



Overview of the National Energy Policy & Energy Demand and Supply Projection Studies for Nigeria

By

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OUTLINE

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1. Introduction

- ❖ The essence of humanity is to:-
 - attain high standard of living (Socio-economic development)
 - worship Almighty God (Spiritual development)
- ❖ Energy has, time immemorial, been found to be essential in enhancing the attainment of these human desires.
- ❖ Modern governments worldwide, developed policies to guide and enhance efficient energy development for providing relevant final energies of electricity, fuel and process heat for driving development in their nations.
- ❖ In 2003, the Federal Executive Council of the Federal Republic of Nigeria, approved a National Energy Policy for Nigeria. The national energy policy serves as an umbrella policy that gives government's overall energy policy direction, drawn from all energy sub-sectoral policies.
- ❖ The National Energy Policy has the following objectives:-
 - To ensure the development of the nation's energy resources, with diversified energy resources option, for the achievement of national energy security and an efficient energy delivery system with an optimal energy resource mix.
 - To guarantee increased contribution of energy productive activities to national income.
 - To guarantee adequate, reliable and sustainable supply of energy at appropriate costs and in an environmentally friendly manner, to the various sectors of the economy, for national development.

1. Introduction Cont'd...

- To guarantee an efficient and cost effective consumption pattern of energy resources.
 - To accelerate the process of acquisition and diffusion of technology and managerial expertise in the energy sector and indigenous participation in energy sector industries, for stability and self-reliance.
 - To promote increased investments and development of the energy sector industries with private sector leadership.
 - To ensure a comprehensive, integrated and well-informed energy sector plans and programmes for effective development.
 - To foster international co-operation in energy trade and projects development in both the African region and the world at large.
 - To successfully use the nation's abundant energy resources to promote international co-operation.
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- ❖ The National Energy Policy is a document often sought after by investors and researchers.
 - ❖ This paper presents an overview of the National Energy Policy (NEP) as well as areas under review in view of developments since the last approval. An overview of the long term energy demand and supply studies is also provided as a planning instrument.
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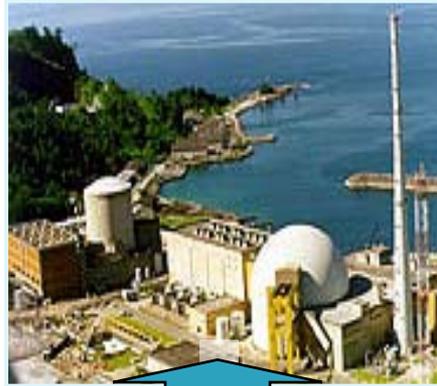
1. Introduction Cont'd....

Hydropower Potential



SHP: 3,500 MW
Large Hydro: 11,500 MW

Uranium ore



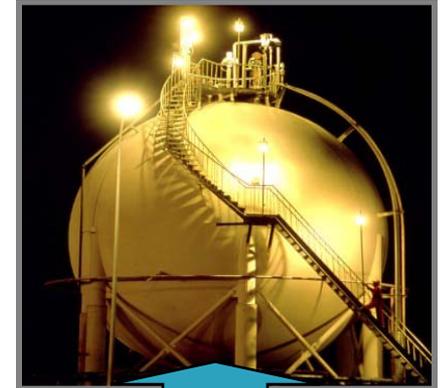
Total reserves:
Not Yet Quantified

Crude oil & Tar sand



Total reserves:
36.22 billion barrels (Crude)
31 billion barrels oil eqv. (Tar sand)

Natural Gas



Total reserves:
187 Trillion SCF

Coal



Total reserves:
2.175 billion tonnes

Wind



(2-4) m/s at 10m height
(main land)

Biomass



Excess of 1.2m
Tonnes/day

Solar



3.5-7.0 kWh/m²/day

2. The Development of the National Energy Policy

- ❖ September 1978: An Energy Policy Conference was held in Jos, Plateau State - Communique of the Conference recommended production of a National Energy Policy
- ❖ 1984: Federal Ministry of Science and Technology (FMST) produced a draft Energy Policy Guidelines.
- ❖ 1993: ECN produced a draft National Energy Policy
- ❖ 1996: Inter-Ministerial Technical Committee under the Chairmanship of the FMST was set up to review the draft national energy policy.
- ❖ 2001: Another Inter-Ministerial committee under the Office of the Secretary to the Government of the Federation was set up to review the 1996 document.

2. The Development of the National Energy Policy Cont'd

- ❖ April 2003: The Federal Executive Council (FEC) approved the draft National Energy Policy.
- ❖ 20th June 2005: The National Energy Policy (NEP) was launched by President Olusegun Obasanjo in the State House.
- ❖ 5th July 2005: The National Energy Policy was presented to the public by the Hon. Minister of Science and Technology, Prof. T. Isoun supported by the then Minister of Petroleum, Dr. Dakouro
- ❖ In drafting the National Energy Policy, under the arrow head of the Energy Commission of Nigeria, resource persons and experts from the following took part:-
 - Policy and planning agencies;
 - Energy producers and marketers;
 - Promoters of sustainable energy systems;
 - Energy consumers;
 - Academia.
 - Energy regulators
 - Non - governmental organizations
 - Development partners
 - The banking sector
 - Women organizations
 - The organized private sector
 - Private energy consultants

3. The Structure and Content of the National Energy Policy

- ❖ The NEP contains six chapters beginning with Introduction.
- ❖ The other chapters are titled:
 - Energy Sources: Oil and Gas and Other Conventional (Coal & Tar Sands) Energy Sources; Nuclear Energy; New and Renewable Energy Sources;
 - Energy Utilization: Electricity, Industry, Agriculture and Transport.
 - Energy Issues: Environment, Energy Efficiency and Conservation, Research, Development and Training, Energy Manpower Development; Bilateral, Regional and International Cooperation, Energy Databank.
 - Energy Financing: Indigenous participation. Financing.
 - Planning and Policy Implementation: Energy Planning, Policy Implementation, prioritization of Strategies into Short, Medium and Long term, Monitoring and Evaluation.
- ❖ the structure of the policy is such that each item is supported by a policy statement, objectives of the policy and strategies for attaining the policy objectives.

4. Key Provisions of NEP

Crude Oil - Policy Statements

- i. The nation shall engage intensively in crude oil exploration and development with a view to increasing the reserve base to the highest level possible.
- ii. Emphasis shall be placed on internal self-sufficiency in, and export of, petroleum products.
- iii. The nation shall encourage indigenous and foreign companies to fully participate in both upstream and downstream activities of the oil industry.
- iv. The nation shall encourage the adoption of environmentally friendly oil exploration and exploitation methods.
- v. The nation shall progressively deregulate and privatize the oil industry.

