BIOGAS PILOT PROJECT STRUCTURE AND PROCEDURE

1. **Potential for biogas.** The market potential for biogas in Bhutan was assessed by SNV, Netherlands Development Organisation in the technical feasibility study and subsequent market assessment.\(^1\) Key findings of the studies and assessments are as follows:

   (i) around 16,000 biogas plants are technically and economically feasible especially in the southern belt and inner mountain valleys;
   
   (ii) primary fuel used by rural households for cooking is firewood;
   
   (iii) majority of the farmers surveyed expressed willingness to replace firewood with biogas due to health and environmental benefits of using biogas for cooking;
   
   (iv) the majority of farmers have cattle to produce sufficient quantity of dung for the biogas plant; and
   
   (v) majority requested financial assistance in the form of a loan and a subsidy.

2. **Proposed program.** The pilot program aims for the construction of 1,600 biogas plants, and target recipients are farmers, in particular dairy farmers groups. The size of a typical plant costs Nu26,000. This will be covered by (i) upfront equity from farmers (a minimum of 27.5% of the plant cost, Nu7,150), (ii) subsidy (45% of the plant cost, or Nu11,700 per unit, whichever is lower), and (iii) subloan (a maximum of 27.5% of the plant cost, Nu7,150). The program also entails training, capacity building, marketing, and information dissemination, project supervision and implementation consulting services, under the Asian Development Bank (ADB) and SNV finance.

3. **Institutional arrangements.** The Department of Energy (DOE), Ministry of Economic Affairs will be the executing agency. The Department of Livestock (DOL), Ministry of Agriculture and Forests and the Bhutan Development Finance Corporation (BDFC) will be the implementing agencies. The initial target group will be the dairy farmers who have a sufficient number of cattle to produce dung for biogas plants but any interesting farmer can participate. The BDFC will be the financial intermediary to manage the Biogas Fund that provides subsidies and micro-credits to participating farmers. The DOL will set up a project implementation unit (PIU) and the SNV will provide consulting services to the PIU.

4. **Fund flow structure.** The Government of Bhutan will provide the portion of the ADB finance required to establish the Biogas Fund, which will have two nominal separate accounts for subsidy and revolving credit funds. The BDFC will manage the Biogas Fund according to the financial management guidelines set forth in the memorandum of understanding signed among the DOE, DOL, BDFC, and SNV, and release subsidy and loan funds to the participating farmers only after their applications are approved by the PIU and BDFC. All subloan repayments will be credited and revolved to the Biogas Fund (see Figure 1).

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5. **Terms and conditions of biogas loans to borrowers.** Based on the market studies, public consultations, and affordability assessments, a micro-credit with an interest rate not exceeding 10% is necessary to help farmers overcome the entry and financial barriers. The BDFC has agreed to extend credit at its minimum interest rate of 10% per annum (reducing balance) to participating farmers, and cover credit risk and intermediation costs within the interest rate of 10%. The subloan term will be for a maximum of 5 years and the maximum amount of credit will be Nu50,000. There will be no requirement for collateral, but the BDFC’s standard minimum equity contribution by borrowers will be required.

6. **Eligibility requirement.** The biogas target recipient’s eligibility will be checked on the following procedures:\(^2\)

   (i) The PIU approval of the application for proposed biogas plant(s) based on
   (a) plant design and size consistent with the technical standards\(^3\) to ensure it will
   work properly at the site altitude and climate, and with the amounts of dung available,

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\(^3\) The technical standards will be published by the PIU and endorsed by the DOE.
(b) cost estimates of a biogas plant set including the biogas plant, piping, fittings/valves, biogas stoves, and their relevant facilities, and
(c) contractor (i.e., a mason) certified by the PIU for construction of biogas plants, and with at least two-year warranty by the mason(s) for the biogas plant and one-year for piping and fittings.

(ii) The BDFC’s approval of credit based on
(a) minimum upfront equity requirement at 27.5% of the total plant unit cost,
(b) its own standard credit assessment for the subborrower(s),
(c) its own disbursement procedures,
(d) financing of a biogas plant set including the biogas plant, piping, fittings/valves, and biogas stoves,
(e) procurement in accordance with ADB’s Procurement Guidelines.
(f) compliance with the government's environmental laws and regulations, and ADB’s Safeguard Policy Statement (2009).

7. Exit strategy. At the end of the pilot period, the principal in the Biogas Fund could be used to provide further credit or subsidy for subsequent biogas installations if the government decides to continue or expand the biogas program. Should the government decide to terminate the biogas program, the balance of the Biogas Fund will be returned to the government.