

**MARKETING FEATURES OF RENEWABLE ENERGY IN THE
MANUFACTURING INDUSTRY**

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Abstract

One of the most important issues and problems of today's world is the rapid depletion of energy and energy resources. In particular, the unconscious and inexhaustible use of resources such as coal, petroleum and natural gas, which are called fossil fuels, caused both the depletion of these resources and the damage to the natural environment and the deterioration of the ecological balance. For this reason, people has started to produce and consume renewable (green) energy resources.

In this study, we analysed the concept of renewable energy, renewable energy resources, green marketing and marketing of renewable energy resources in the manufacturing industry were tried to be evaluated.

Keywords: Renewable Energy, Renewable Energy Resources, Green Marketing.

1. Introduction

As the world population increases, the customers of human beings are also increasing. The need for energy is also increasing rapidly without meeting these needs and industrialization. Our energy need is tried to be met by energy resources that actually disrupt the balance of production and consumption and pollute the environment. Fossil fuels such as oil, natural gas and coal, which meet a great part of our energy needs, have increased in the use of these resources and have increased the average temperature of the world to very high levels, polluting nature and the environment with effects such as ozone depletion, global warming, climate change and threatens. In addition, natural disasters such as floods and storms, which cause billions of dollars of damage every year, started to increase.

That's why we have to focus on producing and consuming energy cleanable. Because, as a result of the widespread use of clean / renewable / green energy resources, a completely different world will enter our lives.

2. Method

In this research, literature review, internet resources and archive study were made as a method.

3. Discussion

3.1 Renewable energy

Renewable energy... In other words, clean energy, green energy, environmentally friendly energy. Green energy is the name given to energy types that have self-renewal properties such as solar, wind, geothermal, hydrogen, biomass energy. Green energies both have the ability to renew themselves and do not harm the nature, environment and natural cycle. For this reason, the production and use of renewable (green) energy resources is of great importance for all humanity and the future of nature.

Green energy is the clean energies that exist spontaneously in nature, that can renew itself, that is, it can exist continuously, do not emit greenhouse gases or emit little or no harm to the ecological balance and the environment and do not pollute.

3.2 Renewable Energy Resources:

Table 1: Renewable Energy sources

<i>Renewable Energy sources</i>	<i>Source or Fuel of Energy</i>
Solar Energy	Sun
Wind Energy	Wind
Hydro Energy	Rivers
Biomass	Biological residues
Geothermal	groundwater

3.2.1 Solar Energy

Solar energy technologies collect solar rays directly and provide heat or electricity generation in these rays. The source of this energy is the fusion reactions that take place with the conversion of hydrogen on the sun's surface to helium. The intensity of the space solar energy of the Earth's atmosphere is roughly constant and has a value of 1370 W / m², but varies between 0-1100 W / m² on Earth. The energy reaching the Earth from the sun is not the greatest feature. The distance between the Earth and the Sun is 150 million km. The energy coming to the world from the sun is 20 thousand times the energy used on Earth in a year. Even a small part of this energy coming to the world is many times more than the current energy consumption of humanity. Studies on benefiting from solar energy gained speed especially after the 1970s, solar energy systems showed a decrease in terms of technological progress and cost, and it became accepted as an environmentally clean energy source.



Photo:1 Solar Energy Panels

The annual amount of solar hours in the territory of Azerbaijan is 2400-2900 hours / year / m, and the amount of solar energy falling to the earth's surface is 1500-2000 kW / h, which creates ample opportunities for the use of solar energy in Absheron, Nakhchivan and Kur-Araz regions. For this purpose, in the lighting systems of administrative and social buildings, streets, parks in Baku and suburban settlements, as well as in Gobustan, Salyan, Bilasuvar, etc. in the districts

In order to provide the local population with clean water by treating drinking water with the use of solar PV modules, the installation of solar panels with a capacity of 5 MW has been launched.

