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Local Autonomy in Energy Decision-making and Management in Ghana

Author(s)

Daniel Kweku Baah Inkoom, Department of Planning, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana, dinkoom@gmail.com

Akosua Baah Kwarteng, Amaka-Otchere, Department of Planning, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana, abk.amakaotchere@gmail.com

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Abstract

After decades of unstable power supply and a past decade of worst power crisis, it is undisputable that Ghana can no longer rely on the centralised on-grid system of energy supply if the nation were to reach universal access to energy by 2020. In 2011, the Renewal Energy Law was passed as part of an energy reformation and transition process, which aimed for Renewable Energy to contribute 10% to the energy mix and targeted remote and off-grid communities. This paper examines how the implementation of the Law implies the involvement of the local governments in a decentralised system of management.

Keywords: Renewable energy, Local level governance, Decentralisation, Ghana

1 Introduction

The challenge of centralised energy management in Ghana is as old as the sovereignty of the nation. Since independence, power has been generated from the Akosombo and Kpong Hydroelectric power dams on the White and Black Volta with a combined generation capacity of 1180MW. In 2013 the Bui Dam also located on the Black Volta was also commissioned with generation capacity of 400MW. It has been the goal of the Government to extend power to the whole country as a catalyst for growth and development. The government has since 1989 been implementing the National Electrification Scheme (NES) and its complementary Self-Help Electrification Project which particularly aimed at quickening the pace of rural electrification. The goal has been to reach universal access to electricity by the year 2020. Power sector reforms were implemented (Government of Ghana/World Bank, 2014). Electrification access rate grew from 15% in 1990 to 72% as at 2012 (Ministry of Energy, 2010). The generation, transmission and distribution of both hydroelectric and thermal power have been centralised through state institutions - the Volta River Authority and Bui Power Authority undertake generation, the Ghana Grid Company is in charge of transmission and the Northern Electricity Department and the Electricity Company of Ghana are responsible for distribution.

2 Problem conceptualization

As Ghana's population grows and the economy expands, energy demand increases - electricity demand is currently estimated at 1400MW is growing at 6-7% per annum (Energy Commission, 2012). In addition, the Akosombo HEP suffers obsoleteness of its equipment. Even though the output of the three dams is supplemented with thermal generation from Aboadze (989.5 MW) and independent power producers (IPP) (890MW), the country has

been plagued with the worst energy crisis in the past decade necessitating power rationing programme at various points in time. Again, in spite of the electricity access gains of 72% made, the rural-urban divide persists: 87% of the 72% households which have access are urban dwellers. The rural access rate is 49% (Kemausour, 2016) and a large proportion of rural areas are very remote and in off-grid regions giving utility investors no economic incentive to invest. This necessitated the adoption of alternative sources of energy. In congruence with the UN goal of sustainable energy which aims at doubling the proportion of renewable energy in the global energy mix and given the country's abundant renewable energy resource endowment, the government pursued the renewable energy option, giving it the necessary regulatory and policy framework. In 2011, the Renewable Energy Law, Act 832 was passed as part of an energy reformation and transition process. A complementary Renewable Energy Directorate under the Ministry of Energy was created. The intervention was a welcomed act particularly for the private sector which has over the years been spearheading the renewable energy sub-sector without an enabling regulatory environment. Improving rural energy access is foremost priority for the Act. Particularly for unattractive market of the remote and off-grid regions, the renewable energy options are acknowledged as the least-cost options to improving energy access (Practical Action, 2012). Specifically, the Ministry of Energy aims at increasing the proportion of renewables in the country's energy mix from an almost negligible proportion to 10% by 2020 (Energy Commission, 2012). Furthermore, the current government's flagship industrial policy - "one district, one factory" - has implications for the adequacy of energy supply in each local government [also known as the District Assembly in Ghana]. Since the passage of the RE Law, a number of renewable energy projects have been undertaken with much concentration in the rural Districts and communities. In Ghana, the Ministry of Local Government and Rural Development and the 216 local governments exist to promote good governance at the decentralised governance

level and balanced rural based development. Nonetheless, the execution and control of the renewable and alternative energy projects are still at the central government level. The centralised approach to power supply and delivery has its challenges. In addition to high transmission and distribution loses and unattractiveness of extending supply to the remote areas, the following challenges bedevils this approach - (i) inadequate power supply infrastructure requiring huge investments; (ii) inadequate access to electricity; (iii) high cost of fuel for electricity generation; (iv) inadequate regulatory capacity and enforcement; (v) operational and managerial difficulties in utility companies, and (vi) vulnerability to climate change (Ministry of Energy, 2010).

This paper examines the provisions of the reformation instrument – the Renewable Energy Law - as the catalyst for improving energy access at the rural and local government jurisdictions given that the highest demand for renewable energy lies in the rural region. It also examines the policy and regulatory framework which operates in tandem with the REL, the extent to which they imply devolution of power and decision-making on energy to the local governments and the capacities of the local governments to execute such responsibility.

The research is based on the argument that energy reform and transition aimed at increasing energy access to the energy poor regions will be achieved with the devolution of power and resources to the local governments. To examine this proposition both secondary and empirical evidence are employed. Secondary data was organised through document review. Empirical evidence was gathered using qualitative instruments in three Districts - the Builsa North and Kassena-Nankana-East Districts in the Upper East Region and the Atebubu-Amantin District in the Brong Ahafo Region of Ghana respectively. Interviews were conducted in 10 communities across the Dstricits. In addition, institutional interviews within the local governments' administrations and nation-wide interviews with private sector were carried out.

