218.63	28,370.81	0.00	182.87	1,534.26	701.16	0.00
22	-	Exports	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	-	Products transferred	0.00	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	+	Interproduct transfers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	-	Stock change (1,000 b)	0.00	-86.60	0.00	638.50	-582.25	-541.18	-291.08	0.00	-6.21	-166.77	-20.50	0.00
26	-	Demand	0.00	0.00	0.00	35,522.08	1,527.88	1,498.49	7,348.45	0.00	48.17	216.39	149.98	0.00
27	=	Statistical difference	0.00	13.22	0.62	105,455.00	4,848.76	4,721.63	21,024.70	1.36	136.23	1,318.33	551.23	0.00
28		Closing stocks (1,000 b)	0.00	7.70	0.00	5,308.79	663.70	582.76	1,903.15	0.00	115.07	349.76	141.69	0.00
29														



Data collected



Natural Gas Balance

	B	C	D	E	F
2	Table 3 Natural gas - balance			<u>Definitions</u>	
3				<u>Menu</u>	
4					
5	Balance (million standard cubic meters)				
6	Production				
7			+ Production (gross)	77,595.42	
8			- Re-injection	14,699.51	
9			- Flared	7,162.91	
10			- Shrinkage	359.98	
11			- Own use	6,800.70	
12			= Marketed production	48,572.31	
13	Balance				
14			+ Marketed production	48,572.31	
15			+ From other sources		
16			+ Imports	0.00	
17			- Exports	38,464.21	
18			- Demand	10,108.10	
19			- Stock change		
20			= Statistical difference	0.00	
21	Closing stocks				
22			Memo: Household consumption		
23			Memo: Power generation		
24			Memo: Deliveries to PetChem		
25	Representative domestic prices				
26			Retail prices (incl. taxes, NC/MWh, 2021)		
27			Total taxes (NC/MWh, 2021)		
28					
31					
32	Marketed Production		OK		
33	Statistical difference		OK		
34	Statistical difference/Demand		OK		
35					



Data collected



Natural Gas Trade

Table 3.1 Natural gas - trade by origin/destination				Exports		Imports	
				via Pipeline	as LNG	via Pipeline	as LNG
				(mscm)	(mscm natural gas)	(mscm)	(mscm natural gas)
Total				3.55	38,464.21	0.00	0.00
Regions							
	Africa			3,545.05	466,885.92	0.00	0.00
	Asia and Pacific			0.00	13,797,541.65	0.00	0.00
	Europe			0.00	21,263,490.42	0.00	0.00
	FSU			0.00	0.00	0.00	0.00
	Middle East			0.00	2,628,172.21	0.00	0.00
	North America			0.00	0.00	0.00	0.00
	Latin America			0.00	308,123.47	0.00	0.00
	Non-specified/Other			0.00	0.00	0.00	0.00
Countries							
	Albania						
	Algeria						
	Angola						
	Antigua and Barbuda						
	Argentina						
	Armenia						
	Aruba						
	Australia						
	Austria						
	Azerbaijan						
	Bahamas						



Data collected



Provisional Energy Balance 2021

		Total	Coal and Coal products	Primary oil	Petroleum products	Natural gas	Electricity	of which Nuclear	of which Hydro	of which Geothermal	Solar
Table 4.2 Energy balance											
Primary flows											
	Production	0.00					0.00				
	Imports	0.00									
	Exports	151.44				69.58	81.86		12.28		
	Stock changes	0.00									
	Total primary energy supply	-69.58	0.00	0.00	0.00	-69.58					
Transformation											
	Electricity and heat generation	5,257.88				2,415.78	2,842.10		426.31		
	Oil refineries	0.00									
	Other transformation	0.00									
	Total transformation	5,257.88	0.00	0.00	0.00	2,415.78	2,842.10				
Energy industry Own use and Losses											
	Own Use	117.04				53.78	63.27		9.49		
	Losses	1,520.13				698.44	821.69		123.25		
Final consumption											
	International bunkers	0.00									
	Industry sector	0.00									
	Transport sector	0.00									
	Other sectors	0.00									
	Non-energy use	0.00									
	Total final consumption	0.00	0.00	0.00	0.00	0.00	0.00				