4. Key Provisions of NEP, Contd..

Crude Oil – Objectives of the Policy Statements

- i. To increase the reserve to production ratio.
- ii. To ensure that refining to consumption ratio is greater than unity, so as to ensure domestic self-reliance in the production of petroleum products for domestic consumption.
- iii. To adequately protect the country from the vulnerability of oil price fluctuations.
- iv. To ensure adequate and reliable supply and distribution of petroleum products to meet the demand of the domestic market.
- v. To derive more economic benefits from the nation's crude oil resources.
- vi. To accelerate the process of technology acquisition and diffusion in the oil industry.
- vii. To enhance national indigenous capability and expertise in such a vital industry.
- viii. To improve the efficiency in the management and operation of the oil industry.
- ix. To attract increased private sector capital inflow to the oil industry.

4. Key Provisions of NEP, Contd....

➤ ***Strategies for Implementation***

- i. Investing in and intensifying crude oil exploration and production.
- ii. Maximizing and expanding the refining capacity in the country to cater fully for local consumption and export of petroleum products.
- iii. Expanding and promoting research and development activities in the country.
- iv. Taking appropriate measures to ensure that Nigerians are put into key decision-making positions in the oil industry.
- v. Providing appropriate fiscal incentives to attract investments and ensure reasonable returns.
- vi. Ensuring adequate geographical coverage of oil refining and petroleum products distribution network

4. Key Provisions of NEP, Contd.

- vii. Ensuring the availability of adequate strategic reserves of storage capacity for refined products for at least 90 days of forward consumption
- viii. Encouraging local engineering design and fabrication of equipment and spares in Nigeria.
- ix. Ensuring the use of locally available materials, such as bentonite and barytes, for oil exploration.
- x. Emphasizing the processing of crude oil for export to withstand the adverse effect of crude oil price fluctuations.
- xi. Reviewing existing laws and regulations to create the enabling environment for increased private sector participation in the oil industry, especially in the downstream sub-sector.
- xii. Improving the living standards of people in oil producing communities through the provision of socio-economic infrastructure.

4. Key Provisions of NEP, Contd.

Natural Gas – Policy

- ❖ i. The nation's gas resources shall be harnessed and optimally integrated into the national economy, energy mix and industrial processes.
- ❖ ii. The nation shall engage intensively in gas exploration and development with a view to increasing the reserve base to the highest level possible.
- ❖ iii. The nation shall put in place necessary infrastructure and incentives to encourage indigenous and foreign companies to invest in the industry.
- ❖ iv. The nation shall put in place necessary infrastructure and incentives to ensure adequate geographical coverage of the gas transmission and distribution network.

4. Key Provisions of NEP, Contd

Natural Gas – Objectives of the Policy Statements

- i. To eliminate the flaring of associated gas **by 2008/2015**.
- ▶ ii. To expand the utilization of natural gas as industrial and domestic fuel, as well as for power generation.
- ▶ iii. To increase the use of natural gas as industrial feedstock for petrochemical, pharmaceutical and fertilizer plants, etc.
- ▶ iv. To use gas to diversify the foreign exchange earning base of the nation.
- v. To accelerate the process of technology acquisition and diffusion in the gas industry.
- ▶ vi. To encourage indigenous entrepreneurial capability in the gas industry including the development of end-use devices.
- ▶ vii. To determine the level of gas reserves available to the nation.

4. Key Provisions of NEMP, Contd.

Natural Gas – Strategies for Implementation

- i. Encouraging the oil-producing companies to gather and utilize associated gas in order to eliminate flaring by 2008.
- ii. Imposing appropriate and effective penalties to discourage gas flaring.
- iii. Encouraging the establishment of the necessary infrastructure for the effective gathering, transmission and distribution of gas nationwide.
- iv. Providing incentives to encourage industrial and domestic consumers to use gas or to convert to gas.
- v. Providing incentives to encourage the introduction and use of LPG appliances in areas not accessible to natural gas so as to encourage the consumer preference for gas.
- vi. Establishing suitable infrastructure for the export of natural gas.
- vii. Expanding and promoting gas related R & D outfits in the country.

4. Key Provisions of NEP, Contd...

- viii. Formulating suitable urban and regional planning regulations needed for the effective distribution of natural gas to, and its utilization by, domestic and industrial consumers.
- ix. Providing necessary incentives to indigenous and foreign entrepreneurs to facilitate their participation in the gas industry.
- x. Ensuring that the price of natural gas is cost-effective, while giving due attention to the effect on local consumption.
- xi. Embarking on deliberate exploration for gas deposits in all parts of the country.

4. Key Provisions of NEP, Contd...

❖ **Coal**

❖ **Policies**

- The nation shall pursue vigorously a comprehensive programme of resuscitation of the coal industry.
- Extensive exploration activities to maintain a high level of coal reserves shall be carried out.
- Private sector as well as indigenous participation in the coal industry shall be actively promoted.
- The exploitation and utilization of the coal reserves shall be done in an environmentally acceptable manner.

❖ **Objectives**

- To promote production of coal for export.
- To promote effective utilization of coal for complementing the nation's energy needs and as industrial feedstock.
- To attract increased investment into, and promote indigenous participation in, the coal industry.
- To utilize coal in meeting the critical national need of providing a viable alternative to fuelwood in order to conserve our forests.
- To minimize environmental pollution arising from the utilization of coal.

4. Key Provisions of NEP, Contd...

❖ Strategies

- Intensifying the drive for coal exploration and production activities.
- Providing adequate incentives to indigenous and foreign entrepreneurs so as to attract investments in coal exploration and production.
- Providing adequate incentives for the large scale production of coal stoves at affordable prices.
- Providing adequate incentives to indigenous and foreign entrepreneurs for the establishment of coal-based industries.
- Developing adequate infrastructure for handling and transportation of coal within and out of the country.
- Organizing awareness programmes for the use of smokeless coal briquettes as an alternative to fuelwood.
- Encouraging R & D in the production, processing and utilization of coal.
- Introducing clean coal technologies into coal utilization.
- Re-introducing the use of coal for power generation.

4. Key Provisions of NEP, Contd...

❖ **Nuclear**

❖ **Policy**

- The nation shall pursue the exploitation of nuclear energy for peaceful purposes.

❖ **Objectives**

- To pursue the introduction of nuclear power into the generation of electricity, in the long term.
- To apply nuclear science and technology in industry, agriculture, medicine and water resources management.
- To pursue the exploration of nuclear mineral resources in the country.
- To institute nuclear safety and environmental protection measures.
- To promote the development of nuclear science and technology.

❖ **Strategies**

- Intensifying manpower development in the utilization of nuclear energy for peaceful purposes.
- Providing adequate resources to the Nigerian Nuclear Regulatory Authority (NNRA) for the enforcement of nuclear laws and regulations.
- Intensifying research and development efforts in nuclear science and technology.
- Developing an appropriate institutional framework and infrastructure for the development of nuclear science and technology in the country.
- Creating incentives for career development in nuclear science and technology.
- Commissioning the nuclear research reactor.
- Completing all the on-going nuclear related projects (e.g. accelerator and industrial irradiator projects).
- Undertaking regular public enlightenment campaigns on applications of nuclear technology, nuclear safety and radiation protection.
- Identifying accurately the availability and the extent of nuclear and other related mineral resources.
- Providing adequate funding for the development of nuclear science and technology.
- Establishing a nuclear radiation surveillance programme for the protection of the environment.
- Fostering co-operation with the International Atomic Energy Agency.