3.2.2. Wind Energy

Wind power; It is a natural, renewable, clean and eternal power and its source is the sun. A small amount such as 1-2% of the energy that the sun sends to the world is transformed into wind energy. Air flow occurs due to the temperature and pressure difference that occurs as a result of the sun not heating the earth and the atmosphere homogeneously. If an air mass gets warmer than its current state, it rises above the atmosphere and with the rise of this air mass, the same volume of cold air mass settles in the empty space. The displacement of these air masses is called wind. In other words, wind; It is the air flow that occurs due to the pressure differences between two adjacent pressure zones and moves from the high pressure center to the low pressure center. While winds flow from high pressure areas to low pressure areas; It is shaped by reasons such as the rotation of the earth around its own axis, surface friction, local heat dissipation, different atmospheric events in front of the wind and the topographic structure of the land. The characteristics of the wind show temporal and regional variations depending on local geographical differences and inhomogeneous warming of the earth. The wind is expressed in two parameters, namely speed and direction. Wind speed increases with height and its theoretical strength changes in proportion to the cube of its speed. (www.eie.gov.tr)



Photo: 2 Wind Energy Panels

As the wind enters the territory of Azerbaijan from a narrow strip along the Caspian coast, from the air corridor between the Greater and Lesser Caucasus Mountains, the wind is often stronger in these areas.

This effect is maximized in the Absheron Peninsula and the Absheron Sea, which stretches into the Caspian Sea. According to research conducted by the State Agency, the average annual wind speed here is 7.0-8.5 m / s at an altitude of 80 meters above the Earth's surface, which is "highly favorable" energy potential according to the classification of the International Renewable Energy Agency (IRENA). belongs to the class.

3.2.3 Biomass energy

Biomass, which emerged as the origin of plants and living organisms, is generally referred to as plant organisms that store solar energy with the help of photosynthesis. Biomass can also be defined as the total mass of living organisms belonging to a species or a society consisting of various species at a given time. Specially grown plants such as corn and wheat, herbs, algae, algae in the sea, animal excrements, fertilizer and industrial waste, all organic waste (fruit and vegetable residues) disposed of from homes are sources of biomass. The use of biomass is becoming increasingly important to solve the energy problem because of the limited energy resources such as petroleum, coal and natural gas and also because they create environmental pollution (www.eie.gov.tr).

According to another definition, wood, charcoal, animal waste; agricultural products and forestry organic waste, alcohol and methane fermentation; The type of energy obtained through living (biological) sources such as various aquatic plants is called biomass energy. In short, the energy obtained from organic materials in various ways is biomass energy. (MEB, 2012: 24). Biomass energy can be obtained by burning the plants that make up the biomass by accumulating the carbon of the carbon dioxide they take from the atmosphere during

photosynthesis. Electricity can be produced from the steam that can be obtained by creating energy forests with fast growing plants, growing on one side and burning on the other. Generating energy by burning methane gas produced by digesting animal and vegetable wastes is also known as the biogas method.

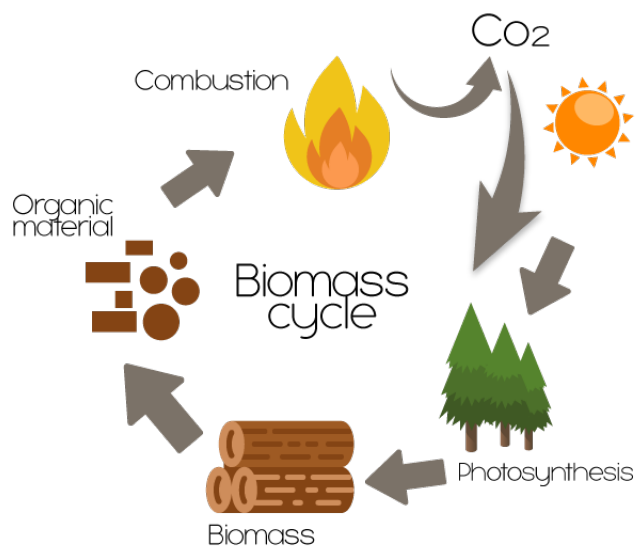


Photo:3 Renewable energy

3.2.4 Geothermal

Geothermal heat (excluding geothermal source heat pumps) can be used as a source for low temperature process heat applications. Today less than one percent of the total industrial heat use is provided from geothermal sources (IEA, 2012b). About half of the demand comes from the pulp and paper sector and the remainder from drying, evaporation, distillation or washing applications in various other sectors (EGEC, n.d.; IEA, 2012b). In Iceland as an example, geothermal heat is typically used for fish drying (Arason, 2003). Similarly, the drying of tomatoes is done with geothermal heat in Greece (EGEC, n.d.). Geothermal heat can be directly applied to the industrial processes if the distance between the heat source and the end- user is sufficiently close (IEA-ETSAP, 2010). In this analysis, conventional deep geothermal heat-production technology for low-temperature heat applications is considered. These application offer the largest potential in all industry sectors with the exception of the chemical and petrochemical and the iron and steel sectors, where medium- and high-temperature process heat dominates the demand.