In the context of this paper and REL (Act 832), renewable energy excludes large-hydro. The local governance structure is four-tier, involving the metropolitan assembly, the municipal assembly and the district Assembly. The emphasis of this work is on the District Assemblies and not the metro and municipal assemblies (See section 3).

3 Conceptual/theoretical underpinning –Situating the energy sub-sector in Ghana's decentralised system of governance

Decentralisation has been severally defined. Adopting the definition by Rondinelli et al., decentralisation is defined as the transfer of responsibility for planning, management, and resource-raising and allocation from the central government to (i) field units of central government ministries or agencies; (ii) subordinate units or levels of government; (iii) semi-autonomous public authorities or corporations; (iv area-wide regional or functional authorities; or (v) Non-Governmental Organisations (NGOs)/Private Voluntary Organisation.

In 1992, the newly formed democratic government of Ghana adopted the decentralised and local system of governance. The 1992 Constitution established the Local Government Act 1993 (Act 462) which institutes the District Assemblies as the highest political, legislating, budgeting and planning authority at the local level. The Decentralisation Policy of Ghana devolves power, functions and responsibility as well as human and financial resources from the Central Government to the local government (Institute of Local Government (ILGS), 2010). The local government structure is a four-tier structure consisting of the regional coordinating council (RCC), the metropolitan, the municipal and district assemblies (MMDAs), the urban/town/area/zonal councils and the unit committee (Figure 3-1). Unlike the RCCs (which are administrative and coordinating institutions), the MMDAs are policy makers in congruence with the policy formulation direction provided by the National Development Planning Committee (NDPC), the highest planning authority in

Ghana. The MMDAs have the mandate to function as the fulcrum of local governance (ILGS, 2010). They shall exercise deliberative, legislative and executive functions and shall be responsible for the overall development of the district. They shall formulate and execute plans, programmes and strategies for the effective mobilisation of the resources necessary for the overall development of the district. They shall also promote and support productive activity and social development in the district and remove any obstacles to initiative and development. In addition, they shall initiate programmes for the development of basic infrastructure and provide municipal works and services in the district. The DA operates with two main committees – the Executive and the Public Relations and Complaint Committees. The Executive Committee consists of a number of operational sub-committees. The *Works Sub-committee* existing under the Executive Committee is expected to monitor and make appropriate recommendations to the Executive on infrastructure needs and services including electricity needs. In addition to the named sub-committees, the DA has the authority to create any other sub-committee it deems necessary. This is further discussed in Section (5).

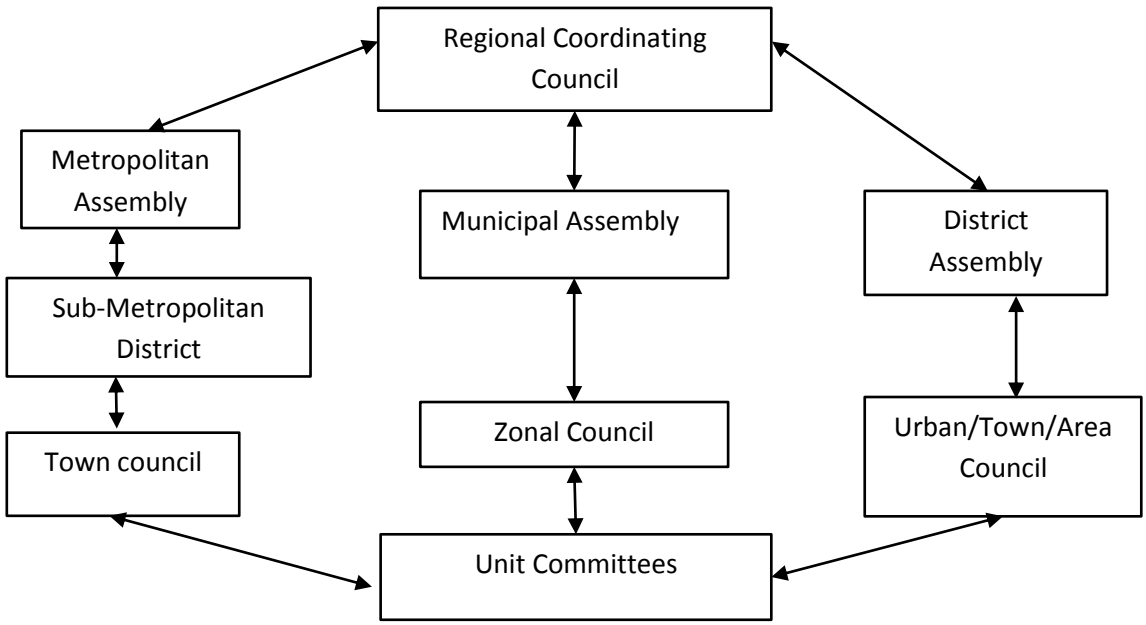

Fig 3-1: The Local Governance Structure of Ghana
Source: Institute of Local Government, 2010

The interaction between centralised central government system with its institutions and decentralised local government institutions will be assessed using Prahalad's conceptual model of the Fortune at the Bottom of the Pyramid and Christensen's conceptual model of Disruptive Technologies. Prahalad (2005) argues that the lenses through which we perceive the world are often coloured by our own ideologies and experiences, and in the case of organisations, the established management practices. He calls this phenomenon the *dominant logic*. Christensen (1997) argues that the development of new technologies [innovation] require isolation, that is, separating the management and implementation of the innovation from the mainstream organisation to have maximum impact and to prevent the management of the mainstream unit from undermining the management of the innovation.

