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OVERVIEW OF THE IMPORTANCE OF USING BIOENERGY IN THE DIRECTION OF SUSTAINABLE DEVELOPMENT

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Abstract

The tremendous development of science and technology, in today's world, has apparently caused the comfort and well-being of human life. But this development, It has also caused new problems for mankind, including environmental pollution, extensive changes in water and air etc. pointed out. Because oil and its derivatives are valuable and vital national capitals of the country, but consumption nprincipled ones sometimes cause irreparable losses. Fossil fuels, numerous environmental pollutants creates In other words, on the one hand, as a result of burning fossil materials, toxic gases enter the environment and human breathing causes problems and pollutes the environment And on the other hand, the density of these gases in the atmosphere prevents heat from escaping from the surroundings the earth, and causes an increase in air temperature and extensive climate changes. The best solution that most scientists have suggested, in order to stop the growing trend of these harmful gases, the use of clean energy, such as solar energy, Wind, geothermal, hydrogen, etc. are instead of the energies obtained from fossil fuels. In addition, fossil energies, Like oil, gas and coal, they will eventually end one day, and with its end, human civilization, which is directly dependent on It has energy, it will face a new and great challenge Therefore, in international programs and policies, including in the organization's programs 1 United Nations, in line with sustainable development A special role has been assigned to renewable energy sources. The purpose of compiling this article, 1 investigating the importance of using biomass energy As one of the important sources of energy, it replaces other fossil fuels

Index Terms: *Technology, Bioenergy, Sustainable Development, Renewable, Environment.*

I. INTRODUCTION

One of the alternative energy sources, which can be used as a renewable energy source Or bioenergy can be classified as 4, biomass energy Is. Biomass energy is a term for any type of non-fossil fuel, which is classified as organic, biological or plant material. Takes. This class of materials can become a usable energy source. Using biomass as a resource Energy has been attractive not only for economic reasons, but also from an environmental point of view. On the other hand, it is an acceleration factor They know how to achieve sustainable development. Sustainable development, which takes into account the needs of the present human being with regard to the ability of the future generation, Result The logical growth of awareness is towards global issues of environment and development. Today, the term sustainable development is a movement, for Neil to international agreements, which respects the interests of all and supports the integration of the world's environment and the development system. (Afzlian, 2022). Biomass energy sources can be the main form of energy, such as electricity, or energy carriers, such as fuels. gaseous and liquid to meet the various needs of human society; Therefore, since energy consumption, one of the important riteria, to determine The level of progress and quality of life, energy policy can be summed up in three axes1 - moving towards Use of renewable, clean and environmentally friendly energies 1-Restructuring in the energy sector and making it competitive 3-Increasing efficiency in energy consumption (Shekibai et al., 2023, p. 134) according to the first axis, renewable energies, with nature And the environment is more compatible. Their production and

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preparation is less polluting and because they are renewable, they have no end. from this Therefore, renewable energies have a greater share in the world's energy supply.

II. BIOMASS:

Biomass is the translation of the English word biomass, which includes all substances in nature that have been alive in the past and now It includes waste, waste and waste. In fact, biomass resources are in a way the origin of fossil resources. In the field of Energy is used to describe a series of products that result from photosynthesis. Each year through photosynthesis, Many times the annual energy consumption of the world, solar energy is stored in the leaves of trees. Through the process Photosynthesis, living plants are able to absorb and utilize the sun's abundant energy, along with carbon from the earth's atmosphere and absorb nutrients. Produce biomass from the soil. As a result, we can define biomass as an organic or biological substance that It contains solar energy stored in the form of chemical energy. Biomass produced from plant materials, crops, Forest waste or sewage waste can be solidified or through a wide range of conversion and refining processes. They can be in the form of liquid or gas fuel. Then these materials can be used to generate electricity, heat or vehicle fuel.

III. BIOMASS ENERGY SOURCES IN NATURE:

Biomass energy sources exist in three main forms: solid, liquid, and gas, and are divided into primary and secondary subsets as follows.

- Primary type: Produced using solar energy from plant photosynthesis
- Secondary type: produced by decomposition or transformation of organic matter

A part of the sun's radiation, which reaches the earth's atmosphere, is absorbed and stored in plants through the process of photosynthesis. to be Plants are carbon storage sources. They absorb carbon dioxide from the air and store it as carbon. Part of this Carbon is converted into energy by living organisms, and another part is stored in living tissues, and the third part is excreted; And also pay attention to the fact that biomass energy reserves in trees are equivalent to the reserves of fossil fuels that can be extracted.

Biomass sources that are suitable for production are generally divided into six groups:

1- Wood fuels

1- Forestry, agriculture, horticulture and food industry wastes

3- Municipal solid waste

4- Livestock excrement

5- Municipal sewage

6- Industrial organic wastes, residues and residues

The comparison of technologies is based on two points of view:

- Moisture percentage criteria, perishability and biomass specific limitations
- Compatibility of the technology with the types of biomass available on site

From the review and comparison of different biomass technologies, based on raw material processing, operating temperature and pressure, process management, compatibility with raw materials and the need for the type of auxiliary material, energy efficiency, the possibilities of converting energy consumption and the degree of complexity can be attributed to this It was concluded that which of these technologies has more points.