3.2.5 Hydroelectric Energy

Hydroelectric power plants (HEPPs) convert flowing water into electricity. The flowing water feed energy determines the water flow or fall rate. Water flowing in a large river is a great source of energy. Or when the water is dropped from a very high point, high energy is obtained again. Either way, empty the channel or hoses, the water flows towards the turbines, causing turbines such as propellers to spin for electricity generation. Turbines are connected

to generators and convert mechanical energy into electrical energy (www.eie.gov.tr). Hydraulic energy is the energy source with the most advanced technology development among renewable energy sources. Hydroelectric power plants are the most important renewable energy sources and have a large share for energy. Potential energy of water carried high by rain and snow is converted into electrical energy by means of turbines and generators. Hydroelectric is one of the energy source group that is qualified as renewable due to its annual rainfall.

3.3 Renewable Energy in the Manufacturing Industry

Across the globe, manufacturers are increasingly developing new ways of using renewable energy to strengthen clean energy competitiveness in various industries.

Bioenergy can be obtained from various types of biomass raw materials, including from logging and agricultural waste, as well as animal waste; forest plantations with a short cutting rotation; energy crops; organic component of municipal solid waste and other types of organic waste. Through a variety of processes, these raw materials can be directly used to generate electricity or heat, or can be used to create gaseous, liquid or solid fuels. The range of bioenergy technologies is wide and the level of their technical development varies considerably. Some examples of commercially available technologies are small and large boilers, domestic pellet heating systems, and the production of ethanol from sugar and starch. Advanced combined cycle biomass gasification plants and lignocellulose-based transport fuels are examples of technologies that are in the pre-commercial stage, and algae liquid biofuel production and several other biological conversion methods are in the research and development (R&D) stage. Bioenergy technologies find their application in centralized and decentralized installations, with traditional biomass currently being the most widely used in developing countries⁴. Bioenergy typically offers continuous or controlled energy production. Bioenergy projects usually rely on local and regional fuel supplies, but recent events show that solid biomass and liquid biofuels are increasingly being traded internationally.

Direct **solar energy** conversion technologies use solar energy to generate electricity using photovoltaic cells and solar energy concentration (SSC) to produce thermal energy (heating or cooling using either passive or active means), to meet direct lighting needs and for potential production fuel that can be used for transport and other purposes. The degree of development of technologies for the use of solar installations ranges from R&D (for example, fuels obtained from solar energy) to relatively ready-to-use (for example, SSC) and off-the-shelf (for example, passive and active solar heating and photocells based on silicon wafers) technologies. Many, but not all, technologies are modular in nature, allowing them to be used in both centralized and decentralized energy systems. Solar power is volatile and, to some extent, unpredictable, although the time profile of solar power, under some circumstances, correlates relatively well with energy demand. Thermal storage offers opportunities to improve the regulation of energy output for some technologies such as SSC and direct solar heating.

Geothermal energy uses the available thermal energy from the bowels of the Earth. Heat is extracted from geothermal reservoirs using wells or other means. Reservoirs that are

naturally hot enough and permeable are called hydrothermal reservoirs, and reservoirs that are hot enough but improved by hydraulic stimulation are called advanced geothermal systems (EGS). Once on the surface, fluids of varying temperatures can be used to generate electricity or more directly in areas where thermal energy is required, including district heating or the use of lower temperature heat from shallow wells for geothermal heat pumps used for heating or cooling. Hydrothermal power plants and thermal applications of geothermal energy are technically developed technologies, while UGS projects are in the demonstration and experimental stages, as well as in the R&D stage. When geothermal power plants are used to generate electricity, they typically provide a constant output.

Hydropower uses the energy of water moving from higher horizons to lower horizons, mainly to generate electricity. Hydropower projects include reservoir dam designs, natural river and watercourse designs and are ongoing throughout the project. This diversity gives hydropower the ability to meet large, centralized urban needs as well as decentralized rural needs. Hydropower technologies are mature technologies.

Ocean energy is extracted from the potential, kinetic, thermal and chemical energy of seawater, which can be converted to provide electricity, thermal energy or drinking water. A wide range of technologies are possible, such as tidal dams, underwater turbines for tidal and ocean currents, heat exchangers for converting ocean thermal energy, and various devices for harnessing wave energy and salinity gradients. Ocean energy technologies, with the exception of tidal dams, are undergoing demonstration and pilot testing, and many require additional R&D. Some technologies have variable output energy profiles with varying levels of predictability (for example, waves, tidal amplitude, and currents), while other technologies may be capable of nearly constant or even controlled operation (for example, ocean thermal energy and salinity gradient).

