

Technical knowledge of biological plants America and localizes it for energy production from agricultural residues in IRAN (Khuzestan province)**Ashraf jazayeri^{1*}, Tayeb Saki Nejad², Sorosh zarrin abadi³**

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Abstract: Power generation business in the United States with approximately 9,733 MW of installed capacity from agricultural waste and non-agricultural sector, the largest source of non-renewable water power in the world has created. The capacity of 9733 MW including 5,886 MW of forest plants and agricultural residues, 3,308 MW power generation capacities of 539 MW waste urban and other materials, such as the gas is obtained from buried waste. Maximum electricity production from biomass to electricity load based on the existing electricity distribution system is used. More than 200 companies from non-wood products and food industries in the United States produce electricity biomass. Four power generation systems using biomass there. Direct fuel, the fuel mixture (with coal), and plants gasify module. Most biomass power plants are direct systems such as traditional fossil fuel power plants often act. Biomass production in North America is 180 million tons of which 43 percent of the amount of agricultural residues in plants using advanced biological anaerobic bacteria and gas production and energy production are a combination of fuel between the available biomass Potential country of Iran 22 million is a system of energy production from residue agriculture often is that this residue in a tank Amplifier as burnt is fuel ash and gas artificial is that gas result can be thermal energy used or by the generator to electrical energy to become today the ability to produce 15 billion cubic meters of gas household artificial residue agriculture there is fuel derived from technologies convert biomass or state gas (Environmental gas) or liquid (methanol, ethanol and biodiesel), which for produce electricity and heat are used. It is estimated that if only 10 percent of farms and forests to provide and providing allocated biomass, annual production of energy from biomass, equivalent to four-fifths of world energy consumption will be present. Developing communities that almost three-quarters of the world's population are included, 35 percent of energy consumption comes from biomass. If the process can be used to power advanced production techniques such as biological America, collecting, etc. in areas such as agriculture in Khuzestan, which remains almost "Between 25-18 percent of products is very high figure is in addition to performing and indigenous on energy production, burning farms and destruction of ecosystems, soil, water, air and will prevent Use of biomass resources, one of the best and most economical solutions to provide basic energy needs of people in remote areas, and environmental benefits this type of environment, renewable energy and its development, its application, is reasonable and affordable.

[Ashraf jazayeri, Tayeb Saki Nejad, Sorosh zarrin abadi. **Technical knowledge of biological plants America and localizes it for energy production from agricultural residues in IRAN (Khuzestan province)**. Journal of American Science 2010;6(12):1761-1765]. (ISSN: 1545-1003). <http://www.americanscience.org>.

Keywords: biological plants, infrastructure, agriculture remains

1. Introduction

Where power producers to provide low cost biomass have access to selected conditions using biomass fuels in combination caused their development of market competition is. This especially in the near future for power generation companies will find the truth if their method of electricity generation from biomass with coal combination to select. This method will save on fuel costs. Many active people engaged in the electricity market to offer to purchase electricity generated by the Complies with environmental laws, including electricity from biomass are. This move in response to consumer demand and emergencies is legal As we know, electricity from the most basic needs of life in the new century is considered, such as lighting applications ranging from homes and streets in the use of telephone and

television as well as industrial and medical uses, such as metals and machinery and medical instruments ... Shows that this energy unmatched role in the development of human and community needs are. World statistics on the growing world demand shows that about 70 percent of global investment in energy sector development - equivalent to 11 trillion dollars - over the next three decades, is dedicated to providing electricity as compared to three times the equivalent figure last three decades is. International Energy Agency estimates that electricity than any other energy in final energy demand growth rate of 2.8 percent will face. On the other hand the resources scattered in different parts of the world energy supply has caused the country, different methods are used to provide energy. For example, in Norway probe, ninety-nine percent of the country electricity power

plant - water is produced. While in America in less than 10 percent of its electricity this way comes. In a prediction that the next 50 years, 30 percent of plants in the world of fuel coal, 10 percent of gas used, 15 percent of renewable energy sources (water, wind, solar and thermal energy the earth ...), and 15 percent of atomic energy for power plant use, biological plants in this way as fossil fuel power plants with fuel for thermal energy needed to be used. The difference is that the fuel and products of biological organisms (plants, animal waste, crop residues and ...) will be provided. Because this method requires extensive agricultural land is facing many constraints, but with shrinking fossil resources and rising prices, a serious rival for these fuels will be considered.