4. Key Provisions of NEP, Contd.

Electricity – Policy Statements

- i. The nation shall make steady and reliable electric power available at all times, at economic rates, for economic, industrial, and social activities of the country.
- ii. The nation shall continue to engage intensively in the development of electric power with a view to making reliable electricity available to 75% of the population by the year 2020.
- iii. The nation shall promote private sector participation in the electricity sub-sector, while ensuring broad-based participation of Nigerians.

4. Key Provisions of NEP, Contd.

Electricity - Objectives of the Policy Statements

- i. To provide electricity to all state capitals, local government headquarters as well as other major towns by the year 2010.
- ii. To stimulate industrialization in the rural areas in order to minimize rural-urban migration.
- iii. To provide reliable and stable power supply to consumers, especially to industries.
- iv. To ensure the removal of bottlenecks militating against the utilization of the full capacity of the electric power plants.
- v. To broaden the energy options for generating electricity.
- vi. To attract adequate investment capital, both foreign and domestic, for the development of the electricity industry.
- vii. To maximize access by Nigerians to the investment opportunities in the electricity industry.

4. Key Provisions of NEP, Contd.

Electricity – Strategies for Implementation

- i. Rehabilitating existing power plants in order to derive optimum power from the installed capacity.
- ii. Completing on-going projects designed to enable the National Electric Power Authority (NEPA) satisfy the national demand.
- iii. Reinforcing the transmission and distribution networks necessary to allow consumers to enjoy steady and reliable supply of electricity
- iv. Establishing basic engineering infrastructure for the local manufacture of electrical equipment, devices and materials.
- v. Encouraging research and development in the generation, transmission and distribution of electricity.

4. Key Provisions of NEP, Contd.

Electricity – Strategies for Implementation

- vi. Reducing high import duties paid on generation, transmission and distribution materials
- vii. Setting up a National Electricity Supply Training Institute and zonal training centres where the core of the middle level manpower and artisans, various cadres of professional technical officers, operators, linesmen and cable joiners are to be trained and groomed in the art of operation and maintenance of equipment for the generation, transmission and distribution of electricity.
- viii. Ensuring the participation and involvement of indigenous engineers and applied research groups in the execution of on-going and future projects right from feasibility studies, with the objective of establishing local capacity in the long term.
- ix. Developing and implementing a programme for the participation of the private sector in the various sectors of the electricity industry.
- x. Developing other potential sites for hydropower, gas and coal-fired power plants for electricity generation.

4. Key Provisions of NEP, Contd.

- xi. Intensifying the national effort in training, research and development with a view to generating electricity using nuclear, solar, wind and other renewable resources in order to conserve our fossil fuels.
- xii. Taking effective measures to ensure the security of electrical installations.
- xiii. Providing appropriate incentives to entrepreneurs to ensure adequate returns on investment.
- xiv. Providing appropriate financing facilities to support indigenous investments in the electricity industry.
- xv. Encouraging off-grid generation and supply of power in remote or isolated areas.
- xvi. Establishing a Rural Electrification Fund to facilitate electrification in the rural areas.
- xvii. Establishing a reduced tariff regime for very low income and especially handicapped electricity consumers and a mechanism for funding the subsidy.

4. Key Provisions of NEP, Contd..

Renewable Energy - Solar Energy

Policies

- The nation shall aggressively pursue the integration of solar energy into the nation's energy mix.
- The nation shall keep abreast of worldwide developments in solar energy technology.

Objectives

- To enhance energy security in the nation through diversifying the energy supply mix;
- To increase energy access especially in the rural and semi-urban areas;
- To facilitate employment creation and empowerment; and
- To protect the environment and mitigate climate change.

4. Key Provisions of NEP, Contd..

Strategies

- Promoting training and manpower development.
 - Intensifying research and development in solar energy technology.

 - Providing adequate incentives to local manufacturers for the production of solar energy systems.
 - Providing adequate incentives to suppliers of solar energy products and services.
 - Introducing measures to support the local solar energy industry.

 - Setting up extension programmes to introduce solar technology into the energy mix.
 - Providing fiscal incentives for the installation of solar energy systems.
 - Setting up and maintaining a comprehensive information system on available solar energy resources and technologies.
- 

4. Key Provisions of NEP, Contd..

❖ **Energy Efficiencies and Conservation:**

❖ **Policies**

- Energy conservation shall be promoted at all levels of exploitation of the nation's energy resources.
- The nation shall promote the development and adoption of energy efficient methods in energy utilization.

❖ **Objectives**

- To ensure the prudent exploitation of the nation's non-renewable energy resources.
- To enhance energy security and self-reliance.
- To reduce the cost of production of energy-dependent goods and services.
- To reduce adverse impacts of energy utilization on the environment.
- To increase the proportion of hydrocarbon resources available for special applications such as industrial feedstock and for export.
- To eliminate avoidable investments in energy supply infrastructure.

❖ **Strategies**

- Ensuring strict adherence to the regulations of the petroleum industry, and relevant agencies on energy resource exploitation and the environment.
- Providing institutional arrangements and incentives for the promotion of energy conservation and the use of energy efficient methods.

4. Key Provisions of NEP, Contd..

❖ Strategies Cont'd...

- Developing building codes so that buildings are designed to take advantage of climatic conditions in order to reduce energy consumption.
 - Ensuring the importation of the more energy- efficient equipment and machinery.
 - Reducing energy consumption by improving and expanding mass transportation and communication systems all over the country.
 - Promoting R & D activities in energy conservation and efficiency including the development and manufacture of energy- efficient equipment and machinery.
 - Encouraging the production and use of improved and more-efficient cooking stoves.
 - Taking appropriate measures to reduce energy storage, transmission and distribution losses.
 - Promoting public awareness about the benefits of improved energy efficiency.
- 

4. Key Provisions of NEP, Contd..

❖ **Bilateral, Regional and International Cooperation**

❖ ***Policies***

- Nigeria's energy resources shall be deployed in promoting and enhancing regional and international co-operation for the overall economic and technological advancement of the nation.
- Nigeria shall lay emphasis on fostering and strengthening energy cooperation and integration within the ECOWAS sub-region.

❖

❖ ***Objectives***

- To enhance Nigeria's effective participation in international energy related organizations.
 - To facilitate the acquisition of technology for the development of the energy sector.
 - To encourage a cooperative approach in the exploitation of energy resources and development of energy supply infrastructure.
 - To optimize the utilization of the region's energy resources.
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4. Key Provisions of NEP, Contd..

