



# DEMAND SIDE MANAGEMENT AND EFFICIENT LIGHTING INITIATIVES IN NIGERIA

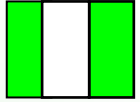


By

**Prof. B. Garba**

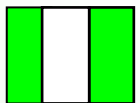
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# PRESENTATION OUTLINE

- Introduction
- Efficient Lighting Initiatives
- Energy Efficiency Action Plan of Nigeria
- Renewable Energy Master Plan of Nigeria
- Other Energy Efficiency and Conservation Activities in Nigeria
- Conclusion

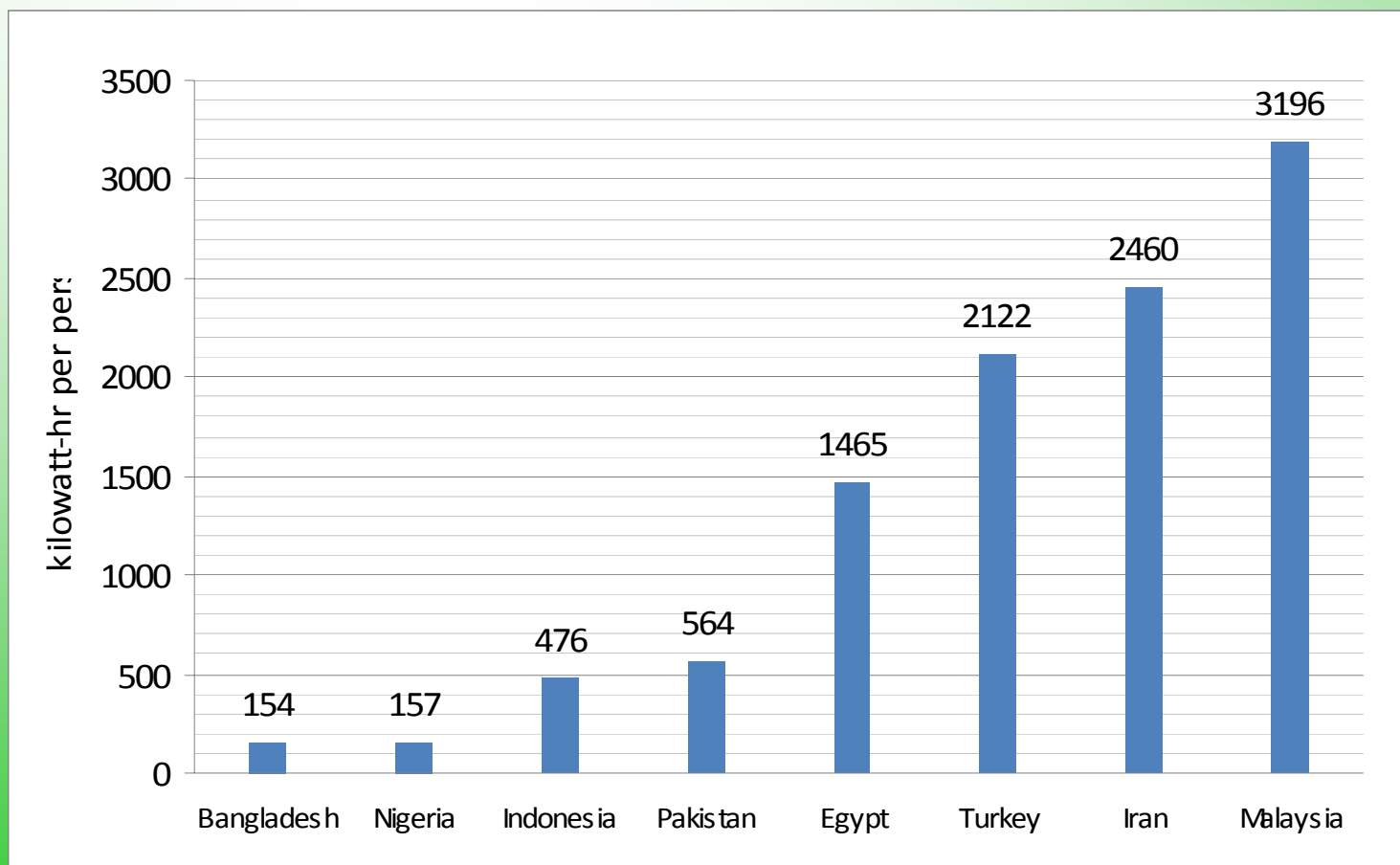


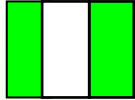
## INTRODUCTION

Nigeria Electricity demand is growing faster than the countries population and Nigeria's electricity per capita is one of the lowest in the world. To sustain this rapid economic and population growth, Nigeria needs to take action to meet the resulting increase in energy needs.