2. Biological metabolism of plants Fuel biology (biological) Biomass

Means any organic material, known source of renewable energy is considered. Waste sawdust, residues of agricultural products, and organic material from urban and industrial waste can be burned when electricity and liquid fuel directly used in transportation becomes. State Florida, agricultural fuel inventory of about 20% of biomass fuel in this state provide. Agriculture remains a wide variety of compounds are, of course, some for use as fuel are not appropriate. Agricultural residues suitable for fuel in power plants, solid fuel biomass materials are included in the following types:

- **Food processing residues such as nuclei, conveyors, and skin**
- **Destruction of gardens and vineyards**
- **Pruning of gardens and vineyards**
- **Straw farm**

Cereals and oilseeds major industrial inputs used in production of more ethanol, biodiesel and bio products are used today. Food and feed processing residues and a third residue after the consumer in order to produce a low amount of electricity are used. Of course, this amount of biomass than small agricultural biomass resources currently available, and little of the full potential of agriculture is. With appropriate economic stimulus measures and advanced technologies such as crop plants with increased yield and more efficient harvesting equipment, sufficient amounts of residual agricultural products and food and feed processing residues for the stability can be produced. In addition, the amount of sustainable biomass obtained from agricultural land can be devoted more land to produce wood products and increased herbaceous perennial.

3. Biological metabolism of plants in America

North America produced 180 million tons of biomass is that 43 percent of the amount of agricultural residues that plants using advanced biological anaerobic bacteria and gas production and energy production are a combination of fuel between the available biomass Potential country of Iran 22 million is a system of energy production from residue agriculture often Gasification is that this residue in a tank called Gassy Amplifier as Term chemical burned is Vials fuel ash and gas artificial is that gas result can be thermal energy used or by the generator to electrical energy to become today the ability to produce 15 billion cubic meters of gas household artificial residue agriculture there is fuel derived from technologies convert biomass or state gas (Environmental gas) or liquid (methanol, ethanol and biodiesel), which for produce electricity and heat are used. Large amounts of agricultural crop residue to form straw production that even if outdoors and plowing fields, so that usage can be 30 to 40 percent of these are leftover waste (between and Amos, 2003). This residue can be collected and processed to fuel power plants would. Fuel-based straw are expensive and their low mass density and hardness of some problems in handling their burning creates. Consequently very little material to help fuel sources. Even with the current level of use of biomass fuels leading agricultural areas, enormous amounts of agricultural residues for use as fuel in power plants still open are burned. Fate for most other agricultural residues used for fuel is burned in open space; even a small percentage of these applications in the absence of fuel or plowing are buried. Almost one-third of biomass energy plant in California (as a leading regional) areas Farm state have been constructed to use the residue as fuel in many capital absorbed to compensate for pollution that if some residue biomass in the case of absorption by the plant was not open as it was burned and in these conditions For energy to be used. For example, U.S. agriculture from the beginning to the twentieth century has changed considerably.

Key stimulus for this change in technology and mechanization increased performance fiber in cereal products were the main. Mechanization notably a need for horses, and consequently reduced production of oats (as livestock feed) much reduced. Mechanization, while the same performance per unit area in the period 1915 to 1978 wheat yields per unit area to more than double corn also fulfilled the function of the pan more than tripled its former reach the same performance side shows more product (straw) is equal to two or three. Of course, biotechnology and genetically modified products and high product varieties produced in this way has a role to reward. The point that should be noted here is that many of

the input potential of biomass, like straw, ash problem lies is that software behavior which sedimentation problems are getting.

Researcher's conversion and marine algae befouls and the use of methyl (root univalent hydrocarbon) Gas to convert methane from natural gas components to the remarkable success received. Although ethanol full biological energy known today, but just barely Energy is considered distressed situation. Researchers working to develop the more organic materials such as sugar cane, seaweed, grass, sewage and hospital waste, even for purposes of transportation and power generation to energy with less pollution have become. The current production of biological energy around 643 thousand barrels per day in 2050 that requires about 34 million barrels per day is estimated.

Canals in Venice, one of the important sources of energy known as the green features that can generate electricity at the commercial level will find. A Power 272.6 million dollars in expected electricity production license from biological fuel Canal hast algae. Fuel power plants, algae collected in a canal 26 feet planted biological reactor (with Gas fertilize the plant) and dried and then extracted the juice and add alkaline materials to be converted into befoul. Predicted plant in 2011 could power 40 MW (with the lowest carbon pollution) that production costs in the supply, it provides other types of ships and vessels in the port side should be taken.

