

# **LIQUIFIED PETROLEUM GAS (LPG) PROMOTION:**

## **THE GHANA EXPERIENCE**

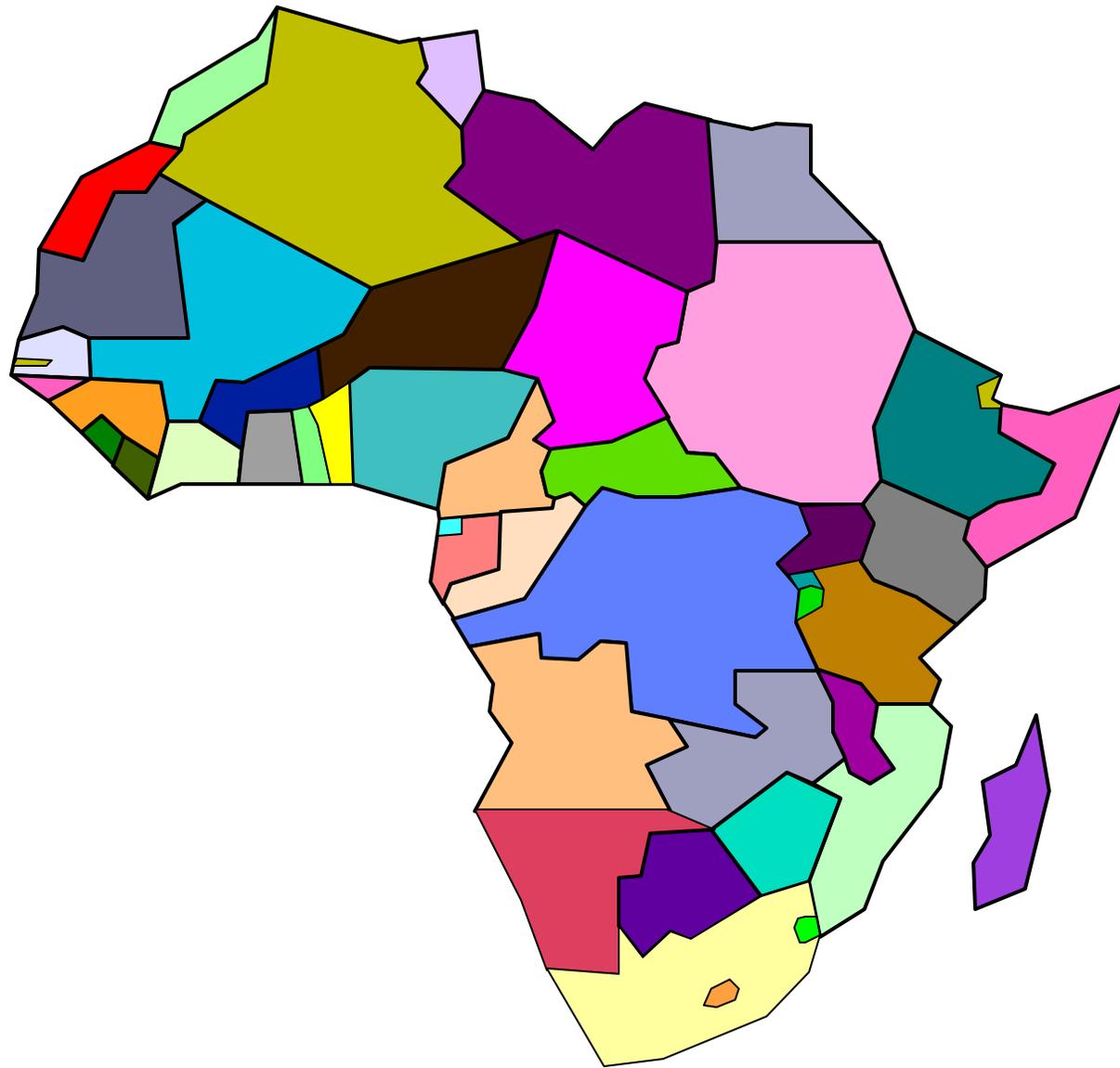
**PRESENTATION AT:  
UNDP/WORLD BANK-ENERGY AND  
POVERTY W'KSHOP**

**ADDIS ABABA, ETHIOPIA**

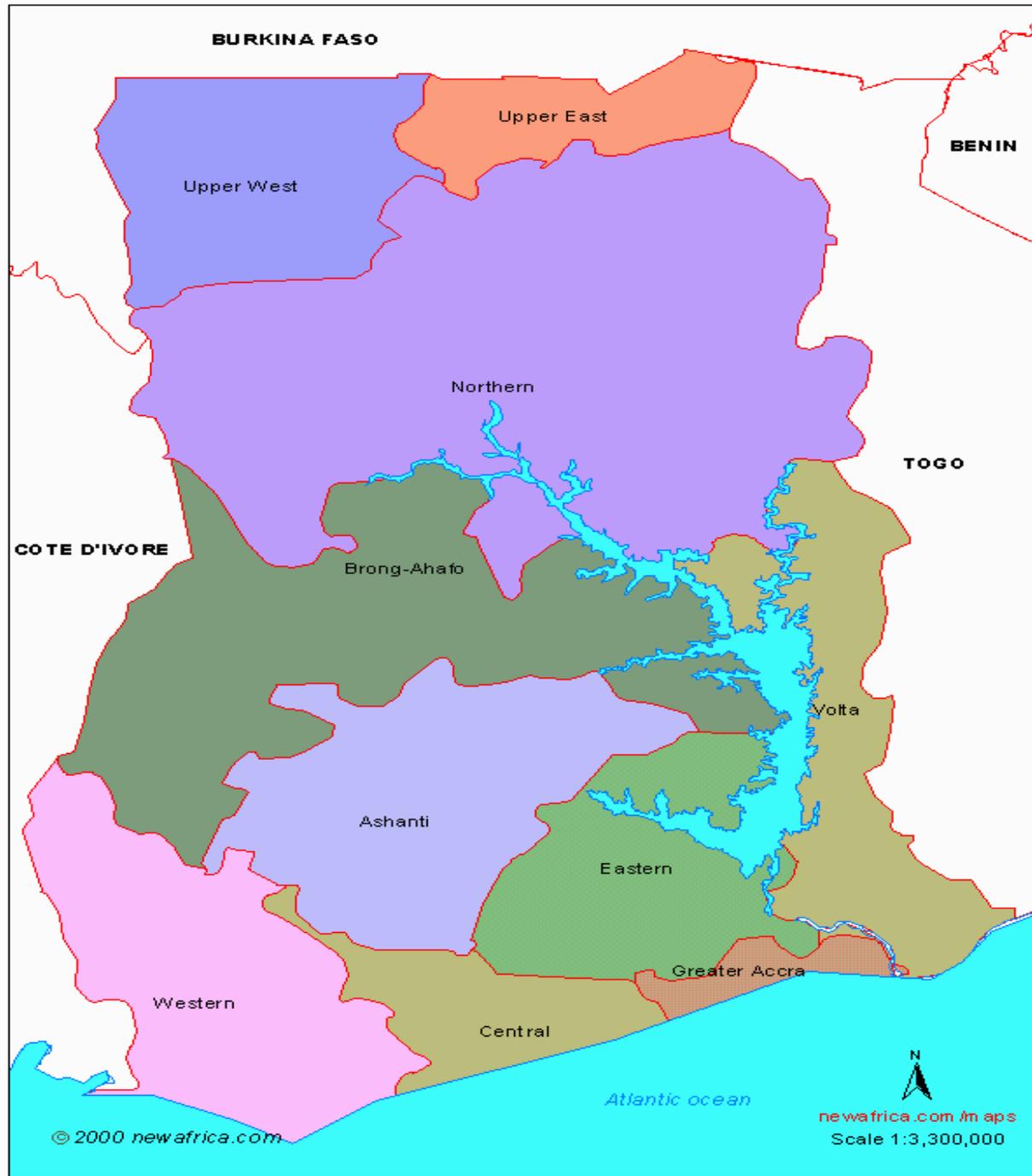
**BY:**

**EMMANUEL A. QUAYE – FOLI  
MINISTRY OF ENERGY  
GHANA**

**OCTOBER 2002**



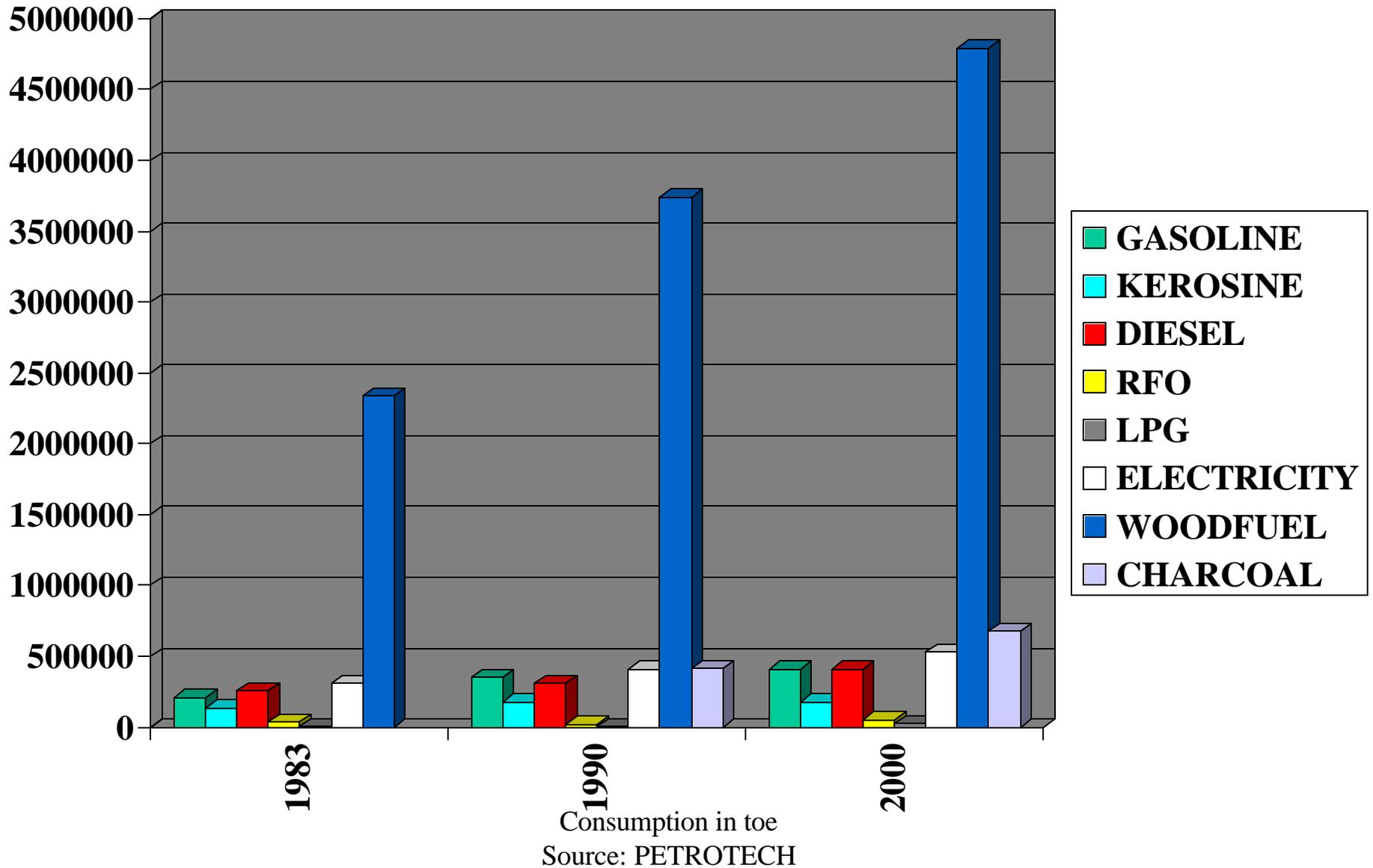