Data collected



Macroeconomics Data

	B	C	D	E	F	G	H	I	J	K	L
2	Table 4.3 Macroeconomics										
3											
4				2021	2020	2019	2018	2017	2016	2015	
8			Consumer price index**	385.93	329.98	291.39	230.21	207.42	179.59	173.12	
9			Exchange rate national currency (US\$)	403.43	358.56	306.92	306.08	305.79	253.49	193.28	
10			Current account balance (Mill. US\$)	N/A	N/A	N/A	5,334.44	10,399.24	2,722.34	-15,438.64	
11			Government revenue (Mill. US\$)	N/A	N/A	N/A	13,634.02	9,304.98	10,441.70	17,416.40	22,
12			Government expenditure (Mill. US\$)	N/A	N/A	N/A	25,451.93	21,100.32	19,208.39	25,324.18	27,
13			Population (Thousands)	218,402	213,402	208,282	202,988	197,697	192,414.23	187,146.21	181,
14	Petroleum and Natural gas exports (Mill. US\$)										
15			Crude oil exports	39,025.08	26,696.52	43,391.27	53,750.84	37,370.88	26,324.81	39,815.57	74,
16			NGL exports	1,822.73	631.31	1,310.56	573.90	270.35	963.38	1,352.52	
17			Other primary oil exports	443.85	402.12	404.41	36.77	36.56	N/A	N/A	
18			Petroleum product exports	86.18	0.00	21.83	151.50	305.00	6.35	0.15	
19			Total oil exports	41,377.84	27,729.95	45,106.23	54,513.02	37,982.79	27,294.54	41,168.24	75,
20			Total natural gas exports		4,096.61	5,889.84	6,180.03	5,229.66	4,010.12	5,930.74	8,
21	Nominal GDP (Mill. US\$)										
22			Household consumption	271,258.78	296,985.07	347,005.61	321,458.68	299,551.81	328,287.05	386,930.92	407,
23			Government consumption	22,318.71	37,460.26	27,940.03	23,635.82	16,545.26	21,787.45	29,226.90	36,
24			Investment	147,671.37	6,718.71	7,849.19	7,870.72	7,878.19	9,503.53	76,278.94	89,
25			Exports	46,867.94	37,984.41	67,480.89	65,356.91	49,491.55	37,301.00	52,524.81	104,
26			Imports	51,667.26	71,284.83	93,968.62	73,851.03	49,508.36	46,552.49	52,524.97	70,
27			Memo: oil & natural gas sector		N/A	N/B					
28	Real GDP (Mill. US\$)*										
29			Household consumption	131,787.18	119,383.19	136,479.79	140,217.86	134,138.08	162,541.17	227,349.55	273,
30			Government consumption	10,885.33	18,565.30	14,194.95	12,373.44	9,300.67	12,193.60	18,840.22	26,
31			Investment	26,552.71	33,315.79	38,830.12	29,472.40	31,497.74	35,586.56	56,652.41	70,
32			Exports	25,477.28	46,259.48	73,994.37	64,533.14	65,518.58	72,683.37	85,470.64	104,
33			Imports	12,803.95	20,101.92	30,616.39	24,124.64	16,188.83	18,642.89	27,277.05	44,
34			Memo: oil & natural gas sector		N/B						
35	Base year for CPI and RGDP										
36			*Please indicate base year (GDP)	2010							



Data collected



2021 Petroleum Data Harmonization and Validation Session, 29th - 30th March 2022





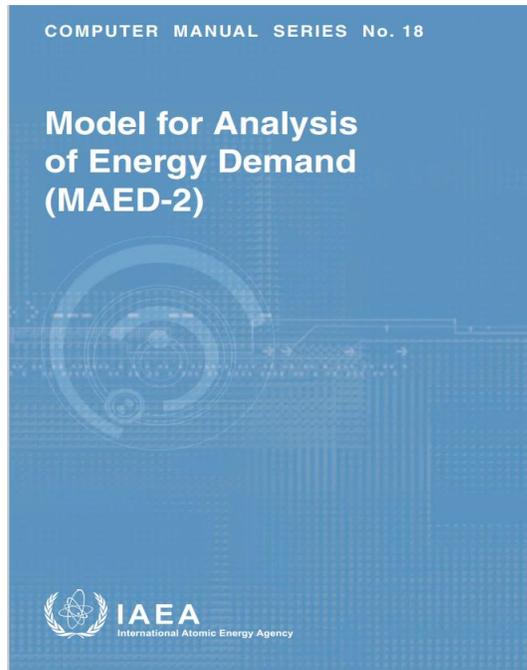
Tools used in the development of the national energy balance and indicators from statistics



Manual System – Computer Spreadsheet

- Migrating to automated system

Model for Analysis of Energy Demand **MAED**



MAED evaluates future energy demands based on medium to long term scenarios of socioeconomic, technological and demographic development. Energy demand is disaggregated into a large number of end-use categories corresponding to different goods and services. The influences of social, economic and technological driving factors from a given scenario are estimated. These are combined to give an overall picture of future energy demand growth



