Buletinul Ştiinţific al Universităţii „POLITEHNICA” din Timişoara

Seria HIDROTEHNICA
TRANSACTIONS on HYDROTECHNICS

Tom 57(71), Fascicola 2, 2012

Alternative energie. A must for future

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Abstract: Renewable energy is derived from natural processes that are replenished constantly. In its various forms, it derives directly from the sun, or from heat generated deep within the earth. Included in the definition is electricity and heat generated from solar, wind, ocean, hydropower, biomass, geothermal resources, and biofuels and hydrogen derived from renewable resources.

Keywords: solar energy, thermal energy, biofuels wind power, water energy

1. INTRODUCTION

Energy consumption is closely related to certain parameters. One of these parameters is population. World population is growing, improving living standards, industrialization, influenced unequivocally and energy consumption. Global energy consumption is projected to increase by 57% by 2025.

Thus it is necessary to produce as a percentage of energy from renewable sources. This is important for environmental protection and sustainable management of existing natural resources. This paper aims to analyze the global energy situation, national and European and future prospects in the field.

2. CONVENTIONAL ENERGIES. CATEGORIES AND CHARACTERISTICS

2.1 SOLAR ENERGY

Life of the Sun is estimated at 5 billion years, which leads to the conclusion that our time scale, it is an inexhaustible and therefore renewable energy. Exist several ways to capture conversion of solar energy.

• Thermal solar energy

It is based on the production of hot water used in buildings, or in order to allow drive turbines as with conventional thermal plants for electricity production. Surface waters of the sea are naturally heated by the sun, which is a huge energy reservoir in the tropics. Extraction projects this "thermal energy of the great" are based on thermodynamic drive different cars (fig. 1). It is based on the temperature difference between surface water (25 to 30 ° C) and deep water (5 ° C at 1000 m depth). For this solution to be practical as the temperature difference should be greater than 20 ° C, but the yield of 2% is very low (fig. 2).