Wind energy uses the kinetic energy of air jets. The main application related to climate change mitigation is the generation of electricity from large wind turbines located on land (onshore) or in seawater or freshwater (coastal). Onshore wind energy technologies are already being produced and applied on a large scale. Offshore wind energy technology has great potential for continuous technical improvement. Wind power is volatile and to some extent unpredictable, but experience and detailed studies in many regions have shown that the integration of wind power does not usually pose insurmountable technical barriers.

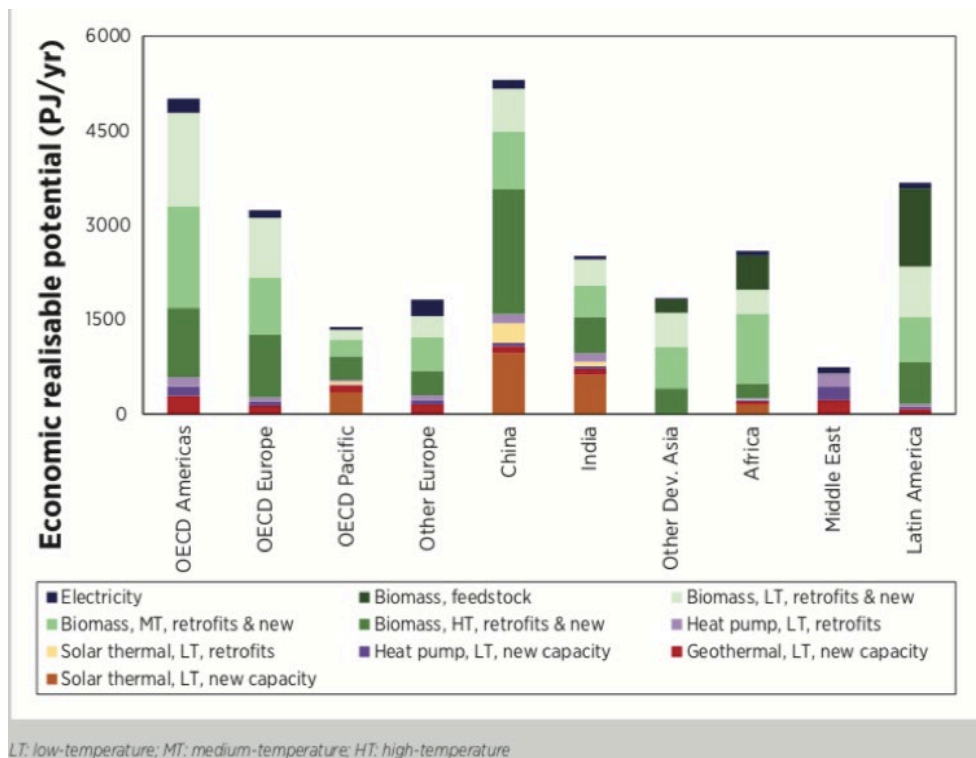


Photo:4 The Economic Realisable Potential of Renewable Energy Technologies in the Manufacturing Industry, with a Breakdown by Regions, 2030

3.4 Marketing of Renewable Energy

The reason why renewable energy sources are so on the agenda is that global warming and resources are beginning to run out. We are in an age where no technological investment or innovation can be realized without considering economic concerns. We have noticed that we are rapidly and unconsciously consuming our natural resources and we are trying to fix this. As human beings, our knowledge and strength are sufficient, but unfortunately our efforts are not at the level they should be.

It is not enough to produce only environmentally friendly and minimizing damages. Businesses should take into account the environment and nature in all their activities from a to z, and they should bring this to the fore in their relations with consumers. While producing renewable energy or producing other products by using renewable energy, implementing green marketing strategies while marketing this energy or products should become a business policy or even identity. The understanding of marketing the advantages of renewable energy generation with the advantages of green marketing should dominate. Production and marketing of renewable energies is, of course, not a phenomenon that companies can make their own decisions completely independently. States have intense legislation on laws, regulations and licensing regarding renewable energy in both generation and consumption.