# Consumption per Capita in the D-8 Countries in 2004 2007/2008 World Development Report, UNDP)





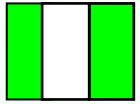
## INTRODUCTION (Cont.)

- The only way any country can meet its energy requirements is by increasing generation or reducing demand.
- Increasing generation requires huge amount of money and takes time.
- The immediate strategy is to reduce the demand and this can be achieved through the use of energy efficient appliances such as the energy saving bulbs.
- These bulbs have been designed to replace incandescent lamp without changing the lamp holder-pin base or screw.
- They have the advantage of having less energy (power) consumption, longer life and higher and better luminosity.



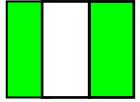
## INTRODUCTION (Cont.)

- To maintain our quality of life, we must use our electrical energy wisely. The choice we make about how we use our electricity has great impact on our lives.
- Thus, the way and manner in which we produce and consume our meager generated electricity is therefore crucial to the long-term sustainability of human development.
- There are many things we can do to use less energy and use it more wisely. These things involve energy conservation and energy efficiency, referred to as energy management.
- The most effective and practical solution to achieving immediate relief and reduction in the load demand is by replacing incandescent lamps with energy saving bulbs.



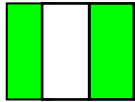
# Efficient Lighting Initiatives

- Among all the energy management strategies, the substitution of incandescent bulbs with energy saving bulbs (Compact Fluorescent Lamps) is gaining momentum.
- This practice does not have an impact on people's habits or way of life and it is considered to be of relatively low investment cost with immediate returns.
- This practice has no limitation, however, implementing it around the world is still on a slow basis and there are a number of countries that do not yet see this as an objective to pursue.



## Efficient Lighting ...Cont.

- The substitution of an incandescent lighting bulb by its energy saving homologue has brought about the reduction of high demands during peak hours.
- This information was obtained from studies conducted in Cuba and other countries that had retrofitted their incandescent lamps with energy saving ones.
- From their experience, the substitution of incandescent light bulbs, would reduce the high peak demand of any country's electric generating system by 30-60MW for every 1m bulbs.



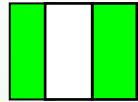
## Efficient Lighting ...Cont.

- The Energy Commission of Nigeria, which is the apex organ of government for the strategic planning and co-ordination of the national policies in the field of energy in all its ramifications, has since realized that lighting constitutes about 18% of the total power usage in the country as compared to 8-10% in the developed countries.
- The Commission had embarked upon a project of substituting 1M incandescent bulbs with CFL's. This project is expected to yield a saving of about 30MW of electricity.
- It is estimated that Nigeria will require about 50M CFL's to replace the incandescent lamps in the residential sector in the whole country.
- This implies a saving of about 1,500MW of electricity



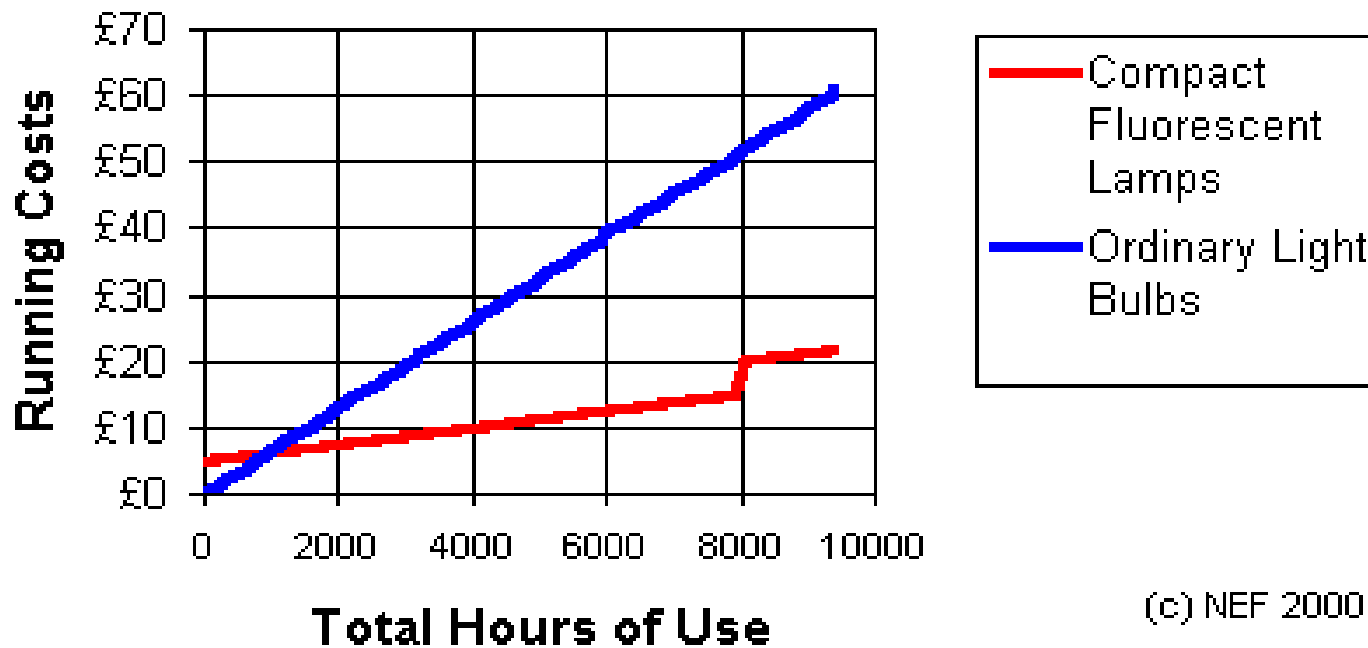
## Running Costs of CFLs & Ordinary Bulbs