# GHANA ADMINISTRATIVE MAP



## SNAPSHOTS OF THE ENERGY SCENE IN GHANA

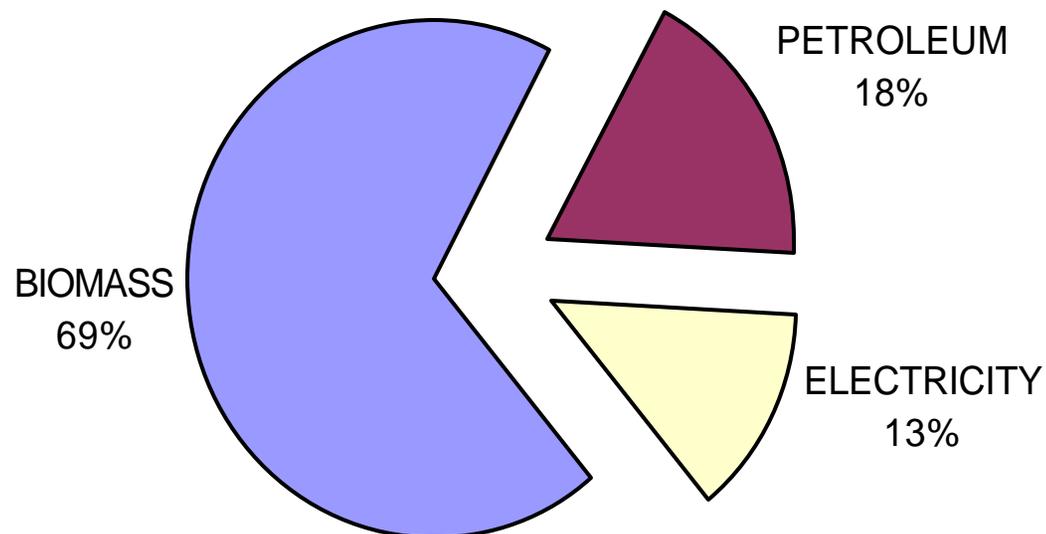
TYPE OF FUEL	1983	1990	2000
GASOLINE	207000	351000	410000
KEROSINE	132000	172000	173000
DIESEL	252000	308000	412000
RFO	37000	19000	50000
LPG	3000	7000	26000
ELECTRICITY	308000	411000	529000
WOODFUEL	2339000	3745000	4795000
CHARCOAL	0	414000	674000
* consumption in toe		**source: PETROTECH	

# SNAPSHOTS OF THE ENERGY SCENE IN GHANA



# ENERGY CONSUMPTION IN GHANA

(source: W. A. Togobo/MoEn)



## GROWTH IN ENERGY CONSUMPTION (1990-2000)

FUEL TYPE	% GROWTH PER YEAR
GASOLINE	1.5 –4.0
KEROSINE	0.2
DIESEL	1.2 –1.3
RFO	0.6
LPG	14.0
ELECTRCITY	10
WOODFUEL	2.5 –3.0
CHARCOAL	3.0 –5.0

