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Sustainable Conditions of Biogas Plant (A renewable energy Source) ; Suggestions to Policy Makers : A Case Study

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ABSTRACT

In Gujarat, there is huge quantity of biomass produced or available which is a great source of energy and goes unexploited and generating Green house Gases(CHG).Out of the many ways to use this renewable energy BIOGAS production is the greenest of them all reducing CHG and supplying renewable energy in various forms. Management of landfills has always been a great challenge for urban local bodies. These landfills produces great amount of Biogas naturally by anaerobic fermentation process, which currently is not harnessed properly. utilization of Landfill biogas for various energy need will be one such effort for reduction of carbon footprint and utilization of energy which otherwise is wasted. Biogas is a methane rich gas sourced from renewable biomass such as organic waste, sewage, agricultural residues or energy crops. Bio Methane can be derived from woody biomass like forestry residues through production of synthetic gas. In each case it offers a climate friendly way of substituting fossil natural gas and is a flexible energy carrier for fuel, electricity and heat applications, moreover, material use for Bio Methane offers additional possibilities. Special separating the biogas production plant from its point of utilisation offers a lot more potential for increase the energy efficiency by serving heat sinks with thermal energy from cogeneration in a Bio Methane combined heat and power plant (CHP). Also the by product of the biogas plant which is digested slurry, is the best form of liquid organic fertilizer and its further enhancement gives best quality Organic Fertilizer which helps in promoting Government of India's mission on organic farming and reduction of chemical fertilizer. In total the whole Biogas projects are almost zero residue project and in turn giving various by products conserving our environment and fulfilling our need of energy. Also it will contribute significantly to the State Action Plan on Climate Change (SAPCC) and 'Swachh Bharat Abhiyan'. It also can be implemented as "Start up India" Program giving many advantages Launched by Government of India

Keywords: SAPCC, CHP, CHG, Quality Organic Fertilizer, CERC, GST, VAT

I. INTRODUCTION

The aim of the integrated policy framework for biogas and biomass is to:

-"Improve social acceptance for biomass to energy and fuels by steering focus towards the use of untapped waste and residual biomass streams in Biogas and biomass power plants (existing and new ones); facilitate the use of perennial crops; reinforce cogeneration and heat uptake; and ensure a clear plan is in place for bio fuels in transport and other uses."

-To provide energy and fertilizer self sustainability for farmers by having continuous source of 24x7 electricity and Quality Organic Fertilizer.

-To provide self sustainability for all the Gaushalas which are working towards prevention of cow slaughtering and giving protection to cows which are Non Milk productive and nurturing them. They can

setup Biogas plant using Cow Dung as their raw material and fulfil their own energy need and earn revenue from other products for the better nourishment of all Non Productive cows.

-To improve the soil health by utilization of Organic fertilizer and thereby contributing towards overall agricultural revolution and reducing government's financial burden of subsidy of chemical Fertilizer.

-To reduce the GHG Emission, promote renewable Energy, for contributing to "swachh Bharat Mission" and Climate Change Protocol.

Hurdles:-

Though being the greenest of all energy Biogas is not much popular due to various reasons

-Project delay due to clearances from multiple government bodies/agencies.

-Land to made N.A.(Non Agricultural) for the project considering it as industrial project under current state norms which increases capital and time of the Project.

-Usually biogas projects are in remote areas Villages close to availability of raw material which creates problems for establishing grid connection for use of electricity during start up of power plant and there after feeding in surplus power in grid.

-No generic rate for power produced by biogas plant in state although CERC(Central Electricity Regulatory commission) has issued its rate.

-No policy guideline for the use of Bio Methane (which has least carbon footprint) in Gas Grid or it's consumption at CNG station for its use in Transport vehicles.

-Marketing of Organic fertilizer which is by product adds up to operating cost of the plant and there by affecting smooth plant operation.

-Lack of R&D support. Though it is proven technology for giving known products but it still has great potential in terms of developing new research products from it and there by earning effective revenue and increasing sustainability of the plant over a period of time and contributing to environment immensely.

Suggestions :-

Land:-

-Agricultural land should be allowed for setting up the biogas project.