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IV. NECESSITY AND BENEFITS OF USING BIOMASS ENERGY:

- Solving the environmental problems resulting from the release of biomass resources in nature
- Reducing the emission of greenhouse gases, especially methane
- The possibility of producing energy at the place of consumption
- The possibility of delivering clean energy in the form of solid, liquid, gas
- Ability to deliver energy in the form of electricity, heat and fuel for cars
- Energy production with accessibility

As mentioned, the use of biomass as an energy source is not only because of its novelty, but also because

Economic and environmental development is also attractive, and on the other hand, it is seen as a factor in accelerating the achievement of sustainable development. Systems that convert biomass into usable energy can be installed in small capacities in the form of modules, and Medium and high capacities are used. All these items have organic materials and have the ability to burn; Therefore, for each one, a certain calorific value can be determined determined A large amount of heat energy is released from the combination of any organic fuel with oxygen, carbon dioxide and water.

V. BIOMASS ENERGY EXTRACTION TECHNOLOGIES:

Marouzeh, biomass energy, among renewable energies, has the first place in the world's energy supply. At the moment There are various technologies and methods for processing, purifying and disposing of waste. In some of these technologies, energy production, It has priority, and in some others, waste removal is a priority. for different sources of biomass and its various applications, Many technologies have been developed or are being developed. Different biomass technologies, at different stages Development, and introduction to the market, are located and include a wide range of laboratory development, and prototyping. Energy use Biomass is currently classified in the following three general ways:

- Combustion of waste incinerators, wood burners, carbonization
- Thermochemical (plasma, gasification, pyrolysis)
- Biochemical (landfill, anaerobic digestion, biofuel production)

The aim of thermochemical, biological and combustion methods is to produce energy, eliminate waste and produce heat, respectively. from the point According to the technical opinion, according to the environmental conditions, all the above methods or a combination of them can be implemented and used.

VI. SELECTION CRITERIA FOR BIOMASS TO ENERGY CONVERSION TECHNOLOGIES:

Economic, social, technological conditions and the development level of the regions, in the selection of effective technologies for converting biomass into energy are. Without paying attention to these factors, it is not possible to ensure the success of energy conversion projects from biomass. At The selection of criteria is considered more than anything, the needs and conditions of the country. Examples of these items that are of great importance they have, including providing the energy needed by remote and needy areas, optimal use of waste materials, the possibility of implementing technologies In the country, relative simplicity of technologies, compatibility with other technologies of conversion and energy consumption. The issue of simplicity and applicability, In the technology of converting biomass into energy, it can be evaluated by examining the number and type of equipment used in the said technology. Factors affecting the complexity and implementation capability of technology:

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- Operating temperature
- The need to process and improve raw materials before the main process such as (drying, crushing, grinding, changing state)
- physical or chemical composition
- The need for continuous process control
- The need to add auxiliary materials to the process, such as air, steam, various gases, liquids, etc
- The need to refine and improve energy products
- Operating pressure (process performance mode in terms of normal pressure or under pressure)

VII. THE COMPARISON OF TECHNOLOGIES IS BASED ON TWO POINTS OF VIEW:

As mentioned, the use of biomass as an energy source is not only because of its novelty, but also because Economic and environmental development is also attractive, and on the other hand, it is seen as a factor in accelerating the achievement of sustainable development. Systems that convert biomass into usable energy can be installed in small capacities in the form of modules, and Medium and high capacities are used. Agriculture and forestry industries are the main reserves of biomass, which are fundamental opportunities provides for the economic development of rural and remote areas. It is usually lower than fossil fuels. In addition, the commercial use and exploitation of biomass can cause problems related to Destruction of waste and garbage in other industries including forestry and wood products, food processing and especially solid waste Urban, in urban centers, remove or reduce.

Discussion:

The energy that human life depends on is currently the energy of non-renewable fossil fuels that these fuels It causes crises such as global warming and disruption of the earth's natural ecosystem and environmental pollution In the not too distant future, it should be replaced by new and renewable energies. In recent years, increased attention worldwide and especially in Developed countries have increased the use of bioenergy in energy supply. The vastness of Iran and the quantitative and qualitative diversity of resources Biomass indicates the existence of a suitable capability to produce electricity from biomass sources in the countryAbundance of biomass resources, from a The side and many problems caused by the release of these valuable resources in nature, cause the increasing attention of government organizations and institutions and Specializing in the use of anaerobic digestion technology as a suitable solution to produce electricity and heat energy and solve problems. The environment has become corrupt due to organic waste. On the other hand, there are other benefits such as creating productive employment and helping the economy rural areas, improving living conditions and beautifying the environment, delivering energy at the point of consumption, the existence of suitable potential in the country and the occurrence of crises Environment in different parts of the country , are one of the factors that cause double attention at the world level, especially in developed countries The use of applied technology is suitable and appropriate in this field; which, of course, can be done with proper investment and planning This field was successful and caused the sustainable development of the cities and villages of the country.

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