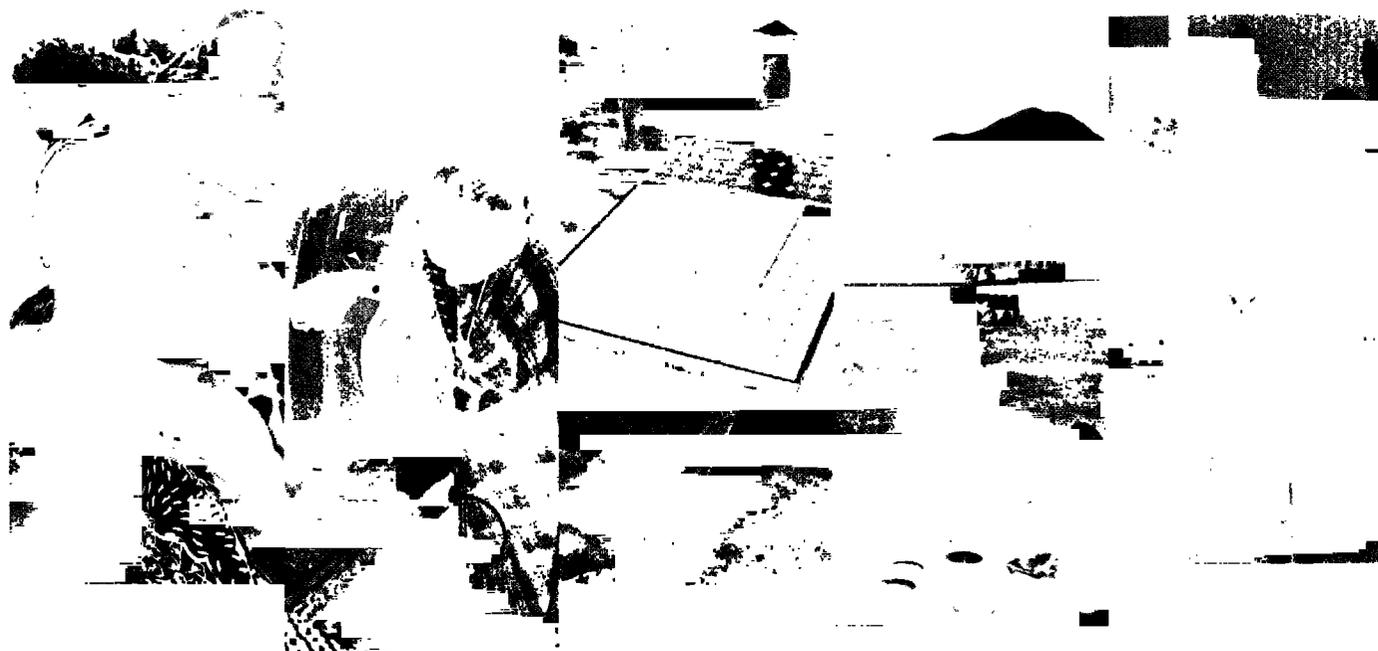


ESMAP TECHNICAL PAPER  
088

*Ghana: Poverty and Social Impact Analysis  
of Electricity Tariffs*

35991



Energy

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Management

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Programme

December 2005



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# **Ghana: Poverty and Social Impact Analysis of Electricity Tariffs**

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**December 2005**

Sarah Keener and Sudeshna Ghosh Banerjee

Energy Sector Management Assistance Program  
(ESMAP)

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# 1

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## Reform Context

1.1 In May 2003 the Government of Ghana was preparing its first Poverty Reduction Strategy Credit (PRSC) in support of its poverty reduction strategy (GPRS). As part of the stakeholder consultations on the strategy's preparation, a number of areas were identified where poverty and social impact analysis (PSIA) would strengthen the process of design, monitoring and evaluation of key policies. The World Bank agreed to support one of the topics selected by stakeholders - an analysis in the energy sector - after assessing (a) the breadth of potential impact from the reform (b) the level of sensitivity to the reform (c) the level of public consensus and need for dialogue.<sup>1</sup>

1.2 The main objectives of electricity sector reform in Ghana, which has been under discussion since 1994, are to (i) meet the demand for expansion of capacity for electricity generation by opening the market to private investment, and de-regulating part of the market; (ii) to improve the efficiency of the sector through performance contracts, competition among power producers, and tariffs that reflect the cost structure, and; (iii) to reduce the fiscal drain of the sector on the Government budget by gradually moving tariffs towards full cost recovery.<sup>2</sup>

1.3 The topic of the PSIA was chosen in collaboration with stakeholders (see section below) and did not focus on the entire spectrum of sector reform because a broader Economic and Sector Work on the Energy Sector was already underway by the World Bank, and because of the limited time frame to feed into the GPRS and PRSC.

1.4 The PSIA was initially included in the list of areas for research because of public concern over a combined increase of 72% in the end-user electricity tariffs in August 2002 and March 2003, and by the subsequent enactment in 2003 of an automatically adjusting tariff formula for electricity. After further stakeholder consultation in Ghana, this research was narrowed to focus on whether the lifeline tariff (households consuming below 50 kWh per month receive a government subsidy) was an effective tool in protecting the poor from tariff increases and, on an indicative basis, to assess how consumers were coping with the higher tariffs. This analysis was deemed important

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<sup>1</sup> This was made possible thanks to the support of ESMAP, of the Danish trust fund, and to TFESSD support.

<sup>2</sup> In June 1994, the Government through a policy paper outlined the strategic framework for power sector reform and established a power sector reform committee (PSRC) to oversee the reform of the sector.

because the automatic tariff adjustment mechanism, which at the time was expected to lead to further tariff increases. In spite of the heated debate on electricity tariffs, little analytical work had been completed on issues of affordability and the coherence between expanding electricity services and having an economically viable sector – both objectives contained in the GPRS.

1.5 The overall fiscal drain of the electricity sector had, by 2002, become substantial; in 2002 deficits of the three electricity utility companies (VRA, ECG, NED)<sup>3</sup> approached 11% of Government spending, or 4% of GDP.<sup>4</sup> Of this US\$204 million deficit, US\$124 million alone stemmed from interest and exchange rate losses. Projected losses for 2003 were expected to rise to the equivalent of 17% of total government spending for the previous year and 6% of GDP. This financial situation affected the utility investments and resulted in inadequate generation reserve, transmission network constraints, overloaded transformers, and degraded distribution networks. All of these factors reduced the quality of service to customers, particularly in the more populated areas outside of Northern Ghana. Ageing equipment further increased system losses, and indirectly added to the cost of production and distribution of electricity. If full cost recovery as well as full debt service were to be included, total costs would be near USD 0.08 – 0.10 per kWh (2003). New financial needs to restructure and revitalize the sector were, at the time, calculated to add additional debt service of at least USD 0.01 to this average price per kWh.<sup>5</sup>

1.6 The attempt to reform electricity tariffs in Ghana is not a recent phenomenon and in fact predates other major reform initiatives in the power sector. As Table 1.1 below illustrates, there is a long history of attempting to reconcile the desire to have tariffs that reflect economic costs and yet that are affordable to consumers. Tariffs that adjust regularly to reflect fluctuations in costs (such as exchange rate or inflation) were implemented between 1994 and 1997. In pursuance of the agreement to ensure that tariffs approximate the Long Run Marginal Cost (LRMC), the GoG continued to increase electricity tariffs without any opposition<sup>6</sup> until an increase of over 300% in May 1997 provoked intense nationwide protest with the Association of Ghana Industries (AGI), the Trades Union Congress (TUC) and the Civil Servants Association (CSA) at the forefront. Following this increase, draft legislation was enacted to establish an independent regulatory agency. The Public Utility Regulatory Commission (PURC) bill became law

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<sup>3</sup> Volta River Authority, Electricity Company of Ghana, Northern Electricity Department

<sup>4</sup> Based on Government spending as reported in PRSC2, less amortization, foreign assistance and arrears. The country's three electricity agencies are the Volta River Authority (VRA), the generator; the Electricity Company of Ghana (ECG), the southern distributor; and the Northern Electricity Department (NED), part of VRA, which distributes electricity in northern Ghana.

<sup>5</sup> As per a draft financial model for ECG constructed as part of this PSIA.

<sup>6</sup> The only opposition to tariff increase between 1994 and 1997 arose when the MoE approved tariffs which were to take retrospective effect. This decision was challenged by a group of consumers in court seeking clarification regarding the legality of the retroactive billing. The court ruled against the retroactive billing and instructed the utilities to obtain Parliamentary approval before enforcing the 1994 and 1995 tariffs.

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shortly thereafter, in October 1997, and an eight member PURC board was sworn in on November 10, 1997.

**Table 1.1: History of Tariff Reform in Ghana**

Year	Event
1976 - 1986	No changes in tariff.
1986	Coopers & Lybrand first major tariff study. Study recommends tariffs based on Long-Run Marginal Cost (LRMC), classifying consumers based on groupings of consumers who impose similar costs on the systems, and grouping residential consumers by level of consumption. Progressive with lifeline consumption of 50 kWh applying to all consumers. Also adopted uniform national tariff structure.
1988	The level of tariffs recommended by the Coopers and Lybrand was substantially adopted and approximated 75% of LRMC
1989	Tariffs increases, ranging from 6% for low-income consumers to 20% for non-residential consumers, were implemented in order to enable VRA to continue to earn an 8% and ECG a 6% ROR. However, in fixing the tariff, the GoG expressed concerns at the prospect of further adjustments to domestic tariffs to reflect recent devaluation and inflationary pressures at a time when the service remained unreliable. The GoG expressed the wish to re-examine certain aspects of the 1986 tariff study, and this leads to commissioning of next major tariff study (ACRES).
1990 - 1992	ACRES study points out: <ul style="list-style-type: none"> <li>• The inverted block rate structure recommended by Coopers and Lybrand was cumbersome to administer and a source of customer discontent.</li> <li>• Recommended adoption of “adjusted LRMC” – an LRMC adjusted to reflect the financial requirements of the utilities.</li> <li>• Recommended merging of all residential tariff structure into a single energy rate with the exception of the lifeline tariffs</li> <li>• New electricity tariffs introduced in January 1992 based on the recommendation of ACRES International, which was actively supported by the World Bank.<sup>7</sup></li> </ul>
January 1993	The GoG agrees to adopt a <u>formula-based approach to tariff adjustment and provide for the regular and systematic adjustment of the tariff thereafter on the basis of the agreed formula.</u> Essentially the formula provided for phasing-in prevailing tariffs to LRMC adjusting for inflation and exchange rate movements. Tariff increases were implemented in January 1993 and an agreement reached for further increases in 1994 and 1995 within the framework of this agreement.
1994-1997	Tariffs continue to increase per the agreed formula, although the focus is on a set Rate of Return for the utilities rather than LRMC.
1997	Tariff increases of over 300% prompt nationwide protest. President Rawlings suspends increase until a regulatory commission (PURC) is formed. In response PURC was formed and placed in charge of tariff setting rather than Parliament.
Feb. 1998 Sept. 1998 May 2001 July 2002	PURC tariff adjustments
2001	PURC outlines a Transitional Plan for tariffs to cover 2001 – 2004, including regulations for consumer consultation on tariffs.

