

Advanced Chemistry: 2019 -Advances in biomass and biogas energy- Abdeen Omer

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There is strong scientific evidence that the average temperature of the earth's surface is rising and this may be attributed to increased concentration of carbon dioxide (CO₂), and other greenhouse gases (GHGs) in the atmosphere as released by burning fossil fuels. One of the chief sources of greenhouse gases is burning of fossil fuels. Biogas from biomass appears to have potential as an alternative energy source, which is potentially rich in biomass resources. In the present study, current literature is reviewed regarding the ecological, social, cultural and economic impacts of biogas technology. In this communication an attempt has been made to give an overview of present and future use of biomass as an industrial feedstock for production of fuels, chemicals and other materials. However, to be truly competitive in an open market situation, higher value products are required. Results suggest that biogas technology must be encouraged, promoted, invested, implemented, and demonstrated, but especially in remote rural areas.

Energy is an important think about development since it stimulates, and supports economic process, and development. Fossil fuels, especially oil and gas, are finite in extent, and will be regarded as depleting assets, and efforts are oriented to look for brand spanking new sources of energy. The clamour everywhere the planet for the necessity to conserve energy and therefore the environment has intensified as traditional energy resources still dwindle whilst the environment becomes increasingly degraded. the essential sort of biomass comes mainly from firewood, charcoal and crop residues. Out of the entire fuel wood and charcoal supplies 92% was consumed within the household sector with most of firewood consumption in rural areas. The term biomass is usually applied to plant materials grown for non-food use, including that grown as a source of fuel. However, the economics of production are such purposegrown crops aren't competitive with fossil-fuel alternatives under many circumstances in industrial countries, unless subsidies and/or tax concessions are applied. For this reason, much of the plant materials used as a source of energy at the

present are within the sort of crop and forest residues, animal manure, and therefore the organic fraction of municipal solid waste and agro-industrial processing by-products, like bagasse, oil-palm residues, sawdust and wood off-cuts. The economics of use of such materials are improved since they're collected in one place and sometimes have associated disposal costs.

Biogas may be a generic term for gases generated from the decomposition of organic material. because the material breaks down, methane (CH₄) is produced as shown in Figure 2. Sources that generate biogas are numerous and varied. These include landfill sites, wastewater treatment plants and anaerobic digesters. Landfills and wastewater treatment plants emit biogas from decaying waste. To date, the waste industry has focused on controlling these emissions to our surroundings and in some cases, tapping this potential source of fuel to power gas turbines, thus generating electricity. the first components of landfill gas are methane (CH₄), CO₂ (CO₂), and nitrogen (N₂). the typical concentration of methane is ~45%, CO₂ is ~36% and nitrogen is ~18%. Other components within the gas are oxygen.

The importance and role of biogases in energy production is growing. Nowadays, tons of nations in Europe promote utilization of renewable energies by guaranteed refund prices or emission trading systems. A general schematic of an agricultural biogas plant, with the anaerobic digester at the 'heart' of it as shown in Figure 3. Pre-treatment steps (e.g., chopping, grinding, mixing or hygienisation) depend upon the origination of the raw materials.

In the past 20 years the planet has become increasingly conscious of the depletion of fuel reserves and therefore the indications of climatic changes supported CO₂ emissions. Therefore extending the utilization of renewable resources, efficient energy production and therefore the reduction of energy consumption are the most goals to succeed in a sustainable energy supply. Renewable energy sources include water and wind generation, solar and heat,

also as energy from biomass. The technical achievability and therefore the actual usage of those energy sources are different around Europe, but biomass is seen to possess an excellent potential in many of them. An efficient method for the conversion of biomass to energy is that the production of biogas by microbial degradation of organic matter under the absence of oxygen (anaerobic digestion). It's now possible to supply biogas at rural installation, upgrade it to bio-methane, feed it into the gas grid, use it during a heat demand-controlled CHP and to receive revenues.

There is an unmistakable link between energy and sustainable human development. Energy isn't an end in itself, but an important tool to facilitate social and economic activities. Thus, the shortage of obtainable energy services correlates closely with many challenges of sustainable development, like poverty alleviation, the advancement of girls, protection of the environment, and jobs creation. Emphasis on institution building and enhanced policy dialogue is important to make the social, economic, and politically enabling conditions for a transition to a more sustainable future. On the opposite hand, biomass energy technologies are a promising option, with a potentially large impact for Sudan like other developing countries, where the present levels of energy services are low. Biomass accounts for about one third of all energy in developing countries as an entire, and nearly 96% in a number of least developed countries.

Biogas technology cannot only provide fuel, but is additionally important for comprehensive utilization of biomass forestry, farming, fishery, evaluating the agricultural economy, protecting the environment, and realizing agricultural recycling, also as improving the sanitary conditions, in rural areas. B. The biomass energy, one among the important options, which could gradually replace the oil in facing the increased demand for oil and should be a complicated period during this century. Any country can depend upon the biomass energy to satisfy a part of local consumption. C. Development of biogas technology may be a vital component of other rural energy programme, whose potential is yet to be exploited. A concerted effect is required by all if this is often to be realized. The technology will find ready use in domestic, farming,

and small-scale industrial applications. D. Support biomass research and exchange experiences with countries that are advanced during this field. Within the meantime, the biomass energy can help to save lots of exhausting the oil wealth. The diminishing agricultural land may hamper biogas energy development but appropriate technological and resource management techniques will offset the consequences.

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