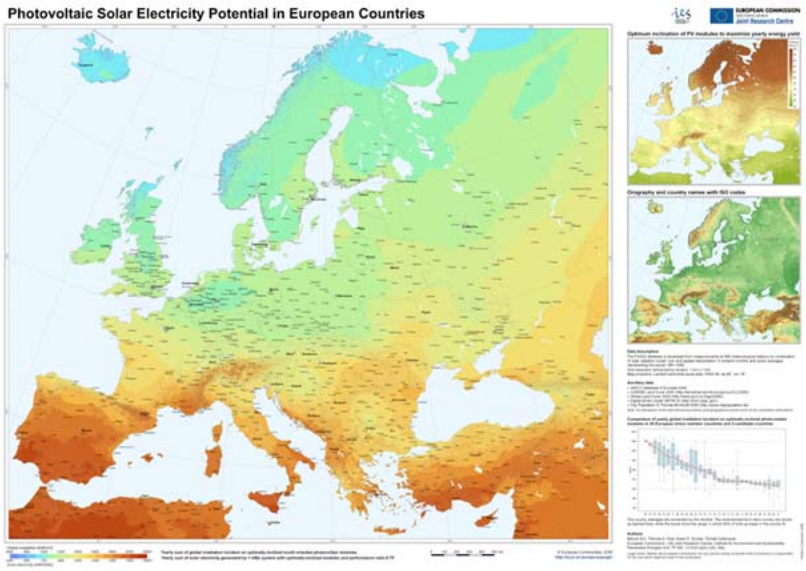

Fig. 1 Solar Energy in the European context

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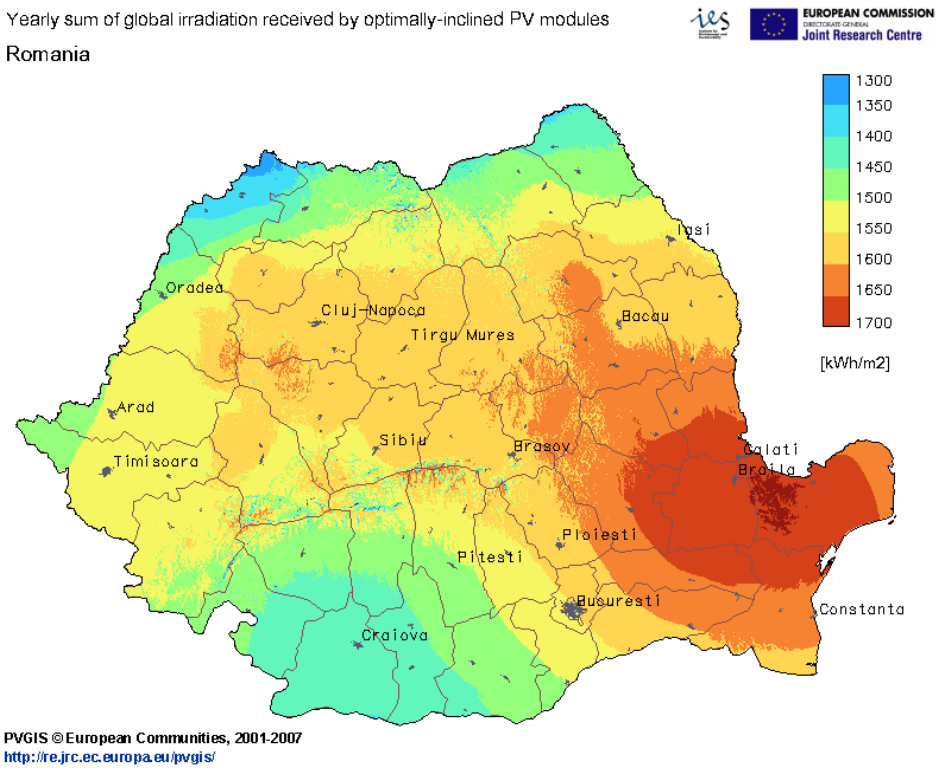

Fig. 2 Potential – Solar energy

• Photovoltaic solar energy

This form of energy based on direct production of electricity through silicon cells. When shines when climatic conditions are favorable, the sun delivers a power of 1 kW / m. Photovoltaic panels allow direct conversion into electricity of 10 to 15% of this power. Energy production of such a panel varies with increased or decreased solar intensity: 100 kWh / sqm / year in Northern Europe and the Mediterranean is two times higher. A 5x4 meter photovoltaic roof has 3kW power and produces 2 to 6 MWh / year [1]

2.2 WIND POWER

Available wind source is evaluated on a global scale to about 60,000 TWh per year, half of this potential being in offshore locations (on the high seas or oceans). Theoretically, home wind energy can meet global electricity demand that rises to 40,000 TWh (including losses). On the other hand, the main drawback of this source of energy is the wind instability. In periods of extreme temperatures when energy demand is fierce, the wind effect is virtually nonexistent, which led to the solution to achieve hybrid plants to produce electricity, which contain, in addition to wind power and other energy sources based sources with high stability in operation and energy storage systems. If electrical energy storage systems for high capacity price should be considered high cost of these systems that are in development phase Map Europe has only 9% of the available wind potential in the world, but in 2002 it held 72% of the installed capacity of wind origin. It has produced 50 TWh wind power home in 2002, world production of 70 TWh. Technically available wind potential in Europe is 5,000 TWh per year [1].

In fig 3 is presented National situation Wind Energy in the European context.