❖ **Strategies**

- Working out a co-coordinated approach to regional and sub-regional energy planning based on co-operation and consultation among member countries of ECOWAS and other members of the African Union (AU).
- Facilitating the establishment of mechanisms within the ECOWAS sub-region and other African countries to enhance energy trade and interchange of relevant technology and information.
- Promoting favourable trading relationships with member countries of ECOWAS and the AU which will ease the financing of energy supply and other energy-related projects.
- Working out viable cooperative arrangements to allow for the easy distribution of petroleum and gas within the region.
- Mobilizing domestic capital within the community and creating a favourable investment climate to attract international financing for energy development projects.
- Ensuring Nigeria's active membership in energy related regional and international organizations.
- Pooling available human resources through networking of national energy training and research centers.
- Encouraging the standardization of energy related plants, machineries and spares and the establishment of infrastructural facilities within the community for their production.

4. Key Provisions of NEP, Contd..

❖ ENERGY FINANCING

❖ Policies

- The nation shall explore and adopt all viable financing options from local and international sources for cost effective exploitation of its energy resources.
- Investments in the energy sector shall be accorded high priority within the economic sector.
- Government shall encourage private investments, both domestic and foreign, in the energy sector.

❖ Objectives

- To ensure the availability of adequate funding for the energy sector.
 - To ensure continuity in the funding of projects in the energy sector.
 - To attract foreign investments from a highly competitive international finance market.
 - To ensure that the energy supply options adopted are the most cost-effective for the country.
 - To increase foreign exchange earnings through export of energy products
 - To encourage the local development of energy technology with a view to minimizing the cost input of energy projects.
- 

4. Key Provisions of NEP, Contd..

❖ **Strategies**

- Dedicating a certain percentage of the nation's income from conventional energy sub-sector to support training, research, development and demonstration, and technology acquisition in the energy sector.
 - Providing fiscal incentives for prospective investors in the energy sector.
 - Reviewing the existing laws and regulations for the operation of energy sector industries so as to increase private sector participation in the industries.
 - Ensuring a reasonable return on investments through cost-effective energy pricing.
 - Establishing guaranteed and dependable repayment schemes for loans invested in energy projects.
 - Establishing a favourable investment climate to attract investments in the energy sector.
 - Providing adequate infrastructural facilities to enterprises involved in the development of the energy sector
 - Encouraging the establishment of offshore banking units to attract inflow of offshore investment funds, as well as activities of international investment banking and brokerage firms.
 - Encouraging energy firms to source development funds from the Nigerian capital market.
 - Furthering the internationalization of Nigeria's Capital Market by encouraging the stocks of Nigeria's energy corporate units to be quoted in the international Stock Exchange to attract foreign portfolio investment capital.
 - Expanding the scope of venture capital financing to embrace investments in the energy sector.
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5. Energy Demand and Supply Projection Studies

- ❖ The Energy Commission of Nigeria, in fulfillment of its mandate for strategic planning went into partnership with the IAEA to have a quantitative insight into Nigeria's long term energy demand and supply using MAED and MESSAGE energy planning models of IAEA.
- ❖ Taking into consideration the economic vision, demography, available energy resources and modern developmental path, the models indicated that huge amount of energy in the forms of electricity, fuels and heat would be required to meet this vision.
- ❖ Whereas MAED is a scenario – based model, MESSAGE is an optimization model which also takes into consideration general environmental impacts.

5. Energy Demand and Supply Projection Studies

The assumptions for the study are as follows:

Reference Growth Scenario:

- GDP grows by an average of 7% per annum.
- The main driver of growth is the manufacturing sector
- Manufacturing to account for 15% of GDP by 2020 from 4% in 2010
- Poverty to be reduced by half by 2015 in line with MDG objectives.

High Growth Scenario

- GDP grows by an average of 10% p.a.
- Manufacturing to contribute 22% to GDP by 2030 from 4% in 2010
- Nigeria transits from an agrarian to an industrializing economy

5. Energy Demand and Supply Projection Studies

- **Optimistic Growth Scenario I**
 - GDP grows by an average of 11.5% p.a.
 - Manufacturing to contribute 22% to GDP by 2030 from 4% in 2010
 - Nigeria transits from an agrarian to an industrializing economy
- **Optimistic Growth Scenario II**
 - GDP grows by an average of 13% p.a.
 - Manufacturing to contribute 22% to GDP by 2030 from 4% in 2010
 - Nigeria transits from an agrarian to an industrialized economy

5. Energy Demand and Supply Projection Studies

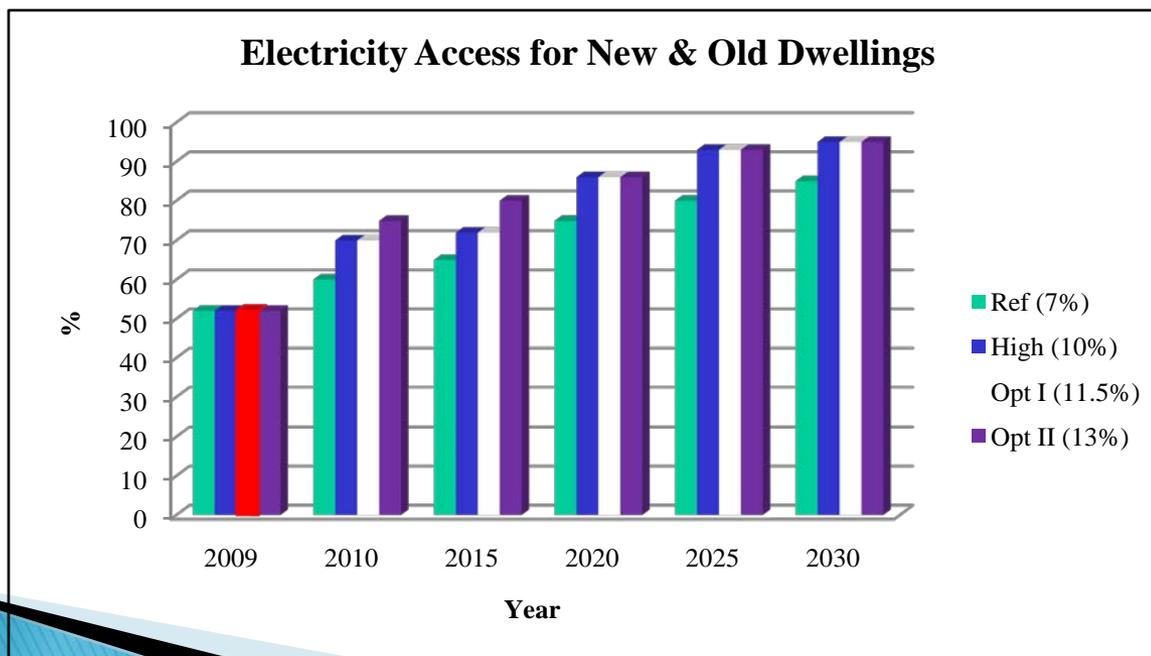
Demographic assumptions

Parameter	2010	2015	2020	2025	2030
Population growth rate	3.16	3.52	3.80	4.00	4.00
Number of persons per household	5.2	5.60	5.60	5.40	5.20
Number of households	30.0	33.7	42.1	53.2	67.3

