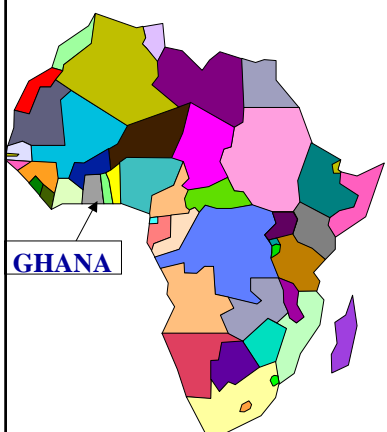


PfA Policy Dialogue Conference,
*The Role of Renewable Energy for Poverty Alleviation
and Sustainable Development in Africa*
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The Ghana Experience in Funding Rural/Renewable Energy Through Levies on Fossil Fuels and Electricity

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Brief about Ghana



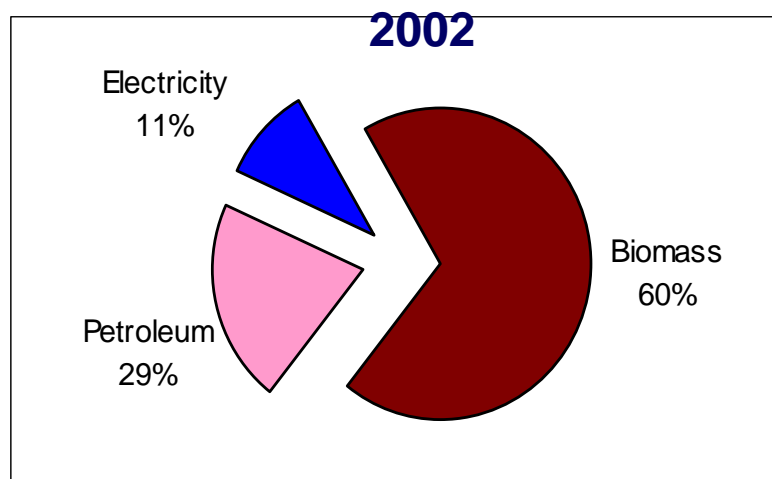
- **Population:** 21.03million (2004 est)
- **GDP per Capita:** \$407 (2004 est)
- **GDP - composition by sector:** :
agriculture: 34.3% industry: 24.2%
services: 41.4% (2004 est.)
- **Major sources of foreign exchange.**
- Gold, timber, and cocoa production
- **Budget (2004 est)**
 - **revenue:** US\$2.17billion
 - **Expenditure:** US\$ 2.56billion
- **Inflation rate:** 13%
- **Electricity Access:** 65%

Source: World Factbook - Ghana

Energy Resources in Ghana

- Energy resource in Ghana is mainly hydro and biomass - Renewable Energy
- Solar Energy play a significant role in the agric sector (crop production, drying etc)
- Moderate wind speed yet to be exploited
- No crude oil resources in commercial quantities. All crude oil and some petroleum products have to be imported.
- Natural gas deposits found are not in commercial quantities
- No nuclear power plant in operation
- No coal resource or coal plant

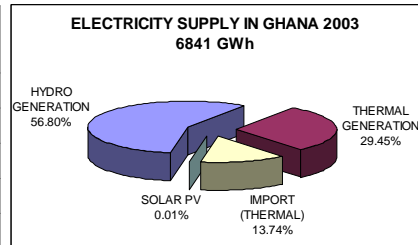
Energy Consumption in Ghana



Biomass is the bulk of energy consumed mainly for cooking & water heating in the residential & commercial sector

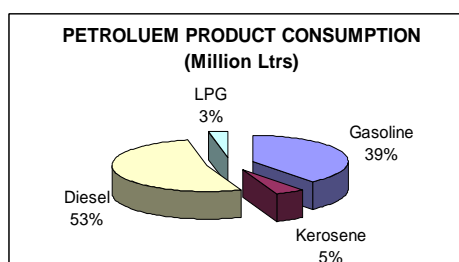
Electricity Supply in Ghana 2003

GENERATION SOURCE	ENERGY GWh	% SHARE
HYDRO GENERATION	3885	57%
THERMAL GENERATION	2014	29%
IMPORT (THERMAL)	940	14%
SOLAR PV	0.80	0.01%
TOTAL ENERGY	6841	



Petroleum Consumption in Ghana 2003

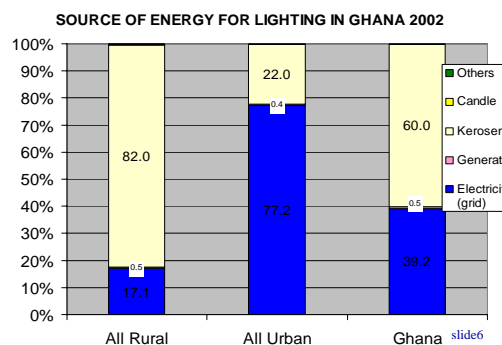
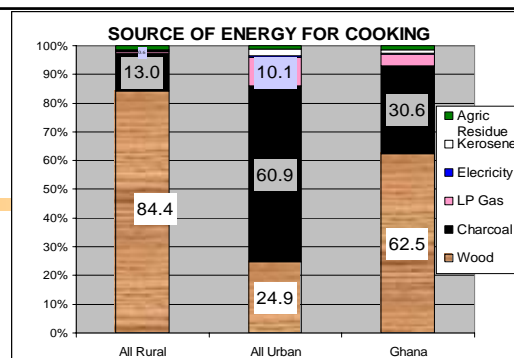
Petroleum product	(Million Ltrs)	% Share
Gasoline	647.8	39%
Kerosene	85.2	5%
Diesel	865.6	52%
LPG	56.7	3%



