



Energy Efficiency in Nigeria: Planning and Goals

Workshop on Energy Efficiency and
Demand-Side Management
Dubai, U.A.E

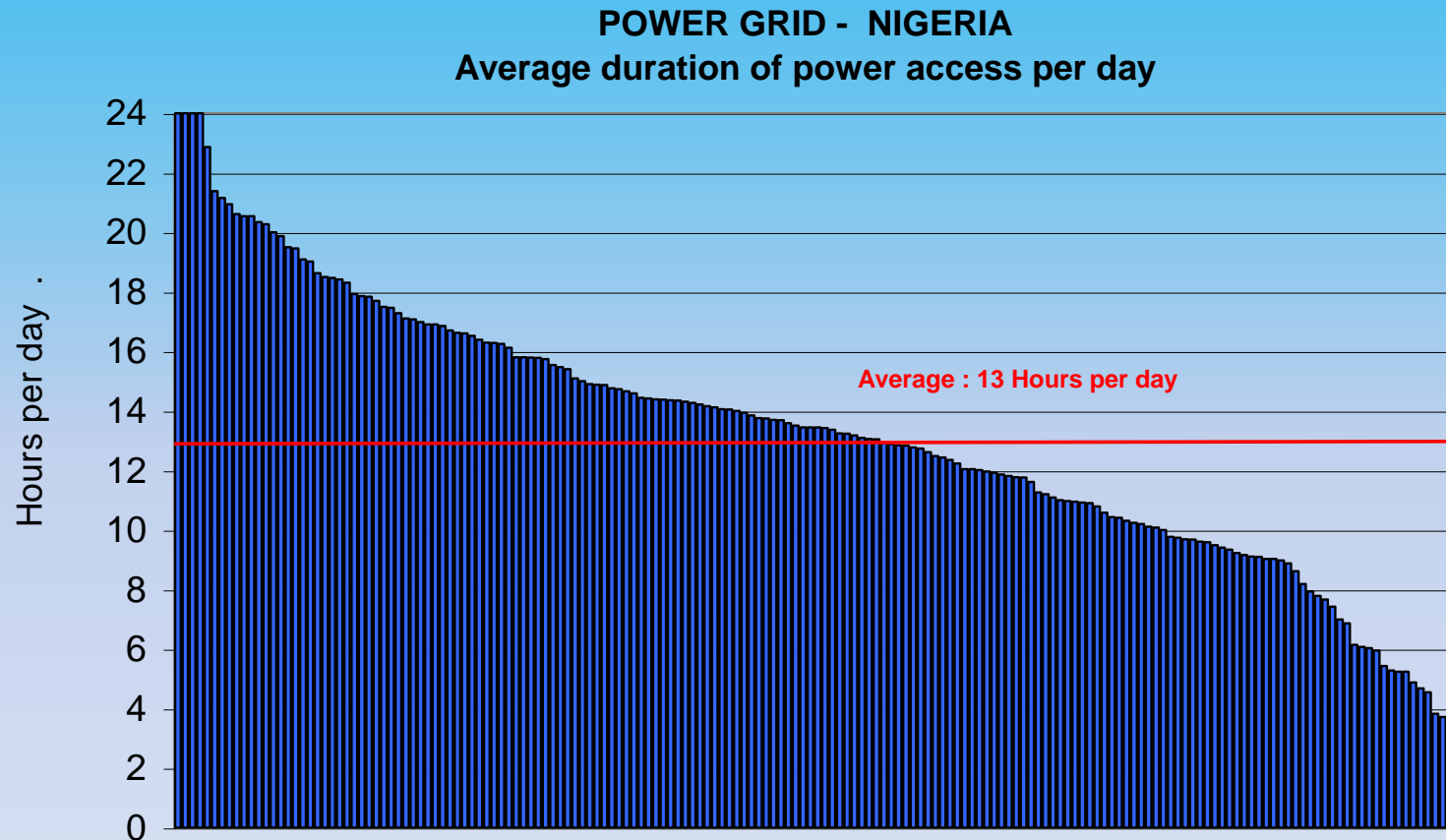
Yusuf Abdussalam



Large Demand Supply Gap

- Population - 160 million
- Current Electricity Demand estimated at over 15,000 MW (Peak), 10,000 MW during off peak.
- Current Power Generation: 3,500 MW – 4,000 MW
- Deficit 6,500-11,000 MW leading to frequent load shedding, poor access and energy poverty
- Generation per cap : 25.4W
- Energy sent out/person = 564Wh
 - Just enough to power 60W incandescent bulb for 9 hours

