Biogas power generation plant pdf

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Sign In New National Biogas and Organic Manure Programme and Biogas Power Generation Introduction:-Biogas is a clean and efficient fuel. Biogas is produced from Cattle Dung, Human Excreta and other organic matter in Biogas Plant through a process called 'Digestion'. Biogas contains 55% to 60% methane which is inflammable. It also contains 30% to 35% carbon dioxide and traces of Nitrogen, Hydrogen and Water. Bio slurry which is bye product has manurial value more than farm yard manure. Objectives The objectives of the scheme are as follows:- To provide clean cooking fuel for kitchen, lighting and meeting other thermal and small power needs of farmers/dairy farmers/users including individual households and to improve organic manure system based on bio slurry from biogas plants in rural and semi urban areas by setting up of biogas plants. To mitigate drudgery of women and time saving for them for other livelihood activities and reduce pressure on forests and accentuate social benefits; To improve sanitation in rural and semi-urban areas including linking sanitary toilets with cattle dung biogas plants. To provide biogas plant produced slurry (liquid/semi-solid or dried) as an organic enriched bio-manure to help reduce use of chemical fertilizers such as urea. Linking biogas slurry with enrichment units such as vermicomposting, phosphate Rich organic Manure (PROM) plants and other organic enrichment facilities as a source of value addition to biogas plant slurry. To meet 'lifeline energy' needs for cooking as envisaged in ''integrated Energy Policy'' of NITI Aayog (erstwhile Planning Commission) To help in combating and reduction in causes of climate change by preventing emissions of Green Houses Gases (GHGs) such as carbon dioxide and methane into the atmosphere. Potential and Achievement:- A cumulative total of 1.78 Lakh Family type biogas plants have been set up in the State of Punjab upto 31.3.2020. against estimated potential of 4.5 lakh plants. Approved designs of family type biogas plants. Use of Domestic type Biogas Plants.;- Cooking Biogas can be used in a specially designed burner for cooking. A biogas plant of 6 cum. capacity is sufficient for providing cooking fuel to a family of 10 to 12 members. Lighting :- Gas lamps can be fueled by biogas. The requirement of gas for powering a 100 candle lamp (60 W) is 0.13 cum. per hour. Power Generation : Biogas can be used to operate a dual fuel engine and can replace upto 80% of diesel. Now 100% Biogas Engine with Generators are also available which are suitable for large size biogas plants. Procedures of Implementation :- This programme is being implemented with the active participation of Turnkey workers who have been trained by Punjab Agriculture University (PAU), Ludhiana. The turnkey workers arrange a trained mason for installation of Biogas plants, helps the beneficiary for procuring good quality material which includes burners and other fittings required for the biogas plants. The turnkey worker got filled the application form of the beneficiary for informing the concerned field officer for starting the installation of Biogas plant. Then the beneficiary got installed the plant through trained mason under the supervision of turnkey worker and field officer of PEDA. After completion / commissioning of the biogas plant the application is submitted to Head Quarter of PEDA for release of permissible subsidy to beneficiaries and SEW charges to the concerned SEW. After sample checking from H.Q. level, the subsidy and SEW charges are released. The turnkey worker stands guaranteed for five years for successful operation of the biogas plant. Pattern of Central Financial Assistance for 2020-21 Rate of Central Financial Assistance (CFA) Rates of Central Financial Assistance (CFA) for different approved component of New national Biogas and organic Manure Programme (NNBOMP) are as given below . Central Financial Assistance under the New national Biogas and organic Manure Programme (NNBOMP) w.e.f 01.04.2018 for the medium term plan of 14th Finance Commission up to March, 2020 for Biogas Plant size from 1 cu.m. to 25 cu.m per day are as follows:- Sr No. Particulars of Central Financial Assistance (CFA) Biogas Plants under NNBOMP (size 1 to 25 cubic metre biogas per day) A Central subsidy Rates Applicable (in Rs. Per plant)) 1 cubic Metre 2-6 Cubic Metre 8-10 cubic metre 15 cubic metre 20-25 cubic metre 1 For the State of Punjab 7500 12,000 16,000 20,000 25,000 2 Additional Subsidy for cattle dung based biogas plants if linked with sanitary toilets, only for individual households1600 (Rs. Per biogas Plants) fixed 1600 1600 1600 Nil Nil B Turn-Key job fee for Rs. 2500/- per biogas plant for fixed dome design construction based construction, supervision, commissioning, and plants such as Deenbandhu and floating gasholder KVIC type brick masonry models from 1 to 10 m3 and Rs. 4500/- per plant for 15 to 25 m3 plant size. Trun Key job fee will also be provided for eligible biogas free O&M warranty plants for pre-fabricated plants as per above mentioned models for five years trouble involving part construction work either for digester or dome. free operations of plant including quality Turn Key job fee at the flat rate of Rs. 1000/- per plant will be also eligible for biogas plants of size ranging from 1 to 25 m3 which are control at all levels. completely pre-fabricated manufactured biogas plants and made up of standard quality material FRP/HDPE/PVC etc. as already approved or as and when approved by MNRE. However, no Turn Key Job Fee will be payable for bag type digesters made of rubberized nylon fabric (flexi model) plants