Rural Energy

- Woodfuel and kerosene are the main sources of energy in rural Ghana
- These have negative impact on the health of women and children

Source: GLSS 2000



Policy Objective - Increase access to high quality energy services in rural areas.

- Ensure modern energy is put to productive use to stimulate socio-economic development, create wealth and alleviate poverty
- We know that it is unlikely that energy services will be made available to the poorest segments of the rural population without some form of support. (subsidy).

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- Our experience shows that energy subsidy often did not reach those who needed it most

- benefits were rather enjoyed by middle to high income groups instead of the rural poor who most often have no access to any modern energy service
 - ‡ Diesel => bulk transportation - (no access road)
 - ‡ LPG => deforestation - (commercial cars, taxis)
 - ‡ Kerosene => rural lighting - (mixed with diesel-retailers)
- **Strategy** focused on energy delivery mechanism to ensure that support/subsidy reach those who need it most.

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ENERGY SECTOR PROGRAMMES TO INCREASE RURAL ACCESS

1. National Electrification Programme

- Objective - to extend electricity supply to all communities with population above 500 inhabitants by 2020.
 - Through Self Help Electrification Programme (SHEP), communities within 20km of existing 11/33KV grid lines acquire their own LV poles and wire at least 30% of houses to qualify for Gov. bears the rest of the cost of electrification.
 - For remote off-grid institutions and island communities, strategy is to support the initial investment cost for solar PV products.

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2. PRODUCTIVE USE OF ELECTRICITY

- Objective – Undertake a study to assess the feasibility of embarking on a scheme for the productive use of electricity to create wealth and alleviate poverty.
 - Develop a strategy for implementing a pilot project(s) to demonstrate the practicability and sustainability of a Productive Uses of Electricity (PUE) programme in the District.
 - Secure funds to implement pilot project in partnership with the private sector

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3 LPG PROMOTION PROGRAMME

- Objective – Utilize LPG produce at Refinery as substitute for charcoal & firewood in households and public institutions.
 - Increase number of LPG cylinders and also introduce smaller capacity 5kg cylinders at affordable cost
 - Increasing LPG distribution outlets throughout the country
 - Conversion of institutional kitchens to switch from Firewood to LPG

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4. KEROSENE DISTRIBUTION IMPROVEMENT PROGRAMME

- Objective -Ensure that kerosene is made available for lighting at all times to rural dwellers at affordable price.
 - Increase distribution and retailer outlet in rural communities – (Supply 20 kerosene surface tanks to remote rural areas in each district through out the country).
 - Provide financial incentives to encourage transporters to ensure regular supply of the fuel to these remote locations.

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5. RENEWABLE ENERGY DEV. PROGRAMME

- Objective – Support R&D and promotion of proven renewable energy systems suitable for socio-economic development particularly in rural areas.
 - Solar
 - Wind
 - Small & Mini Hydro
 - Biogas
 - Energy crops (Bio-diesel)

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SOURCE OF FUNDING

- Donor support
 - Mainly used to finance foreign component cost (material imports) for the programme.
 - Programmes supported solely by donors without local contribution stands the risks of being abandoned once funds are exhausted.
 - Need for local support for continuity and sustainability of programme
- Government Budget
- Taxes & levies on Energy

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NATIONAL ELECTRIFICATION LEVY

- Levy of c1.7(US¢0.02/kWh) on grid electricity consumers
 - Support local cost (purchase of local materials and labour) for grid extension.
 - Support for the PUE studies
- Estimated amt of c9.8billion (US\$1.1million) generated annually
 - Though small, significant to support Gov. budgetary allocations to ensure sustainability of ongoing projects.

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KEROSENE PROMOTION FUND

- This is a levy of c50/litre (US¢0.55)on kerosene used to support the Kerosene Distribution Improvement Programme.
- The programme is solely supported from this fund with no external funding.
- About c4.7billion (US\$0.53million) is expected this year from the fund to support the programme.

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LPG PROMOTION LEVY

- This was a levy of about c1.5/kg (then US¢0.02/kg) to support the LPG promotion programme.
- This levy was however withdrawn in 1998 when LPG demand outstripped supply from refinery.

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ENERGY FUND

- This is a levy of c5.0 (US¢0.06)/litre on gasoline, kerosene and diesel fuel products to support R&D and promotion of Ghana's natural energy resources particularly renewable energy.
- About c8.4billion (US\$0.94million) is expected into the fund this year.