5. Energy Demand and Supply Projection Studies

Electricity access for old and new dwellings (%)

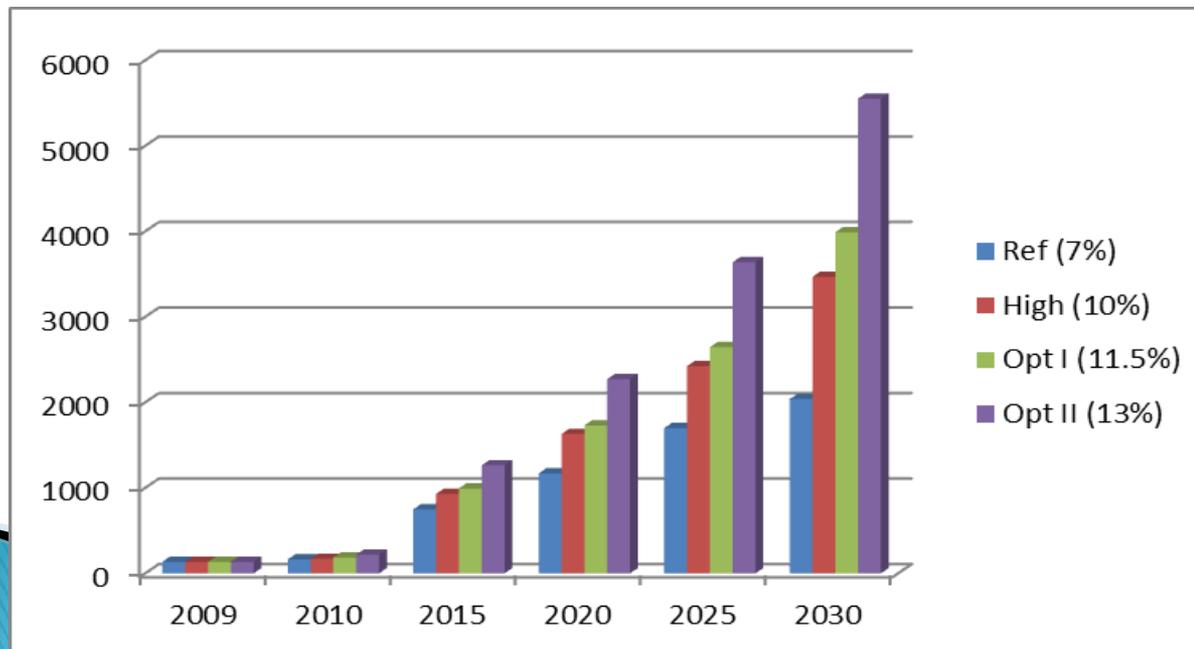
	2009	2010	2015	2020	2025	2030
Ref (7%)	52	60	65	75	80	85
High (10%)	52	70	72	86	93	95
Opt I (11.5%)	52	70	72	86	93	95
Opt II (13%)	52	75	80	86	93	95



5. Energy Demand and Supply Projection Studies

Electricity Demand per Capita (KWh/cap)

	2009	2010	2015	2020	2025	2030
Ref (7%)	135.2	164	749	1170	1699	2038
High (10%)	135.2	170	929	1630	2424	3468
Opt I (11.5%)	135.2	185	994	1730	2645	3990
Opt II (13%)	135.2	220	1264	2271	3638	5551



5. Energy Demand and Supply Projection Studies

Final Energy Demand by Sector (Mtoe)

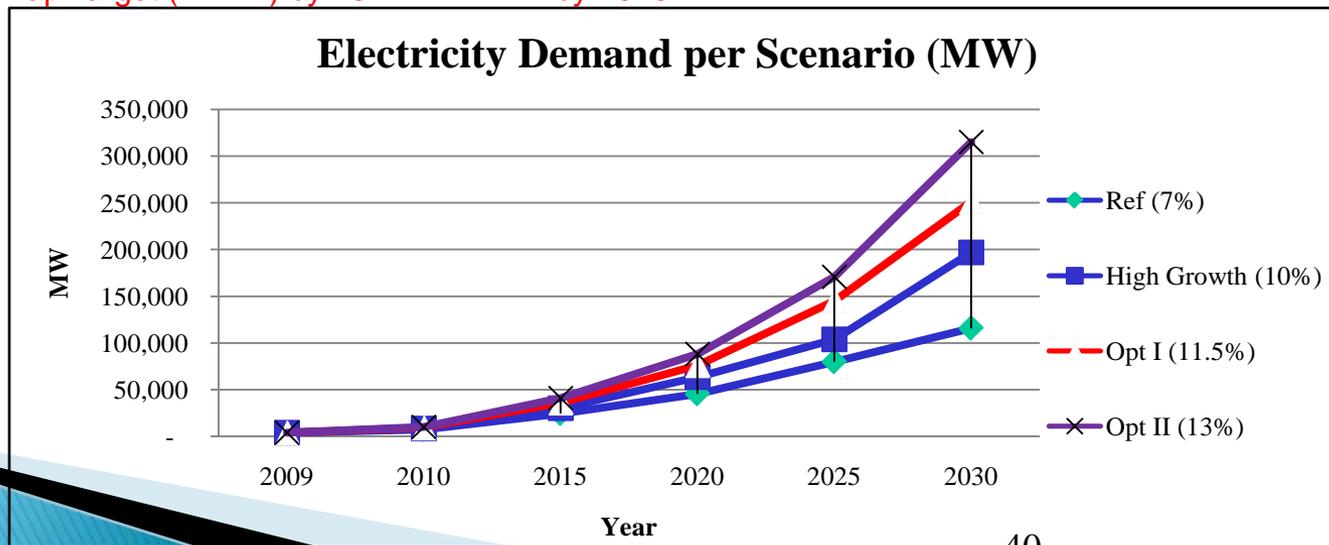
	2009	2010	2015	2020	2025	2030
Reference						
Total	36.02	37.11	61.43	94.29	138.84	190.98
Industry	1.15	0.47	23.34	46.72	73.80	105.52
Transport	7.65	9.26	11.63	15.53	21.12	28.51
Households	24.09	24.68	23.40	27.28	36.46	46.29
Services	3.13	2.71	3.055	4.76	7.46	10.67
High Growth						
Total	36.02	37.56	73.94	124.16	200.95	346.90
Industry	1.15	1.73	30.46	62.21	115.30	233.12
Transport	7.65	7.36	11.04	16.49	24.02	34.88
Households	24.09	27.32	30.44	39.53	52.16	65.15
Services	3.13	1.15	3.305	5.93	9.49	13.75
Optimistic I						
Total	36.02	38.15	73.68	127.40	220.31	413.68
Industry	1.15	3.05	30.00	66.20	134.79	300.01
Transport	7.65	8.69	11.07	16.50	24.20	35.50
Households	24.09	23.24	29.01	38.50	51.10	63.22
Services	3.13	3.17	3.600	6.20	10.22	14.95
Optimistic II						
Total	36.02	40.66	77.15	143.75	278.45	541.42
Industry	1.15	6.92	34.97	81.66	190.01	420.74
Transport	7.65	5.56	11.11	16.51	24.71	37.63
Households	24.09	24.72	26.3735	36.60	49.75	62.97
Services	3.13	3.46	4.70126	8.98	13.99	20.08