4 Government policy on the renewable energy sector

The policy of the Government of Ghana on renewable energy (excluding large hydro) enshrined in the National Energy Policy 2010 is to have renewable energy constituting 10% of the national energy mix by 2020, to develop legislation to encourage renewable energy technology development and utilisation (Ministry of Energy, 2010:20), while attaining universal access to electricity by 2030. Even though the REL (Act 832) outlines a number of renewable energy sources, the paper will focus on a few whose economic and technical viability has been confirmed through prefeasibility and feasibility studies in the Ghana context and applicable to the study areas.

The government's policy on wind and solar energy focuses on improving the cost-effectiveness of solar and wind technologies, creating a favourable regulatory and fiscal regime, supporting indigenous research and development to reduce the cost of solar and wind energy technologies, and supporting the use of decentralised off-grid alternative technologies where they are competitive with conventional electricity supply. A wind resource study by

Solar and Wind Energy Resource Assessment (SWERA) indicates that the total wind capacity of the country is 5640MW but the potentials are concentrated in the Volta, Eastern, Northern, Brong Ahafo and Ashanti Regions (Table 4-2), (SWERA, undated). These areas are estimated to have Class 3 potential (Table 4-1). From Table 4-2, the two study districts in the Upper East Region do fall within the potential zone.

On the other hand, even though the Brong Ahafo Region has elevation ranging between 152m and 712m above sea level, exhibiting possible potential, the study District – the Atebubu-Amantin District - has elevation ranging between 60m and 300m above sea level (Atebubu-Amantin District Assembly, 2010) and therefore do not fall within potential wind resource.

Table 4-1: Moderate-to-excellent wind resource at 50m

Wind resource utility scale	Wind class	Wind power at 50m W/m^2	Wind speed at 50m m/s	Total area km^2	Percent windy land	Total capacity installed MW
Moderate	3	300 – 400	6.4 – 7.0	715	0.3	3,575
Good	4	400 – 500	7.0 – 7.5	268	0.1	1,340
Excellent	5	500 – 600	7.5 – 8.0	82	<0.1	410
Excellent	6	600 – 800	8.0 – 8.8	63	<0.1	315
Total				1,128	0.5	5,640

Assumptions: Installed capacity per km^2 = 5MW; Total land area of Ghana = 230,940km^2
Source: Amaka-Otchere, 2014

Table 4-2: Potential moderate to excellent wind resource by Region

Region	Class 3 (km^2)	Class 4 (km^2)	Class 5 (km^2)	Class 6 (km^2)	Good to Excellent Potential (MW)	Moderate to Excellent Potential (MW)
Ashanti	93	11	0	0	55	520
Brong Ahafo	83	17	16	2	175	590
Central	0	0	0	0	0	0
Eastern	285	26	0	0	130	1,555
Greater Accra	0	0	0	0	0	0
Northern	73	53	0	0	265	630
Upper East	0	0	0	0	0	0
Upper West	0	0	0	0	0	0
Volta	181	161	66	61	1440	2,345
Western	0	0	0	0	0	0
Total	715	268	82	63	2,065	5,640

Source: Based on Solar and Wind Energy Resource Assessment, (undated)

In the case of mini-hydro, the government policy is to provide pricing incentives for mini-hydro projects. Even though the overall potential of mini-hydro is limited, 22 potential medium and small hydro power sites with capacities ranging from 5.6MW to 24.5MW have been identified that could be developed for power generation (Energy Commission, 2012:33).

Again in 2010, the Sustainable Energy for All Ghana Action Plan was out-doored. The Plan which is Ghana's response to the UN Energy Access for All, premised on the fact that prioritising the acceleration of sustainable access to clean modern energy for households

and productive uses is a means of achieving accelerated growth that is shared through job creation and poverty reduction. It is anticipated that the development and use of renewable energy resources have the potential to ensure Ghana's energy security and also mitigate the negative climate change impact of energy production and use. The Ghana Energy Access and Development Project (GEDAP) is currently one of government's strategic and high impact interventions towards the attainment of the sustainable energy access for all. It is a multi-donor funded project supporting Ghana to improve the operational efficiency of the electricity distribution system and increase the population's access to electricity using multiple electrification and service delivery schemes. It aims at improving access to electricity supplied from both the grid and renewable energy, that is, isolated mini-grids and solar photovoltaic systems electricity. The project suggests the setting up of a Rural Energy Directorate at the Ministry of Energy to oversee the renewable energy interventions.

The Renewable Energy Law

In 2011, the Renewable Energy Act 2011, Act 832 was passed. The Act provided a legislative and institutional framework for the promotion and development of renewable energy (Government of Ghana, 2011). The objective of the Act is to provide for the development, management and utilisation of renewable energy sources for the production of heat and power in an efficient and environmentally sustainable manner. Among its key provisions are: (i) Feed-in-Tariff Scheme under which electricity generated from renewable energy sources is offered a guaranteed price; (ii) Purchase Obligation under which power distribution utilities and bulk electricity consumers would be obliged to purchase a certain percentage of their energy required from electricity generated from renewable energy sources; (iii) Licensing Regime for commercial renewable energy service providers among others to ensure transparency of operation in the renewable energy industry; (iv) Off-grid Electrification to

promote Mini-grid and stand-alone RE systems for remote off-grid locations; (v) Establishment of Renewable Energy Authority to own, implement and manage renewable energy assets on behalf of the State particularly for off-grid electrification. In consonance with the fifth provision of the Act, the Renewable and Alternative Energy Directorate was been established within the Ministry of Energy as a complementary output to the REL. The aim of the Directorate is to develop policies and promote renewable energy to increase access to sustainable energy services. The Ministry of Energy and its Minister are designated as responsible for providing policy direction for achieving the object of the Act.

