

Stability in Energy: Biogas and National development

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We all dream to see Bangladesh similar to any developed country. People will live in peace and happiness. No hunger, no poverty and no uncertainty. There is no doubt that Bangladesh is a country of lot of potentials. 300 millions

hands can build the country better than any others in the world. Bangladesh is being called from our heart as Queen of the countries of the world. Unfortunately we are not moving accordingly. Until the country's economic backbone is strong, we cannot expect any real development of the country. We need the development of infrastructures, communication, industries, education to achieve economic strength. Once we have all those, Bangladesh could be a rich country. We all dream that.

The country is not developing the way we are dreaming. All the developments are stacked up due to energy crisis. Countries grid connection is so far serve only 40% of the total area. If we consider the household then the percentage would definitely much below than this figure. Existing industries are facing severe power crisis and cannot run their factory continuously resulting production losses and unemployment. New residential, commercial or industrial connection is very few. Looking at the future the nation is morally disappointed. We cannot also blame our government all the time. A substantial amount of subsidy is going from our national budget every year with the present limited supply. If government want to undertake whole population under electricity or gas connection, it might need almost all funds to given up. In that case, where we will stand? Is there any way we can overcome the situation?

Yes, we do have way to overcome this situation. The waste of the country or the biomass can solve the problem. Government would not require exhausting our natural gas resource or subsidizing on fossil fuel or electricity. The world is now moving towards Renewable Energy – RE. RE can help us to have energy from all kind of waste or sunlight or biomass or wind. Here we will discuss on Waste to Biogas and Biogas to Power.

150 million people are living in the country. Millions of people are producing a huge amount of waste from their daily life. If we consider only kitchen waste –which is a major part of municipal waste then the country can be enlighten form the electricity made out of this. Grid connection is limited in 40% of the total countries area. And it is not even possible to cover 100% area in a decade. But RE can be established all around the country. People can get electricity or gas anywhere of the country. It is true and can be implemented if government really wants to ensure the right of 150 million people of the country. Unfortunately some people are getting cooking gas at 500.00 taka and some people need to pay 1,600.00 taka for LPG. All citizens have the right to get same facility.

All poultry farm can be a Power Station in the country. Big farms can be able to set up their Waste to Power by their own. The small poultry farms can be together as cooperatives and build a community Biogas Power Plant. All we need the cooperation of the government and it's agencies. Grameen Shakti is playing a vital role in setting up Rural Biogas plants in Bangladesh. So far 25000 biogas plants are being made by Grameen Shakti out of 70000 total quantities. Engr. M.A. Gofran of Grameen Shakti is dedicated to develop the country's biogas potential and further development. We must appreciate Mr. Gofran as well as Grameen Shakti for these efforts. At least 50000 house hold can cook with biogas in the country.

The world is now more developed in Biogas. Now Anaerobic Digestion is move advanced and the technology can ensure stable energy supply in the National Power Grid or Gas Lines. The raw materials are simply different kind of wastes such as: Poultry litter, Cow dang, Organic municipal waste (mainly food waste/kitchen waste), food waste from the restaurants, biomass, etc.

If we consider a poultry farm, we can calculate one chicken one watt power. Or one cattle is about 50 watt. Thus medium farms of 50000 layer chickens can make 720 KW.h/day. Poultry breeder farms of 100000 birds can make 1944 KW.h/day. A big farm of 500000 layers can make 8100 KW.h/day. All together the poultry farms in Bangladesh have a potential of producing 500 MW/d electricity or more.

If all these things are so positive, then why not coming up with RE production? Let us reply the question from our last several years experience. Everything is possible if government support. Our national Power Grid is always in pressure. If one hour there is any maintenance requirement, there is a instant production drop of 300MW. Recently we heard that electricity production cost is about 21.00 Taka per KW. While buying electricity from any entrepreneurs' the price is lower. What is the reason of this discretion? If someone add some power to the National Grid, he must get a thanks and the actual Cost of Electricity by Government.

And if someone supply electricity from RE, which do not need any fossil fuel or subsidy from government, should get Extra Incentives to supply electricity to National Grid. In my assumption, government knows that very well, but never take the initiatives to do that.