After adjustment for maximum boiler power generation with biomass by adding a very small loss in efficiency occurs or no does not make any losses. In these conditions, the energy in biomass with high efficiency (about 33 to 37 percent) coal power plant will become.

Biomass converter system with gas heating biomass in the environment act and there is analysis of solid biomass and flammable gas that is rising. In this way energy than directly burning biomass is superior. Biogas biomass analysis can be cleaned and the spent filters and chemical composition of the device in which it separated. This gas can be more efficient power generation systems that use its combined cycle is called. In this system, gas turbine to generate electricity and steam turbines are combined together. The system efficiency can be increased to 60 percent.

Systems can be converted to gas fuel cell systems for future applications can be combined. Fuel cell using the process (and heat) to hydrogen gas turns it into electricity. Then much of the substance that is water vapor in the air will be rising Iranian researcher with Ohio State University discovered bacteria capable of complex molecules break down cellulose in the cow digestive system for the first time successfully developed microbial

fuel cell system capable of generating electricity from waste cellulose was . Innovative Fuel Cell system that also can be a source of renewable energy, clean and efficient electricity supply required for remote control systems and also areas away from electricity transmission network is used, an attractive and promising perspective in making bio-refineries maps in which they discovered by using bacteria, organic waste and waste, electricity, methane and hydrogen is produced. The young Iranian researcher, although already successful researchers and other research groups to design microbial fuel cells systems are available, but mainly from simple ingredients and still qualify for food value, such as simple sugars and starches used for electricity production This is the first time possible to produce electricity from decomposition of complex cellulose molecules that abound in agricultural and industrial waste exist, is provided. Rope Hamid Yazdi, PhD student in Biotechnology Engineering America Ohio State University (2009) who led the investigation is responsible for technology reporter in an interview with Iranian Students News Agency (ISNA) said: The new fuel cell using bacteria that have been discovered in the cow rumen, cellulose from waste paper, wood products, and vegetable waste in the fields after harvesting, parsing, and electricity is produced. He noted: Cellulose is a complex chemical compound that only a few bacteria have the ability to break down the bacteria and the ability to transfer electrons produced from the metabolism of cellulose to have the electrode was not discovered until now. Since the collection of rumen bacteria in ruminants as the best-developed and cellulose. Users can work in anaerobic conditions are therefore used in this way were considered as the result was very good.

Yazdi (2009) rope emphasized: microbial fuel cells a new technology for the production of alternative and sustainable energies in which the use of specific bacteria as catalysts for the production of free electrons from agricultural waste and even sewage electric current is produced. The significance of this lack of technology gases and uses renewable organic sources and thus is infinite. He noted: One of the most important sources of renewable cellulosic waste from agricultural and industrial units that many researchers in the University of Ohio and other universities in America and the world to convert the waste compounds can be used to try, but technically and economically difficulties in the enjoyment of them exists. Our innovative approach lies in the composition of chemical energy directly into electrical energy without combustion and thus produces pollutants and high efficiency electricity is produced. This method, especially in areas that were due to natural disasters or in areas having not

connected to the power grid as well as remote control systems that frequent battery replacement difficult or impossible, they can be used.

In the future we as a bio-refinery oil refinery to create that organic waste (agricultural - industrial) and excretion into the water and electricity, hydrogen and methane, which is outside. According to this scholar, innovative fuel cell system can currently up 3.5 watt per cubic meter volume of the anode, producing electricity with the hope that more progress is research about the result, it can increase efficiency.

Cell Two anode and cathode compartment is composed. The anode compartment anaerobic decomposition of cellulose electrons through electron transport chain to transfer outside the cell is rendered. These electrons are then both directly or by a carrier made of graphite electrode in the anode being transferred and from there through an external circuit to the cathode used. While the hydrogen ions from the bacterial metabolism through a selective membrane to the cathode part is transmitted in this section is that aerobic electrons with input from the anode the hydrogen ions and oxygen in the cathode electrode surface it is made from graphite compound and water are formed. Fuel Cell cycle thus formed. He admitted to the microbial fuel cell that already has been designed, said: This is a very important point in this project have been able for the first time electricity we cellulosic compounds, while other groups of very simple compounds such as sugar and starch that can be used both by humans is their use. Yazdi rope at the end about why use of fuel cells and bacteria in microbial fuel cells to the advantage of fuel cells commonly said: Conventional fuel cells use hydrogen as fuel and purpose platinum catalyst to apply directly, but if compounds organics like cellulose in the cell to produce electricity to use, the catalysts have the ability to break them, so bacteria as biological catalysts will be the best option. Such bacteria also have the ability to break down the complex molecules have such, should be able to directly or indirectly generated electrons are transferred to the electrode.