Institutional framework for renewable energy supply

To assess the role, interest, degree of influence, the level of organisation of stakeholder institutions in the renewable energy sector, dynamics in policy implementation, and locus of the local government in the macro scheme of control and interest, an analysis of the relevant stakeholders for the purposes of this study was undertaken.

Until 2010, the major institutions involved in the energy sector were the power sub-sector and petroleum sub-sector institutions, and the regulatory agencies. These are centralised institutions operating at the Central Government level. Both the energy policy framework and the accompanying strategy document guiding the sub-sectors made no specific provision for a renewable energy sub-sector institution, even though the documents cursorily provided strategies towards promoting the sub-sector. Obviously, this suggested a regulatory and a technical setback for the development and promotion of renewable energy. Consequently, even after the creation of the Renewable and Alternative Energy Directorate (RAED), the centralised (dominant) management logic prevailed in the management of the sub-sector in spite of the fact that the primary objects of the RAED were to be found at the

local government level. This logic refuses to appreciate and allow new worldviews - that is, the local government - in management of the sub-sector.

The roles of the stakeholders are analysed below:

The Ministry of Energy

The Ministry of Energy is responsible for the formulation, implementation, monitoring, and evaluation of energy sector policies. Before the establishment of the RAED, the Ministry had two directorates – petroleum and power. The Ministry deems electricity as the dominant modern energy used in the industrial and service sectors (MoE, 2010). Although a rural electrification agency was previously suggested, it was not established because that required the creation of another level of bureaucracy (Abavana, 2010) which the Government was not willing to create. The Ministry prioritises the provision of electricity through the grid over other forms of electricity production. Being a traditional institution, it was for a long time more concerned with the conventional forms of energy provision and thus, until the passing of the REL which required the creation of the RAED. Now, the Renewable Energy Act 2011, Act 832, taxes the Minister of Energy to provide the policy direction for the achievement of the objectives of the Act (Government of Ghana, 2011).

The Renewable and Alternative Energy Directorate

The aim of the Renewable and Alternative Energy Directorate (initially known as the Renewable Energy Directorate) is to own, implement and manage renewable energy assets on behalf of the State. Renewable energy resources considered by the Directorate are woodfuel, hydro, solar, wind, biofuel, waste-to-energy, and animal traction. It performs according to the legislating Act.

The Regulatory Agencies

In terms of regulation, the Energy Commission (EC), the Public Utility Regulatory Commission (PURC) and the National Petroleum Authority (NPA) are three regulatory agencies established by Acts of Parliament to ensure the proper functioning of all players in the energy sector and to create the requisite conducive environment for the protection of private investment in the sector. Their roles with regards to the renewable energy sub-sector are indicated in Table 4-3.

Table 4-3: Regulatory Agencies in the Energy Sector

Regulatory agency	**Role**
Energy Commission (EC)	• Regulation, management, development and utilisation of energy resources particularly with licensing of operators and setting technical standards • Advises the Minister of Energy on energy matters Specifically for Renewable Energy development, it i. Creates a platform for collaboration between government, private sector and civil society for the promotion of renewable energy ii. Advices on incorporating renewable energy into educational curriculum iii. Advices on tax and levy exemptions for the development of renewable energy iv. Consults with the PURC on rates chargeable v. Promotes the development of renewable energy through local manufacturing of components, training, advocacy vi. Implements the provisions of the Renewable Energy Act 2011, Act 832
Public Utilities Regulatory Commission (PURC)	Generally responsible for monitoring quality of service and consumer protection, and providing guidelines for rates to be charged for the provision of utility services For the development of Renewable Energy, it performs these specific roles: i. Approves rates chargeable for the purchase of electricity from renewable energy sources by public utilities ii. Approves charges for grid connection from renewable energy iii. Approves rates chargeable for wheeling of electricity from renewable energy sources
National Petroleum Authority (NPA)	Responsible for both the licensing of operators in the downstream petroleum sector and setting technical standards and enforcement as well as pricing of petroleum products With regards to renewable energy development, it considers the nature of fuel produced from renewable energy resources to

	ensure the integration of relevant renewable energy project into the fuel supply system

Sources: Ministry of Energy, Ghana – National Energy Policy, February 2010; Renewable Energy Act, 2011 (Act 832); Energy Commission of Ghana, http://www.purc.com.gh/purc/ (Accessed 07/05/2017)

Among the three regulators, the role of the EC is paramount in the promotion of renewable energy. The EC is mandated by the Act to implement the provisions of the Act. Energy resources considered under the Act and relevant to the study are wind, solar, hydro, biomass, and bio-fuel.