<sup>7</sup> The main features of the 1992 tariff increase were as follow: tariffs for residential consumers increased from 20% to 30% of LRMC; non-residential tariff mirrored LMRC; and LV and HV industrial tariffs moved from 26% and 33% of LRMC to about 42% and 54% of LRMC respectively in the case of ECG and to about 70% in the case of VRA.

Year	Event
January, 2003	Tariff formula allowing for automatic adjustment to reflect exchange rate and inflation is enacted and supposed to take effect July 2003
October, 2003	First automatic adjustment of the tariff per the formula.
2005	PURC scheduled to carry out major tariff review

Source: Authors elaboration

1.7 Ghana's residential tariff structure has moved from 5 sub-groups based on levels of consumption, to four and then three during the 2003 tariff review process.<sup>8</sup> The lowest group, the lifeline, offers a flat rate to customers consuming 50 KWh per month or less, and was originally created to minimize the cost to the utility of billing small accounts. Starting in August of 2002, the Government of Ghana introduced a subsidy for those consuming within the lifeline, and it came to be used as a tool for ensuring that lower income users were protected from tariff increases. When the automatic adjustment formula for tariffs was set to start in 2002, the GoG increased the subsidy on the lifeline to protect this block from the automatic adjustment; the adjustment with the formula did not take effect until October, 2003.

**Table 1.2: Residential Tariff Structure (Cedis per kWh)**

KWh/Month	Feb 98	Sept 98	May 01	Aug 02**	Mar 03	Oct 03***
0 – 50 ¢/Month	2000	4000	7800	9000	13000	13000
0 – 50*	87	174	339	391	565	565
51-300	50	120 – 150	242- 304	400	550	610
Over 300	75 – 180	220- 350	570	960	960	1065

Source: PURC, 2003

\* Is a flat rate, assumes average consumption levels of 23 kWh/month

\*\* Government subsidy of ¢5000 starts

\*\*\*Government subsidy increased to ¢6080 to keep lifeline constant

1.8 At the start of the PSIA tariff increases had brought the average end user tariffs to the point that they covered the PURC-defined economic costs which do not include an allowance for current inefficiencies (estimated to be about 2 US cents/kWh - PURC 2002).<sup>9</sup> However, more recent financial analysis of the sector pointed to the fact that the middle tariff band (51 – 300 kWh) was paying below actual average cost and therefore was being subsidized as well as the lifeline band.

<sup>8</sup> There are five main tariff categories, including residential. The residential, non-residential and SLT-LV customers are supplied electricity at nominal voltage levels of 415/230V and are together classified as low voltage customers for the purpose of cost allocation while SLT-MV and SLT-HV customers are classified as medium voltage customers. The PURC approved an average increase of 72% but this was implemented in two-steps. The first round of increases of 60% came into effect in August while the second round was introduced in March 2003. So the March 2003 was just an extension of the July 2002 tariff increase and not a major tariff review.

<sup>9</sup> PURC sets benchmarks for efficiency and bases its tariffs on the assumption that these efficiency targets are being met, and that the end-user should not pay for inefficiencies in the utility.

# 2

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## The PSIA Process: Stakeholder Involvement and Methods

2.1 Given the high profile of tariff policy in Ghana, the PSIA placed equal priority on informing policy discussion and involving national stakeholders in the research process as on the technical research issues. The research was led by national consultants, and guided by a multi-stakeholder Steering Committee in order to increase the chances that the analysis would lead to enhanced policy debate and operational changes. National involvement therefore had several elements:

- The multi-stakeholder group was involved from the beginning in the elaboration of terms of reference, and in vetting interim field reports and drafts. Some members also participated in a two-day training session and portions of the fieldwork;<sup>10</sup>
- Consultants collecting information were required to share all background reports and analysis, and information on methodology, with the steering and technical committees (compiling and sharing available background studies and methodology guidance on CD-ROMs) to increase local knowledge of the tradeoffs in the policy being considered; and
- National capacity and experience with this type of analysis was developed by contracting local research partners not only to implement field work but to lead the analysis and report writing as well. The PSIA was guided by the Kumasi Institute of Technology and Environment (KITE), a Ghanaian NGO active in energy policy issues.<sup>11</sup>

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<sup>10</sup> The training covered (i) PSIA concepts and methodology (ii) the application of these concepts to research on tariffs (iii) analysis to date of existing information (iii) focus group techniques (iv) the use of the field instruments. The field survey was preceded with testing of the draft questionnaires for validity, accuracy clarity and timing.

<sup>11</sup> World Bank staff and consultants provided support and training throughout the process. An international consulting firm, Ramboll, provided some assistance as well but did not write up the final report.

2.2 The Steering Committee comprised the Minister of Energy (Chairman), Minister of State and Economic Planning and Chief Executives of the National Development Planning Commission (NDPC) – the body tasked with monitoring the GPRS, the PURC, and the Volta River Authority (VRA) – the government owned electricity generator. The Chairman was well disposed to report on the PSIA to the Cabinet. In order to facilitate ongoing collaboration, a technical committee was also formed, and comprised representatives of stakeholder institutions, namely the Ministry of Energy, Ministry of Finance and Economic Planning, National Development Planning Commission, Ghana Statistical Service, VRA, the electricity distributor companies for both the North and the South of the country (Electricity Company of Ghana- ECG and Northern Electricity Department - NED), PURC, the World Bank and two nongovernmental organizations (NGOs) representing consumer interests.

2.3 The Ghana PSIA presented special challenges; it had a limited time frame in which to inform the electricity tariff policy as included in the PRSC and GPRS, and primary data specific to the issue at hand was lacking. In particular, while tariffs had increased substantially, the most recent household income data was from 1998/1999, prior to tariff increases. Further, this data did not identify “lifeline” customers as such, and based on discussion with the Department of Statistics, it was clear that one could not impute quantities consumed because of the common error of taking the arrears section of the bill as the current bill. As the PSIA research later revealed, arrears for urban slum households tended to be many multiples of arrears for other groups and thus using this data to impute the impact of higher tariffs on households’ budgets would not have been accurate. Finally, as noted above, updated household surveys and a thorough tariff review (2005) were planned, and the PSIA was not meant to replace these, but to inform policy in the interim period.

2.4 The research approach therefore dealt with these constraints in two ways: (i) it focused on testing assumptions behind the policy reform using existing data and; (ii) it used utility data on all customers to assess the behavioural response to tariff increases and to identify any major reactions, and a small sample of more in-depth primary research to provide insight into why consumers were reacting as they were and to identify specific groups that could not be identified through utility data. The research also provided recommendations for the design of future nationally representative household surveys that could be undertaken to inform the thorough tariff review planned for 2005. The small-scale survey covered 318 households (KITE) which included both compound and individual households, and was complemented by focus group discussions and key informant interviews. In addition, the PSIA analysed how different stakeholders intervened to affect the implementation of previous tariff reforms. Finally, while the PSIA focused on the specific lifeline tariff policy which was being debated, it also recognized that access to and costs of biomass, fuelwood and kerosene have a much larger impact on the majority of the poor.

2.5 The fieldwork was carried out in Tamale, Accra and Kumasi – the three major urban areas where the majority of electricity consumers were concentrated, and which represent the country's three main ecological zones (coastal, forest and savannah). For the in-depth quantitative surveys, and for some of the key informant interviews, 90 customers in ECG (services Accra and Kumasi) and NED (services Tamale) customer databases were randomly selected within the following categories, all said to have a significant share of lifeline customers: urban areas with low to middle income residents (URBAN), rural areas (SHEP)<sup>12</sup> and urban slums (SLUM)<sup>13</sup>.

2.6 Customer data from the largest distribution utility, ECG, related to consumption, current bill, and arrears was collected on as many of those households interviewed as possible using the customer identification number as the common key; this allowed the research team to eventually pair this information with households' responses, and, most importantly, to show trends over time for these same households in terms of electricity consumption. In addition, for some of the specialized surveys, specific neighbourhoods and consumer groups were targeted such as those with problems with disconnection or illegal connections. Finally, a specificity of housing in Ghana is the existence of shared compound houses; policy makers were concerned that these houses were not able to benefit from lifeline tariffs, and that they were among the most vulnerable, and they were also included in the research and analysis. Accordingly, the following methods were used:

- New analysis of nationally representative existing data (Ghana Living Standards Survey 4 from 1998/1990, preliminary results from Core Welfare Indicators Questionnaire 2003, analysis of utility records to assess the recent behavioral response to tariff increases)
- In depth focus group discussions, covering a sample of compound house dwellers, rural and peri-urban customers
- Limited quantitative survey work administered to SHEP, URBAN, SLUM, and compound house dwellers and landlords.
- Key informant interviews with specific stakeholder groups such as disconnected consumers, commercial consumers, bonded cashiers of ECG, district technical officers of ECG; ECG loss control units, NED officials; urban non-connected alternative energy producers - e.g. solar, LPG, fuel wood,

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<sup>12</sup> SHEP was introduced to assist communities that are within 20km of an existing 33kV or 11KV network, have procured low voltage poles, and have 30% of houses wired to get power ahead of their respective scheduled dates of connection under the National Electrification Scheme. At the time of community connection, households pay ₵5,000 to get connected. Within these communities, houses that are more than 25 km away from the LV network pay an additional fee to have the distribution wires extended to their houses.

<sup>13</sup> Out of the total sample of 318 households, the rest include compound households, commercial, high income residential, and disconnected customers. For the purpose of this paper, only results from individual households are presented.

kerosene, candles, high consumption customers and commercial illegal consumers.

- Financial modeling of the cost of the lifeline and issues in sustainability by a financial analyst, using the utility's base financial model.

# 3

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## Stakeholder Perspectives and Incentives

3.1 Stakeholder analysis revealed the incentives and diverse perspectives of the different institutions within, and outside of, the electricity sector, as well as their likely degree of influence over tariff reform. In general, one can posit that three basic mechanisms exist for funding the investments needed to improve utility company performance and reduce losses: (i) government investment, which may not materialize due to financial shortfalls and could jeopardize macroeconomic stability; (ii) recovery of costs and an investment margin through tariffs, which must be sensitive to willingness and ability of consumers to pay; (iii) private investment, which requires a financially strong sector and some form of government guarantee. Much of the debate over tariffs in Ghana revolved around different perspectives on which of these methods are most appropriate. A particularly contentious issue concerned differing perceptions of whether electricity tariffs in Ghana were already too high or too low. Those who saw it as too low generally believe that consumers should pay the cost of service provision, and those who saw it as too high generally believed that the Government, through overall taxes or other sources, should bear a greater burden of the cost of service provision.

3.2 VRA, ECG, the Ministry of Finance and some development partners were the main proponents of tariff reform; they asserted that tariffs were too low, largely because they face mounting costs from increased reliance on more expensive thermal generation, which is directly affected by changes in international oil prices which are denominated in dollar terms. International energy experts also tended to view tariffs in per kWh terms and to compare them to neighbouring countries, which had higher tariffs.