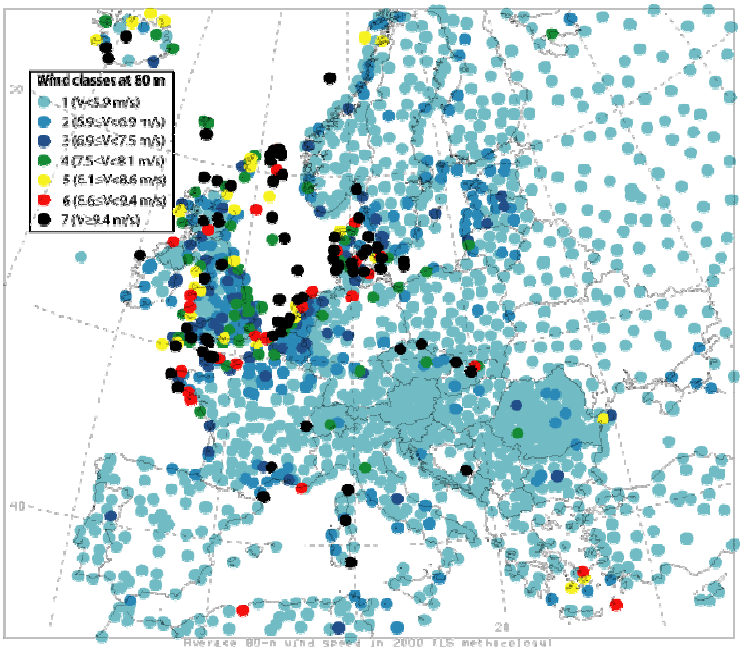

Fig.3 National situation Wind energy in the European context

2.3 THE KINETIC ENERGY AND POTENTIAL WATER

In terms of power installed worldwide, hydroelectric power can be considered the first renewable source of electricity. This is due both to lower cost price of the catchment, and tradition, already in the field. Global potential is an advantage to be exploited. The production of hydroelectric power in early 2000 was 2700 TWh per year, with an installed capacity of 740 GW. It can reach 8,100 TWh by 2050 by doubling the installed power economically competitive.

- Source of hydroelectric power

In this category fall hydroelectric power plants greater than 10 MW. In industrialized countries, this type of source is operated at 100% of its maximum potential. Dams allow energy storage, providing a necessity in times of high demand. In several cases, energy storage basins upstream or downstream, allows energy storage systems using turbo-alternator reversible type that makes pumping in us critically. This form of energy storage is widely used in the world.

- Small hydroelectric power source

Hydropower plants with a capacity lower than 10 MW are located generally along the water, their operation depends largely on water flow. These small plants are used for decentralized production. World production is estimated at 85 Twh.

- Tide

And this type of primary energy sources can be used to produce electricity. It is based on the exploitation of periodic fluctuations of sea level due to gravitational attraction exerted by the Moon and the Sun on the water. The world is being studied several types of plants capture this energy. Major projects are underway in Canada, France and England. These projects are not safe, because by implementing existing ideas in this area change considerable local ecosystem.

- Wave

This source is another important source of energy. Annual average power on the Atlantic coast is between 15 and 80 kW / m of coast. Prototypes of such plants are now in the phase of analysis and testing. Unfortunately, wave energy but can not be used widely because large areas occupied by plants capture

2.4 GEOTHERMAL ENERGY

Earth's temperature significantly increases with proximity to the center. In some areas of the planet, the deep water is found at very high temperatures. Geothermal high temperature (150 to 300 ° C) involves pumping the water to the surface through heat exchangers, steam is formed, which are then used in turbines, as with conventional thermal plants and thus produce electricity.

With a low temperature geothermal resources (less than 100 ° C) are extracted using heat pumps in order to release a quantity of heat for different needs.

Natural geothermal potential is still considered limited because there are many locations where he meets a very high temperature (greater than 200 ° C), but no water. This thermal resource can be exploited through technology "hot, dry rocks" developing. The principle consists in pumping the water through a well deep areas (above 3000 m) corresponding cracks in rock.

This reheated water up through another well and allows the generation of electricity as with conventional thermal plants. However, the potential of this type of energy is not clear.

2.5 BIOMASS

Can be considered a renewable energy, sustainable exploitation provided they (forest restoration and so

on). In general, the term biomass refers to a source that provides biofuels.

Biomass is the most abundant renewable resource on the planet. This includes absolutely all organic matter produced by metabolic processes of living organisms. Biomass is the first form of energy used by man, with the discovery of fire. Embedded energy in biomass is released by various methods, which, however, ultimately, is the chemical process of combustion.

Biomass is organic material made from plants and animals (microorganisms). Biomass contains stored energy from the sun. Plants absorb the sun's energy in a process called photosynthesis. The chemical energy in plants gets passed on to animals and people that eat them.

Biomass is a renewable energy source because we can always grow more trees and crops, and waste will always exist. Some examples of biomass fuels are wood, crops, manure, and some garbage [5].

2.6 BIOFUELS

Liquid biofuels are more expensive in terms of obtaining and produced on the basis of culture

energy (reed, cane, sunflower, wheat, corn, ...) are best placed amounting in applications from transport. They are currently used mainly to power heat engines, being mixed with small amounts of traditional fuels to improve their characteristics. The most famous are in this sense "bioethanol" and "biodiesel.