The District Assemblies

There are currently 216 Districts Assemblies who are responsible for the overall development of their Districts. At the District Assembly (DA) level, issues of energy are treated under the Works Sub-committee (Institute of Local Government Studies, 2010). However, the sub-committee is basically concerned with power transmission and distribution. Even in terms of power supply, the DA as a governing authority has very minimal control. Its control is limited to community selection and communicating the results of the selection to the Ministry of Energy. Evidently, the structure of the Work sub-committee does not make provision for renewable energy development. The renewable energy concerns are handled among different district departments which are related to context of the sub-sector, i.e. Forestry Department, Department of Food and Agriculture, District Water Unit, and Environmental Protection Agency (EPA), in collaboration with the private sector. For example, the Departments of Food and Agriculture, and Forestry, and the EPA by virtue of their mandates are concerned about bio-fuel production and use. The unregularised nature and structure of dealing with renewable energy at the District level leave rooms for exploitation by profit-oriented investors. In a related example, a foreign investor which had acquired large tracts of land for the production of bio-oil plants in one of the study Districts had an off-take agreement with a

major strategic partner for the distribution of biodiesel in Europe. As a result, its production concentrated on satisfying the bigger international market to the detriment of the smaller local market and local communities whose land had been leased to the investor. A key informant interview conducted in the local communities in the District revealed that family lands stretching over thousands of hectares, supposed to serve as sources of livelihood have been leased out by traditional rulers who are custodians of these lands to the investor for biofuel production (Author's field study, June 2012). Typical with the land tenure system of Ghana, an informal agreement with the leesee to employ the local residents failed. The local communities lost both their livelihoods and their compensation.

Again, as a result of this limited control by the DAs, plans for renewable energy projects, their distribution and upscaling are determined at the central government level. For instance, even though the renewable energy development component of the GEDAP targets rural settlements, the institutional set-up for implementation and management is centralised without the involvement of the local assemblies: the credit facilities provided by the Project engages the Apex Bank and rural banks directly; the supply chain consists of nationally accredited suppliers; inspection and verification of supplied products are undertaken by national teams; and retailers and vendors are picked directly from the communities without the involvement of the local authorities (Author's field survey, 2012).

One cannot also rule out the politico-social factor which influences the execution of energy projects at the District level (Author's field survey - Institutional interview, 2012). In spite of the government policy to increase the renewable energy factor in the national mix, on-grid electrification appears as a more preferred option that earns more political scores. Thus, it not uncommon to see rural communities connected to the national grid outside the planned geographical scope of the distribution agencies within a given timeframe. Although these occurrences eventually increasing access, it also distorts planned District energy

delivery programmes; private investors in renewable energy are discouraged due to losses incurred as a result of abandoned projects; and neighbouring communities provided with the renewable alternative are disillusioned and mistrust the energy delivery system. In a another dimension, planned energy supply programmes are sometimes halted due to changes in governments and the necessary changes in the administrative machinery that comes with it. A few examples of this case are illustrated in next section.

Development partners

Most large and medium-scale energy access interventions in Ghana have been funded by bi-and-multi-lateral development partners. They provide both the capital investment and the technical support for these interventions. The GEDAP for instance is funded by the International Development Agency (IDA), Global Environment Facility (GEF), African Development Bank (AfDB), Global Partnership on Output-based Aid (GPOBA), Africa Catalytic Growth Fund (ACGF) and the Swiss Agency for Economic Affairs (SECO); Affordable Lighting for All was funded by the Dutch Government, and the Ghana Multifunctional Project by the United Nations Development Programme (UNDP). The magnitude of the investment corroborates with the magnitude of their interest and influence in energy policy decisions which affects the local governments as well.

Private investors

Similar to the performance of the development partners, private investors play a critical role in promoting renewable energy development. The private sector has been the main driver of the energy sub-sector at a time when the Central Government itself was not incentivised to invest in the sector. Private investors include chains of importers, assembling units, installers, suppliers, distributors, and research institutions. The rural market has been tagged unprofitable both by the government utility agencies and by private sector which are profit-

driven. Thus, private investors concentrated most of their efforts on the small urban market and/ or were involved in some national projects before the passing of the REL. Even without the enabling regulatory environment, they identified the renewable energy sector as a market niche that could be developed, albeit, according to their own rules of operation. For instance, one key informant in renewal energy supply industry indicated an intention of building a community solar off-grid electrification system and a community petroleum gas distribution depot on the build-operate-transfer (BOT) business model.

On another hand, the private sector sees itself as side-lined in government policy decisions that affect them. The sector lamented their minimal involvement in the drafting the Renewable Energy Bill before it was passed into a Law (Author's institutional survey, 2012). The sector however had a weak and fragmented front which did not give them enough leverage for their involvement.

The Rural Community

The rural community is rarely directly involved in the formulation of rural energy policies. Nonetheless, it serves as the source of data for baseline studies, feasibility studies and pilot programmes, from which information is derived on community expectations. This is expected to inform policy.

On the other hand, rural communities may express their desire and request for energy services through their local government representatives – the Unit Committee or the Assembly members in their communities. In field interview, 6 out of 10 communities studied had taken such initiative in the past. None of the communities took initiatives on renewable energy had been made because they were rarely aware of the renewable energy options.

The discussion is summarised in Figure 4-1. The Ministry, representing the Central Government and development partners wield more power and influence than the other

stakeholders. The District Assembly has relatively low power and influence; likewise the community which had the highest interest in access to energy. By implication, the decisions of the Ministry and Development Partners overshadow decisions made at the local level.

