

3.2 Biomass Gasifier

Biomass gasification for off grid applications involves production of gaseous fuel called producer gas used in a gas engines and modified gasoline and diesel internal combustion engines for electricity generation. Producer gas can also be used to produce steam which is then expanded on a steam reciprocating internal engines to produce electricity. Besides providing electricity to isolated areas in rural areas, it has the additional benefit of creating employment for the feedstock providers who are mostly small and medium scale farmers and foresters.

The vision for REA is “Electricity for all Rural Areas by the year 2030.” To achieve this target the SNDP stipulates that the Rural Electrification Master Plan (REMP) will continue to be implemented and will utilize other technologies including renewable energies for isolated min grids . The target for diffusion of biomass gasifier technology involves dissemination of the technology of at least 20 sites with an estimated capacity ranging from 100 to 1000 kW per site. Implementation of such a program will lead to avoidance of 70,000CO₂equiv. Other benefits will include creation of employment for the rural folk in the provision of the biomass feedstock to the gasifier plants.

Strategic Objective	Deployment of biomass gasifier for off grid electricity generation				
Strategies	Output	Responsibility	Timeframe	Budget(Estimated Budget)US\$	
	Objective verifiable activity	Means of verification			
Create awareness and information program for small scale project developers and entrepreneurs for biomass gasifier	Provide information on markets, technology and feedstock characteristics	Information on markets, technology and feedstock characteristics prepared	DOE, REA, ZDA, Consultants	12 months	20,000
	Create awareness on off-grid business opportunities for small scale project developers and entrepreneurs and financial institutions	Information on off grid business opportunities for small scale project developers and entrepreneurs and financial institutions prepared and disseminated.			
Techno-economic assessment of off-grid systems.	Undertake techno-economic assessment aimed at ascertaining viability of biomass gasifier for off grid applications	Techno-economic assessment undertaken	DOE, REA, ZDA, Consultants, Project developers	12 months	30,000
	Ascertain cost effectiveness and comparison with cost of on-grid extension.	Cost effectiveness and comparison with cost of on-grid extension ascertained.			

Resource assessment and logistics.	Undertake a study on resource assessment and logistics at promising sites to include their suitability for use in biomass gasifiers for electricity generation.	Resource assessment and logistics undertaken	DOE, REA, ZDA, Consultants, Private sector	12 months	20,000
	Select feedstock suitable for biomass gasifier operations and identify suitable locations influenced by demand.	Feedstock suitable for biomass gasifier selected and suitable locations identified to feed into implementation plan			
Implementation program and support policies for biomass gasifier.	Develop implementation program for biomass gasifier dissemination identified locations	Implementation program developed	DOE, REA, ZDA, Consultants, Private sector, Financial institutions	12 months	50,000
	Provides support policies in terms of incentives and public finance for off-grid systems to leverage tariff	Support policies in terms of incentives and public finance provided.			
	Recommend business model for implementation of biomass gasifier for electricity generation dissemination.	Business model recommended			
	Develop the project for biomass gasifier to meet the criteria of eligibility, baseline setting and MRV to benefit from carbon financing through CDM/PoA/NAMA/SE4ALL/LEDS	Project for biomass gasifier developed to benefit from CDM/PoA/NAMA/SE4ALL/LEDS			

Various actors will have different roles in relation to the strategic objectives and related activities requiring attention

3.3 Energy Management – Energy Efficiency

This measure involves introduction of energy efficiency and management tools aimed at improving energy use in industrial, commercial/services and household. Under industry, technologies include on site electricity generation, energy system optimisation and energy management standards. This measure is relatively low cost and contributes to reduced cost and hence enhanced competitiveness of affected industrial concerns in addition to reduction of GHG emissions. Under commercial/ services, the technologies include air conditioning efficiency, load control measures, and ripple control technologies. Under household use, the measures include use of Compact Fluorescent Lights (CFL) or Light Emitting Diodes lights (LEDs) and solar water heater (for domestic and commercial entities). All these measures contribute to reduction in electrical energy demand and avoids premature investments in energy supply in addition to reducing GHG emissions and air pollution