Bioethanol is the main liquid biofuel is produced around the world and especially in Brazil and the United States. World production is about 50 billion liters annually, of which 37 billion liters from two Aner. Materials most used are sugarcane and cereals.

Biodiesel is the second level of production but is in constant development. Main producers of biodiesel is the European Union, which produces more than 4 million tonnes of the world total of 4.6 million tons. As raw material mainly used canola oil and the sunflower.

It is estimated that production of biofuels will take a great scale; the annual increase in the last five years is over 15%. Romania has a huge potential biofuels market of about 600,000 tons per year. Several domestic and international companies have announced plans to build biofuel refineries in Romania.

2.7 GASEOUS BIOFUELS

Are mainly used in the household and transport, but also in industrial. Biogas is a complex of light hydrocarbons obtained by the decomposition of organic waste from non-recyclable waste, agricultural and industrial use in wet environments and without molecular oxygen. This process takes place naturally by decomposition of organic material settled on the bottom of still water or in other places where air enters. Main constituent of biogas is methane.

As raw material for biogas is used mainly garbage from livestock, aquatic plants and algae. The latter have an extremely high multiplier in a relatively short time, which creates a high availability of organic matter that can be used methanisation pathway. Methane is the component that gives the energy value of biogas. Besides methane, biogas also contains carbon dioxide, hydrogen, hydrogen sulfide, water vapor, ammonia, nitrogen, etc. various gaseous organic compounds. Due to the presence of these gases, calorific value of biogas is much lower than pure methane.

3. NATIONAL AND EUROPEAN ENERGY STRATEGY

3.1 THE INTERNATIONAL CONTEXT

According to New Energy Policy of the European Union (EU) developed in 2007, energy is an essential element of development in the European Union. But equally a challenge regarding the impact of the energy sector on climate change, increasing dependence on energy imports and increasing energy prices. To overcome these challenges, the European Commission (EC) considers absolutely necessary for the EU to promote a common energy policy based on energy security, sustainable development and competitiveness. In terms of security of energy supply, the EU expects natural gas import dependency will increase from 57% currently to 84% in 2030 and oil from 82% to 93% for the same period [2] .

Regarding sustainable development, it should be noted that in 2007 the energy sector, the EU, one of the main producers of greenhouse gases.

If not taking drastic measures at EU level, the rate of evolution of energy and existing technologies in 2007, emissions of greenhouse gases in the EU will increase by about 5% and about 55 global % until 2030. Nuclear energy in Europe is currently one of the largest sources of CO2-free energy. In 2007 nuclear power provides one third of EU electricity production, thus having a real contribution to sustainable development

European Commission proposes a set of documents that are new EU Energy Policy the following objectives:

- reducing emissions of greenhouse gases by 20% by 2020 compared with 1990.
- increasing the share of renewable energy in the total energy mix from less than 7% in 2006, 20% of total EU energy consumption by 2020, increasing the share of biofuels to at least 10% of the energy content of fuels use in transport by 2020;

- Reduce global primary energy consumption by 20% by 2020.

Scenario of increasing renewable energy use by sector and region is presented below in Table 1.

Table 1 Current and future scenario of the share of renewables in electricity, heat and fuels

Region	Electricity		Heat		Biofuels			
					Road		Aviation	
	2008	2035	2008	2035	2008	2035	2008	2035
OECD	**17%**	**33%**	**11%**	**23%**	**3%**	**12%**	**0%**	**3%**
Europe	21%	44%	12%	25%	3%	12%	0%	0%
United Stated	9%	25%	10%	25%	4%	15%	0%	4%
Japan	10%	19%	3%	7%	0%	1%	0%	4%
Australia/ New Zeeland	15%	31%	18%	41%	0%	2%	0%	0%
Non OECD	**21%**	**31%**	**9%**	**12%**	**2%**	**6%**	**0%**	**0%**
China	17%	27%	1%	5%	1%	4%	0%	0%
India	16%	26%	24%	19%	0%	16%	n.a.	n.a.
Other Asia	16%	31%	11%	15%	1%	4%	0%	0%
Brazil	84%	75%	47%	50%	21%	41%	0%	3%
Other Latin America	52%	65%	13%	15%	0%	5%	0%	0%
Russia	16%	28%	5%	5%	0%	2%	0%	0%
Meadle East	1%	16%	1%	3%	0%	0%	0%	0%
Africa	16%	39%	31%	37%	0%	2%	0%	0%
Overall	**19%**	**32%**	**10%**	**16%**	**3%**	**8%**	**0%**	**1%**
European Union	**17%**	**41%**	**13%**	**26%**	**3%**	**14%**	**0%**	**0%**