- Although CFLs cost more to buy, they save money because they use less electricity. Based on lifespan analysis, you pay much more using incandescent lamps compared to compact fluorescent lamps.

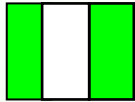


# Running Costs of CFLs & Ordinary Bulbs

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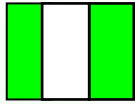


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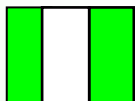
## What Wattage of CFL should I Buy?

- Compact Fluorescent Lamps are sold by the wattage, in much the same way as normal bulbs. However because they use a lot less energy, a lower wattage bulb will be needed to give out the same amount of light.
- The table below gives the approximate equivalents that can be used:



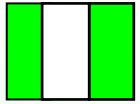
# What Wattage of CFL should I Buy?

Incandescent Bulb	CFL
25W	5W
60W	15W
100W	18W
150W	32W



# Effect of Replacing Incandescent Lamps with CFL's in some countries

S/No	Country	Total Bulb Changed	Energy Saved at Peak Demand (MW)
1	Haiti	1,568,844.00	47.1
2	Surinam	440,793.00	18.8
3	Jamaica	2,823,908	93.3
4	St. Kitts Nevis	129,318	2.2
5	St. Vincente Granadinas	166,112	3.5
6	Granada	133,253	1.9
7	Guyana	446,796	16.2
8	Belice	168,912	2.1
9	Dominica	137,679	3.3
10	Antigua Barbada	163,108	5.0
11	Venezuela (Res.)	53,157,988	1,412.6
12	Venezuela (Non Res.)	15,364,793	403.6
13	N. Korea		1,000



# ENERGY EFFICIENCY MASTER /ACTION PLAN FOR NIGERIA



- Phase out backward generating capacity with low efficiency and invest in smart grid
- Enhanced energy efficiency by electrical equipment upgrading and technology innovation.
- Renewable energy for electricity development
- Develop and deploy clean coal technology for power generation
- Develop a safe and secure Nuclear Energy for power generation
- Set National building codes.
- Set federal efficiency standards to reduce electricity consumption
- Appliances labeling, certification and accreditation
- Education, information and awareness
- Set regulations on electricity consumption
- Energy audit and energy management systems
- Market oriented policy reforms



# RENEWABLE ENERGY MASTER PLAN OF NIGERIA

- ❖ The Energy Commission of Nigeria with the assistance of UNDP developed a renewable energy master plan (REMP) which articulates Nigeria's vision and sets out road map for enhancing energy access to rural areas and for achieving sustainable development goals.
- ❖ The REMP is anchored on the mounting convergence of values, principles and targets as embedded in the National Economic Empowerment and Development Strategy (NEEDS), National Energy Policy, National Policy on Integrated Rural Development, the Millenium Development Goals (MDGs) and International conventions to reduce poverty and reverse global environmental change.