Increasing and encouraging the production and consumption of renewable energy resources is of great importance in terms of reducing foreign dependency in energy,

differentiating energy resources, ensuring efficiency and security in energy, and protecting our nature. Therefore, the necessary legal infrastructure, incentives and regulations and evaluation mechanisms of national energy policies and legal regulations and good practice examples in other countries of the world should be developed. Turkey in order to reduce the impact on the increase and the nature and man the share of renewable energy and renewable (wind, solar, geothermal, water, sea, etc.) by the production of energy resources and the use of relevant government agencies nationally and should be planned at the international level and the license application should be made in this scheme . In addition, the fact that renewable energy investors alleviate bureaucracy in their relations with the state such as planning and licensing, for example, having a single official institution like Denmark will facilitate the process.

For example, an Energy Development Company was established under the umbrella of the National Petroleum Corporation of the Philippines in 1976 to realize the geothermal potential it has in the Philippines, and as a result of this company researching and developing geothermal resources, Philippines has become the second in the world in terms of geothermal power generation after the USA. Since it is established and controlled by the state, the company, which carried out its geothermal resource exploration with public funds, was privatized two years ago and now has the power to search and develop geothermal resources anywhere in the world without government guarantee.

Countries can apply different incentives to encourage the production and consumption of renewable energy resources. In the Renewable Energy Incentives report of the TOBB European Union Department, these incentives are discussed under 3 headings. (www.tobb.org.tr) Incentives imposing price determination and quantity obligations; basically consists of purchase guaranteed tariffs and standards. It varies from country to country. It is the guarantee that the electricity obtained from renewable energy sources will be purchased at the amount and tariff specified in advance by the state. In some countries there may be auctions that allow producers to get the privilege of selling a certain amount of renewable energy to the state. "Green Energy Certificates" giving concessions can be issued.

Cost-reducing investment policies; Providing subsidies and discounts, tax cuts, investment tax credits, accelerated depreciation, production tax credits, income tax incentives, VAT exemptions, environmental tax exemptions, grants, import tax reductions, and representing both large-age and small-age investments and installations, Incentives for both investors and consumers. Public investments and incentives for the development of the renewable energy market; public benefit funds are incentives such as construction, design, site determination and permits, and renewable energy legislation where bureaucratic obstacles are minimized.

Businesses should determine the marketing strategy as the feature that will provide the greatest competitive advantage. Considering the increase of green consumers, it should create the perception of the consumer by using the image of the environment-friendly product and business, that its products consume renewable energy in promotional activities such as advertising, promotion, packaging, labeling, sponsorships, personal sales, sales development

efforts, public relations. That this perception is not temporary, it should not be and it should be shown to be sincere and kept alive.

4. Results

According to many countries in the world, our country is rich in renewable energy sources such as solar, wind, geothermal and hydraulic. However, the utilization potential of these resources cannot be evaluated to the extent required. Generating and expanding the use of the existing potential with maximum efficiency will not only reduce or completely eliminate our country's external dependence on energy, it will also provide an economic power and advantage. Especially in marketing activities such as product production, development, distribution, promotion, production using green energies, green packaging, green distribution and all other marketing activities are carried out in line with the increasing green consumers and their sensitivities, it is inevitable that it will provide competitive advantage and superiority. By minimizing the damage and damage to nature, the continuity cycle of nature and ecological system will continue. While leaving a cleaner natural environment and world from today to the future, individuals and societies will lead a more prosperous life.

Ensuring that the state is accessible to all, businesses have economic goals and nature. It is achieved by observing that they act with a consciousness and an ideal. In this direction, a synergistic implementation should be made.

Governments should encourage theoretical, promotional and educational activities with a facilitating and intensive incentive approach, through legal regulations. Workshops, forums, congresses and symposiums should be held regularly by universities with the participation of individuals and the public. Trainings and courses should be organized, TV films and information booklets introducing renewable energy systems should be prepared in order to raise awareness and awareness for individuals. In cultural and artistic events, the trend should be started with intense advertisements and promotions. For example, the construction of exemplary (housing-government office-school) buildings in their regions where their heating-cooling-electricity needs are met with renewable energy sources should be encouraged. Well, renewable energy systems and energy resources should be included in education programs in secondary and higher education institutions.

The International Energy Agency (IEA) states that it aims to double the renewable energy consumption, which is 6% in EU countries. These goals should be achieved by considering the potential and realities of our country.

In this way, the production and use of renewable energy will be marketed and extracted officially and consciously. As the demand for these energy resources will increase, the supply will increase.

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