3.3 The PSIA found that although Ghana's tariffs were lower in comparison to other countries in the region, these comparisons did not take into account Ghana's higher rates of access which affect both the political economy and willingness to pay; In Ghana the newest consumer is poorer both than current consumers and than consumers in these other countries where only the highest income consumers have access to electricity. As Table 3.1 illustrates, while Ghana had lower tariffs than neighbouring Countries such as Benin or Togo, it also had substantially higher rates of access and thus was going beyond the highest income consumers likely to be connected to the grid first.

**Table 3.1: Cross-Country Comparison of Electricity Tariffs**

	Connection rate 2000 / <sup>1</sup>	Inhabitants with electricity Million / <sup>1</sup>	Average household tariff USc/kWh / <sup>2</sup>	**Social tariff USc/kWh	GDP Per Capita (PPP) (2002) <sup>***</sup>
Ivory Coast	50%	8.0	8.5	5.0	1500
Ghana	43%	8.0	7.2 / <sup>3</sup>	6.3 / <sup>4</sup>	2130
Benin	22%	1.4	12.4	10.4	1031
Burkina Faso	13%	1.6	14.9	13.2	1012
Togo	9%	0.4	10.7	10.5	1458

1/Source: IEA World –outlook 2002 – Energy and Poverty

2/ Michel Layac – Presentation on West African Power Pool, Jan. 2004, ESMAP/WB

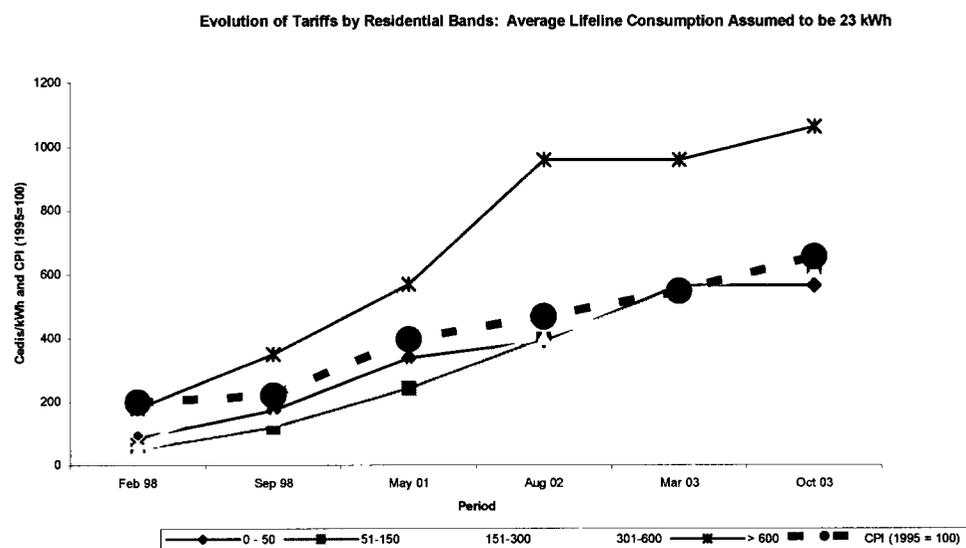
3/ Updated from ECG and NED data February 2003

4/ Range depends on consumption as this is a flat tariff. Unit range goes from 2.9 US cents per kWh to US\$1.49 per kWh if one consumers 50 or 1 kWh per month respectively. Rate for average consumption level (23 kWh) is presented here and reflects price to the consumer.

\*\*\* World Development Indicators, 2004

3.4 Further, protection of the middle tariff band in Ghana – which at the time of research was also subsidized - largely reflects middle class customers concentrated in high voting urban areas. As Figure 3.1 shows, tariffs increased most sharply for the top tariff band that was covering costs; further, up until 2003 lifeline customers were, on average, paying slightly more or the same per unit as the next two tariff bands (51 kWh – 300 kWh).

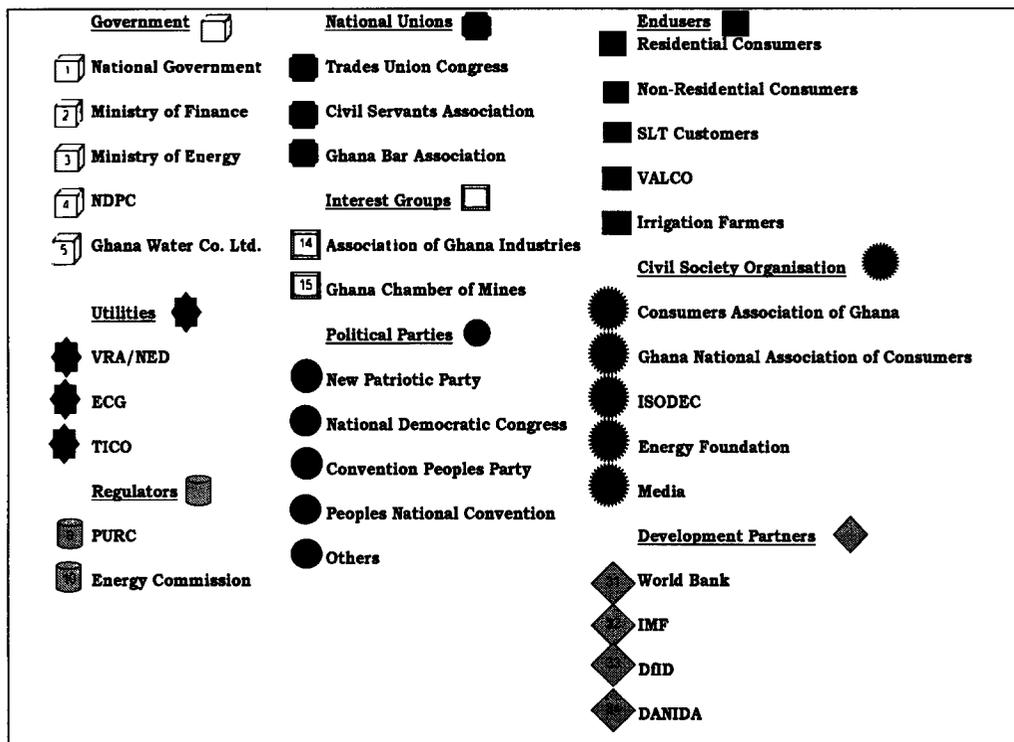
3.5 Consumers and the press, on the other hand, saw tariff increases in cedi terms, which generally followed the CPI, except for those of the highest consumption category (600 kWh/Month).

**Figure 3.1: Evolution of tariffs (in cedis)**

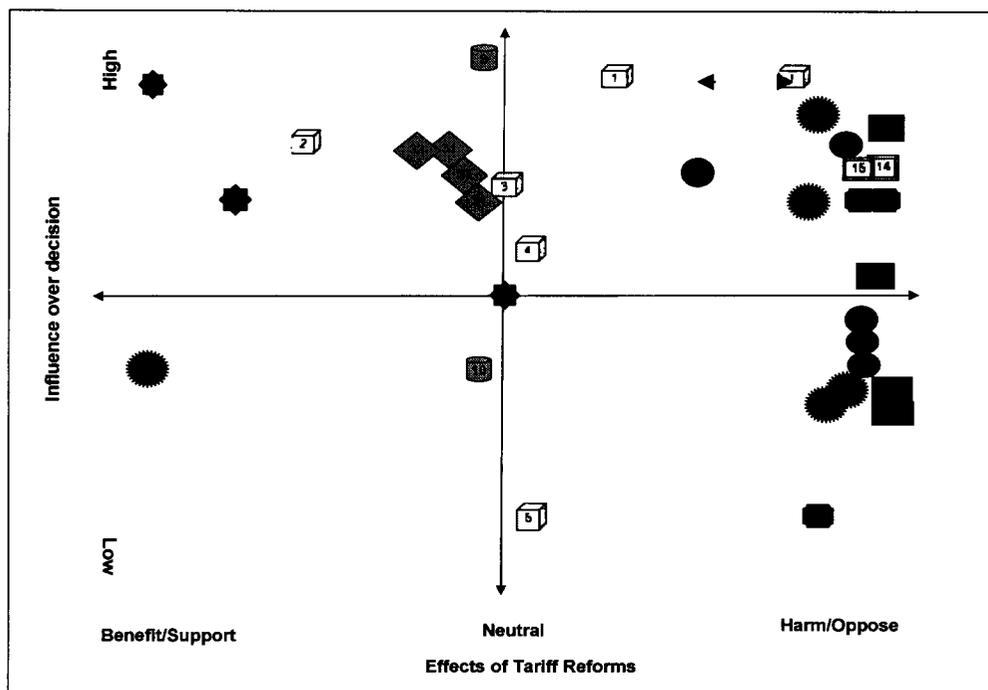
Source: PURC, 2003

3.6 Figures 3.2 and 3.3 provide a graphic illustration of the influence various stakeholders have on tariff reform, as well as their degree of support or opposition to tariff increases. It should be noted that the symbols are based on a qualitative ranking emerging from a review of documents and stakeholder interviews. Some groups of consumers have more direct influence over reform because they have power and are well organized – high consumption industrial customers for example because they generate a significant share of the utilities’ revenue and can, on occasion, bargain directly with the utilities for more favourable payment terms. VRA has historically been perhaps the most influential stakeholder in tariff reform because it proposes the initial tariffs which form the basis for subsequent negotiations, was able to bypass the Ministry of Energy and report directly to the President, and generated substantial foreign exchange from sales to a major international aluminium company, VALCO. VALCO had been consuming about one third of the electricity available from a main power source, the Akosombo dam, at low rates due to a long-term contract that it had signed which was under dispute at the time of the PSIA, thus ceasing VALCO operations during this period. As the percentage of VRA’s revenues from VALCO and thus foreign exchange have decreased, it has seen the personal emoluments accorded to VRA staff decrease, and thus has pushed harder to recover costs from other areas such as consumer tariffs.

**Figure 3.2: Stakeholders in Tariff Setting Process**



Source: Authors' elaboration

**Figure 3.3: Interests and Influence of Key Stakeholders in Tariff Reform**

Source: Authors' elaboration

3.7 More dispersed customers – such as residential customers mapped to the bottom right quadrant - have less direct influence over tariff reform in between electoral periods, but are very likely to be potentially harmed by tariff increases. Their primary avenue of influence stems from their votes around electoral periods. As a result, the central government (number 1 in the Figure 3.3) tends to move away from tariff increases close to electoral periods, or may try to influence the regulator, PURC, to delay such increases. The perceptions of these less organized consumers are heavily influenced through the media, and in particular through the large number of FM radio stations (over 70). Among the residential consumers, it is important to note that the majority fall within the middle tariff band (50 – 300 kWh) which were paying tariffs below average cost though they were consuming one-third of residential electricity. These are also likely to represent the bulk of voters in densely populated urban areas who may therefore have a fair degree of influence in voting. Alternative avenues of influence consist of only two consumer associations with a small staff and low level of funding who therefore only have a limited power, though they do represent consumers at PURC public hearings.

3.8 PURC has a mandate to oversee the tariff setting process, to represent the interests of the consumer, with final decisions that, in principle, are not subject to any executive or legislative consent and/or concurrence. In practice PURC remains dependent on the Government for the majority of its operating budget, and this has caused some to raise questions on whether it is put under pressure by GoG during pre-electoral periods. Although both PURC and the government acknowledge that tariffs must be rationalized to economic and cost-reflective levels, concerns about the likely impact of tariff reforms

on end-users have led to some resistance from these two major stakeholders against the steep increases in tariffs proposed by the utilities.