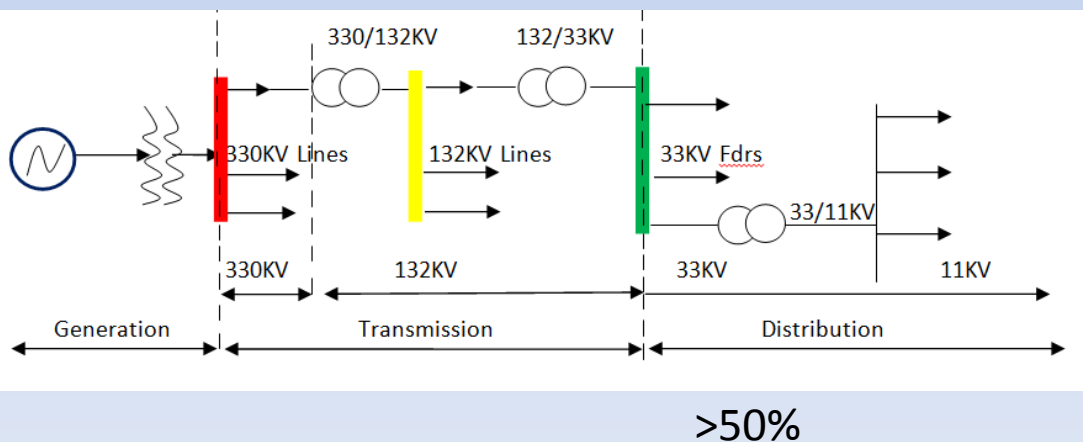
Challenges



High Losses

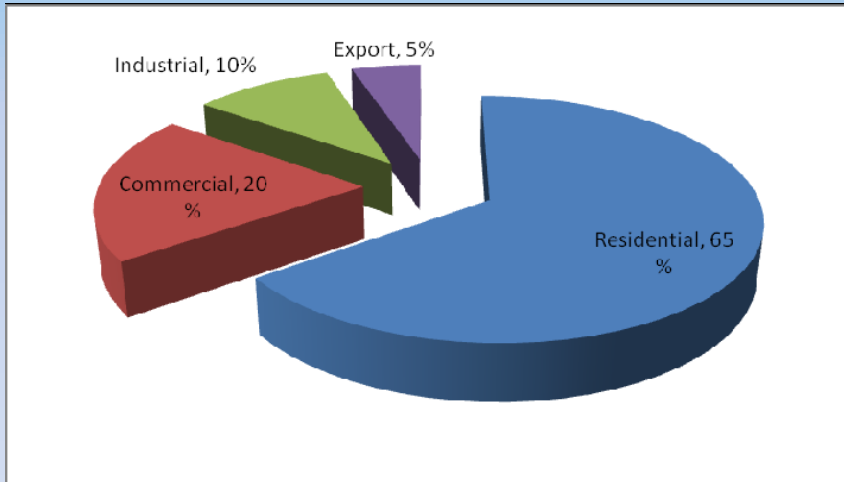
Caused by :

- Electricity demand is increasing at about 7% annually
- inefficient generation, interruptions in gas supplies, high transmission & distribution losses and non technical losses (power theft)
- Focus has been on supply expansion at the expense of demand reduction strategy
- – About 1500 MW of stranded generation capacity i.e. generation that cannot be evacuated into the national grid because transformers and transmission lines required for the task have not been constructed.