# GHANA'S LPG SOURCE

- LPG is produced from the Tema Oil Refinery(TOR)
- It is a mixture of 70% propane and 30% butane
- The country currently requires about 45,000 barrels of crude per day
- About 27% of total export earnings spent on petroleum products in 2000

# LPG PRODUCTION AND SUPPLIES BEFORE THE PROMOTION EXERCISE

<b>YEAR</b>	<b>DEMAND '000 kg</b>	<b>PRODUCTION '000 kg</b>	<b>IMPORTS '000 kg</b>	<b>EXPORTS '000 kg</b>
<b>1981</b>	<b>6,388</b>	<b>6,809</b>	<b>-</b>	<b>162</b>
<b>1982</b>	<b>6,529</b>	<b>7,085</b>	<b>-</b>	<b>141</b>
<b>1983</b>	<b>3,098</b>	<b>3,251</b>	<b>-</b>	<b>0</b>
<b>1984</b>	<b>4,351</b>	<b>4,708</b>	<b>-</b>	<b>663</b>
<b>1985</b>	<b>4,137</b>	<b>5,732</b>	<b>-</b>	<b>987</b>
<b>1986</b>	<b>4,713</b>	<b>6,243</b>	<b>-</b>	<b>1,510</b>
<b>1987</b>	<b>4,627</b>	<b>6,447</b>	<b>-</b>	<b>1,692</b>
<b>1988</b>	<b>4,939</b>	<b>5,861</b>	<b>-</b>	<b>240</b>
<b>1989</b>	<b>6,387</b>	<b>6,895</b>	<b>-</b>	<b>885</b>

**\*source: PETROTECH**

## **According to the Ghana Living Standards Survey (GLSS) of 1988:**

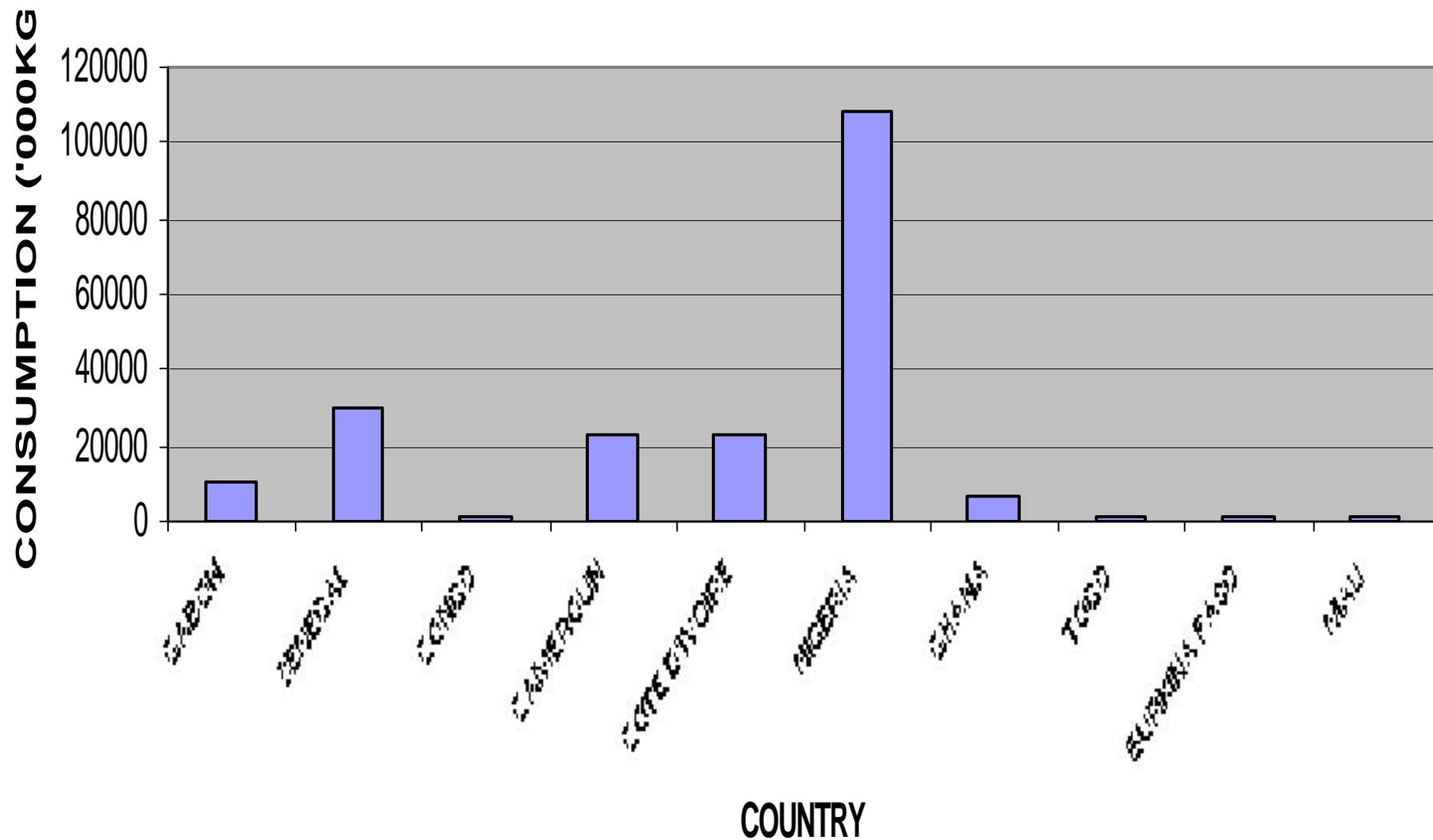
- Only 4.8% of the population in Accra used LPG.**
- Only 0.8% of the population in other urban areas used LPG.**
- Nobody in the rural areas used LPG.**