3.9 Opposition political parties, unions, and associations have often vehemently opposed tariff increases in the public press. Three groups that have had a fair degree of influence over the public discourse on tariffs, and are therefore found in the upper right hand quadrant, are the Civil Servants Association which has branches in all regional capitals, the Association of Ghana Industries which has the clout of the large industrial consumers behind it, and the Trades Union Congress, which has a membership of 600,000. This contrasts with both the consumer organizations, which are comparatively small in size and budget, and with the group for which there is no formal representation – rural consumers both on and off grid.

3.10 Based on discussions with staff of the southern electricity distributor, ECG, two factors may influence the degree to which local staff implement the move towards greater cost recovery; first, some staff felt that they were working for VRA (the distributor) because they viewed VRA's tariffs as increasing faster than ECGs and therefore felt their company received the lesser benefit from higher tariffs; second, with the exception of rural collectors, front-line staff only feel the brunt of tariff increases through more angry customers, more illegal connections and higher arrears, and none of the benefits as their remuneration is not directly tied to collection rates. This may represent one factor in the arrears growth that accompanied tariff increases.

3.11 Finally, tension exists between political imperatives and the incentives of a commercially-oriented utility for the following reason. The way to ensure the greatest returns from the substantial capital expansion costs is to maximize the density of connections rather than spreading connections over broader physical or regional areas. This also reduces costs of service provision and maintenance for the distribution utility. However, through the Self-help electrification program (SHEP, further described in the next section), the political incentive and the incentives inherent in poverty alleviation targets, is to extend electricity to as many communities as possible – rather than to concentrate the density of currently connected communities. This means that while access is increasing, it is largely to low consumption dispersed customers. This leads to a higher number of new consumers being lower consumption (lifeline), more rural, and potentially more dispersed than existing customers. This creates upward pressure on tariffs for other categories of consumers and increases in cross-subsidies.

## **Results**

### ***Poverty Context:***

3.12 Beginning the decade with half of its population below poverty line, Ghana managed to reduce its poverty incidence to 42% by 1998/99, driven in part by robust growth rates of around 5% at the end of the 1990s. But poverty reduction and human development have been uneven, with most of the improvement in the more urbanized Accra and the forest zone. In the rural Savannah (primarily Northern, Upper East, Upper

West), poverty remained unchanged throughout the 1990s, and these three regions also have the lowest access to health care facilities, water and electricity (Demery, 2003). Thus, poverty remains a largely rural phenomenon, with 80% of the poor living in rural areas.

**Table 3.2: Ghana Regional Poverty Incidence, 1988/89**

Regions	Poverty incidence (%)
Greater Accra	7
Western	25
Ashanti	36
Volta	37
Brong Ahafo	39
Eastern	48
Central	50
Northern	69
Upper West	88
Upper East	89
GHANA	42

Source: Demery, 2003

### ***The Lifeline Tariff***

3.13 In 2002 the GoG introduced a 5,000 cedi subsidy per consumer in the lifeline band (consuming 50 kWh per month or less), to be paid by the Ministry of Finance to the ECG and NED, the electricity distributors. In October 2003 the lifeline subsidy was raised from ¢5,000 per lifeline customer to ¢6,080 in order to keep the lifeline tariff at a constant ¢13,000, while tariffs for other customers increased according to the newly implemented automatic formula.

## **I. The Effectiveness of the Lifeline Tariff**

### ***Broader Issues of Targeting***<sup>14</sup>

3.14 The first key assumption that the PSIA probed was whether the poor had access to electricity – a pre-condition for higher prices having a direct impact. A review of existing national household survey data clearly demonstrated that in broad terms, those that fall under the poverty line do not tend to have access to electricity in rural areas, where the majority of the poor are concentrated; only 7% of rural poor people use electricity for lighting, while 93% use paraffin or kerosene.<sup>15</sup> Among the smaller number of urban poor, roughly 54% use electricity for lighting.<sup>16</sup> These figures reflect

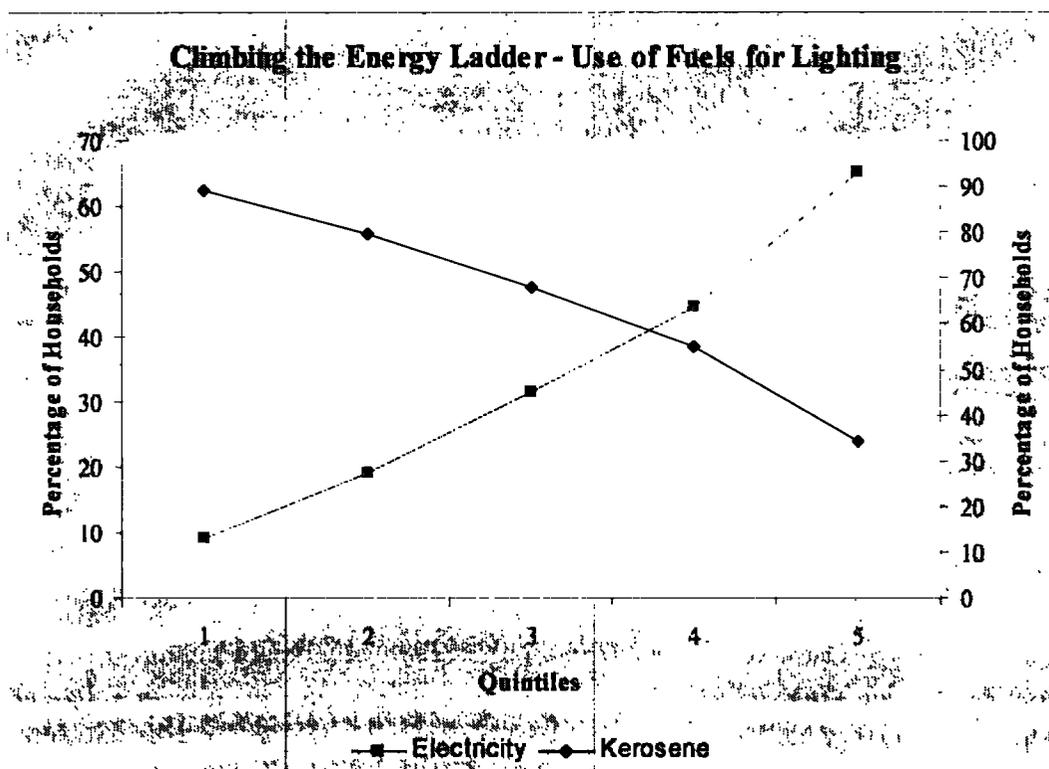
<sup>14</sup> Access is one of the key transmission channels in PSIA; people with electricity access will be most directly affected by changes in price or quality. Indirect or second-order effects would include price increases by those using electricity as an input cost. Such indirect effects were not analysed in the Phase I PSIA.

<sup>15</sup> Preliminary results, GSS CWIQ 2003.

<sup>16</sup> It is important to keep in mind that there are far fewer poor people in urban than in rural areas; for example, in 1999 only 20% of those in other urban areas and less than 5% of those in greater Accra fell below the upper poverty line.

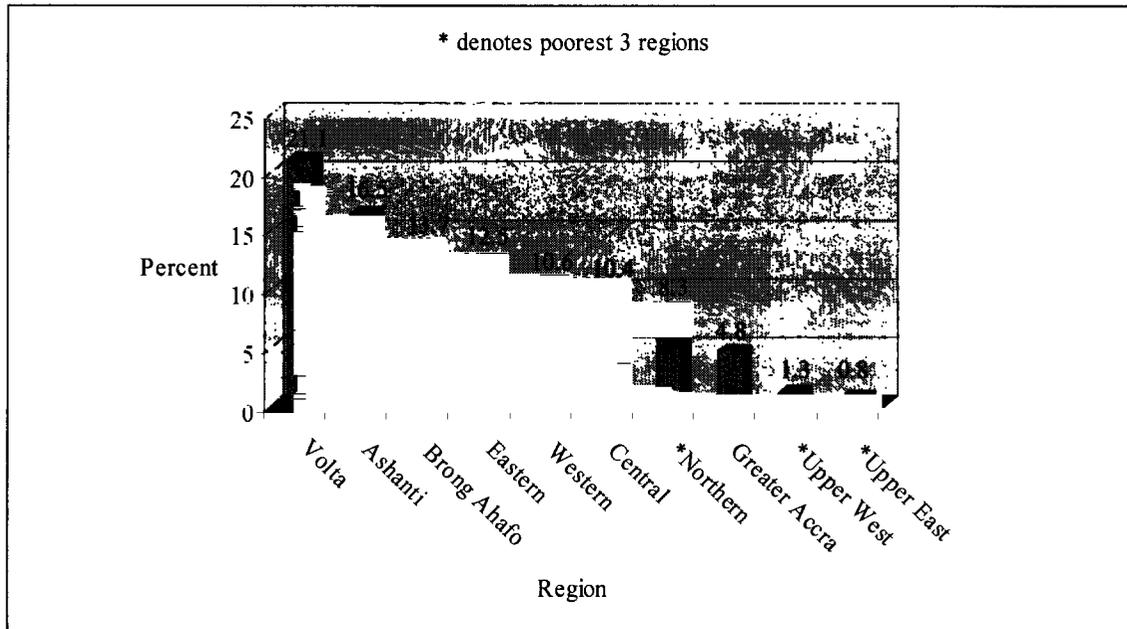
trends in other developing countries, where households move up the “energy ladder” using cleaner fuels such as gas for cooking and electricity for lighting as their incomes rise. Overall, the poor are not likely to be reliant on electricity. They are much more affected by price and access to paraffin, kerosene, or wood.

**Figure 3.4: Use of Main Fuel for Lighting in Different Income Groups in Ghana**



Source: GLSS4, 1998/99

3.15 The PSIA found that the gap in access to electricity was largest in the poorer northern regions (in NED distribution area) in spite of the existence of the Self Help Electrification Program (SHEP), that provided very low connection fees to rural communities (5,000 cedis or less than US\$3) within 20 km of the network. As shown in Figure 3.5, only 10% of the communities earmarked for electrification by SHEP 4 were in the three poorer savannah regions (Upper East, Upper West and Northern Regions) where less than 30% of the population has electricity access. SHEP has focused on more populated, less poverty endemic areas such as the Ashanti region, in part because it is supposed to assess the ability of customers to pay, and wants to maximize connections, which is easier to do in more densely populated areas. Thus, new investments in rural electrification are not adequately reaching the very poorest Northern regions which saw a decreased share in new rural electrification funding.