as it does not involve higher construction techniques and any supervision of construction. The manufactures and developers of such biogas plants for implementation under this scheme will have to provide a free warranty and guarantee of five years for all plants for post installation trouble free operations under the terms and conditions of Turn-Key job work scheme applicable including for all those who are implementing the scheme on bidding basis. Approved models of Family Type Biogas Plants/small biogas Plants. Appropriate size and models of biogas plants would be selected on the basis of preference/choice of the beneficiaries and shall be installed keeping in view the technical requirements such as location, distance between kitchen and cattle-shed, availability of water and main feed-stock cattle dung and other biodegradable organic biomass wastes and sanitary toilets. Approved models for such plants are available from 1 to 25 m3 capacities for fixed dome design and floating Gas holder KVIC design models of plants. In addition, the ferrocement and Brick- masonry biogas plants, prefabricated models of Deenbandhu biogas plants made of High Density Polyethelene (HDPE) and KVIC model and Deenbandhu Model of Plants made of Fiber-glass Reinforced Plastic (FRP) and Reinforced Cement Concrete (RCC) material based approved biogas plants would be covered under the scheme. Only the MNRE approved specifications/ ISI marked models of biogas plants and approved by BIS will be eligible for CFA under NNBOMP. The MNRE approved models of biogas plants are available from 1 M m3 per day capacities for fixed dome design and floating Gasholder KVIC design type biogas plants. The commonly used and approved models of biogas plants are as given under:- Sl No. Biogas Plant Models* Specifications/Ministry's letter Nos. and dated and date of approval. 1 Fixed Dome /Gasholder Biogas Plants: Deenbandhu fixed dome model with brick masonry costruction. Deenbandhu Ferro-cement model with in -situ technique. Prefabricated RCC fixed dome model. Solid-state Deenbandhu fixed Dome. Ministry's letter No. 13-10/96-BG dated 10.1.2002. Code of Practices (Second Revision, IS 9478:1989 of the BIS, New Delhi. Ministry's letter No. 13-11/99-BG dated 5.3.1999 Ministry's O.M No. 13-5/2016-BG (NBMMP) dated 07.11.2016 2. Floating Dome Design Biogas Plants: KVIC floating steel metal Gasholder with brick masonry digester KVIC floating gasholder type plant with Ferro-Cement digester. KVIC design biogas plant with Fibre Glass Reinforced Plastic (FRP) and Digester. Code of Practices (Second Revision), IS 9478:1989 of the BIS, New Delhi. Code of practice IS-12986:1990 of BIS, New Delhi. Specifications of FRP Gasholder should be as per IS-12986:1990 Code of Practices (Second Revision),IS 9478:1989 of the BIS , New Delhi. MNRE O.M No. 18-1/2014-BE(NBMMP) dated 26.11.2014 Pragati Model Biogas Plants. KVIC design type digester with floating Gasholder, made up of HDPE/PVC/FRP/RCC etc. material plant 3. Prefabricated model Biogas Plants. (i) Prefabricated Reinforced Cement Concrete (RCC) digester with KVIC floating drum/gasholder. - Ministry's O.M. NO. 18-1/2014 BE (NBMMP), dated 26.11.2014 4. Bag Type Biogas Plants. (Flexi model) - Ministry's letter No. 7-39/89-BG dated 14.7.95 It is mentioned that the NNBOMP Scheme has been discontinued by the Ministry of New & Renewable Energy, GOI from the financial year 2021-22. However, there is a lot of demand for such type of Domestic type Biogas Plants in the state and this one of the most acceptable Programme of Renewable Energy in the Rural areas of the State. On the basis of acceptability, potential and also employment opportunities available as per scheme in the State, PEDA has already taken up the matter with MNRE,GOI to continue the scheme. Biogas Power Generation (Off-grid) and Thermal application Programme (BPGTP) Biogas plants are reliable source of decentralized Renewable Energy for heating, cooking as well as generating electricity/power generation and as thermal energy application alternative in our country. In order to promote this Decentralized Renewable Energy Source (DRES) of power generation, specifically in the small capacity range (3 Kw to 250 kw) and thermal energy for heating/cooling from the biogas produced from Biogas Plants of 30 m3 to 2500 m3 size, operated based on the availability of required quantity of biodegradable organic waste (s). The scheme has been redesigned to enlarge its pan-India base. The feed stocks for biogas plants that is waste (s) in required quantity and its availability at plant site matching with the biogas plant size from Biomass sources in a sustained manner for a longer period of 15 to 20 years is one of the major parameter for project site selection and feasibility. The eligible feed stock for the purpose of setting up Biogas plants under this scheme are biomass wastes such as cattle dung/animal wastes, food & kitchen waste, poultry dropping waste in single mode or with mix of poultry waste and cattle dung/goat & sheep dropping, paddy straw, green grass including elephant grass. Central Financial Assistance (CFA) for setting up Biogas Plants under the (BPGTP) The applicable rate of CFA/subsidy for setting up of Biogas based power generation (off-grid) and Thermal application projects are provided in three slabs of sizes of Biogas Plants and corresponding power generation/thermal Energy generation capacity. In all the projects categories , the CFA will be paid on re- reimbursement basis, except for the SC &ST categories where in the CFA at the rate of 50% of the estimated CFA of the project will be given at the middle of the project execution and the balance 50% after proper completion and commissioning of the