Bio-Energy – Highly Adaptable Energy System

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Abstract

Bio-energy is a unique renewable energy resource with complex and highly heterogeneous value chains. It is the production of energy from living or once living biological materials. Its use can provide benefits in terms of reduction in greenhouse gas emissions and as a means of lessening society's dependence on fossil fuels. Biomass for energy can be used to provide heat, power and fuel for transport. There is substantial potential to develop a reliable, sustainable and economic supply of biomass and to encourage a multiplicity of uses for bio-energy. Substantial benefits should flow from a coordinated bio-energy strategy involving all relevant government departments and executive agencies. This should be facilitated by the Department of Energy and Climate Change which should be recognized as the Department responsible for leading the development and implementation of the strategy. The strategy should set long-term targets, make explicit roles of domestic and imported supplies of bio-energy, and develop plans for utilization of resources both within and outside government, including winning support from all relevant stakeholders. There is need for better information on land use, and improved understanding of how to optimize the use of available land to produce food, fibre and energy in a sustainable and cost effective manner. Development of large scale bio-refineries, improved methods of harvesting and transport suitable for use on marginal land, and of programmes of education for farmers about sustainable practices are also necessary. It can be confirmed that bio-energy could make a significant contribution to the energy system in a cost effective manner. It would also make an integral contribution to the goal of 80% reduction in greenhouse gas emissions by 2050 In order that users will have confidence in the reliability of supplies of biomass and bio-fuels, it is essential that an efficient domestic system is developed for production of these fuels, at a scale substantially greater than those so far happened. In order to improve the competitiveness of bio-energy, new science and technology can be brought to bear, as this has potential for increasing the supply and reducing the cost of bio-energy.

Keywords: Renewable Energy, Heterogeneous Chains, Bio-Energy, Bio-Mass, Bio Fuels, Algae, Fossil Fuels

I. INTRODUCTION

Bio gas is generated through a process of anaerobic digestion of Bio Mass. Bio Mass is organic matter produced by plants, both terrestrial (those grown on land) and aquatic (those grown in water) and their derivatives. It includes forest crops and residues, crops grown especially for their energy content on energy farms and animal manure. Unlike coal, oil and natural gas, which takes Millions of years to form, bio mass can be considered as a renewable energy source because plant life renews and adds to itself energy year. It can also be considered a from of solar energy as the latter is used indirectly to grow these plants by photosynthesis.

Out of several sources of renewable energy like solar, wind, tidal, wave energy, Geothermal energy, nuclear energy, energy through bio mass are important features in our Country. Biomass of all the living earth's matter is an enormous energy store. Through photosynthesis processes the biomass energy store is continuously replenished. Naturally, biomass experiences numerous energy exchanges via chemical, physical and biological processes. Biomass Sources are energy crops which are the purpose-grown energy crops (e.g. corn, sugar cane) and wastes (energy from wastes) which include unwanted products from human activities.Biomass is probably our oldest source of energy after the sun. For thousands of years, people have burned wood to heat their homes and cook their food. Biomass gets its energy from the sun.

Bio-energy is a unique and highly adaptable renewable energy source. It can be used for heat and power production and liquid fuel for transport and it already makes up a substantial proportion of the global primary energy consumption. Bio-energy chains and products are also highly complex and heterogeneous with a range of disciplines contributing to the development of the sector ranging from biotechnology, agronomy through to chemical engineering Bio gas is a cheep and clean fuel. It burns with a blue flame which is smoke-free. When it is burnt in silk mantle lamps, it illuminates better than kerosene in petromax lanterns. Bio gas can replace Petrol and diesel in engines. Bio fuels are liquid fuels from a non-fossil biological origin and also represent a renewable energy resource. Bio fuels can be divided into bio gasoline and biodiesel depending on the material of origin used. Biogas, primarily methane and carbon dioxide, is produced through the bacterial decomposition of organic matter like sewage, manure, organic household waste and plant crops. This is based upon an age-old tradition of composting human, animal and plant wastes to produce organic fertilizer. In fact bio gas programme has been recognized for making available a clean and efficient fuel for cooking, lighting, engine and the liquid slurry as a fertilizer and soil conditioner all over the World. Since the 1920's there have been sporadic attempts made to recover bio gas from sewage wastes and animal dung.

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Economical, social environmental and health benefits are in rural areas it gives comparatively cheaper and better fuel for cooking lighting and power generation .The problem of uncertainly of availability of commercial energy can be resolved .The rural population of the country uses fire wood for meeting their cooking requirements. This reduces the national forest wealth. Our forest area can be conserved by using bio gas. The dependency on chemical fertilizer for better-agricultural production has increased to a great extent as bio gas slurry is a best organic fertilizer which helps in improving soil fertility and crop production. Social Benefits are it burns giving soot less flame and smokeless cooking, as such it provides cleanliness in the houses. The cooking on bio gas is faster and also women is not required to waste their time to collect fuel from forest, as such it reduces the drudgery of women who can use her free time for other developmental activities. It provides lighting in the rural areas, which are far away from electrical supply lines. Thus it helps the children to use their time in study of employment. It also helps in generation of employment opportunities to village artisans. This also stops the Migration of people from rural to urban areas in search of employment. Generally, rural women and children spend their energy and time for collection of fuel, chopping wood, collecting wood and crop stalks or buying coal or kerosene for cooking from distant places, energy and time saved due to sue of bio gas can be used for constructive work or going to school for education. Bio energy contributes to maintain clean and healthier environment by processing human growth. More transportation means have increased the pressure on environment. In present circumstances bio gas utilization would be a solution for environmental protection for healthy and prosperous society. Sanitation problems in villages through systematic collection and through proper processing of animal dung and human excreta will be solved. It helps to prevent deforestation. Consequently it controls soil erosion, and floods.

Recent advances in public concern about environmental pollution and the sustainability of natural resources have rapidly transformed the nation's many manufacturing industries, from chemical to pharmaceutical, to become more environmentally benign and bio-based ones. Meanwhile, rising energy demands and oil prices have prompted large petroleum companies to explore bio fuels as alternative energy sources.

The current proportion of electricity generated from renewable is 7.4%. Energy recovered from landfill gas contributes roughly one-third. So waste to energy as a whole already provides almost one-half of the renewable energy mix.

In order that users will have confidence in the reliability of supplies of biomass and bio-fuels, it is essential that an efficient energy policy objectives must be taken care like saving energy with the Green Deal. Reducing energy use by households, businesses and the public sector, and help to protect the fuel power. Delivering secure energy on the way to a low carbon energy future. Driving ambitious action on climate change at home and abroadand to manage our energy legacy responsibly and cost-effectively

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