**Figure 3.5: Regional Share of SHEP Projects**

Source: GoG, 2003

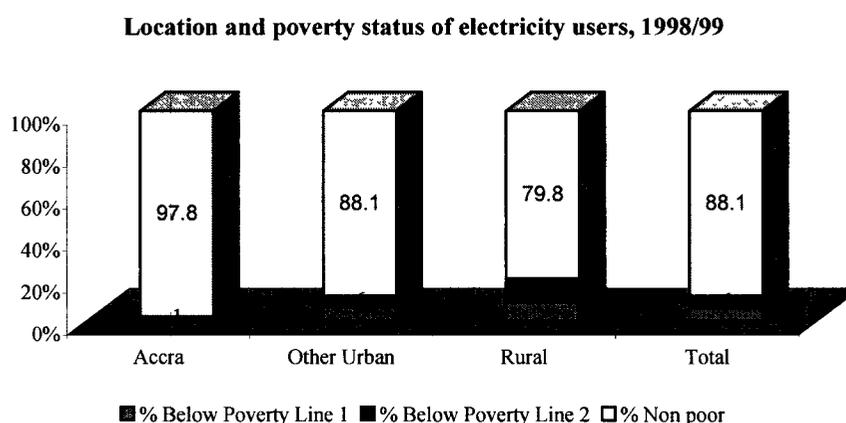
### **Targeting Poor Electricity Users**

3.16 A second issue that the PSIA probed was the assumption that those falling in the lifeline band also fell below the poverty line. While national level household surveys did not identify which consumers fell in the lifeline tariff band, and because imputing consumption patterns from reported expenditures could have introduced a heavy bias due to the intermingling of arrears with current charges, the research team focused on using indicators not related to electricity consumption (income, poverty) from the 1998/1999 household survey data and subjecting this to sensitivity analysis, projected forward. Even if the lifeline were to reach all poor electricity consumers, roughly half the lifeline subsidy would still “leak” to households that do not fall below the upper poverty line.<sup>17</sup> On the other hand, if one assumes that new customers are poorer than existing customers (assuming 20% of all new customers fell below the poverty line) then the leakage could drop to 46%, but would still be substantial. Further, KITE survey data showed that lifeline customers are no more vulnerable (missing meals; selling assets) than other

<sup>17</sup> The lifeline is currently extended to approximately 24% of residential consumers; yet in 1999 12% of those with electricity fell below the poverty line (GLSS4). The leakage calculation assumes that the composition of new customers is similar to the composition of old customers and that all of those who are poor consume in the lifeline bracket (which is unlikely). Different assumptions could move this leakage up or down; overall poverty has declined since 1999 so there may be fewer poor electricity consumers. On the other hand, new electricity consumers are likely to be rural and lower income than existing customers. If one assumes that new customers are poorer than existing customers (assuming 20% of all new customers fell below the poverty line) then the leakage could drop to 46%. Overall, 12% of those with access to electricity fell below the upper poverty line (GLSS4) in 1999.

customers. The minority of customers who exhibited signs of vulnerability (such as taking children from school because of an inability to pay school fees, selling assets) were as likely to be consuming above the lifeline as below it; no statistically significant difference could be found between the lifeline and non-lifeline customers on most proxy indicators for vulnerability.<sup>18</sup> In conclusion, at present the lifeline tariff represents an imperfect mechanism for reaching poor electricity users.

**Figure 3.6: Location and poverty status of electricity users**



Source: GLSS4, 1998/99

3.17 If one were to try to better target the lifeline, where would the poorer electricity users be found and how would one target them? In 1998/99 poorer electricity users were more likely to be found in rural areas, and in specific regions. Although very few poor rural households have electricity, among the rural residents that do have electricity, about 20% fell below the poverty line in 1998/99 compared to less than 1% in Greater Accra and only 12% in other urban areas. In other words, in poorer regions, even low rates of access can reach a proportionally larger number of poor people. For example, in Central, Volta and Upper East, 27% of people with electricity access fell below the poverty line, compared with only 3% in Greater Accra.<sup>19</sup> But as noted above, overall access rates remain low in the poorer northern regions, and their share of investments for new connections is also disproportionately low.

3.18 The rationale for narrowing the lifeline to reduce leakage would only make sense if it were more likely to reach poor households and/or if the administrative and transaction cost of such refined targeting was outweighed by the direct savings incurred. During discussions with stakeholders on these preliminary findings, and through the financial analysis carried out as part of this PSIA the following became clear: 1) The

<sup>18</sup> The KITE data focused on consumers in middle to low income areas and was not meant to be representative of the entire customer base. Among this specific group, it found between 0%-19% of lifeliners exhibiting indicators of vulnerability, about 20% exhibited at least one sign of vulnerability (selling assets)

<sup>19</sup> GSS 2000.

financial cost of the lifeline is minimal, as at present lifeline customers consume only 2% of residential consumption 2) to the utilities the lifeline was not originally a poverty tool, but rather a tool to minimize the administrative costs of small accounts and an initial discussion of options among technical committee members revealed that they were not interested in lowering the lifeline for this reason 3) the much larger issue is that the households in the lifeline exhibited no statistical differences in terms of poverty (or few) compared to non-lifeline customers - this was true even of those at the lower end of the lifeline consumption bracket. Thus, while it is true that on a unit basis those at the lower end of the lifeline pay less, the larger poverty issues are that many who could do not take advantage of the lifeline, instead ending up in arrears or disconnected, and the majority of the poor do not have access to electricity.

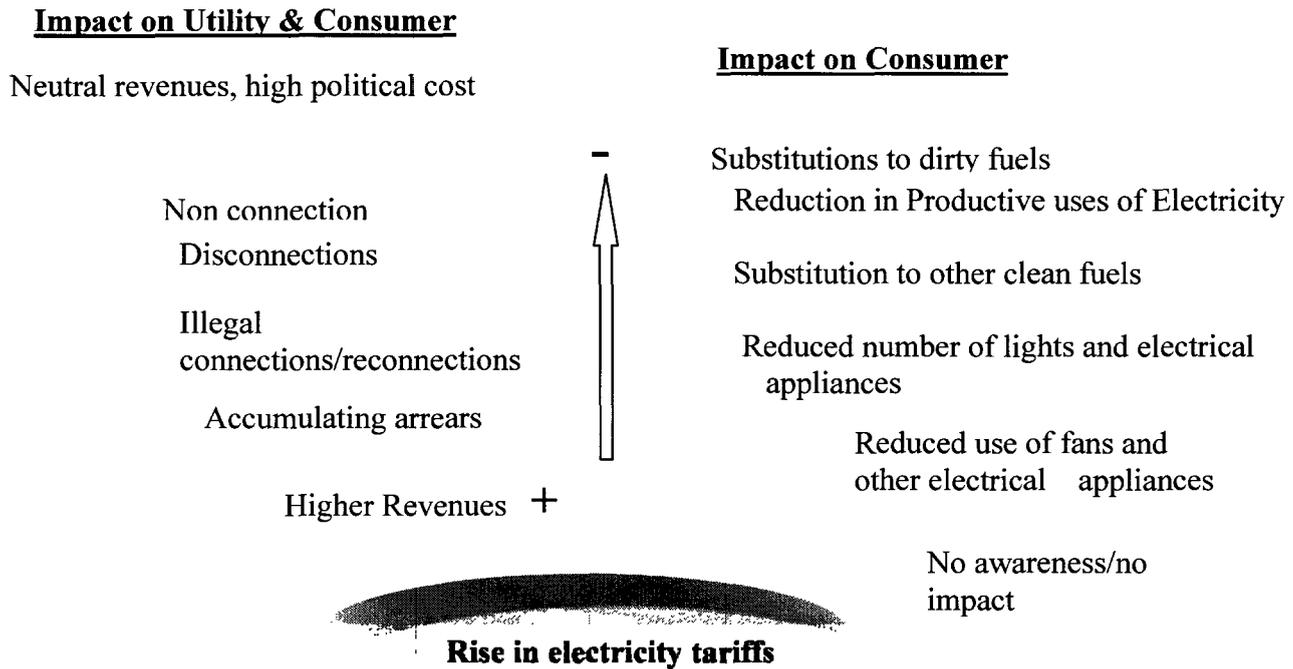
## **II. Indicative Indicators of Social and Poverty Impact of Higher Tariffs**

3.19 On the consumer side, the research team looked at positive or negative impacts from tariffs using a continuum of behavioural responses as rough indicators of whether these tariffs were having major impacts.<sup>20</sup> This analysis was not meant to replace analysis of national household survey data but to indicate any urgent problems that could not wait for a subsequent nationally representative household survey (GLSS) and that should be taken into consideration in the PRSC2 and the GPRS. The objective was to ascertain whether the impact of higher electricity prices was widespread such that they could not be addressed through a lifeline or other targeted scheme. Thus, the approach was to select a small random sample within strata, using utility database as the sample frame, and then to triangulate this with information on consumption for all consumers and for sub-sets of consumers from the utilities. While such a small sample on in-depth coping mechanisms could not be statistically significant, combined with evidence on consumption patterns from all consumer accounts (from the utilities) it nonetheless provided useful insights into how to better design a targeting program.

3.20 The continuum below posits that if consumers responsible for bills are not aware of the price increase, it is less likely that it had a significant direct impact. Consumers may respond to higher tariffs by conserving energy, such as turning out lights when not in use or using more energy efficient appliances or bulbs. Further along the continuum of behavioural response, lie responses that may have negative impacts such as reducing use of lights, when such use is not excessive, or reduction in productive uses of electricity. A common response, the accumulation of arrears, might only have a negative impact on the consumer if fines or disconnection is actually imposed by utility workers. Finally, substitution to dirty fuels such as wood or coal would have significant negative externalities (Figure 3.7).

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<sup>20</sup> In the absence of household survey data, before and after tariff increases.

**Figure 3.7: Continuum of Coping Strategies to Higher Tariffs**

Source: Authors' elaboration

3.21 While the researchers expected there to be extensive knowledge of price increases among consumers because of a high level of media coverage, they found that just over half of connected respondents (n=90) interviewed in a subset of areas (urban, slum, and rural electrification areas) recalled that tariffs had risen; these same households were asked follow-up questions on problems with bill payment and coping strategies. Of those aware of the price increase, almost half did nothing in response. The observations from the survey reinforce the results found by examining trends in utility data; some people are having trouble paying bills, but it does not reflect the situation of the majority of consumers. 14% of the medium to low income consumers interviewed cited rising electricity prices as the main reason for difficulty in paying bills, followed by changes in financial situation (9%) and seasonality of income (9%) (Table 3.3).

3.22 The most significant finding is the difference between urban and rural respondents in terms of their awareness of the link between consumption and lower bills with a clear gap among rural residents, likely because of lower literacy rates. Therefore, while the research team expected widespread knowledge of tariff increases, only about half of residential consumers were aware of such increases, and still only half of these made changes in response, in many cases because of a lack of knowledge in rural areas on how the lifeline works. Among those who did make changes (more predominant in urban areas) the most common response was to reduce the use of electricity for lighting.

**Table 3.3: Coping Responses to Price Rise**

	Urban N = 30	Slum N = 30	Shep N = 30	Total N = 90
				Effective N = 49
Did not make changes	19%	40%	78%	47% (N=23)
Flat rate	33%	17%	7%	13%
Bill is affordable	33%	17%	29%	26%
Unaware of the link between price and conservation measures	33%	67%	64%	61%
Already conserving before increases				
No other alternative than to pay				
Made Changes	81%	60%	22%	53% (N=26)
Borrow money			25%	4%
Sold assets				4%
Disconnected		12%		4%
Reduced number of electrical appliances	15%	25%		15%
Use of CFL bulbs	23%	12%	25%	19%
Reduced use of lighting	38%	37%	50%	38%
Reduced use of fan and other electrical appliances		12%		4%
Switched or used alternative sources of energy.	8%			4%
Combination of measures	16%			8%

Source: KITE Survey, 2003

3.23 Qualitative research on particular customer groups pointed to one group that felt that it was being acutely affected by higher tariffs, but that would not have been captured in the broader analysis or by looking at utility data. This was small commercial enterprises such as corn millers, whose customers were not high income, and who had competition from other firms who used diesel or other energy sources. Interviews with utility staff further confirmed that problems with illegal connections were particularly persistent among this group of customers.