-Places where useable land is available with the government or local bodies should be given on long term lease at token amount as decided by committee near raw material availability.

Current implemented policy by punjab government under NRSE Policy. NRSE projects on the terms and conditions specified in para 4 (i) of NRSE Policy- -2012 under the heading (4. Fiscal Assistance by Govt. of Punjab) i.e. Rs.1.50 lac per annum per site for the useful life period of the project as per CERC norms plus construction period say 3 years in the present RFP case for a total period of 20+3=23 years.(20 years is the useful life of the project) which may be extended on mutual consent. The period of 23 years can be curtailed down if the installed machines plant become redundant or the agreement is terminated.

Permission and Clearance Mechanism:-

-There should be single window clearance system for various government agencies. (Suggested timeline of 45-60 days).

- Fast track Power Grid permission availability at the site for power during start up and there after feeding In surplus power in grid.

-Permissions regarding supplying Bio Methane in existing Gas Grid.

-Integrated permission from PESO(Petroleum and explosive safety organization) for Biogas plant developer, planning to set up Bio CNG Gas station at biogas plant site along with Bio CNG bottling plant.

Tariff:-

power

-There should be generic tariff rate of power produced of biogas by respective plant.

Currently CERC has given generic rate for the biogas power in their order date 30 March

2016 which as below.

Levellised fixed cost: Rs 4.09per kWh

Variable cost: Rs 3.59 per kWh

TOTAL: Rs 7.68 per kWh

Copy of the same order is attached in annexure-1.

Gas

-There should be generic tariff rate of Gas per Kg of bio-methane produced through biogas plant, landfill or through Biogenic synthesis of producer gas of biomass Plant feed in gas Grid or used as Bio-CNG for vehicles at CNG Gas station.

Proposed Bio-Methane gas rate for biogas plant- To be decided Rs/Kg.

Along with this Bonuses should be given in general over power or gas Basic tariff for the following :-

-For Emission reduction.

-For Energy crops.

-For Organic Manure.

-For New techniques and using by-products innovatively.

-For using Heat in case of CHP Unit.

Taxation:-

-100% electricity duty for power consumed from State licensee during construction and testing of the project shall be waived.

- Octroi or Govt Levy exemption: Octroi on NRSE fuels to be used for energy generation and NRSE devices / equipment / machinery for NRSE Power Projects shall be fully exempted. Similarly Octroi on self - consumption of power by captive power plants in the same premises or thru wheeling by open access to same group companies shall also be exempted.

-VAT exemption: To promote usage / generation from NRSE, manufacturing & sale of NRSE devices / systems and equipments / machinery required for NRSE Power Projects shall be exempted from Value Added Tax (VAT) and any cess there upon.

- Entry tax exemption: 100% Exemption from entry tax in respect of all supplies (including capital goods, structure and raw materials) made for setting up and trial operations of the projects.

-100% exemption from payment of fee and stamp duty for registration/lease deed charges for the land required for the project.

-Biogas earns great amount of Carbon Credits but this mechanism is not functional properly in our current system, so for it's equivalent same benefit there should be Income Tax exemption on sales of all products for initial 10 years from project commissioned date and additional excise or future GST (when implemented) for 10 Years.

-Raw material for Biogas being waste, there should not be levy of any taxes during it's procurement.

-One of the main operating cost in Biogas plant is the cost of Transportation of it's raw materials and transportation of it's sales of finished Products. To overcome that and to reduce plant operation cost there should be exemption on any taxes on transportation cost of raw material purchases and transportation cost of it's finished products sales.

Management and better realisation of Raw material:-

- For long term availability of raw materials at constant unit price and for benefit of all developer, trader and seller a mechanism or bank model should be made to procure it properly and from which all the entities would be benefitted.

Suggested Model:-

Cow Dung

In case of Cow Dung, there should be an establishment of a Cow dung bank by co-operative dairy entities (Amul) which deals with it.

Currently all the milk producers come to sell their milk at each individual mandli at village level from which dairy collects milk for further process. Same existing network can be used for collection of cow dung related with all milk producer, which gives them additional revenue and the energy which is not used properly will be used to the fullest. Thus solving all problems in case of long term raw material availability at constant price, control of pollution, harnessing energy at the fullest and milk producers generating additional income.