Daily Energy Watch Saturday, November 15th 2014			
	YESTERDAY	TODAY	+/-
↑ ENERGY - GENERATED MWh	89,734	91,866	↑
↑ ENERGY - SENT OUT MWh	87,894	90,253	↑
↑ PEAK MW	3,909	4,069	↑
↓ OFF-PEAK MW	3,594	3,515	↓
↓ SPINNING RESERVE MW	277	244	↓
↑ CONSTRAINED MW	1,539	1,467	↑
↑ UNITS - AVAILABLE	66	67	↑
↑ UNITS - ON BARS	50	53	↑

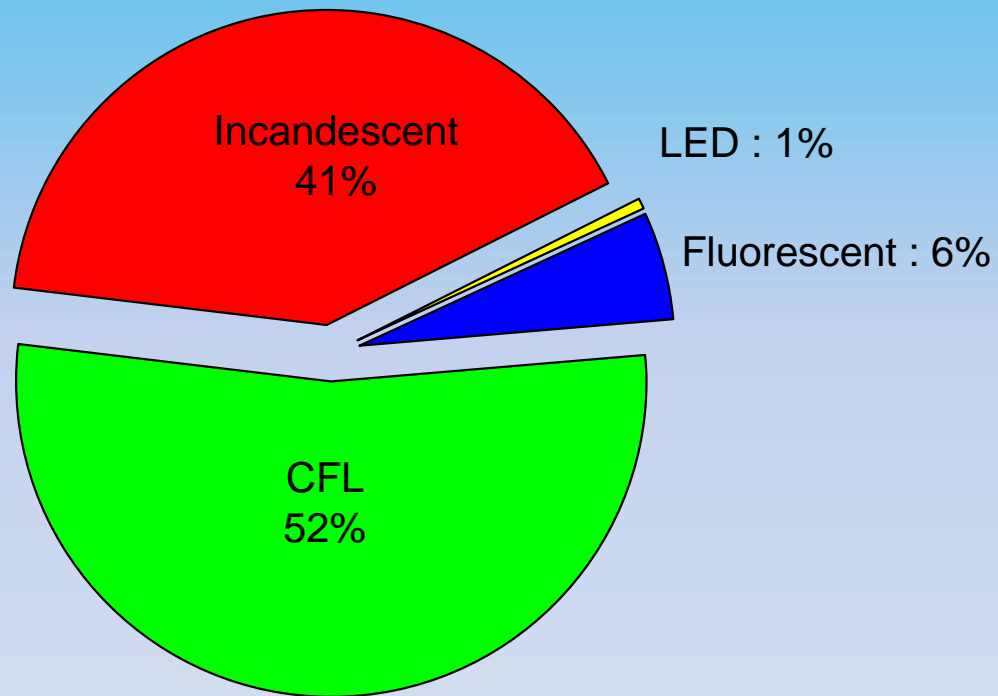
Focal Areas of Impact



Electricity consumption by sector in Nigeria

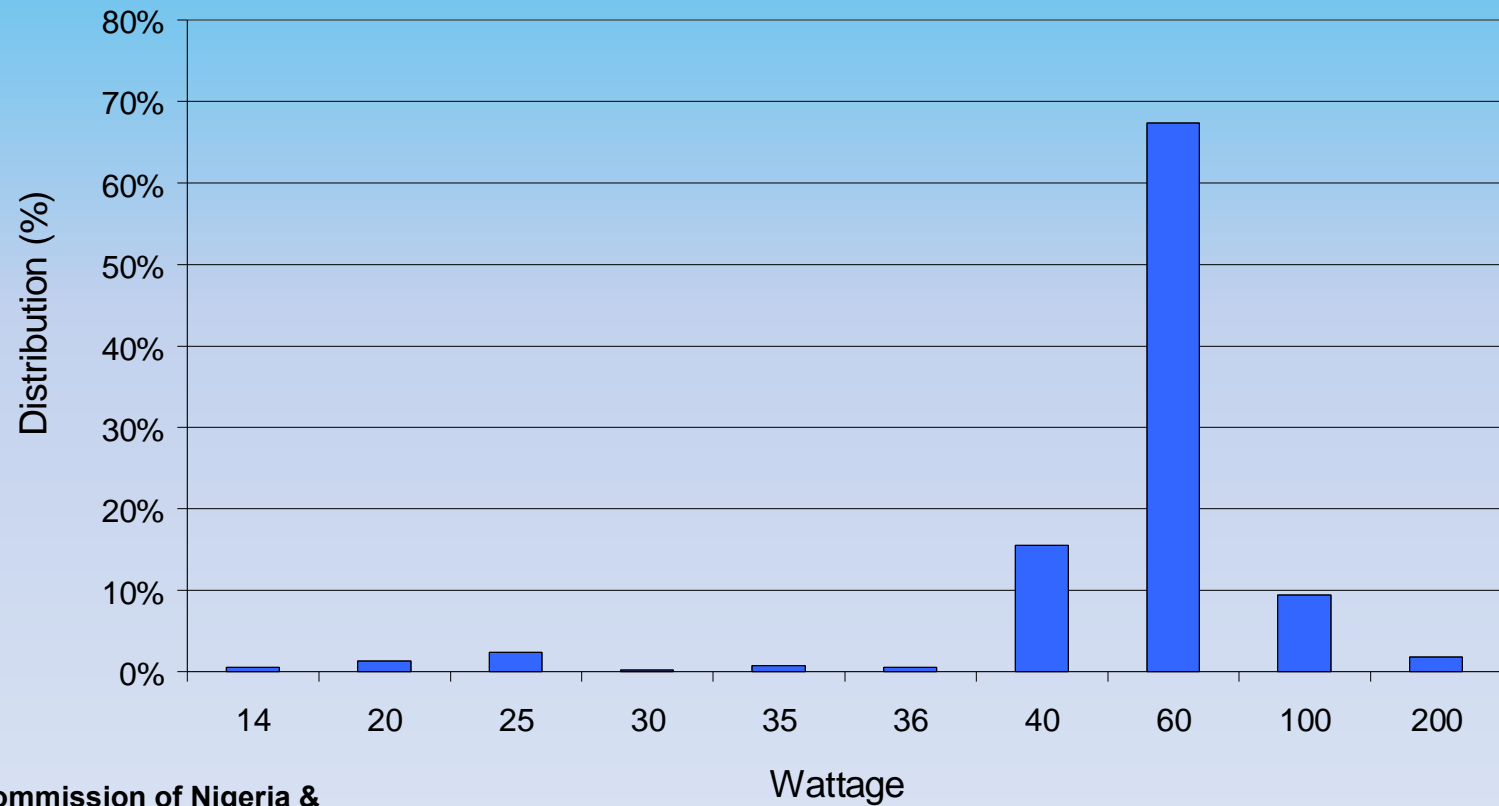
- System peak period coincides with residential peak
- Lighting accounts for 60% of demand at peak load
- >60% of lamps used in the country are inefficient lamps (mainly incandescent lamps)

LIGHTING - NIGERIA
Distribution of light bulbs per type of light sources



LIGHTING - NIGERIA

Distribution of the Incandescent light bulbs units wattage



Barriers to Energy Efficiency Adoption

- Information Barrier :
 - Lack of awareness of energy efficiency technologies and practices,
- Technological Barrier
 - Use of obsolete and inefficient equipment in industrial, commercial and residential sectors.
 - Manufacturing sector is dominated by energy intensive basic material subsector
- Policy Barrier
 - Lack of financial, technological and regulatory incentives to promote efficient and productive uses of energy resources
- Institutional Barrier
 - Absence of effective driver of energy efficiency and renewable energy development
 - Poor energy price signals for energy efficiency
 - Poor collection drive by utilities(metering gap > 50%)

Barriers to Energy Efficiency Adoption

- Cost and Income Barrier
 - energy efficient appliances are generally more expensive and beyond the reach of the poor
- Shortage of skilled energy management professionals
- Difficulty in accessing financing for energy efficiency projects
- Absence of a **focal agency with** resources and commitment to make sure all the above happen

Policy Framework for Energy Efficiency in Nigeria

- 2003 National Energy Policy which provides for
 - Promotion of energy efficiency and conservation in industry.
 - Promotion of public awareness about the benefits of improved energy efficiency
 - Establishment of necessary guidelines and regulations on energy efficiency,
 - Development of codes, standards, regulations and guidelines on energy conservation and use of energy-efficient methods, equipment, machinery and technologies in agriculture, industry, building design and construction, etc.

