

Understanding Bioenergy Value Chain and Gaps in Kenya

General Considerations with Special Emphasis on Biomass and Biogas: Condensed version

Focus on Policy Development and Private Sector Approach

Introduction:

Increased activity and awareness in the bioenergy sector is highly notable, the sad thing is that it is taking too long to understand how to organize the sector for maximum benefit; especially for the Country's growing energy demand. Bioenergy as a major component of Renewable Energy spectrum remains the least understood, the most exploited and the most chaotic.

The Energy spectrum

Kenya Vision 2030 recognizes that to achieve development goals envisioned, energy demand will drastically increase. The document appreciates that while commercial energy is dominated by electricity and petroleum, new sources of energy will have to be exploited including geothermal and renewable energy; as well as noting that wood fuel will continue to play an important role in rural communities.

So the entire energy spectrum includes both petroleum-based and non-fossil sources. The two broad classes in modern usage are now being referred to as "Conventional and Non-renewable energy"; and "New and Renewable energy". The latter increasingly being termed simply as "green energy".

So what is green energy? While there is still a lot of academic debate on definition of green energy (or renewable energy), in our local context we can refer to any energy resource that is non-fossil or non-petroleum based as green energy. The whole spectrum of Renewable Energy include all **bioenergy forms**, wind, solar, small hydros and geothermal. This is the entire spectrum for RE.

The **bioenergy forms** include raw and processed biomass, biogas, and biofuels. Each category has sub-lots which are used in various forms employing a wide range of technologies. **This understanding is critical on how one approaches the sector in terms of policy development and investment planning.** We must not confuse Biomass with Biogas, for example, yet the two are commonly used interchangeably. Nor confuse Bioenergy and RE, the former being a mere subsector for the latter.

Biomass is the primary source for biogas production yes but biomass itself is a huge energy resource in itself whether in processed form like charcoal and briquettes or unprocessed form like raw firewood and animal dung. This distinction is important when analyzing economic value chain in the Bioenergy sector. So when we talk about 70-30 percentile for biomass usage in the energy mix, we know it does not refer to biogas or biofuel. It refers primarily to wood fuel and charcoal.

So when we are looking at this sector, we must decide whether we want to focus on Biogas or Biomass specifically or Bioenergy in general or Renewable Energy as a whole.

To help shed more light on Biomass, below is the breakdown of the three main sources and resources (which can be clean or polluting depending on technology or traditional methods employed):

1. Naturally occurring biomass (for instance, from trees or manure) and other processed forms e.g. charcoal, briquettes and wood pellets;
2. Industrial biomass waste from agro-industries e.g. bagasse and coffee husks;
3. Crops grown commercially with the sole purpose of biofuel production (fuel crops e.g. jatropha)

Bioenergy industry and Market development

Unfortunately, most activity in the Bioenergy sector has been dominated by donor initiatives that come, conduct business and exit at end of programme life; most times without clear entry or exit strategy. While these programmes have not been without injection of much needed impetus into the sector, long term impact has remained elusive.

Until recently when Public Private Partnership has been streamlined and FiTs for renewable energy were introduced, a few private sector initiatives and direct foreign investment have begun to pitch tent. A case in point is the recently commissioned Naivasha Biogas Plant (The Gorge Farm Anaerobic Digester) financed by Tropical Power and which is set to produce 2.2 MW of electricity part of which will off-load to the national grid.

By and large, informal business outfits have dominated the Biomass industry with little or no form of regulation. This scenario has created room for cartels and quack operators to thrive. And where such regulations exist little enforcement is exercised as with the case of Charcoal Regulations of 2009.

So what will make this industry tick? Which business models will work? How can growth be inspired and incentivized? What role need private sector play? With a regional perspective and an estimated investment of \$2.4 billion expected in the East African bioenergy sector, nearly half of that available to SMEs, how can RE entrepreneurs be incubated to tap into these reserves? Which organizational strategy needs to be availed for the sector to thrive?

Policy and Regulation

No market of good economic value can thrive without sound policies, industry regulations and applicable standards or codes of practice. It is imperative to take a survey of how much the Bioenergy sector is covered under these tenets.

The national energy policy and bill are under review. Among several provisions, the Bill provides for Energy Regulation Authority, Rural Electrification and Renewable Energy Corporation as well as Energy and Petroleum Tribunal and Energy and Petroleum Institute. The first two institutions will of course have direct effect on policy and governance of renewable energy.

It is appreciable that institutionalization of renewable energy as a distinct sector has been provided for, albeit with rural electrification added. And this is an important milestone that will give bioenergy the attention it deserves if well-articulated by industry players through organized advocacy and lobbying.

Even through the current Energy Bill as proposed is taking us in the right direction, what is needed now is a push to conclude these documents and mainstream them in the sector. But again this will require a good understanding of the direction the sector wants to take and a carefully planned strategic positioning. The sad thing to note is that the development of these policies and regulations have been

taking place when the sector remains widely scattered and thus risking diluted response and participation.

Options for private sector engagement and approach

It appears that the bioenergy sector is pregnant with promises of a huge economy of monumental scale. Yet it needs more clarity in its value chain differentiation and characterization, more insightful stakeholder mapping and harmonization, more coherent policies and regulations, a deeper understanding of market dynamics and potential scaling-up and a more focused approach to mainstreaming the same into the renewable energy big picture.

So what are the options in terms of policy development and private sector participation? Taking it from the current proposed Energy Bill, Rural Electrification and Renewable Energy Corporation (REREC) will be created and so will the Energy and Petroleum Institute. Currently the MoEP has been split into two departments with two Principal Secretaries already appointed for both.

It can be supposed that REREC itself will have two separate departments: Rural Electrification (the current REA) and Renewable Energy. So then a specific policy/strategy plan needs to be developed for RE (see Draft Bill Section 43(1) (e) and (k). In this strategy plan, attempt should be made to clarify further distinctions between **Bioenergy** (Biofuels, Biogas and Biomass) and **other REs** i.e. Solar, Wind and Small Hydros (see discussions above on understanding the Energy/RE spectrum). Once these two broad distinctions have been made, focus should then shift in developing the sub-streams specifically, within each broad category.

The main drivers for the RE sector will be the private sector and industry BMOs or associations. The policy/strategy developed should be deliberate to support this dimension. To this end one can imagine **one big RE umbrella federation** bringing together sub-sectorial associations namely Biogas, Biomass (these two can easily marry), Biofuels, Solar, Wind and Small Hydros (the last two can also easily marry).

Conclusions and Way Forward

- The economic potential for RE is huge and unprecedented
- Players are too many, too disjointed and lack proper understanding of the sector and its distinctions
- Renewable Energy sector has only two main subsectors (ignoring Geothermal): **Bioenergy** (Biofuels, Biogas and Biomass) and **Other REs** (Solar, Wind and Small Hydros).
- Both public and private sector should push for a National Strategic Plan/Policy for RE sector with distinct parallels for its two subsectors.
- BMOs should be encouraged to form around (1) Biogas and Biomass (2) Biofuels (3) Solar and (4) Wind and Small Hydros, which should coalesce into an RE National Federation as one big representative body.
- KEPSA and other CSOs should take the lead in moving the sector towards this direction
- The current drafts on “Biofuels Policy 2010” and “Bioenergy and LPG Strategy 2015” by MoEP should be recast with a wider stakeholder participation taking into account proper understanding of the sector and its distinctions (sub-sectorial streams).