3.24 During field research, it became clear that consumer attitudes towards arrears were generally lax; it was very common for consumers to pay only some portion of the current bill, assuming that as long as arrears do not become too large, they are less likely to get disconnected. As the existence of arrears often does not imply disconnection, households often did not attach a high priority to paying the electricity bill, prioritising instead other expenditures for which the penalties are much clearer and predictable such as school fees or water bills. Questioned on the frequency with which a household defaults on payment, 31% of respondents indicate bill default every month but a smaller percent, 17% of all consumers interviewed, attested that bill default was due to financial constraints. According to the tenants, such difficulty in payment can occur every month

(21%), at least every 3 months (21%), once every 6 months or less (27%), or rarely (24%).

3.25 One coping mechanism of particular concern both for the consumer and for the utility is disconnection. The survey data revealed that the practice of cycling in and out of connection is widespread; almost half of all the households interviewed reported that they had been disconnected at one point in time, with more frequent disconnection in slum areas and less frequent in rural electrification areas. A little over half of the disconnected households suffered for less than or equal to two weeks. These points to a problem with monthly bill payments and the regularity of income from informal enterprises.

**Table 3.4: Disconnection and reconnection cost**

	Urban N=30	Slum N=30	SHEP N=30	Total N=90
% Disconnected before	50%	57%	37%	48%
% Reconnected	100%	88%	100%	95%
Reconnection cost (cedis)	37,672	235,810	116,545	131,323

Source: KITE Survey, 2003

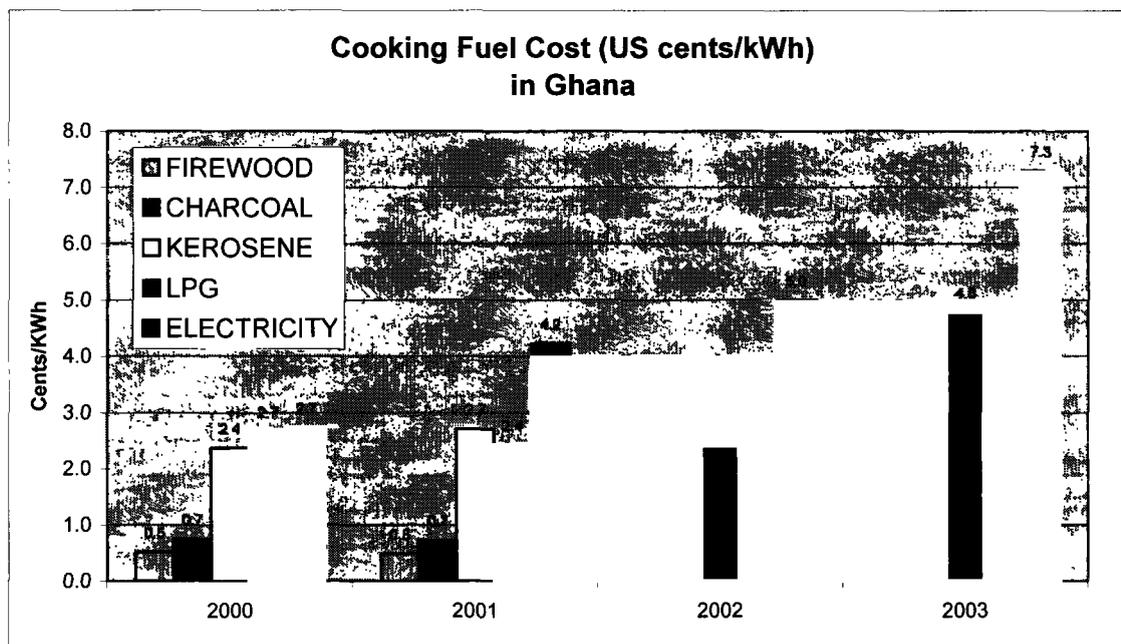
3.26 A more drastic reaction to tariff increase is to seek illegal connection or meter tampering. During focus group discussions, people openly admitted that this occurs, often after someone has been disconnected for non-payment. It is difficult to assess the growth in these “non-technical” losses, since estimates of these losses are not made on an annual basis. The most recent estimate in 2001 of technical and non-technical losses (billing error, illegal connection, and meter problems) showed 11% of electricity produced was lost in this manner.<sup>21</sup>

In Ghana, the potential for substitution to alternative fuels lies primarily in the fuel used for lighting, as for cooking most of the respondents already were at the “bottom of the energy ladder” using mainly charcoal or firewood, given the high relative cost of electricity for this purpose (Figure 3.8). Outside of Ghana and large urban centers, use of LPG (gas) is unlikely given the higher cost of equipment required and limited availability.<sup>22</sup> Of potential concern for the future of Ghana’s wood resources is the comparatively low cost of wood next to electricity. However, as indicated in Table 3.3, only a small proportion of those aware of tariff increases actually switched to alternative fuels (4% overall). Given the dependence of poorer households on kerosene and wood, the increased price and limited availability of kerosene is cause for further research with regard to its impact on poor households.

<sup>21</sup> In spite of additional efforts to reduce these losses since 2001, the overall losses (technical and non-technical) to the sector are stagnant at around 25% - 26% of the electricity produced.

<sup>22</sup> Only about half of urban areas in Ghana have a LPG filling facility placed in the area. The coverage in the rural areas is negligible. LPG is exempted from taxes and levies as part of a policy to promote the substitution away from charcoal for cooking purposes.

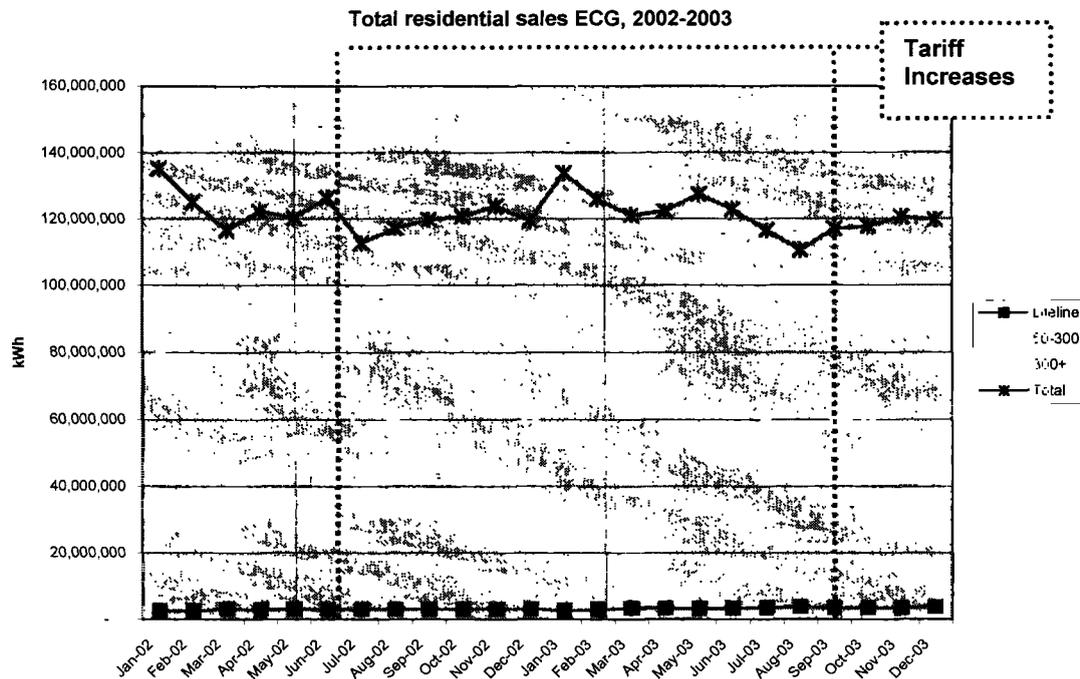
Figure 3.8: Cooking fuel cost



Source: KITE, 2003

3.27 In order to test the validity of some of the indicative data above, the research team analyzed utility data on consumption overall and by tariff band over time for all customers in ECG areas. It confirmed that the total amount of electricity used by residential consumers shows little or no permanent overall reaction to the tariff increases (Figure 3.9). While consumption levels may drop just after a tariff increase, they have tended to move back to an equilibrium that is not significantly lower than previous consumption levels. Variations in the total demand are mainly due to variations in the demand in the highest band and related to seasonal changes in outdoor temperatures and holiday periods (use of air-conditioning or not). While some households are being negatively affected by tariffs and are accumulating arrears or cycling into disconnection, consumption data on all customers confirms the results from the qualitative and small scale research, that this is neither a generalized phenomenon nor significant in scale. Nonetheless, indicators for certain sub-groups merits attention in future sector research.

Figure 3.9: Total ECG Residential Sales, 2002-2003



Source: ECG, 2004

3.28 The Ghana PSIA made explicit the importance of looking not only at the subsidy, but at its sustainability over time; if the overall cost of the subsidy were too high, it might lead to indirect effects which could ultimately harm the poor such as contributing to fiscal deficits which could feed inflation, or leading to declines in service quality or informally implemented limitations on access to poorer groups by the utilities. The incorporation of financial analysis of the utility into the PSIA allowed for this holistic approach.<sup>23</sup> While the nominal cost of a lifeline tariff may be affordable to the utility at present, if the number of such customers grows, and if the central government does not pay its subsidy on time (the case at the time of the PSIA) or does not cover the full cost of service provision, then the utility will tend to rely on informal cross-subsidies among consumers, as long as there are enough consumers paying at cost to cover the others. As noted in the stakeholder analysis, the middle band of consumers represents a politically important block of urban voters, and this has tended to limit the willingness to charge full cost to this group, and tended to result in higher increases for the upper tariff bracket consumers than others. Moreover, such an implicit cross-subsidy would be threatened by one of the proposals for sector reform that was being considered – allowing larger industrial

<sup>23</sup> For further information on this integrated methodology see Keener and Banerjee, *Measuring consumer benefits from utility reform: An exploration of consumer assessment methodology in water sector in Sub-Saharan Africa*, forthcoming 2005.

customers to purchase electricity directly from the generator (VRA) via bilaterally agreed prices, rather than going via the distributor (ECG or NED) and paying formally regulated prices.

3.29 There was, indeed, an increase of consumers in the lower tariff bands in ECG areas over the period of tariff increases. The number of lifeline consumers in ECG went from 19% of residential customers to 21% of residential customers from February 2002 to February 2003. This increase may be due to the combined effect of many new connections falling in the lifeline and a decrease in consumption by those above the lifeline. The annual increase in the total number of residential customers in ECG is around 5%. A general decrease in average consumption is observed for all consumer categories, but again as illustrated in the figure above, these are small changes. In NED service areas; there has been more growth in higher end consumers.