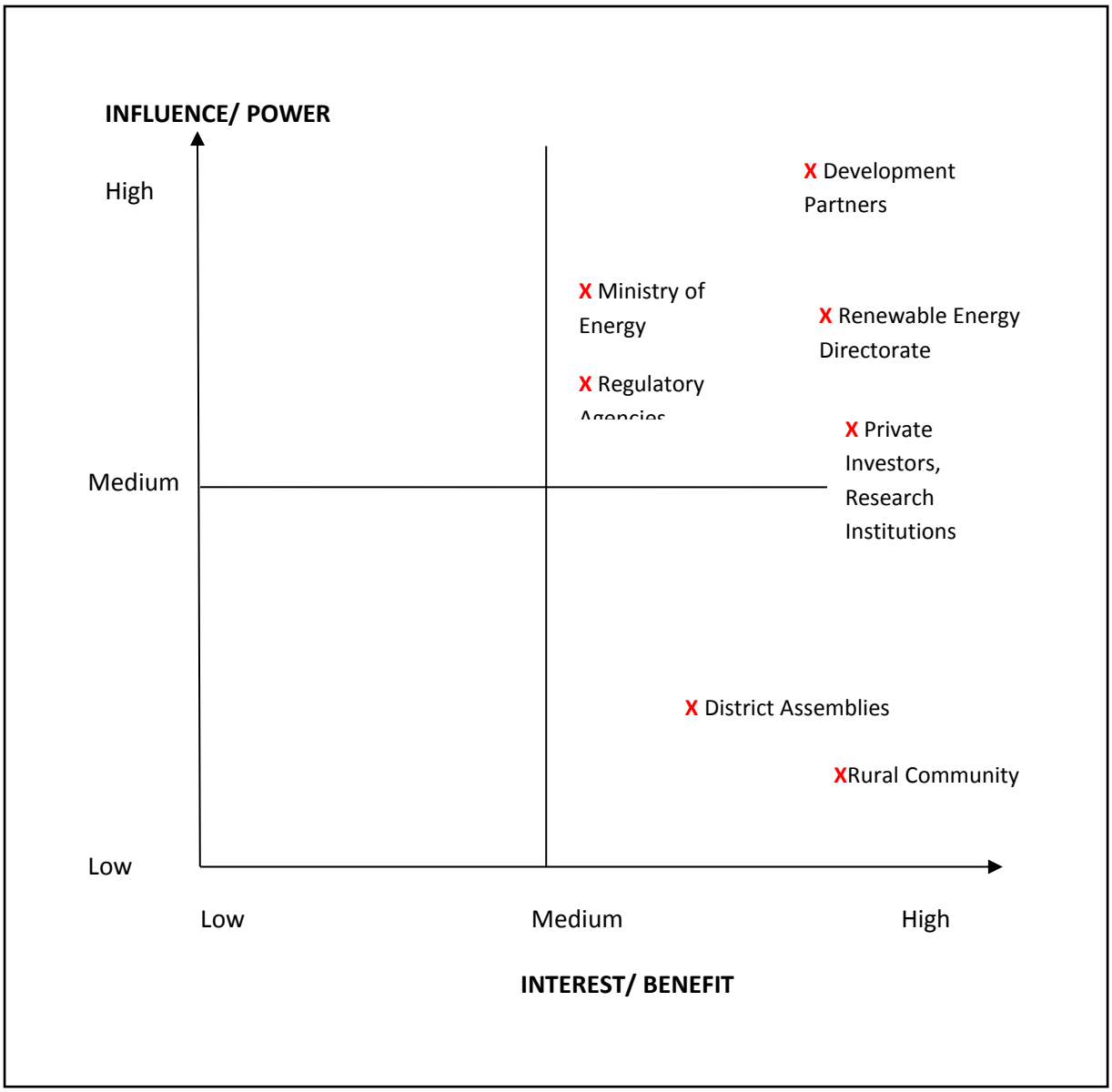

Figure 4-1: Influence and interest of key stakeholders in rural energy supply
Source: Author's construct

5 Local level governance and energy in case study areas

The Medium Term Development Plan (MTDP) (2010-2013) of the Builsa District (currently Builsa North District) treats energy under the Human Development, Productivity and Employment thematic area, instead of the Infrastructure, Energy and Human Settlement Development theme (Builsa District Assembly, 2010).

The major energy activity identified in the MTDP was an on-going rural (on-grid) electrification programme. The MTDP also aimed to increase energy for domestic use by 'introducing renewable energy technologies such as solar PVs and biogas, and introducing and promoting energy efficiency technologies' (Builsa District Assembly, 2010). However, the implementation framework lacked defined strategies and activities to achieve the objectives. On the ground, an off-grid electrification programme under the Ghana Energy Development and Access Project (GEDAP) was rigorously underway in the District since the year 2010. The DA as an agent of change and development was not involved and active in the off-grid development programme in the District. In a key informant interview with the District Planning Officer, it was asserted that the DA was rarely consulted on government and development partners' intended interventions (Author's Institutional interview, 2012). This iterates the disjointed and incoherent manner in which energy is handled.

In the Kassena-Nankana East District, energy challenges named in the MTDP (2010-2013) were inadequate supply of electricity, unreliable electricity supply, and high cost of alternative source of energy, precisely solar (Kassena-Nankana East District, 2010). These were discussed under the Expanded Development of Production Infrastructure theme. The corresponding development priorities included the extension of electricity to 10 rural

communities and promoting the use of solar lighting system in 45 communities at the end of the plan period. This District was relatively specific in the development of the energy infrastructure within the planned period. Detailed time schedules and specific communities were indicated. Grid electricity provision was the most prioritised. The District administration was aware of the GEDAP renewable energy project in their jurisdiction but they were not directly involved in the implementation. The District agricultural extension officers were able to lead the research team to participating communities. In terms of on-grid electrification, the DA felt its hands were tied with respect to projects which were commenced but never completed. In consonance with the discussion on the role of the Work sub-committee in electrification in Section (4), the District's role was limited to identifying communities for the Ministry of Energy. Meanwhile communities involved were disillusioned as they were also not considered for the GEDAP renewable energy project. This threatened the stance of the DA with the people.