History of promotion of Energy Efficiency in Nigeria

- EPSR Act 2005 mandates NERC to ensure efficient electricity industry
- 2006, revised 2011: Draft National energy master plan
- UNIDO support for walk-through energy audit in industry and institutional buildings
- 2009 interministerial committee on RE and EE
- 2008– Cuban Government through ECOWAS –gave Nigeria 1million cfl
- 2008 – EE Labeling standards developed for luminaire
- 2012 – UNDP-GEF–study to Promote Energy Efficiency.
- MYTO tariff review followed by regular PCA during which EE is presented as cost mitigation to consumers

Regulatory Activities on EE

- NERC started EE Labelling Standards for electrical appliances, equipment and machinery was intended to:
 - Reduce total electricity demand
 - Stop Nigeria from becoming a dumping ground for inefficient appliances.
 - Provide consumers with relevant information on the energy efficiency of common household appliances.
 - help buyers of the appliances make informed choices and avoid substandard products, from the energy conservation perspective.
 - Stabilization of Electricity Grid System
 - Stabilization of Brownout and transformer overload

Suggested Parameters for labeling Luminaires (Lamps)

- Parameters considered include
 - Star rating
 - Lamp Efficacy, in lumens per watt (lu/W)
 - Lamp type
 - Input power, in watts
 - Name of manufacturer or company
 - Lamp life, in hours
 - Energy Consumption, in kWh/yr
 - Mercury content (if any)
- The Label is to be printed on a prominent surface of the lamp and where this is not possible, an alternative location may be specially approved.
- It shall also be printed on a prominent surface of the package.

Proposed Standards for Lamps in Nigeria

Star Rating	Efficiency Class	Lamp Efficacy (lu/W)
5 star	Excellent	≥ 75
4 star	Very good	65 – 74
3 star	Good	55 – 64
2 star	Fair	45 – 54
1 star	Low	40 – 44
Not permitted	-	< 40

Proposed Standards for Refrigerators in Nigeria

Appliance	Annual Energy Consumption, kWh/year				
	***** 5-Star	**** 4-Star	*** 3-Star	** 2-Star	* 1-Star
Refrigerators and Refrigerator/Freezers	<250	250 – 300	300 – 350	350-400	400 – 500
Freezers	<300	300-350	350-400	400 – 500	500 – 650

Additional Requirements for Labels

- Labels shall be in the English language.
- Be enclosed in a box.
- Be printed on the packaging, with the print and the background in colours that preserve the legibility of the label, as prescribed in the regulations.
- Be waterproof.
- All stars on the label shall be green against white background.

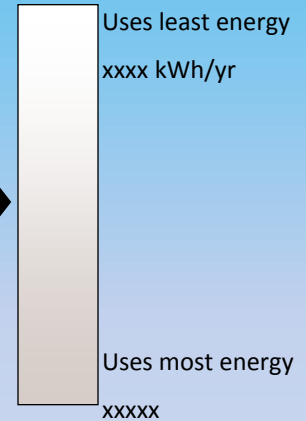
Energy Guide for Lamps



Appliance: xxxxxx
Type: xxxxxx
Manufacturer: xxxxxx
Flux (Lumens): xxxxxx
Input Power (W): xxxxxx
Lamp Life (hours): xxxxxx

Compare this model with others

This lamp uses xxxxx
kWh/yr*



Lamp efficacy in Lumens per Watt** xxxxx

*Based on xxxx hours use. Actual consumption may vary depending on your use of the product

**Coefficient of Performance is the quantity of cooling energy in Watts per Watt of power input.

Similar Models compared with: xxxxx

Test Standard

xxxxxx

Registration number on certificate of registration

xxxxxx

Registration Requirements

Applications for product registration are to include the following:

- Performance test report or data, in accordance with the standard testing and reporting guidelines to be developed and adopted by NERC
- Evidence that the relevant performance tests were carried out in accordance with the standard procedures.
- A sample label.
- The prescribed fee.
- Compliance could be made voluntary for a period of time, say two years.
- Thereafter, it becomes illegal to manufacture, import, distribute, retail, sell or otherwise any of such appliances which does not meet the minimum requirements, or which does not carry the required label

Energy Efficiency will

- SAVE ENERGY**
- SAVE MONEY**
- SAVE THE ENVIRONMENT**

THANK YOU