**Table 3.5: Electricity Company of Ghana (ECG) Consumption and Customer Trends during Tariff Increases**

	Number Res. Consumers			Share of Res. Consumers			Avg. Consumption kWh			Share of Res. Consumption		
	Feb-02	Feb-03	Change	Feb-02	Feb-03	change	Feb-02	Feb-03	change	Feb-02	Feb-03	Change
<b>Lifeline</b>	106,360	124,707	17%	19%	21%	11%	25	23	-8%	2.1%	2.3%	10%
<b>50-300 kWh</b>	336,510	344,341	2%	60%	58%	-3%	162	159	-2%	44%	43%	-2%
<b>300+</b>	122,365	123,312	1%	22%	21%	-5%	555	555	0%	54%	54%	0%
<b>Total residential</b>	565,235	592,360	5%	100%	100%		221	213	-4%	100%	100%	

Source: ECG, 2004

**Table 3.6: Northern Electricity Department (NED) Consumption and Customer Trends during Tariff Increases**

Tariff band	Number of res. Customers			Share of res. Customers			Avg. consumption kWh			Share of res. consumpt.		
	02-Jul	03-Feb	Change	02-Jul	03-Feb	Change	02-Jul	03-Feb	change	02-Jul	03-Feb	change
Lifeline	NA	46,400	NA	24%	23%	-4%	27	28	-4%	14%	13%	-7%
50-300 kWh	NA	67,556	NA	52%	57%	10%	134	134	0%	65%	67%	3%
300+	NA	10,496	NA	7%	8%	14%	784	851	-8%	16%	18%	13%
<b>Total residential</b>		124,492										

Source: NED, 2004

\* Based on a sample of 71,000 NED customers; "0" consumers are not included.

3.30 As consumption has not responded in significant terms to tariff increases, one question was whether the increases simply translated into greater arrears. The research team thus used utility data to analyse the growth in arrears (i) overall (ii) within a random sample of specific consumer groups to assess whether these were associated with specific

consumer groups.<sup>24</sup> Overall, arrears for residential customers increased by 34% between 2002 and 2003. However, arrears expressed as number of corresponding months of billing, had not gone up.<sup>25</sup>

**Table 3.7: ECG trends in Arrears**

Tariff band	Average monthly bill			Arrears/charges		
	Feb-02	Feb-03	% change	Feb-02	Feb-03	% change
Lifeline	7,824	14,002	79%	7.4	5.6	-24%
50-300 kWh	37,289	63,414	70%	3.3	3.0	-9%
300+	217,978	355,908	63%	7.8	7.5	-3%
Total residential	70,861	113,900	61%	6.3	6.0	-6%

Source: ECG, 2004

3.31 In addition to analysing arrears for all customers, the research team sought to delve into which groups were having the most difficulty with arrears and analysed a random sample of customers from ECG supply areas Accra East, Accra West and Ashanti areas from each of the tariff bands over the past two years. The conclusion from this analysis is that at the aggregate level the trend is similar to that of the overall utility data. **While arrears have increased considerably within the past two years, revenues have also been increasing.** Within this random sample, the overall trends in arrears masks variations, which vary significantly. In Kumasi the average arrears among lifeline customers has increased from ₵12,000 in July 2002 to ₵80,000 in February 2004. In Accra East arrears for lifeline customers has almost doubled, but at a much higher level, from ₵200,000 at ₵400,000 (corresponding to about 2½ year's payment) during the same period. This means that lifeline customers in Accra East have paid a very small fraction of their bills since July 2002. Further, absolute levels of arrears in Accra are quite high, and may reflect the number of slum areas where arrears have tended to be high, in contrast to the more general trend outlined in Table 3.5 and 3.6 above. Nonetheless, this tendency in arrears points to the need for more detailed and disaggregated analysis of affordability by tariff band once more recent GLSS data becomes available.

3.32 Finally, the survey team secured the utility records of the interviewed households from ECG. It is evident from the arrears to current bill ratio that the households in compound and slums in Accra and Kumasi are more likely to react with accumulating arrears, particularly in 2003. Further, the ratio of arrears to current bill of slum households show more fluctuations compared to rural electrification and urban households. The households that have answered 'Yes' to any of the four vulnerability indicators (sent away family members, got children out of school, had one meal yesterday, sold assets) are more likely to accumulate higher arrears compared to non-vulnerable households. While the mean arrears of non-vulnerable households are

<sup>24</sup> NED data on arrears was not available.

<sup>25</sup> It is important to understand the billing cycle. The cycle is two months long from reading the meter to the point where the bill is delivered to the customer. Further, the customer gets a period close to 40 days to settle the bill meaning that the billing and collections cycle is nearly three months long. Finally, old arrears, that are unlikely to ever be paid, remain on the books and are not written off.

¢190,719, the arrears are more than twice this for households exhibiting any one of the vulnerability indicators noted above. The rural electrification households in the Accra region appear to be paying their bills on time - the ratio of arrears to current bill is less than 1 for the entire sample period. Over the period of tariff increases arrears have increased substantially, particularly for some customer groups, including those in the lifeline (in spite of a flat tariff). However, this has not yet affected the utility's overall revenues, which have increased, or the ration of arrears to current billing.

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## Conclusions, Policy Recommendations, and Impact

4.1 In order to provide better energy services to the poor, future research in the energy sector needs to compare costs – including the implied ongoing operational and capital costs – of achieving energy access through continued electricity expansion versus other alternatives such as increasing access, price, and efficiency of biomass fuelwood such as kerosene, diesel, and renewable energy sources.

4.2 The lifeline tariff represents an imperfect mechanism of targeting the 5% – 20% of consumers who show signs of vulnerability; in fact, it was originally not designed to target the poor, but to ease the administrative burden on the utility and to provide a “basic needs” level of service. Nonetheless, it has the potential to provide vital protection to the minority of electricity consumers who have (a) exhibited indicators of vulnerability (b) stated that they are having trouble paying their bills. At present, many of those who are having trouble paying bills are not using the lifeline; this points clearly to what was witnessed during fieldwork - a gap in knowledge of how to manage electricity resources and on the protection the lifeline tariff offers, which appears particularly acute among those it is most likely to protect – poorer rural and less literate customers.

4.3 The current nominal cost of the lifeline subsidy is less than 1% of ECG revenues (about US\$1.5 million per annum) and there is therefore no impetus to refocus it in the short-term. The administrative cost of more detailed targeting schemes is unlikely to outweigh the savings generated, particularly since there was no more signs of vulnerability among those in the bottom half of the lifeline band than in the top half. A more efficient use of resources would be to educate vulnerable groups—especially those in rural areas—about how to take advantage of the lifeline tariff. Consumer education on billing and energy savings is needed, particularly in rural areas and among those who do not see the bill, in a way accessible to less educated consumers.

4.4 Utilities should promote public information on why electricity tariffs are increasing, and on how people can save energy to safeguard themselves. If sector reforms on the consolidation of NED and ECG move forward, it may be necessary to review again the tariff structure as electricity losses are considerably higher in NED areas (up to 40% in poorer Northern region).

4.5 Policy makers should carefully consider the indirect impacts on residential consumers of allowing large customers to negotiate agreements with VRA (partial de-regulation). At the time of the PSIA these customers provided an informal cross-subsidy for the lifeline and for those in the middle tariff brackets. If these large customers who contribute to a significant proportion of current charges are lost, there risks a further deterioration of the utilities' financial position, and the utilities may limit access to the poor or quality through indirect means. The alternative would be for the Ministry of Finance to cover the cost of providing such a lifeline in a timely manner.

4.6 To aid those without access, the PSIA recommended that policy makers review the factors affecting availability and pricing of kerosene products in rural areas in the interim, possibly through the related PSIA on petroleum products. In future research, it will be important to assess the best methods to facilitate clean and efficient access to energy in low-density poorer rural areas (more fuel efficient stoves, alternative energy sources, etc.) for those who may not be able to afford electricity services. Policy makers should consider whether the indirect subsidies currently provided to non-lifeline electricity consumers could be better used for expanding clean energy access and energy efficiency in these rural areas.

4.7 In addition, the PSIA recommended indicators to monitor the energy reform process. These include collecting information on the average processing time for new connections, the number of new connections, and ratio of arrears to current payment by band, changes in the prices of electricity dependent products or services, and level of awareness of the lifeline among different groups of consumers compared to a baseline. For future reforms, the PSIA recommended providing incentives in any future management contract for electricity for improved quality of service, with specific input from consumers on those indicators of most value to them.

4.8 Following the completion of this PSIA (late June 2004), the World Bank changed its own allocation for new investments to include resources to prepare project components for non-traditional and off-grid sources of energy which would better target areas where the poor are concentrated in the North of the country, and where their share of new investment for electricity was declining (the Ghana Energy Development and Access Project of over US\$70 million). In effect, the PSIA provided a "voice" for those stakeholders least represented in the stakeholder map – poor rural consumers not yet connected to the grid – and a means for their needs to be taken into account in the design of development projects.

4.9 At the same time, after the PSIA was completed a new Energy Minister took office following the elections in November 2004. The Government continued its use of the lifeline tariff, and its findings were integrated directly into the PRSC2. The policy recommendations that require more complex responses by others – such as the recommendation to increase education for rural consumers – may still require more follow-up. The Government of Ghana (specifically the Ministry of Energy) expressed its interest in managing the dissemination process, which is still in a nascent stage. The National Development Planning Commission (NDPC) that is coordinating these activities

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aims to involve the media during the planned dissemination in 2005. The PSIA has nonetheless received attention from the NGO community, including EURODAD and ChristanAID, which recently concluded an assessment of five Ghana PSIAs conducted in 2003-2004 to understand the PSIA selection mechanism, country ownership, client dialogue, local capacity building, and impact.

### **Lessons Learned**

4.10 Collaboration among stakeholders throughout the PSIA process was crucial in ensuring that there was sufficient internal discussion of the PSIA findings. This collaboration did require additional time commitment of both Bank staff and consultants and Government personnel, within a finite policy planning timeline. The PSIA was therefore divided into what could be done within the time available (to feed into the PRSC and GPRS). While this means that there is still more analysis to undertake, the analysis was nonetheless able to inform some of the broad assumptions behind different policy options, and move towards making concrete steps to ensure that evidence informed approaches. One example was the initial assumption that the best way to reach the poor was through electricity subsidies, while the majority of the poor were, in fact, not connected to the grid, and at least for the poorest Northern regions seeing a declining share of new electricity investments because of competing stakeholder incentives (of financial sustainability versus extending access). Addressing this assumption with existing data allowed for a relatively rapid shift in World Bank lending to better target the needs of the poor in the poorest regions of Ghana.

4.11 One of the accomplishments of the PSIA was to engage a local Energy-sector NGO – KITE to lead the PSIA with support from the World Bank. Such an association not only raised the feeling of ownership among the Ghanaian stakeholders but also raised capacity to undertake evidence-based policy analysis. However, additional time needs to be programmed for training teams on evidence-based policy analysis specific to the sector at hand.