## CONSUMPTION OF LPG IN WEST AFRICA (1989)

COUNTRY	POPULATION	CONSUMPTION '000 kg	CONSUMPTION PER CAPITA in kg
GABON	1,100,000	10,355	9.4
SENEGAL	7,000,000	29,500	4.2
CONGO	1,990,000	1,103	2.2
CAMEROUN	11,000,000	23,035	2.1
COTE d'IVOIRE	11,200,000	22,844	2.0
NIGERIA	110,000,000	108,000	1.0
GHANA	13,900,000	6,387	0.5
TOGO	3,400,000	727	0.2
BURKINA FASO	8,500,000	1,641	0.2
MALI	7,900,000	788	0.1

source: PETROTECH

# CONSUMPTION OF LPG IN WEST AFRICA (1989)



Source: PETROTECH

# **THE GHANA LPG PROMOTION**

- **The promotion started in 1990**
- **Short term aim – to eliminate flaring of LPG at TOR**
- **Long term aim - ensure households that use charcoal and firewood for cooking adopt use of LPG.**

SOME SPECIFIC ISSUES  
(DIFFICULTIES ENCOUNTERED)

- Number of cylinders in circulation
- Non-uniformity in standards among OMCs (Mobil, Shell and Goil)
- Insufficient re-filling points
- Traditional mode of cooking vrs Western style cooking stoves
- Resistance to change

# LPG PRICE BUILD UP (MID '90s)

<b>COST DESCRIPTION</b>	<b>Cedis/kg</b>	<b>US\$/kg</b>
<b>1. Ex- refinery price</b>	<b>607.92</b>	<b>0.26</b>
<b>2. Filling plant expenses</b>	<b>53.86</b>	<b>0.02</b>
<b>3. Promotional levy</b>	<b>61.18</b>	<b>0.03</b>
<b>sub total</b>	<b>722.96</b>	<b>0.31</b>
<b>4. Dealers margin</b>	<b>24.38</b>	<b>0.01</b>
<b>5. Marketers margin</b>	<b>33.80</b>	<b>0.02</b>
<b>6. Transporters margin</b>	<b>47.27</b>	<b>0.02</b>
<b>Ex-Pump Price</b>	<b>823.40</b>	<b>0.36</b>
<b>Home delivery service charge</b>		
<b>5 kg cylinder</b>	<b>80.00/kg</b>	<b>0.04/kg</b>
<b>14.5 kg cylinder</b>	<b>75.86/kg</b>	<b>0.03/kg</b>

Source: MINISTRY OF ENERGY

# **SOME OF THE PROMOTIONAL STRATEGIES**

- ? LPG Promotion Unit set up within the Ministry**
- ? Ministry was primary investor and fixes the prices of LPG.**
- ? Promotional levy used for creating required awareness and demand for the increased use of LPG.**
- ? Door to door LPG delivery – Service Providers charge additional fee for delivery gas to individual residences.**
- ? Cylinders given out to households at amortized price and part of cost was recouped when gas was purchased.**
- ? Government institutions eg. Hospitals, boarding schools etc were encouraged to convert their kitchen to LPG burners.**
- ? Commercial cooked food sellers were given assistance.**

# **SOME OUTPUTS FROM THE PROGRAMME**

- **Increase in cylinders in circulation from 80,000 in 1989 to 600,000 in 1997.**
- **Overall LPG consumption increased from 5,267 MT in 1989 to 32,000MT in 1996.**

