ENERGY EFFICIENCY DRIVE

The story of Ghana

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Presentation Outline

- Background
- What did we do?
- How did we do it?
- Results
- Where do we go from here?
- Conclusion
Background

- Energy resources overstretched:
- Domestic electricity demand is growing at 7% p.a. whereas generation is lacking.
- 30% of total electricity generated goes waste as a result of the use of inefficient appliances.
- It is high time the consumer used electricity wisely.
- The need to act fast was clear.
What did we do?

- Carrot and stick approach
  - Government invested US$12m to buy 6 million Compact fluorescent lamps (CFLs)
  - The lamps were deployed to households at no cost to the consumer in exchange for incandescent lamps
  - Rigorous public education campaign on conservation
- Town hall meetings
- Radio presenters and jingles
- Educational materials in post boxes
What did we do?

- The Stick (Appliance labelling regime)
- Enforcement of LI 1815 Energy Efficiency Standards and Labelling (Non-Ducted Air-conditioners and Self-Ballasted Fluorescent Lamps) Regulations, 2005
What did we do?

- Follow up regulation
  - LI 1932 Energy Efficiency (Prohibition of Manufacture, Sale or Importation of Incandescent Filament Lamp, Used Refrigerator, Used Refrigerator-Freezer, Used Freezer and Used Air-conditioner) Regulations, 2008
Results – Economic benefits

- Peak savings of 124 MW or 172.8GWh/annum
- Delay in thermal energy generation expansion investment of US$105 million
- CO₂ savings of about 112,320 tons per annum
- Reduction of 148,000 barrels of light crude oil for thermal electricity generation
- At an average crude oil price of US$105 per barrel recorded between Oct. 2007 and Oct. 2008, the energy cost savings is estimated at US$33.3 million per annum.
Results – Consumer benefit

- Enhancement of consumer welfare
- Mean household income savings of about GHC31.00 in 25 districts across the country in over 6 months
Results

- By September 2009
  - CFL penetration rate had increased from 20% in 2007 to 79%.
  - Incandescent lamps had also decreased from 58% in 2007 to 3% in 2009.
  - Empirical evidence? Fly by night!
Where do we go from here?

- Transformation of the refrigerating appliance market.
  - Appliances must meet the minimum energy performance standards requirement.
  - Appliance must belong to tropical or sub-tropical climate specifications
  - Importation of used refrigerators are prohibited
Energy Consumption in Refrigeration in Ghana, 2006
A comparative study

Comparative Energy Use

Energy Use (kWh/year) vs. Exterior Volume (cubic meters)

- Linear (US (California))
- Linear (Europe (A++ rating))
- Linear (Ghana)
- Proposed Standard

Equations and R² values:

1. \[ y = 386.19x + 109.17 \]
   \[ R^2 = 0.6057 \]
2. \[ y = 176.23x + 75.288 \]
   \[ R^2 = 0.5358 \]
3. \[ y = 1246.5x + 543.1 \]
   \[ R^2 = 0.1409 \]
Appliance labelling

- Labelled appliance
- Used refrigerators
The Ghana Refrigerator Energy Efficiency Label
What we seek to achieve

- To prevent Ghana from being a dumping ground for energy inefficient appliances
- Offer consumers incentives to purchase energy-efficient products
- The bigger objective is to achieve an energy efficient economy
Appliance Standards Worldwide

*as of 1999
APPLIANCE: ROOM AIR CONDITIONER
TYPE: NO REVERSE CYCLE LOUVERED SIDES
COOLING CAPACITY: 3.2 kW/hr
MANUFACTURER: COMPANY B
MODEL: 4321
REFRIGERANT: R22

ENERGY CONSUMPTION OF THIS UNIT IS
3,274 kWh/yr**

* EER (Energy Efficiency Ratio) is the measure of energy efficiency for Air Conditioners, expressed as Watt of cooling per Watt of electrical power input. Only models between 2.5 and 11.5 kW/hr cooling capacity and with the same features are used for this scale. The given data are according to Ghana Energy Efficiency Labelling requirements for non-ducted air conditioners under Ghana Standard Number GS362.
**Based on 2,000 hours use. Actual consumption may vary depending on actual use of the product.
Removal of this label before first retail purchase is an offence under U 1541
Conclusion

- It is cheaper to conserve than to build
- Appliance standards and labelling regime has proven to be the most effective tool in achieving energy efficient economy
- Our axiom is no label no good
THE END

THANK YOU