Where OECD countries are affiliated to the Organization for Economic Cooperation and Development

3.2 THE NATIONAL CONTEXT

In an economy increasingly globalized a country's energy strategy is done in the context of

developments and changes taking place in the world.

According to the regulations of the European Union, Romania was obliged to contribute to achieving the targets set by the European Commission on renewable energy. Thus was conceived the Romanian Energy Strategy that complies policy directions set out in the EU and contribute to achieving the targets set by the European Commission for all EU states.

Strategy for unlocking the potential of renewable energy is an important step for geothermal energy development in Romania on medium and long term by providing the appropriate framework for the adoption of best decisions and compliance measures agreed with the European Union[2].

Strategic objectives, in accordance with the European Union are:

- energy security by providing the necessary resources and limiting energy import dependency, diversifying import sources and routes of transport, raising adequate national transport networks of electricity, natural gas and oil.

- sustainable development by increasing energy efficiency throughout the chain: natural resources - production - transport - distribution - end use (3% per year reduction in energy intensity in the economy), promoting energy production based on renewable sources (RES), reducing the impact negative environmental energy sector rational and efficient use of primary energy resources. competitiveness through the development of competitive markets for electricity, natural gas, green certificates, liberalization of energy transit, development of international interconnections, further restructuring and privatization in the electricity, heat and gas[2], [3].

- reducing greenhouse emissions by 20% by 2020 compared with 1990

- increasing the share of renewable energy to more than 7% in 2006, 20% of all energy sources by 2020

- increasing the share of biofuels in transport to 5.75% and at least 10% of all fuels used in 2020

- reducing global primary energy consumption by 20% by 2020.

Table 2 National renewable potential

Source	National potential	Aplication
Solar energy	60 PJ 1,2 TWh	Heat Electricity
Wind energy (potential theory)	23 TWh	Electricity
Waterpower of which less than 10 MW	36 TWh 3,6 TWh	Electricity
Biomass and biogas	318 PJ	Heat Electricity
Geothermal energy	7 PJ	Heat

3. CONCLUSIONS

Although increased production of energy from renewable resources in recent years has been impressive, most of the world's energy demand is met by fossil fuels. In 2008, about 19% of the electricity produced globally from renewable resources. Therefore, the existence of government programs to make renewable energy attractive to investors, thus creating a market for them is the most important factor affecting the expansion of renewable energies. Incentives are already available in many countries and this is reflected in the growth rate of renewable energy.

Technologies we can use renewable have high capital costs requiring significant upfront investment, and most of them cannot compete on price with conventional technologies. Such cost reduction is essential for developing large scale renewable energy. Of course prices fell for many of renewable energy, but the goal is to further reduce as fossil fuel prices will increase in the coming period due to lower groundwater resources of the earth and the high demand for energy. Another potential obstacle or can springboard banks. Due to large capital to be invested in these technologies, many projects depend on loans. Bank policy to stimulate these projects will influence the development of renewable energy production technologies.

Geothermal area offers great growth potential. This requires the interdisciplinary collaboration of specialists in construction and engineering geologists, as well as the technical equipment of buildings. It also required extensive research and safer measurements. Of particular importance is here, research anisotropic thermal conduction and its dependence and laboratory tests and the sounding. Similarly, under the rules of measurement known engineering should be introduced uniform rules for geothermal work.

According to the Energy Strategy of Romania global electricity production from renewable resources will increase from 3,800 TWh to 11,200 TWh, while the share in total electricity generation increases from 19% to 32% in 2035. Use of renewable in heat generation increases this share to 10% in 2008 to 16% in 2035.

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