Tools used in the dissemination of statistics to the Public



National Energy Information System

The screenshot shows the Nigeria National Energy Databank website. The page includes a navigation menu on the left with options like Energy Policy, Energy Laws, Petroleum Statistics, Electricity Statistics, Biomass Statistics, Coal Statistics, Balances, and EnerGIS. The main content area displays several key energy indicators:

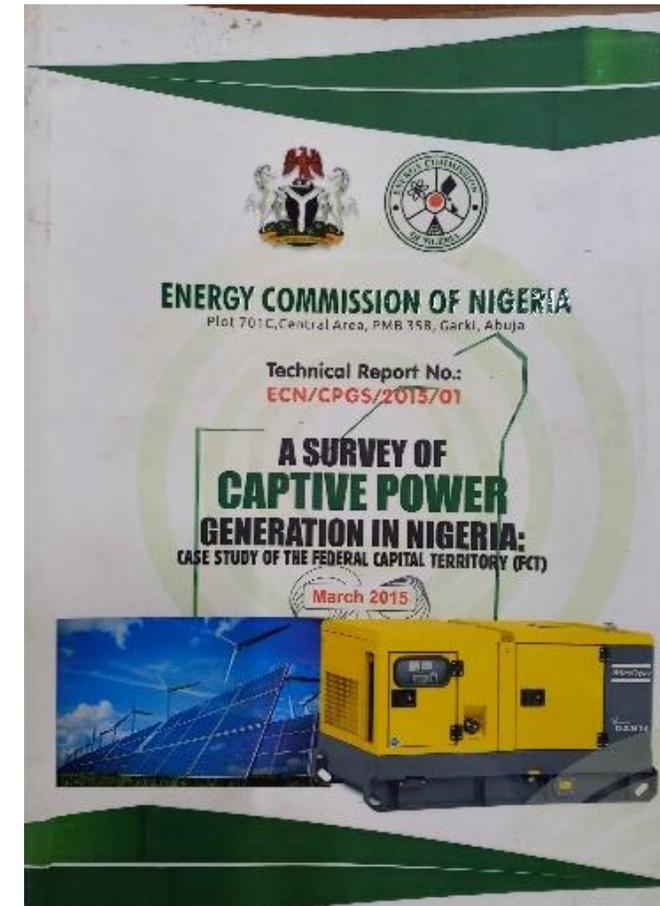
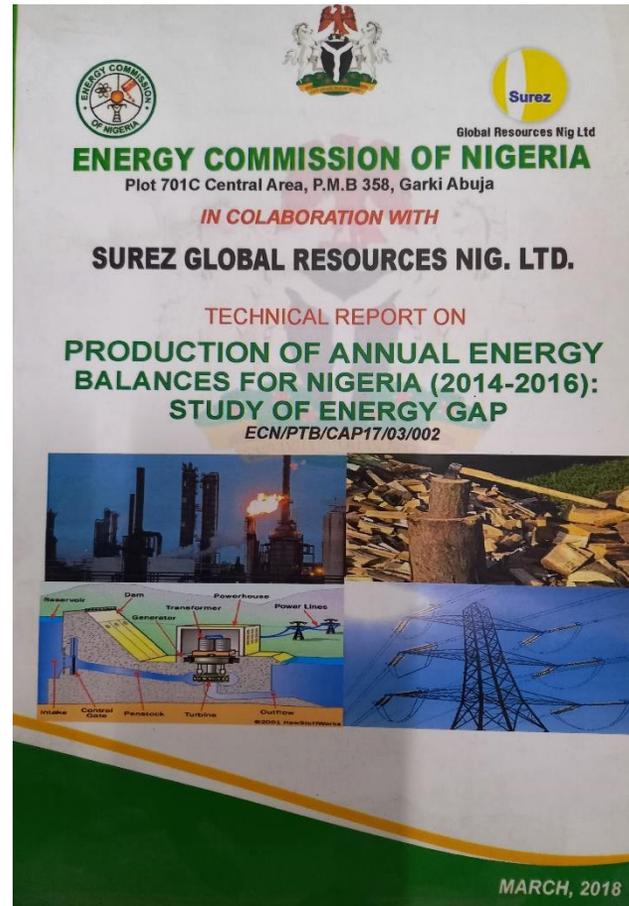
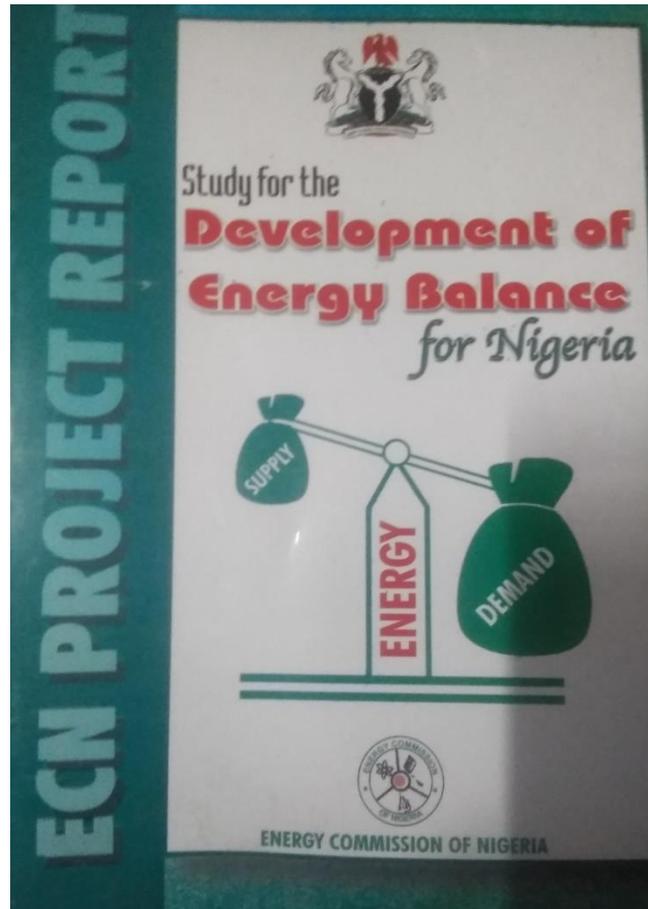
- Pump Price:** N165/Liter
- Crude Oil Price:** \$123.70/Barrel
- Electricity Supply:** 5500MW
- Exchange Rate:** N415.825 to \$1