Other Levies include:

- Road Fund Levy -c600/ltr (6.6cents/ltr)
- Exploration Levy – c10/ltr (1,1cents/ltr)
- etc

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ACHIEVEMENTS- Grid extension

- Rural Electrification access has increased from 478 communities in 1990 to about 3,500 communities in 2004 (65% access).
- There is no community with population above 3,000 without electricity in Ghana.
- Productive use of electricity in some communities have led to sustained job creation
 - Water pumping for all year irrigation farming, among others



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ACHIEVEMENTS – LPG/kerosene

- LPG consumption has increased 5,200MT in 1990 to 68,000MT in 2004
- LPG distribution outlets have been extended to most Districts
- New Kerosene distribution outlets have been established in remote areas in all the 138 districts in Ghana (20 in each District)
- LPG and kerosene transporters and distributors to rural areas are properly compensated.

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ACHIEVEMENTS - RE

- R&D in RE has been vigorously pursued and viable RE technologies demonstrated. These includes:
 - Biogas power for cooking and electrification
 - Off-grid solar rural electrification
 - Small wind power for electrification and water pumping
 - Small and mini hydro developments
 - Improved charcoal production technologies
 - Improved woodfuel stoves, sawdust briquettes
 - Solar water heaters, crop dryers Bio-diesel from jathropa etc

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ACHIEVEMENTS –RE



- Off-grid electrification with renewable have seen significant growth from 0.3MWp in 1991 to 1.1MWp in 2002 using solar PV systems.
- The challenge however is that the target areas where Renewable Energy use can contribute to sustainable development are places where the inhabitants could least afford the energy service.
- Gov. investment in infrastructure development is not enjoyed by the rural poor.

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Cost of PV Energy Delivery

- A 100Wp solar home system providing three lighting points and a socket for radio/ TV (about 300Wh/day) has an initial capital cost of about US\$1,100
- Monthly tariff to reflect the full cost recovery of a 100Wp solar system is about US\$10.11/ month (98cents/KWh)
- Tariff to reflect only operation, maintenance and replacement of components is US\$4.98/ month (46cents/KWh)

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- Meanwhile, under grid electrification, rural subscribers pay only about US\$1.00 as connection fee and a subsidised lifeline tariff of about \$2.00 /month for consumptions upto 50kWh/month. (4.0cents /KWh)
- Cost of transmission, distribution and service drop are paid by Government under the NES.
- SHS enjoys no favourable pricing policy or financial incentive except for the waiver of import duty on solar panels.

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WAY FORWARD

- Need for the creation of a level playing field for renewable energy users to pay tariffs similar to their counterparts on conventional energy, due to the environmental benefits that RE offers.
- Promoting renewable energy through levies on fossil fuels and electricity could have a significant impact in ensuring rural energy access.
- However, a critical evaluation on both the “+ve” and “-ve” impact of the levy is very very important.

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CHALLENGES - LEVIES

- A strong political-will is required to fix or introduce these levies
 - Gov. becomes unpopular with the rich minority in the urban areas likely to be dissatisfied against fuel price increases which if not properly handled, could lead to political unrest.
 - For levies fixed on absolute values, upward adjustment becomes difficult when increasing general fuel prices for the same reason above.
 - A possible option is to fix the levies as percentage of the fuel cost for automatic upward adjustment

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SOME THOUGHTS FOR CONSIDERATION-

Effect of 1% Levy on Electricity and Fossil fuel in Ghana. Renewable Energy Development Levy (REDL)

Energy	Units	Annual consumption	User price cents/unit	RED Levy 1.0%	Revenue US\$Million
Electricity	KWh	6,840,000,000	7.80	7.88	5.34
Gasoline	Ltr	662,568,027	74.07	74.81	4.91
Kerosene	Ltr	95,111,153	59.26	59.85	0.56
Diesel	Ltr	876,299,674	65.19	65.84	5.71
				1.0%	16.53

1.5% RED Levy => US\$24.78million annually

0.5% RED Levy => US\$8.26million annually

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Impact of proposed REDL

- US\$15million can
 - Provide 14,000 rural homes with clean solar lighting systems to reduce indoor air pollution from kerosene light.
 - Maintain over 50,000 SHS annually.
 - Establish about 15MW Wind Parks annually
 - Construct biogas digesters in 3,000 rural farm houses for cooking.
 - Replace traditional inefficient woodstoves with improved stoves in more than one million households.
 - Create thousands of job in bio-diesel plantations and production for energy security

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Conclusion

- Subsidizing energy delivery does not guarantee energy access to the poor. The subsidy or support must be targeted in order to ensure that they reach those who need it most.
- Programmes supported solely by donors without local contribution stands the risks of being abandoned once funds are exhausted
- Taxes and Levies from fossil fuel and electricity can be a sure way of generating revenue to complement Gov. budgetary support to rural energy access.
- However, implementation of these levies and taxes can be difficult and requires a strong political will. It should be such that impacts are minimized.
- A critical evaluation of the Ghana experience is necessary (welcome any donor support for an independent evaluation)

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Funding Rural Energy is Worth a Challenge. In Ghana, we take up this Challenge



Ministry of Energy Ghana
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