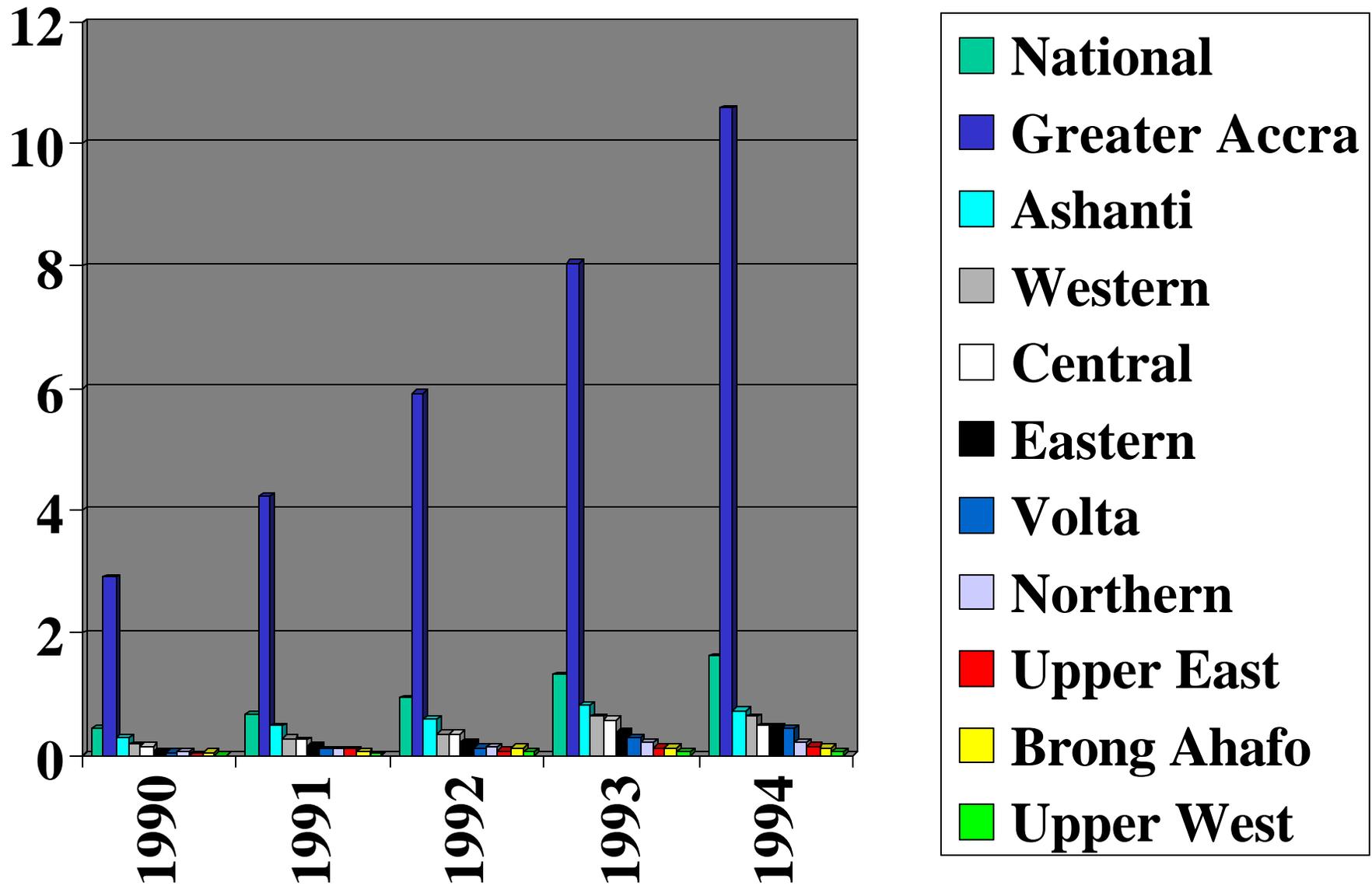
- **Two (2) LPG cylinder Manufacturing Plants are operational in Ghana with total production capacity in excess of 135,000 pieces of a combination of 5kg and 14.5 kg cylinders.**
- **The private sector has established many LPG distribution outlets for both cars and domestic cylinders.**
- **Elements of traditional cook stoves have been used as basis for the design of locally manufactured LPG stoves.**

## REGIONAL PER CAPITA CONSUMPTION OF LPG IN GHANA IN kg (1990 – 1994)

<b>REGION</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>
<b>(NATIONAL)</b>	<b>(0.43)</b>	<b>(0.67)</b>	<b>(0.92)</b>	<b>(1.30)</b>	<b>(1.60)</b>
<b>GREATER ACCRA</b>	<b>2.90</b>	<b>4.24</b>	<b>5.93</b>	<b>8.06</b>	<b>10.59</b>
<b>ASHANTI</b>	<b>0.28</b>	<b>0.46</b>	<b>0.58</b>	<b>0.80</b>	<b>0.71</b>
<b>WESTERN</b>	<b>0.17</b>	<b>0.26</b>	<b>0.34</b>	<b>0.62</b>	<b>0.62</b>
<b>CENTRAL</b>	<b>0.14</b>	<b>0.25</b>	<b>0.33</b>	<b>0.56</b>	<b>0.46</b>
<b>EASTERN</b>	<b>0.06</b>	<b>0.15</b>	<b>0.21</b>	<b>0.37</b>	<b>0.45</b>
<b>VOLTA</b>	<b>0.03</b>	<b>0.08</b>	<b>0.11</b>	<b>0.29</b>	<b>0.43</b>
<b>NORTHERN</b>	<b>0.06</b>	<b>0.08</b>	<b>0.13</b>	<b>0.20</b>	<b>0.20</b>
<b>UPPER EAST</b>	<b>0.02</b>	<b>0.08</b>	<b>0.07</b>	<b>0.10</b>	<b>0.15</b>
<b>BRONG AHAFO</b>	<b>0.03</b>	<b>0.06</b>	<b>0.11</b>	<b>0.11</b>	<b>0.11</b>
<b>UPPER WEST</b>	<b>0.00</b>	<b>0.02</b>	<b>0.06</b>	<b>0.04</b>	<b>0.05</b>