4.12 An observation from the PSIA process is that for policy measures which involve new resources or a diverse set of stakeholders, the process of policy analysis and formulation starts once the PSIA is finished. In order to ensure that the findings continue to be integrated requires two elements: a local level “champion” for the PSIA who is central to the policy discussion, and continued resources for follow-up. Finally, the level of ownership of the PSIA by the lead agency, the Ministry of Energy, is evident in its desire to drive the dissemination process. However, the existence of many competing demands means that this process may therefore take longer than anticipated. This is true for all the five donor-funded PSIAs undertaken in Ghana in 2003-2004 (Eurodad, 2005). Therefore, it is critical to have a well-defined dissemination strategy built into the work-program of PSIA.



# **Annex 1**

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## **Summary Matrix**

Policy	Methods Used, Data Collection	Principal Conclusions	Policy Implications and Options
<p data-bbox="399 272 557 297"><u>Energy Sector</u></p> <p data-bbox="399 363 535 427"><i>Reforms Objectives</i></p> <ol data-bbox="399 461 637 824" style="list-style-type: none"> <li>1. Effectiveness and sustainability of the lifeline tariff in protecting the poor from recent tariff increases.</li> <li>2. Partial evaluation of impact of recent tariff increases on poor electricity consumers</li> </ol>	<p data-bbox="671 272 1027 329">Phase I (not meant to be nationally representative)</p> <ol data-bbox="671 363 1016 695" style="list-style-type: none"> <li>1. New analysis of existing data such as the GLSS4, preliminary results from CWIQ 2003, time series analysis of utility records.</li> <li>2. FGDs, key informant interviews with specific types of consumers and</li> <li>3. Limited quantitative survey work. The total sample size for the interviews was 326.</li> </ol>	<p data-bbox="1050 272 1401 451">The broader picture: In 2003 only 7% of the rural poor had access to electricity. However, about 20% of those with electricity in rural areas fall under the poverty line (1999).</p> <p data-bbox="1050 488 1406 816">Electricity access has increased significantly in Ghana, jumping to cover half the population in 2003. This means although electricity prices are lower than in neighbouring countries, Ghana will face more constraints in the future years in terms of keeping prices affordable for newer and more rural consumers (Phase II to model).</p> <p data-bbox="1050 854 1401 1092">Nonetheless, analysis of utility data over the period of tariff increases failed to demonstrate any significant or generalized reaction in terms of reduced consumption- reactions one would normally see when prices become unaffordable.</p> <p data-bbox="1050 1130 1408 1279">However, between 8% to 20% of electricity consumers exhibit some signs of vulnerability (selling assets etc to pay for electricity).</p> <p data-bbox="1050 1317 1408 1365">Many consumers who could take advantage of the lifeline fail to</p>	<p data-bbox="1428 272 2136 386">Short-Term: The total cost of the lifeline tariff is not significant at present (less than 1% of revenues) and therefore can serve an important purpose in the face of tariff increases over the short-term.</p> <p data-bbox="1428 423 2082 480">The Ministry of Finance should, however, commit to making payments on this subsidy in a timely manner.</p> <p data-bbox="1428 518 2136 696">Rather than spending money on better targeting the lifeline through schemes that are likely to be administratively difficult to implement, the policy focus should be on educating consumers on basic conservation techniques to fall within the lifeline. Such efforts should be in a form that is easy for less literate customers to understand.</p> <p data-bbox="1428 734 2116 883">An overall lack of understanding among consumers as to why tariffs are increasing (the generation mix towards more thermal) adds to the resistance to tariff increases; information should be shared with the press on the structure of the sector and on what factors are driving the increases.</p> <p data-bbox="1428 920 2116 1034">Phase 2 of the PSIA should follow up on one specific group that has been identified as being more affected by others by tariff increases- the small commercial businesses as those mostly involved in illegal connections.</p> <p data-bbox="1428 1071 2136 1250">Nationally representative data on incomes and electricity consumption patterns of different consumer groups (phase 2) will constitute a necessary next step to identify the informal cross-subsidization within the electricity sector, and to identify with precision at what point electricity tariffs will become unaffordable to new customers.</p> <p data-bbox="1428 1287 2136 1369">Long-Term: In conjunction with Phase 2, it would be important to evaluate fully the cost of alternatives to full scale electricity access for the poorer, less densely populated northern areas.</p>

Policy	Methods Used, Data Collection	Principal Conclusions	Policy Implications and Options
		<p>do so because of lack of knowledge about the lifeline (compounded by lack of literacy among a growing rural customer Base).</p> <p>Therefore a minimum of half the lifeline 'leaks' to the non-poor.</p> <p>Compound houses are not poorer than non-compound houses and are not necessarily better off with additional or individual meters.</p>	

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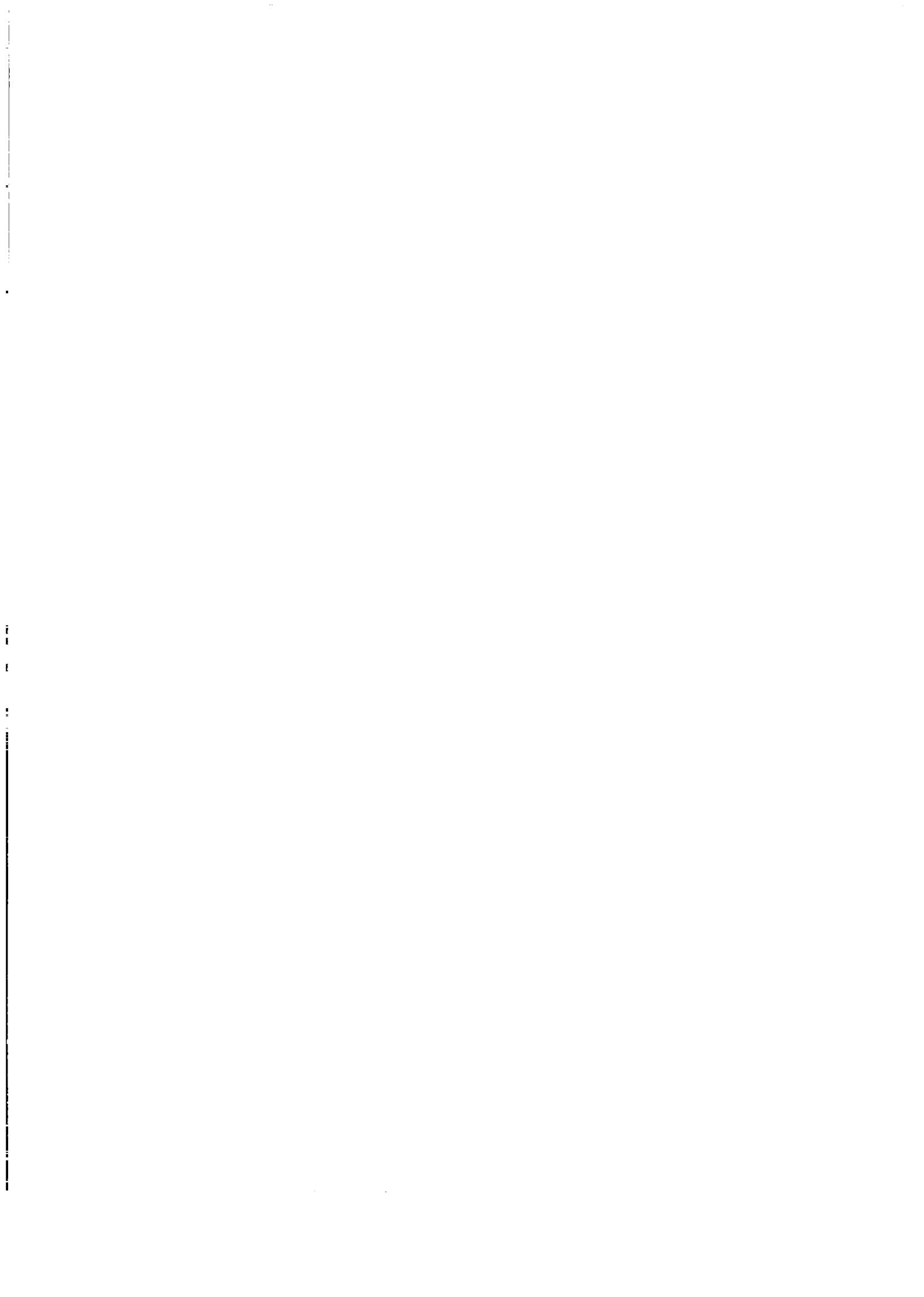
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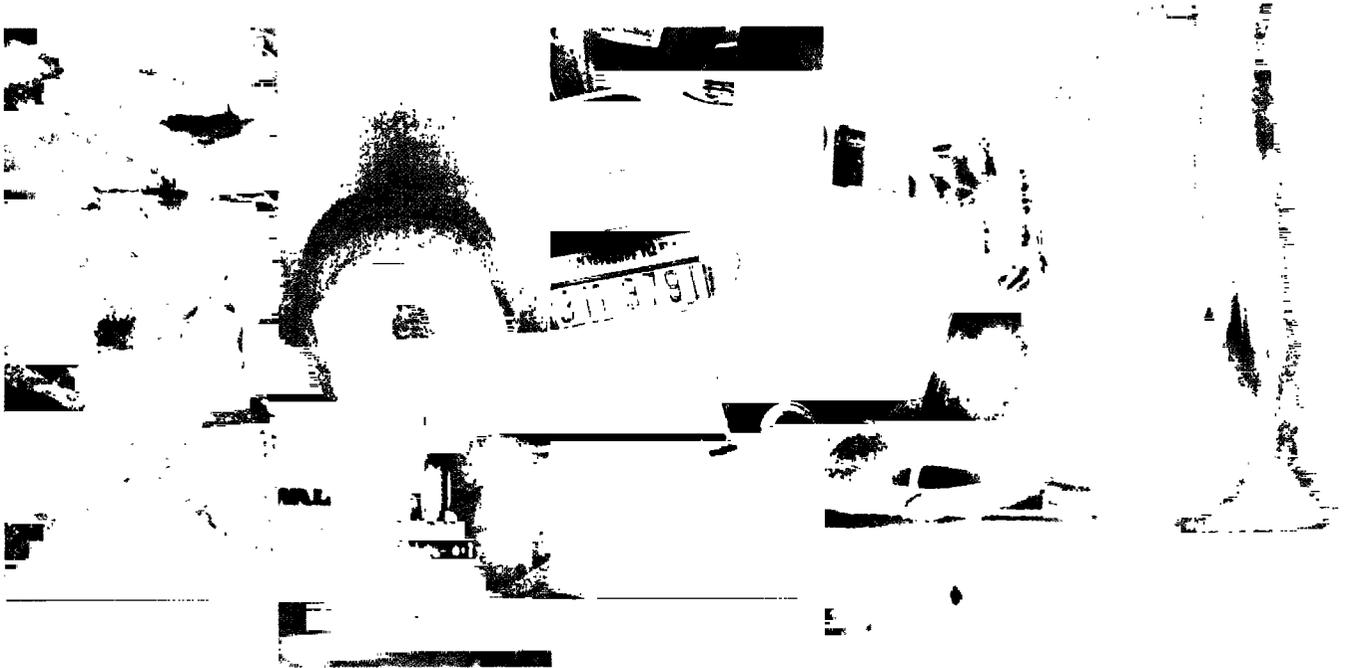
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