There is another big issue for Modern Biogas is Liquid Fertilizer. In Europe, Japan and China Liquid Fertilizer is popular for the farmers as it is at the same time Fertilizer and Irrigation. While using solid fertilizers, you need irrigation immediate after. Unfortunately it is not allowed in Bangladesh.

Three issues need to be realized by the government first as follows:

1. Electricity buying cost should be same as Government's production cost
2. Extra Incentive for electricity supply to National Grid from RE
3. Allow Liquid Fertilizer as Organic Fertilizer

If the above is guaranteed, all the waste of the country will immediately turn in to source of energy and the word 'Load Shading' will be a history in few years. Please note, fossil fuel finish one day, but waste will increase day by day. It is truly an endless source of energy.

Let us look at the Municipal Wastes. If Government takes an initiative of proper waste collection all over the country for biogas production from Municipal waste, there is a potential of 4000 MW/d or more. Let us look at the Table:

Biogas & Electricity Potential:

Population of City/Municipality	Organic Waste (MT)	Biogas Potential (m3)	Power Potential (MW.h)/day	Household Connection based on 6 hours cooking & 100kw.h per day	
				Gas/m3	Electricity kw.h
100000	20	1400	2.240	1167	672
200000	40	2800	4.480	2333	1344
300000	60	4200	6.720	3500	2016
500000	100	7000	11.200	5833	3360
700000	140	9800	15.680	8167	4704
1000000	200	14000	22.400	11667	6720
1500000	300	21000	33.600	17500	10080
2000000	400	28000	44.800	23333	13440
2500000	500	35000	56.000	29167	16800
5000000	1000	70000	112.000	58333	33600
10000000	2000	140000	224.000	116667	67200
150000000	30000	2100000	3360.000	1750000	1008000

A city like Dhaka can produce 3360 MW power per day. That is, installation of a 140MW power generation is easily possible from Dhaka city waste. It is not just an assumption, it is fact based on our previous experience in Bangladesh for Paragon Group. And the global experience of HEEE – our collaboration in Biogas technology.



A Layer farm: Waste from the chickens to Anaerobic Digestion, Treatment and electricity Generating

Biogas project also produce high quality Liquid Fertilizer which is at the same time irrigation and fertilizer for the land. Organic vegetable can be ensured with this fertilizer. Farmers are paying most of their earnings for buying fertilizer. Whereas the liquid fertilizer can be a economy solution for them at a cheaper cost. Since it also work as irrigation therefore using deep tube-well also reduces in some extends.

Germany and China is the top of the list in Biogas technology. All the large scale Anaerobic Digestion based mesospheric biogas generations are in Germany and in China.



Largest Biomass project in Germany



Largest Chicken based biogas project in China

New Era in Bangladesh:

Bangladesh is coming up with the most modern Anaerobic Digester based Biogas to Power project. Paragon Agro Ltd. – a concern of Paragon Group already build country's largest biogas project. 7.2 MW per electricity per day is producing from the chicken litters of the breeder farm. We must congratulate Paragon Group especially Mr. Moshir Rahman, Managing Director, Paragon Group for the initiative. Going Green is the most modern idea and Paragon is the pioneer of such Green Energy in Bangladesh.

The most advantage of biogas project is, it ensure clean energy and can be decentralize anywhere in the country. If Government initiates a community biogas power project can be a parallel grid in the rural area where national grid is not available. This biogas can be treated as natural gas and can be added in National Gas Grip as well. There is also potential of CNG from RE in the area where gas lines not connected.

Waste to Biogas & Power generation also subject to CDM (Clean Development Mechanism) facility. Sales of CO₂ is in one side earning the benefit and on the other hand, the most respectable way to work against global green house gas (GHG) threats. Certified Emission Reduction (CER) is equivalent to CO₂ and subject to sales as Carbon Credit in Mt/year.

The worst crisis of Bangladesh is power and gas. Both the crisis can be overcome by setting up large scale biogas plant either by the individual large farms or through community programs under the support of government. Let us try to utilize the waste source of the country for RE and build the nation for our future generation.