5. Energy Demand and Supply Projection Studies

Electricity Demand Projections Per Scenario, MW

	2009	2010	2015	2020	2025	2030
			24380	45490		
Ref (7%)	4,052	7440	(14,000)*	(40,000)**	79798	115674
High Growth (10%)	4,052	8420	30236	63363	103859	196875
Opt I (11.5%)	4,052	9400	36124	76124	145113	251224
Opt II (13%)	4,052	10230	41133	88282	170901	315113

*Power Roadmap Target (PRMT) by 2014 ** PRMT by 2020



5. Energy Demand and Supply Projection Studies

Projected Total Energy Demand for Fuel Petroleum Products for Nigeria (Million Litres)

Year	PMS		DPK		AGO		Fuel Oil		LPG	
	7%	13%	7%	13%	7%	13%	7%	13%	7%	13%
2009	12,280	12,280	2,600	2,600	2,690	2,690	580	580	27.8	27.8
2010	15,070	18,230	3,290	3,780	6,040	7,310	1,469	2,664	75.9	150.6
2015	21,220	35,880	5,040	6,450	8,520	14,430	2,839	5,641	227.8	529.7
2020	29,830	61,090	7,370	9,950	11,990	24,610	4,604	11,909	614.9	1,263.0
2025	41,910	107,550	11,150	15,430	16,880	43,380	7,216	26,147	1,374.2	2,483.5
2030	58,830	196,960	17,210	28,820	23,720	79,510	16,029	58,873	2,442.8	4,281.8

5. Energy Demand and Supply Projection Studies

Projected Electricity Supply by Fuel Type @ 7% Growth Rate

	2009	2010	2015	2020	2025	2030
Coal	0			3000	4000	5000
Electricity Import	0					
Gas	3803	4977	19761	31319	53636	74230
Hydro	1930	1930	1930	7400	9950	9950
Nuclear	0	0	0	0	1500	4340
Small hydro	20	20	105	200	600	2000
Solar	0	490	2544	3500	10000	20000
Wind	0	23	36	41	47	54
Biomass	0	0	5	30	65	100
Total Supply	5,753	7,440	24,380	45,490	79,798	115,674

5. Energy Demand and Supply Projection Studies

Projected Electricity Supply by Fuel Type @ 10% GDP Growth Rate

	2009 Base Year	2010	2015	2020	2025	2030
Coal	0	-	-	3352.98	6000.00	8000.00
Electricity Import	0	0	0	0	0	40000.00
Gas	3803	6936.65	29277.50	57793.02	110269.00	161938.00
Hydro	1930	1930.00	4157.00	11207.00	12132.00	12132.00
Nuclear	0	-	-	-	6000.00	7000.00
Small hydro	20	20.00	105.00	200.00	600.00	2000.00
Solar	0	490.35	2543.50	3500.00	10000.00	20000.00
Wind	0	23.00	36.00	41.00	47.00	54.00
Biomass	0	-	5.00	30.00	65.00	100.00
Total Supply	5,753.00	9,400.00	36,124.00	76,124.00	145,113.00	251,224.00

5. Energy Demand and Supply Projection Studies

Projected Electricity Supply by Fuel Type Based on 13% Economic Growth Rate (MW)

	2009 (Based Yr)	2010	2015	2020	2025	2030
Coal	0.00	3352.9818	3352.9818	12,121.794	14,011.266	20,398.634
Electricity Import	0.00	0	0	0	0	67727
Gas	3803.00	13109.77	26426.06	49,996.468	120,512.45	164,306.85
Hydro	1930.00	4157	11207	12132	12132	12132
Nuclear	0.00	0.00	3599.995	7199.99	7199.99	7199.99
Small hydro	20.00	105	319.9	759.85	1660.05	3502.1
Solar	0.00	490.35	2543.303	6417.268	15969.94	39737.5
Wind	0.00	23	36	41	47	54
Biomass	0	0	5	30	65	100
Supply	5746.00	21,238.09	47,490.24	88,698.37	171,597.69	315,158.07

5. Energy Demand and Supply Projection Studies

Biomass Programme /Targets:

S/No	Activity/Item	Timeline/Quantity		
		Short (2012-2015)	Medium (2016-2020)	Long (2016-2030)
1	Biomass Electricity (MW)	5	30	100
2	Improved Woodstoves (No.)	300,000	500,000	1,000,000
3	Biogas Digesters (No.)	500	6,000	8,000
4	Biomass Briquetting Machine (No.)	30	50	80
5	Biofuel (ML/year)* - Bio ethanol (B10) - Biodiesel (B20)	1951 730	3559 1254	8837 4270

* Based on 13% Growth rate Supply Projections of PMS and AGO(ECN, 2012)

5. Energy Demand and Supply Projection Studies

Solar Programme/Targets

(i) Electricity

S/N	Activity/Item	Timeline/Quantity		
		Short	Medium	Long
1	Solar PV Home Systems (SHS) (MW)	5	10	15
2	Solar PV Water Pumping (MW)	50	1,000	5,000
3	Solar PV Community Services (MW)	45	500	3,000
4	Solar PV Refrigerators (MW)	20	500	2,000
5	Solar PV Street and Traffic Lighting (MW)	100	1,000	10,000
6	Solar PV Large Scale PV plants (1MW)	80	990	9,990
7	Solar Thermal Electricity (1MW)	300	2,136	18,127
	Total (MW)	600	6,136	48,132

5. Energy Demand and Supply Projection Studies

Solar Thermal (Heat)

S/N	Activity/Item	Timeline/Quantity		
		Short	Medium	Long
1	Solar Water Heaters (No.)	4,000	60,000	150,000
2	Solar Cookers (No.)	2,000	50,000	150,000
3	Solar Dryers (No.)	150	2,000	6,000
4	Solar Stills (No.)	100	3,000	2,000
5	Solar Pasteurizers (No.)	300	4,000	10,000

5. Energy Demand and Supply Projection Studies

Hydropower Programme/Targets

S/N	Activity/Item	Timeline/Quantity		
		Short	Medium	Long
1	Large Hydropower (MW)	4,000	9,000	11,250
2	Small Hydropower (MW)	100	760	3,500
	Total (MW)	4,100	9,760	14,750