In the Atebubu-Amantin District, the failure of district administrative system was daunting. The district development framework existed only in part: only the situational analysis of the MTDP was available; there was no access to the action plan or the list of development priorities. Without an action plan or medium term development priorities, the energy development direction of the District could not easily be determined. Generally, the apathy identified in this District with regards to energy was relatively higher than the two other Districts. Data was gathered from the scanty situational report, interview with District Planning Officer and from community surveys carried out from May to July 2012. Fundamentally, only the two major towns in the District – Atebubu and Amantin – and their immediate surrounding communities (with a range of 20km) were connected to the national grid. The District and three other Districts depended on the power sub-station of a fifth

District, the Techiman District. The power sub-station was overloaded resulting in unreliable power supply particularly under peak conditions.

The District Assembly's involvement in the development of energy in the District was reported by officers to be very minimal. In electrification projects, the DA's role according to the implementation protocol was restricted to the selection of communities for the Ministry of Energy; it did not have the mandate to implement. Similar to the cases reported in the Kassena-Nankana East District, two communities in the District, Kumfia and Fakwesi, were recommended for electrification in 2007 and had had transmission poles were erected. In a community survey, the projects had been abandoned since 2008 (Author's field study, May-July 2012). In a cross-interview with the District administration, they neither initiated nor supported the project. At the time of the study, the District was also not a beneficiary of renewable energy projects.

In line with Local Government Service Legislative Instrument (LI) 1961, departments of mother Ministries have been created as subsidiaries at the local government level to support the activities of the District Assemblies in programmes and project formulation, implementation, coordination, monitoring and evaluation (Government of Ghana, 2009). The LI 1961 however does not accommodate any Department or unit under the Ministry of Energy. [The only section where energy is mentioned is section 10 (2)(p), i.e. the Works department in consultation with the Electricity Company of Ghana will facilitate the provision of streetlights.] Correspondingly, the Renewable Energy Directorate is not represented at the District level.

2

6 Discussion

A careful assessment of the REL shows that the Act 832 does not provide for the involvement of the MMDAs nor their functionaries. There is no specific provision for local governments to implement the provisions of the Law. It may be inferred that the regulatory environment does not support the devolution of power in the energy sector. In the Sustainable Energy for All (SE4All) Ghana Action Plan, one of the main expected outputs is the establishment of Rural Energy Directorate expected to be responsible for off-grid mini-grid rural projects. It is unequivocal that the REL and its implementation find more significance at the rural level than at the urban level for the following reasons:

- Communities which are till date not connected to the grid are remote and off-grid rural communities for which renewable energy-based decentralised energy option are the best options
- In the event of on-grid power rationing, the urban seemingly more productive regions will be prioritised over the rural regions
- The promotion of productive uses of energy to boost growth and productivity targets the rural areas more than the urban areas
- There is a very low propensity of communities already connected to the grid to switch to off-grid facilities unless they do not have options (Amaka-Otchere, 2014).

Granted these reasons, it is not out of place for the local governments which are created to ensure balanced rural based development and to promote substantial and equitable economic growth through accelerated service delivery at the local level to be fully involved in energy provision for their people. The current state of affairs defeats the purpose of decentralisation. The gawking apathy witnessed at the study Districts and the indifference to whether the energy system worked or not is a failure of the decentralised system. Moreover, in the past, many renewable interventions have failed because the local communities lacked technical

capacities to provide after-sales service. Centralised suppliers and distributors often left their clients unattended to after a few initial attempts to provide the service. Two major suppliers based in urban centres of Ghana were explicit on the non-economic sense it made to travel over 700km to rural communities and other administrative Regions just to provide after-sales service, given that the project execution agency (the Central Government) did not provide any form of maintenance contract to the suppliers (Author's Institutional interview, 2012). Evidently, local governments which are the closest entities for planning and implementation could be provided with such technical capacities for sustainability and as leverage for upscaling.

It was also notable that without the existence of a decentralised entity solely responsible for energy, interventions were organised at the District level in an ad hoc manner. Teams consisting of representatives of the various departments concerned were formed during investor enquiries. The absence of a form of regularisation culminated in low commitment to these teams and provided some investors the opportunity to exploit.

Christensen (1997) argues that the development of new technologies [innovation] require isolation, that is, separating the management and implementation of the innovation from the mainstream organisation to have maximum impact and to prevent the management of the mainstream unit from undermining the management of the innovation. It supports Prahalad's argument of the adverse impact of the dominant logic of established management practices on new and evolving systems (Prahalad, 2005). The GEDAP renewable energy component has been implemented on a 'central' scale similar to on-grid electrification projects and has been buffeted with challenges from customer dissatisfaction to suppliers' exasperation.

Going forward, the current industrial policy of 'one district one factory' undoubtedly requires Districts to be energy-sufficient and in a position to take control of its energy affairs for the sustainable implementation of the policy.

7 Conclusion and Recommendation

a. Institutional development and capacity building

The involvement of the DAs in the management of local energy is elemental to improving energy access. The DA needs to engineer pragmatism and competence in district management of energy. Empirical evidence showed a lax attitude of district officials towards energy development. The District could engage with capacity training experts such as the European Union (EU) for external assistance on capacity training and developing new approaches towards promoting energy access. To assess the effectiveness of the training, a pilot phase may be implemented under the oversight of the sponsor. In the process of managing the pilot phase, capacity can be sharpened and improved before an upscale.