Source: GNPC

## REGIONAL PER CAPITA CONSUMPTION OF OF LPG GAS (KG)



Source: GNPC

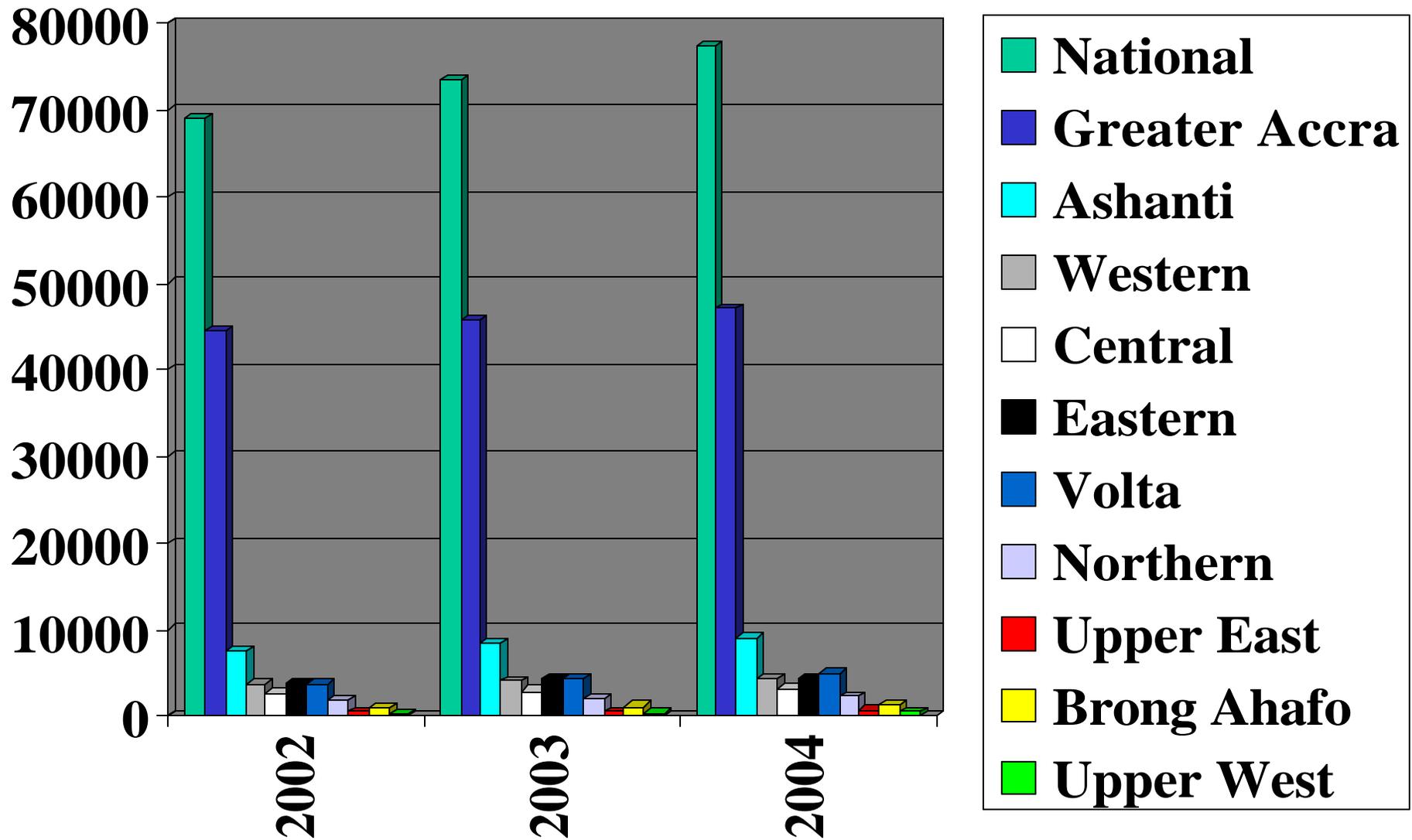
# PROJECTED REGIONAL LPG DEMAND (2002- 2004)

<b>REGION</b>	<b>2002 ('000kg)</b>	<b>2003 ('000kg)</b>	<b>2004 ('000kg)</b>
<b>(NATIONAL)</b>	<b>(69,208)</b>	<b>(73,423)</b>	<b>(77,454)</b>
<b>GREATER ACCRA</b>	<b>44,539</b>	<b>45,842</b>	<b>47,013</b>
<b>ASHANTI</b>	<b>7,549</b>	<b>8,282</b>	<b>8,959</b>
<b>WESTERN</b>	<b>3,624</b>	<b>3,976</b>	<b>4,301</b>
<b>CENTRAL</b>	<b>2,646</b>	<b>2,903</b>	<b>3,140</b>
<b>EASTERN</b>	<b>3,824</b>	<b>4,196</b>	<b>4,196</b>
<b>VOLTA</b>	<b>3,643</b>	<b>4,264</b>	<b>4,927</b>
<b>NORTHERN</b>	<b>1,673</b>	<b>1,959</b>	<b>2,263</b>
<b>UPPER EAST</b>	<b>466</b>	<b>545</b>	<b>630</b>
<b>BRONG AHAFO</b>	<b>956</b>	<b>1,119</b>	<b>1,294</b>
<b>UPPER WEST</b>	<b>289</b>	<b>335</b>	<b>391</b>

Source: PETROTECH

? LPG is the fuel of choice in the urban areas !