Technology led to the use of bio fuels for the future will be cleaner but the industry should worry about the supply of food available to solve Washington - The biomass of at least 4000 years ago man first wood burns, simple and reliable source for energy supply have been. Today, the urgent need to reduce dependence on fossil fuels, technological advances had paved the way for the use of biomass in the future. Many believe that bio fuels as an important subset of biomass, clean and renewable alternative to fossil fuels in the transport process considered. Many others say that bio fuels such as ethanol derived from grain, agricultural

land and provide food in the world would be dangerous to cast and still being applied materials technology much time remains. Any biomass organic waste material, including sawmills, fruit trees and destroyed the forests, agricultural byproducts, and animal feces and human elements of urban and industrial organic waste and many other refers.

From biomass package organic materials in their manufacturing various products such as plastics, polymers, carpets, textiles, detergent, softener materials and oil and fuel needed for transportation is used. Biomass can be contrary to other sources of renewable energy like solar and wind energy, directly to liquid bio fuels such as ethanol and biodiesel into. This fuels some cases the use of biomass that have the fastest growth. According to the Renewable Fuels Association in Washington, the rate of ethanol production in the world in 2006 was about 51.1 billion liters and the countries to reduce oil imports boost rural economies and help air cleanliness, the amount of ethanol is rising. Also expected to increase concerns about emissions and low world oil resources will also increase the production of ethanol.

Bill, a member of the board of American Council of Renewable Energy, told America.gov: ethanol production is increasing rapidly. United States has the largest production in Brazil is ranked second. Other countries developing their own ethanol industry, China, India and Latin America as well as developing and advancing its bio fuels programs are. Food versus fuel ethanol is an alcohol fuel from sugar in cereals such as sorghum and wheat and skin potatoes, rice, sugar cane and sugar beet is obtained. Tom Fawcett, director of technological applications of biomass renewable energy National Laboratory (NREL) United States Department of Energy, told America.gov: Brazilian ethanol from sugar cane to exclusively produce and the United States almost exclusively from corn ethanol to come. University of Arkansas (UA) in research methods to reduce production costs for bio fuel, alternative fuel from vegetable oil, animal fats or algae, renewable fuel that can replace oil with foundation, they are. Students using three methods of combining sound waves for rapid mixing, factor interplay of solid and chemical conditions close to the explosion at elevated temperatures and pressures to improve production of bio fuels to review.

3. Work in Iran

Study the feasibility for plants with fuel waste city with a capacity of 10 MW in cooperation with consulting and Iranian colleague Germans started that is currently available is an action, he existence of more than 400 million tons of residue

agriculture, forestry and waste of livestock, more than 20 million Tons of waste and more than 5 billion cubic meters of sewage in the human potential of this is based on the feasibility study for construction of urban waste-fueled power plant with a capacity of 10 MW in cooperation with a German colleague of Consulting and began and now Action is in hand. In 2004 about 170 thousand hours of electricity from renewal sources production was ranked second after power plants - water is the primary Reviews shows that in the amount of potential energy potential of biomass resources can be obtained from the equivalent of 6 / 15 million crude oil in 2000 is that the rate of 59 percent share of agriculture and forestry, 11 percent share of urban waste, 28 per cent share of livestock waste, urban sewage and 2 percent share of 5 percent share of food. I attempting to compile the atlas for biomass and municipal waste biomass source 4 includes agricultural residue - forests, livestock waste, and waste human and industrial waste has been. The project to identify suitable sites for energy utilization can be obtained from biomass resources, promotion of culture resources in the production of biomass energy and fuel through the recognition of laws and regulations and provide necessary suggestions, technical and economic studies appropriate extraction technologies biomass energy sources and ways to expand their knowledge and capacities and resources of biomass energy extraction runs.

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10/12/2010