Agri Waste

Same as above model in case of agri waste also where all agri waste currently are burnt in field or left in open generating GHG. Same with the help of existing network of Gujarat agro or companies like GSFC/GNFC can act as collecting point. and all such other food processing industry generating waste like potato processing, maize processing, sugar, poultry etc.

-These models will help proper raw material management which is one of the biggest hurdle for smooth operation of Biogas projects and there will be proper utilization of NSRE which otherwise are wasted or are converted with low efficiency.

New Suggested Norms/Policy:-

Electricity:-

-The project developer can use the power for self consumption, sell power to third party or to Obligated Entities to fulfil their RPO as per the rates suggested by CERC.

- To Promote purchase of Biogas Power or decide some specific minimum purchase limit of biogas power for Obligation Entities under RPO as in case of other renewable Energy..

Bio Methane:-

Bio Methane for gas grid

-Bio methane produced from biogas plant, landfill gas or from biogenesis synthetic Gas or other sources renewably in comparison of fossil fuel(Natural Gas) should have Obligation policy for Natural gas company to accept Bio methane at specific rate as suggested feed in tariff in the gas grid nearest to the respective plant (similar to RPO for obligation of renewable power for Power companies).

-This new policy will help to reduce the overall carbon footprint because it will be the most
efficient use of energy from Biogas in purest form.

Bio Methane for transport

-There should be obligation or some Bonus be given for CNG station dealer or Supplier to consume Bio Methane whenever and where ever available along with Natural Gas. The quantity of Bio Methane will be very small quantum for any specific CNG Station to be accepted, which won't be a major hurdle for any dealer or supplier.

-There should be well described quality of Bio Methane by specific agency for it's use for transport vehicles.

Suggested Model:-

-There should some special model where in some section of public transport should run on Clean energy from BioMethane.

-Any transport company willing to promote clean energy in form of Bio methane with long term agreement should be given some special preferences in form of tax benefit, special exclusive rights to operate first at public transport places like airport, railway station etc or special recognition from government.

LandFills

-There is continuous production of Bio gas at the landfill site but due to improper management this energy is not harnessed. Municipal wastes which are currently dumped at landfill sites should not be burnt which causes great amount of pollution and harming our pristine environment. Rather they should be planned properly wherein a specific landfill site is filled first and after when there is no further accommodation of waste or it's closure, local municipal bodies should compulsory put up Land fill Biogas plant by itself or with the help of developer to produce Bio Methane or power which ever is more efficient at specific site.

-landfill Bio Methane can easily be feed in Gas grid because currently most of the municipal cities are having Gas Grid giving maximum advantage to this energy source. Organic Fertilizer

-The by Product of the Biogas plant is the digested slurry which is the rich organic fertilizer. After it's processing it can be converted to subsequent liquid or solid Fertilizer for direct application to farmland and is completely Organic.

-Biogas by product though being great organic fertilizer it's difficult to market it by a specific developer which sometimes hinders the proper operation of the plant and adding upto the operating expenses, which delays profitability of the project.

-Also in the processing of organic fertilizer there should be easy availability of NOC from any body like GPCB as it does not create any pollution rather reduces it. So it should be given complete green Status.

Suggested Model:-

-To promote Organic fertilizer there should be some Long term marketing agreement with current

chemical fertilizer company which has vast market network and biogas developer for selling Bio-Organic Fertilizer. e.g GSFC/GNFC/IFFCO etc.

-As suggested by Planning commission in it's report of "The working group on fertilizer industry for the twelfth plan" states-"use of organic manures and recycling biomass/crop residues to be made mandatory through policy support and incentivization". Copy of which is attached in annexure -2.(15.9.3 a. Page 207).

-In it's accordance there should be some obligation or they should be some incentive for Chemical fertilizer companies to sell organic fertilizer which is clean and green as compared to chemical fertilizer and promote Government of India's mission of Organic farming and Organic fertilizer . Also GOI has various policies like Rashtriya krishi vikas yojna, paramparagat krishi vikas yojna etc on Organic fertilizers. This will also reduce India's shortage of Organic Carbon as suggested by planning commission by use of Organic fertilizer.

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