# PROJECTED REGIONAL LPG DEMAND ('000KG)



LPG is the choice of fuel in the  
Urban areas

Source: PETROTECH

## PRICE BIULD-UP FOR LPG (SINCE DEC. 2001)

COST BREAKDOWN	BUILD UP (cedis)	US\$
1. Ex-pump price	1,217.39	0.15
2. Excise duty @ 15%	182.61	0.02
3. Excise duty specific	100.00	0.01
4. Filling plant expenses	321.20	0.03
sub total	1,731.20	0.21
5. Dealer's margin	109.70	0.01
6. Marketer's margin	136.03	0.02
7. Transporter's margin	193.07	0.02
8. Distribution	30.00	0.01
compensation margin		
EX-PUMP PRICE	2,200.00	0.27
Home delivery Service charge		
5 kg bottle	500.00 (max) per bottle	0.06
14.5 kg bottle	1,400.00 (max) per bottle	0.17

Source: MINISTRY OF ENERGY

## FUEL COST VERSUS % HOUSEHOLD USAGE

TYPE OF FUEL	FUEL COST (cedis/kwh)	FUEL COST (US\$/kwh)	% OF HOUSEHOLD USE
FIREWOOD	42	0.005	62.5%
CHARCOAL	115	0.014	30.6%
LPG	182	0.022	4.1%
KEROSINE	209	0.025	1.1%
ELECTRICITY	400	0.048	0.4%
CROP RESIDUE	0 - 20	0 – 0.002	1.3%

\*source: W. A. TOGOBO/MINISTRY OF ENERGY

***NOTE: THE MOST EXPENSIVE FUEL IS THE LEAST USED BY HOUSEHOLDS***

# COMPARATIVE COST OF COOKING FUEL (SEPT. 2002)

FUEL	DESCRIPTION	CEDIS	US\$
LPG	14.5 kg bottle	32,500	3.96
KEROSINE	1 Gallon	8,800	1.07
FIREWOOD	1 bundle of 9kg (Accra)	1,500	0.18
ELECTRICITY	100 units (50-300 tariff category)	40,000	4.88
ELECTRICITY	100 units (above 300 tariff category)	98,000	11.95
CHARCOAL	1 bag of 46 kg (Accra)	45,000	5.49

Source: W. A. TOGOBO/MIN. OF ENERGY

## **According to the Ghana Living Standards Survey (GLSS) of 2000:**

- 22.7% of the population in Accra use LPG**
- 5.2% of the population in other urban areas use LPG**
- 0.6% of the population in the rural areas use LPG**

# **RESOLVING ISSUE OF FUTURE SUPPLIES**

- **TOR built in 1963 with capacity of 28,000 bpsd**
- **Expansion and modernisation work carried out in two phases**
- *Phase 1 – revamping and expansion to process 45,000bpsd*
- *Phase 11 – installation of secondary conversion plant (RFCC)*

# FUTURE SUPPLIES CONT'D

- When RFCC becomes operational, there will be excess LPG for export as TORs capacity will be increased from 27,713MT to about 166,873MT
- (source: Samsung Revamping Studies/Foster Wheeler USA Corporation Report)

# LESSONS

- ? **LPG is mainly used by medium to high income households**
- ? **Majority of the poor use the cheapest fuel despite the inconveniences**
- ? **Price of fuel is a major determining factor for fuel choice for the majority (the poor)**
- ? **Out of about 18.5 million Ghanaians, over 16.8 million have their meals cooked from wood fuel (firewood and charcoal)**

# **RECENT MONITORING OF LPG OPERATIONS**

- **Done by the Energy Commission**
- **Monitor / enforce compliance with regulations**
- **Ascertain Best Operating Procedures (BOPs) and Job Safe Practices (JSPs) in supply, storage and marketing of LPG.**

# **SHORT COMINGS IDENTIFIED**

- **OMCs have different sets of rules**
- **Deficiencies in LPG appliances (eg cylinder accessories), handling of appliances lack of training for personnel**
- **No National regulations, codes of practice and guidelines for Good Safety Practices in the LPG industry yet**
- **High cost**

# **STEPS BEING TAKEN**

- **On-going consultations towards the development of a National LPG code of Practice and Guidelines for Good Safety Practices.**
- **The final product is expected to be guidelines not only for safe handling and transportation of LPG cylinders but also the following:**

- a Bulk LPG storage facilities at commercial/industrial premises**
- b. Handling and storage of LPG cylinders and accessories of commercial installations**
- c. Handling and storage of LPG cylinders and accessories at domestic installations**
- d. Domestic/commercial/industrial cylinders**
- e. LPG retail outlets and filling plants**
- f. Low pressure regulators**
- g. Mobile LPG filling plants**

**THANK YOU FOR  
YOUR ATTENTION**