Wind Programme/Targets

S/N	Activity/Item	Timeline/Quantity		
		Short	Medium	Long
1	Wind Electricity (MW)	23	40	50
2	Windmill Water Pumping Systems (No.)	20	100	200

5. Energy Demand and Supply Projection Studies

Summary of Renewable Energy Targets

(i) Renewable Electricity Supply Projection in MW (13% GDP Growth Rate)

S/N	Resource	Ref. Year (2009)	Short	Medium	Long
1	Hydro (LHP)	1938	4,000	9,000	11,250
2	Hydro (SHP)	60.18	100	760	3,500
3	Solar PV	15.0	300	4,000	30,005
4	Solar Thermal	-	300	2,136	18,127
5	Biomass	-	5	30	100
6	Wind	10.0	23	40	50
	All Renewables	2025.18	4,628	15,966	63,032
	All Energy Resources	8,700 (installed Gen Capacity)	47,490	88,698	315,158
	% of Renewables	23%	10%	18%	20%
	% RE Less LHP	0.4%	1.3%	8%	16%

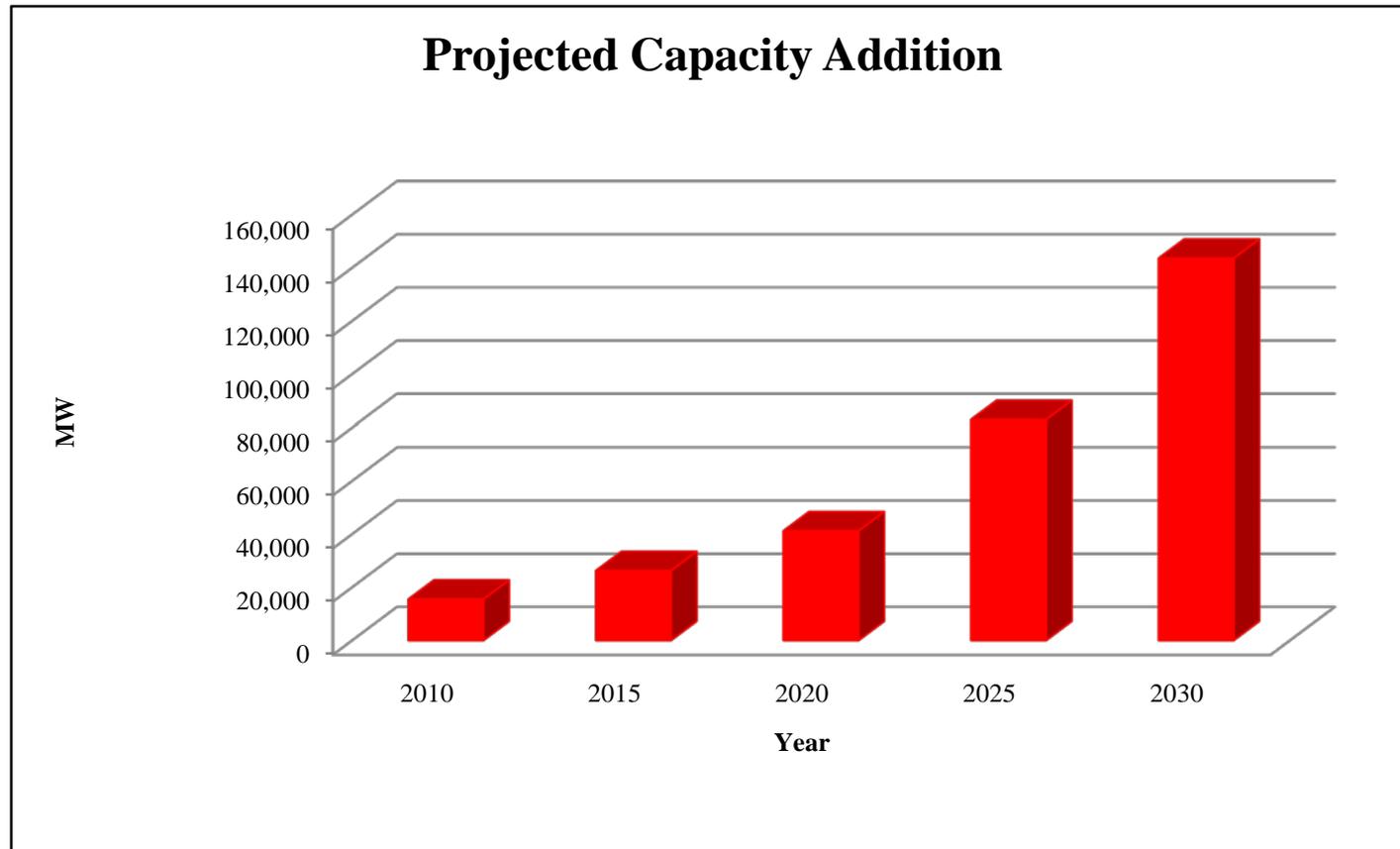
Short – 2015
 Medium – 2020
 Long – 2030

5. Energy Demand and Supply Projection Studies

Projected Capacity Addition (MW) for Optimistic II

	2009 (Based Yr)	2010	2015	2020	2025	2030
Coal	X	3353	0	8769	1889	6387
Electricity Import	X	0	0	0	0	67727
Gas	X	9307	13316	23570	70516	43794
Hydro	X	2227	7050	925	0	0
Nuclear	X	0	3600	3600	0	0
Small hydro	X	85	215	440	900	1842
Solar	X	490	2053	3874	9553	23768
Wind	X	23	13	5	6	7
Biomass	X	0	5	25	35	35
Supply	X	15,485	26,252	41,208	82,899	143,560

5. Energy Demand and Supply Projection Studies



5. Energy Demand and Supply Projection Studies

Cost of various Electricity Generation Technology

Name	Investment Cost (\$/kW)	Variable O&M Cost (\$/kWyr)	Fixed O&M Cost (\$/kWyr)
CCGT	1200	480.92	14.9
OCGT	900	613.2	35.92
Coal	1600	231.26	55.19
Large Hydro	2500	62.19	30.66
Small Hydro	2500	62.19	30.66
Nuclear_PWR	2500	82.34	102.49
Wind Offshore	2200	0.1	208.4
Wind Onshore	2000	0.1	91.1
Grid-Solar PV	4000	0.1	56.06
CSP	3000	0.1	190.9
Biomass*	4000	42.17	51.99