## RENEWABLE ENERGY MASTER PLAN OF NIGERIA ...Cont.

- ❖ Towards the coming decades, Nigeria envisions a peaceful and prosperous nation driven increasingly by renewable energy.
- ❖ In the short term, crude oil will continue to play a dominant role in the economic development of the country.
- ❖ In the medium term, Nigeria envisions an energy transition from crude oil to a less carbon intensive economy increasingly powered by gas.
- ❖ In the long term, Nigeria envisions a country that will significantly be less dependent on hydrocarbons. Energy from the Sun, modern and more efficient conversion of biomass energy, small hydropower plants and wind along with conventional technologies, will provide opportunities to empower people and communities in meeting their energy and development needs.



## RENEWABLE ENERGY MASTER PLAN OF NIGERIA ...Cont.



- ❖ Far into the future, Nigeria will join the rest of the world in developing a hydrogen economy and in accessing the vast energy entrapped in the oceans and in the Earth's crust.
- ❖ This bold new vision of Nigeria is achievable if the developed REMP is implemented and barriers to market penetration of RE Technologies are addressed.



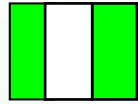
## RENEWABLE ENERGY MASTER PLAN OF NIGERIA ...Cont.

- In order to ensure that the REMP targets are achieved, concrete activities and milestones have been identified in the short, medium and long term.
- These activities and milestones are organised under specific sub-sectoral programmes.
- To address areas of overlap, a Framework Programme for Renewable Energy Promotion that harmonizes cross-cutting issues has been planned.



## RENEWABLE ENERGY MASTER PLAN OF NIGERIA ...Cont.

- However, non of the proposed programmes are in themselves exhaustive and mutually exclusive.
- They are dynamic and adaptable to changes within the overall policy, technology and market environments evolving over the two decades of the Master Plan.
- The Framework programme will ensure that the activities within the various sub-sectoral programmes are mutually supportive.



# Targets For Electricity Generation from RE(MW)

Sources	2007	2015	2025
Wind	1	20	40
Solar PV	5	120	500
Solar Thermal	-	1	5
Small hydro	50	600	2000
Biomass	-	100	800
Total	56	841	3345
ECN High Growth Scenario Projections	7000	14000	29000
Percentage share of projected energy demand	0.8	6	11.53



# IMPACTS OF ENERGY-EFFICIENCY MEASURES ON LOADS

Energy efficiency can be used to reduce existing demand and to decrease demand growth, particularly in areas experiencing rapid demand growth due to new construction.

By energy-efficiency, means embarking on technologies that produce the same or better levels of energy services (for example, light, space conditioning and motor drive power) using less energy.



## IMPACTS OF ENERGY-EFFICIENCY MEASURES ON LOADS ...Cont.

Efficient technologies are generally long lasting and save energy when the end-use equipment is in operation. Depending on the timing of equipment use, energy-efficiency measures also can produce significant reduction in peak demand.

By contrast, the other principal Demand-side Management (DSM) strategy, load management, seeks to lower peak demand during specific, limited periods by temporarily curtailing electricity usage or shifting usage to other periods.



## Other Energy Efficiency and Conservation Activities in Nigeria

- Establishment of National Energy Audit Team for Industries in 2004
- National Workshops for Industrial Professionals in 2004
- Training on Techniques of Energy Conservation and Management in Industries
- Information Dissemination and Training
- Walk Through Energy Audits in 2004
- Training Programme on Energy Auditing in 2004



## Other Energy Efficiency and Conservation Activities in Nigeria (Cont.)

- The FGN on tranfering the Energy Commission to the newly created Ministry of Energy and also approved the establishment of the National Centre for Energy Efficiency and Conservation (NCEEC)
- The main thrust areas of the NCEEC will include:
  - Promoting the implementation of energy efficiency programmes
  - Creating awareness and disseminate information on energy efficiency
  - Formulating energy efficiency and demand side management programmes that encompass and target various economic sectors
  - Undertaking educational programmes, policy promotion and research



## Other Energy Efficiency and Conservation Activities in Nigeria (Cont.)

- The Energy Commission, hosted in Abuja on behalf of the Nigerian National Committee of the World Energy Council (NNC-WEC), and the French Agency for Environmental and Energy Management (ADEME), the Africa Forum on Energy Efficiency from 8<sup>th</sup>- 12<sup>th</sup> January 2007. The theme of the forum was “Making Energy Efficiency a Reality in Africa, not a Myth”
- Planned replacement of incandescence lamps with energy saving lamps.

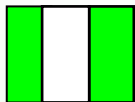


# CONCLUSION

Based on the above submission, confidence is established that energy efficiency and renewable energy can change our energy future for the better.

Demand side management of our lighting requirement can offset the majority of projected load growth in many of our countries in Africa over a short period of time.

Expanded development of renewable energy resources in this continent would further reduce future needs for conventional generation.



**THANK YOU**