Below these indicators, there is an 'Annual Recap Report' section. It features a bar chart titled 'Crude Oil Produced and Exported Chart (million barrels)' and a table titled 'Crude Oil Prices'.

Crude Oil Price Year	Price
Crude Oil Price 1961	\$2.94/\$3.09
Crude Oil Price 1970	\$9/\$12.64
Crude Oil Price 1980	\$12.58/\$15.86
Crude Oil Price 1990	\$10.87/\$15.56



Tools used in the dissemination of statistics to the Public





Tools used in the dissemination of statistics to the Public



ENERGY COMMISSION OF NIGERIA

Plot 701C Central Area P.M.B 358, Garki - Abuja. Tel: +234-805 112 8884

Fax: 234-9-6703 292. 6719403. Email: dg@energy.gov.ng

Welcome you to

STAKEHOLDERS' VALIDATION WORKSHOP

FOR

NIGERIA ENERGY BALANCE, 2019

In Collaboration with



PEAKGATE LIMITED

RC: 1187378

DATE: THURSDAY 9TH, DECEMBER 2021
VENUE: ROCKVIEW HOTEL CLASSIC,
ADEMOLA ADETOKUNBO STREET, WUSE ZONE II, ABUJA.
TIME: 10AM

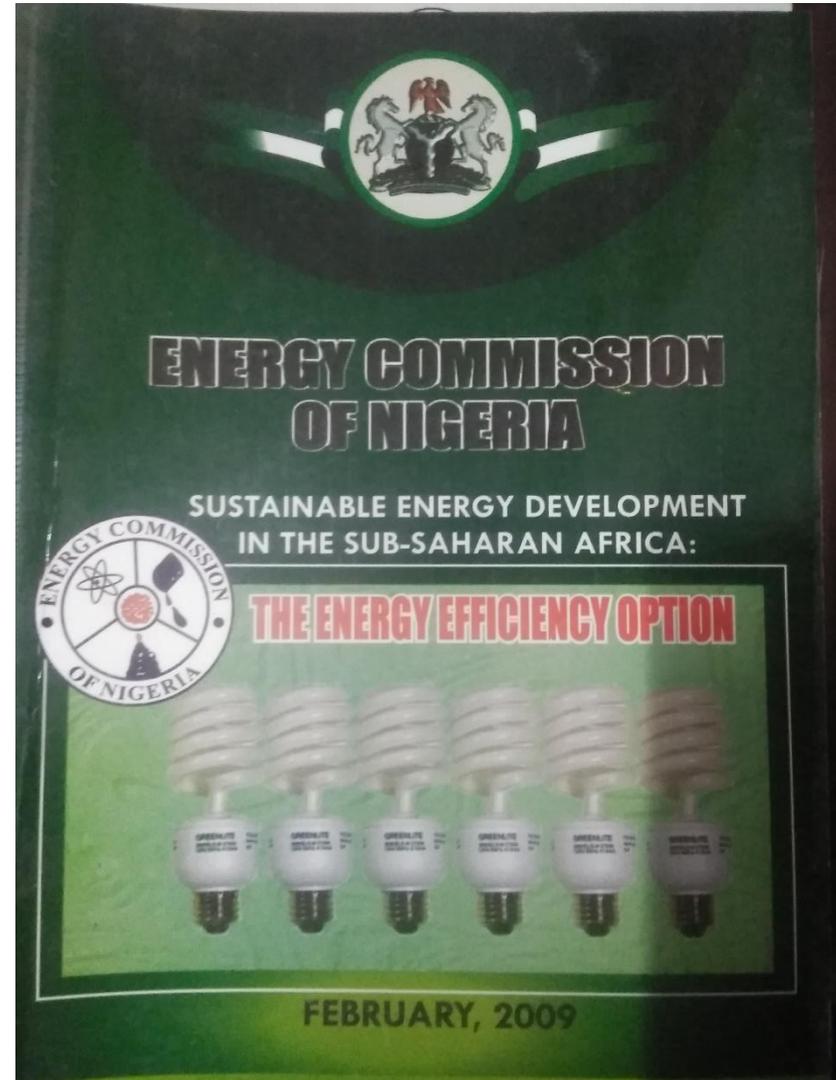
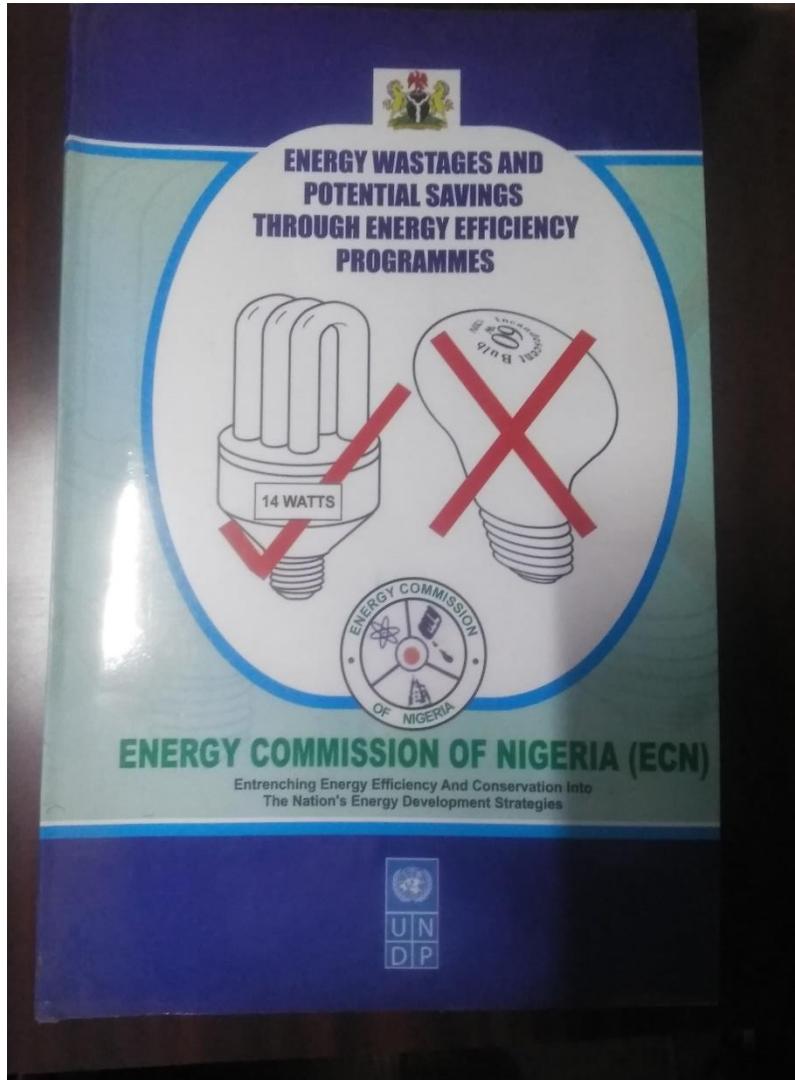


Status on energy efficiency





Status on energy efficiency





Limitations/Constraints



Human Capacity

Biomass Statistics

Energy Consumption Statistics

-Residential

-Industry

-Services

- Transport



**NAGODE
MEDASE**