It is also recommended that an Energy Committee is formed to address the fragmented renewable energy management structure and arrest the possibilities of exploitation of vulnerable local communities. Representative of the various related District Departments shall constitute the Energy Committee with clearly defined roles and responsibilities. The Renewable Energy Law makes provision for licensing regime for commercial renewable energy service providers to ensure transparency of operation. This provision could be the starting point for the Committee in related investor negotiations.

The Committee will also collaborate with the District offices of the utility agencies. It will also facilitate the selection of communities and the determination of project locations. More importantly, the development frameworks of the DAs, i.e. the Medium Term Development Plans, should contain a chapter on energy. This chapter should outline the respective District's specific energy focus and specific policy strategies and implementable

action plans which will serve as a guide to investors. It will be the responsibility of the Energy Committee to ensure adherence to this energy development framework of the District. It is further recommended that the Ministry of Local Government and Rural Development leads the replication of the same committee at the central government level where an inter-ministerial energy committee composed of the Ministries of Energy, Environment and Science, Local Government and Rural Development, Lands, Forestry and Mines, and Food and Agriculture is formed. This committee will be necessary to prevent a disjointed approach to energy development handed down from the mother-Ministries, and to provide an oversight authority to whom the committee at the District level could report to.

b. Regulatory framework

In spite of the challenges of the prevailing structure of the local government system in terms of energy provision, the current energy policy framework – Renewable Energy Act 2011, Act 832 - provides a basis for the Districts studied to step up and vigorously engage the private sector and development organisations to provide alternative energy. Districts in the savannah ecological zone such as the Builsa North and Kassena-Nankana East Districts are most advantageous. The mean temperature of the Districts ranges from 35°C to 40°C; the ecological zone receives daily solar radiation levels of 4-6kWh/m2 and has sunshine for all months of the year with the highest radiation levels being recorded between March and June. Complementarily, it has very low solar diffuse radiation rates of 32%. The medium term development plans of both Districts should have clear policies on the complementary roles of on-grid and off-grid electrification, as well as policies on the type of suppliers and the terms of supply: either on build-operate-transfer (BOT) agreement, as independent power producers (IPP) or (as in the case of majority of suppliers identified in the study districts) importers of energy appliances and equipment. Previously, there did not used to be tariff rates for the various renewable resources. Rural consumers were at the risk of being exploited by private

investors. Currently (since 2014), the Public Utility and Regulatory Commission gazettes feed-in-tariff rates for all the renewable resources considered under the REL every year (Table 7-1).

Table 7-1: Gazetted Feed-in-tariff for Ghana

Renewable Energy Technology	**FIT Effective 1st October 2016 (GHp/kWh)**
Wind	65.3529
Solar PV	59.7750
Hydro ≤10MW	52.9428
Hydro 10MW >≤ 100MW	56.5312
Run-of-River	52.9428
Biomass	69.1225
Biomass (Enhanced Technology)	72.8589
Biomass (Plantation as Feed stock)	78.1092

Source: Public Utilities Regulatory Commission, 2016

In the past, the idea of Rural Electrification Agency was suggested to the Ministry of Energy to manage rural energy. The idea was not applauded due to the bureaucracies involved in setting up the agency. Currently, a Renewable and Alternative Energy Directorate has been instituted. The SE4All Ghana Action Plan suggests for the implementation of the GEDAP the establishment of a Rural Energy Directorate which is expected to be responsible for off-grid mini-grid rural projects and operating under the Renewable and Alternative Energy Directorate. This reiterates the necessity of an institution solely responsible for rural energy promotion and development. The proposition of the SE4All has not yet been effected. Currently, investment-intensive nationwide projects such as the GEDAP operate a secretariat at the Ministry of Energy. This could be subsumed under the proposed Rural Energy

Directorate with decentralised functions at the local government level as part of the functions of the Energy Committee.

Furthermore, at both the local and central government levels, the Ministry of Energy and the Energy Commission, and the corresponding Energy Committee at the District Assembly must involve all stakeholders in the formulation of policies, especially the private sector which has been the forerunner in the promotion of renewable and alternative energy. The DA could also engage the private sector in strategic partnerships in energy investment.

c. Decentralising the energy system

The current structure where the District Assemblies is only mandated to manage implementation [which was not even the practice on the ground] is a contradiction to the local government (decentralisation) system of governance which the country asserts to practice. The local system of government could serve as leverage for decentralising the energy system. It is recommended that the central government cedes power to the DAs in this regard.

It is further proposed that the Central Government gives [neighbouring] DAs given the mandate to team up into economic enclaves to raise capital for energy projects that has cross-cutting effect. Notably, in the case of the 5 District relying on one power sub-station, the operation of the sub-station was under the management of the national utility agency - the Northern Electrification Distribution Company (NEDCo). With such an economic mandate, the two or three local district administrations could team up resources to undertake and manage energy projects to avert such situations.

From the empirical study, the district officials did not appear to be interested in energy issues over which they had no authority. The apathy is disincentive to development. Decentralising the energy system will promote effective lobbying, innovativeness, keen

participation and whip-up the interest and energy of the local administrators. Moreover, the rigorous processes of project identification and buy-in are more likely to make project districts-context specific. By implication, the Districts will not simply be at the receiving end of wholesale energy projects which may not work in their specific contexts.

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