project in all respect. The Central Financial Assistance (CFA) for setting of Biogas Plants under the BPGTP as per scheme are as follows:- Power generating capacity (Kw) Biogas plant capacity (in cubic metre) Requirement of DPR CFA/subsidy limited to the following ceiling or 35% of the project cost whichever is less Administrative charges to Program implementing agencies, State Nodal Departments/Agencies/BDTCs for providing technical supervision, submission of project completion and commissioning reports of project and monitoring of the Project performance. Power Generation Thermal application Power Generation Thermal Application 3-20 Kw 30 m3 To 200 m3 DPR required above 10 kw (100 m3 biogas Plant size) Rs. 35,000/- (Rupees Thirty five thousand only)per kw Rs. 17,500/- (Rupees Seventeen thousand five hundred only)per Kw eq thermal/cooling 10% of the CFA 5% of the CFA >20 kw up to 100 kw Biogas plants of above 200 cu. Metre size or any combination of above plants or approved alternate matching capacity/design DPR required Rs. 30,000/- (Rupees Thirty thousand only) per kw Rs. 15,000/- (Rupees fifteen thousand only)per Kw eq thermal/cooling Rs. 2,00,000/- (fixed) Rs. 1,00,000/- (fixed) >100 kw up to 250 kw 1000 cu metre biogas plant of single digester or combination of above plants or approved alternate matching capacity/design DPR required Rs. 25,000/- (Rupees Twenty five thousand) per Kw Rs. 12,500/- (Rupees twenty thousand five hundred only) per kw eq thermal /cooling Rs. 3,00,000/- (fixed) Rs. 1,50,000/- (fixed) Procedure of implementation The Biogas Power Generation (off-grid) and Thermal application Programme of MNRE will be implemented for setting up of proven standard design specifications and proven Biogas Plants including use of various material and equipment such as 100% Biogas engines, Biogas engines of 80:20 biogas – diesel ratio for matching size electricity Generators and accessories and required input and output measuring systems of energy metering and biogas flow meter with precision and daily logging of operational hours of the biogas plants for their intended end usage. Such Biogas Plants would be operated for effective promotion of biogas based decentralized power generation in range of 3 kw to 250 kw and also for thermal/cooling applications as given in the Administrative Sanction -cum- Guidelines of the scheme. The Central Financial Assistance (CFA) will be provided based on power generation capacity of biogas plants worked out @ 1 m3 biogas generating 1.250 kw (min) of power or equivalent thermal energy generation capacity of biogas plants at half the applicable rate for power generation of biogas in cubic metre per day from the Biogas plants, set up for the project and its optimal functionality by the end users, beneficiaries and plant operators. The proposals of the project under the scheme will be developed and prepared with a complete knowledge of biogas generation through Anaerobic Digestion (AD) process from the available and proposed feeds stocks and requirement of power /thermal load/cooling load and its handling management at the users end. The proposals will be submitted by the designated Programme implementing agencies (PIAs) of the scheme to the MNRE in the format as annexed to this Administrative Sanction-cum guidelines. The complete details of cattle holding at the proposed plant site/quantity of feeds stock available, estimated power to be generated with a minimum of 10 hours of operation per day (i.e in 24 hours durations) load distribution and connected load, details of biogas plants such as design type and model as well as daily design capacity of biogas generation with a particular kind of feed stock/mixed feed stocks, biogas plant digester Volume and HRT in days/hours. The performance rating of biogas engines, biogas generators, power control units, biogas scrubbers and the capacities of connected load of various appliances and biogas consumption rate in cubic metre per hour in case of the thermal application such as Biogas Burners and furnace/boiler capacity and cooling requirement in cubic metre per hour. Pattern of Release of Central Financial Assistance funds. The pattern of release of CFA funds would be, as given below:- The funds would be released on re-imbursement basis after successful commissioning of the biogas based power/thermal plant as per the DPR norms (wherever DPR is required) receipt of utilization certificates, Audited Statement of Expenditure (duly audited by Chartered Accountant Firm and submitted on their letter head). The installation/commissioning of biogas based power plants should be completed within a year and in any case not more than 18 months from the date of sanction of the project. Project completion and commissioning report along with the required inspection reports and photographs of biogas plants, its equipment and accessories (gas flow meter, energy meter and scrubbers) and power generating systems should be submitted to MNRE by the designated Programme implementing Agency. The condition of successful commissioning of the plant would, inter- alia, imply generating of power with operational capacity of the sanctioned biogas plant with the power generations data for minimum 3 months period including the plant operational time period and units generated per day. The performance data of three months should indicate the operational capacity of the plants not less than 70% (minimum) of the rated capacity for 3 months period and not less than 80& of the rated capacity for subsequent consecutive 8 days (72 hours) It is added that the above mentioned scheme also has been discontinued by MNRE,GOI from the F.Y 2021-22 onwards.

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