Sources: IEA; * NERC

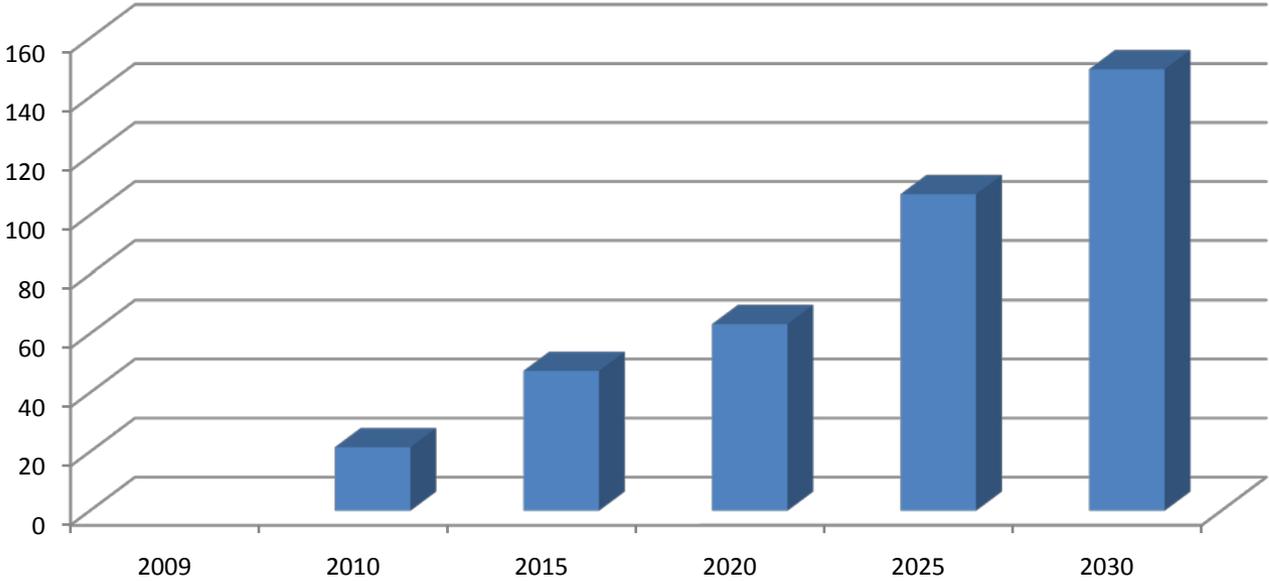
5. Energy Demand and Supply Projection Studies

Additional Investment Cost (Bill. US\$) for Optimistic II

	2009 (Based Yr)	2010	2015	2020	2025	2030
Coal	X	5.365	0.000	14.030	3.023	10.220
Gas (OCGT)	X	8.376	11.985	21.213	63.464	39.415
Hydro	X	5.568	17.625	2.313	0.000	0.000
Nuclear	X	0.00	9.00	9.00	0.00	0.00
Small hydro	X	0.213	0.537	1.100	2.251	4.605
Solar	X	1.961	8.212	15.496	38.211	95.070
Wind	X	0.0506	0.0286	0.0110	0.0132	0.0154
Biomass	X	0.000	0.020	0.100	0.140	0.140
Total investments	X	21.533	47.407	63.263	107.102	149.466

5. Energy Demand and Supply Projection Studies

Additional Investment Costs, Billion US\$



6. Evaluation of the Impacts of the National Energy Policy

- ❖ Enhance investment in the energy sector
 - ❖ Diversified energy mix in the country
 - ❖ Facilitated increased energy supply in the economy
 - ❖ Increased efficient energy utilization
 - ❖ Enhanced local capacity
 - ❖ Greater awareness of the significance of the energy sector
- 

6. Evaluation of the Impacts of the National Energy Policy Cont'd...

- ❖ Despite these impacts, you will agree with me that ten (10) years after the NEP was produced and approved, development have taken place in the national and international energy scenes necessitating its review. These developments include:
 - Greater private sector participation in the energy sector
 - Some neighbouring countries have discovered crude oil in commercial quantities
 - Shale oil and shale gas are being explored in major oil and gas consuming countries.
 - The Nigeria electricity sector has achieved a significant level of reforms through the Electricity Sector Reform Act of 2005.
 - Greater attention is being given to the development of renewable energy and energy efficiency worldwide, for driving sustainable development.
 - Greater gender sensitivity
- ❖ To this effect review has since commenced with participation of stakeholders and these factors are being taken into consideration

6. Evaluation of the Impacts of the National Energy Policy Cont'd...

❖ In addition to removal of obsolete terms, data and information, the review recommended restructuring of the policy into 13 Chapters as follows:

- Chapter 1: Introduction
- Chapter 2: Petroleum Policy
 - Crude Oil
 - Natural Gas
 - **Shale Hydrocarbon Resources**
- Chapter 3: Coal and Tar Sands/Bitumen Policy
 - Coal
 - Tar Sands/Bitumen
- Chapter 4: Nuclear Energy Policy
 - Nuclear
- **Chapter 5: Renewable Energy Policy**
 - Hydropower
 - Solar
 - Wind
 - Hydrogen
 - Other Renewables

6. Evaluation of the Impacts of the National Energy Policy Cont'd...

- **Chapter 6: Bio-Energy Policy**
 - Biomass
 - Fuel-wood
 - Bio-Fuel
- **Chapter 7: Electricity Policy**
- **Chapter 8: Policy on Energy Utilization**
 - Industry
 - Agriculture
 - Transport
 - Households
 - Commercial/Services
- **Chapter 9: Energy Efficiency and Conservation Policy**
 - Residential
 - Industrial
 - Transport
 - Services/Commercial
 - Building Designs
 - Agriculture

6. Evaluation of the Impacts of the National Energy Policy Cont'd...

- Chapter 10: Environment and Climate Change Policy
- Chapter 11: Policy on Other Energy Issues
 - Research and Development
 - Bilateral, Regional and International Cooperation
 - Local Content
 - Manpower Development and Training
 - Community Issues
 - Gender Issues
- Chapter 12: Policy on Energy Financing
- Chapter 13: Planning and Policy Implementation
 - Energy Planning
 - Policy Implementation
 - Energy Information Management
 - Prioritization of Strategies into Short, Medium and Long Term

7. Challenges

- ❖ Uncertainty for sustained political support for the policy
 - ❖ Inadequate human capacity
 - ❖ Inadequate funding
 - ❖ Lack of legislation
- 

8. The Way Forward

- Solicit continuous government political support for the policy
- Review Policy (NEP), and obtain legislation passing it into law
- Continuous building of human and infrastructural capacities
- Draw up National Energy Master Plan

9. Conclusion

- ❖ Energy is essential for economic growth and development and appropriate up-to-date National Energy Policies will ensure that our energy demands are met with adequate supply thus ensuring energy security to support economic development.
 - ❖ Nigeria is endowed with abundant energy resources such as oil and gas, tar sands, uranium, solar, wind, biomass, geothermal and hydropower from which modern energy can be produced and used sustainably.
 - ❖ Appropriate policies and plans, incentives, institutional, and legal frameworks need to be put in place and strengthen to fast track their contributions to meeting the energy needs of the country.
 - ❖ Finally we encourage you to come forward with suggestions that will help improve and update the NEP to enhance its currency and contributions to socio-economic development .
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THANK YOU

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