

ENERGY

*Renewable Energy:***RE-ACTIVATING TURKEY**

Energy is a must thing in everyday life. So, how do we supply the needs in an environmental friendly way? Thanks to the governmental and private incentives, renewable energy sources come into prominence in Turkey recently.

BY YAĞIZ ÖZERCAN



As demand rise, ever-increasing investments are made in the renewable energy by countries and international corporates. Considering the international politics circumstances, finding and investing in alternate energy sources have become crucial in global economic and political equilibrium.

Including solar, wind, wave, geothermal, biomass, hydrogen energy and hydropower; renewable energy sources come into fame with their considerably low-priced, and environmental-friendly qualities, as they look more profitable and ecologic compared to fossil-fuel exploration costs. Turkey is a resource-rich country in terms of renewables.

TURKEY'S ENERGY IN WATER

According to the Global Renewables report conducted by Renewable Energy Network for 21st century (REN21), in geothermal energy capacity ranking –after New Zealand- Turkey has the second best geothermal





capacity. Turkey has increased its geothermal capacity 23% in 2013. China with its 3.7 GW usage is the highest total geothermal energy use capacity. With its 2.7 GW capacity, Turkey comes into prominence in regard to geothermal energy potential. Turkey has also the second highest hydropower capacity after China.

Adding its energy output 2 GW in 2012, 2.9 GW with 2013, Turkey has managed to increase its year-end geothermal capacity to 22.5 GW in 2013, and to 23.7 GW in 2014.

INCREASE IN WIND POWER

Wind power increases its popularity throughout the world. Regarded as the energy-of-the-future, countries are in a race with regard to establishing systems into the wind power sector. New ventures in the field have been made in order to reduce the fossil-fuel dependency. According to world's established wind power statistics by Global Wind Energy Committee (GWEC), world's wind energy

has increased 12.5% compared to 2012. The data suggest that global wind energy has reached 318,515 MW in 2013 with an increase of 35,467 MW. 2012 increase on the other hand was 45,169 MW.

GWEC data indicate that Turkey's established wind energy has increased by 27.9%, twice as much the world average. Growing 646 MW, Turkey's wind energy has reached 2,958 MW in 2013. This progress made Turkey 7th in Europe, 13rd in the world in regarding new energy establishments.

Wind turbines cost only 2-6 cents. Wind farms produce energy 17 to 39 times more than they consume. For nuclear and coal plants, the rates are 16 and 11 times respectively.

Instead of fossil-fuels, obtaining 1 MW electricity via wind turbines, saves the world 1500 tons of CO₂, 6.5 tons of sulfur dioxide, 3.2 tons of nitrogen oxide and 25 kg mercury. The fact that it reduces fossil-fuel dependency, the world is shifting to wind energy recently.

According to the report conducted by Turkish Renewable Energy General Management (YEGM), regions with 6.5+ M/S wind velocity are taken into account, Turkey has a potential to produce 132,000 MW wind energy. The report suggests that there will be investment area worth of \$27.3 billion en route to 20 GW wind energy goal in 2023.

EASY-TO-INSTALL BIOGAS REDUCES COSTS

Especially in agriculture, renewable systems provide considerably low-priced energy opportunities in many fields. Biogas is a system which produces electricity and heat from greenhouse gases

that cause global warming.

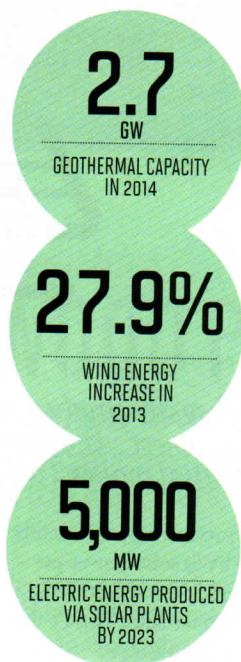
Biogas can be produced not only in the fertilizer plants, but also in all kinds of industry facilities. Including industry and rural areas, bio system can be installed in everywhere in need of electricity and heat.

HIGH QUALITY FUEL PRODUCED BY ANAEROBIC BACTERIA

Becoming a strong venture, the system produce high-quality fuel is provided by anaerobic bacteria. The system needs much more plain tech compared to traditional power plants and occupies less space. The levels of nitrate, phosphor, and potassium remain the same during the process, not to mention their densities arise. Thanks to the high-density fertilizers, farms' production capacity increase. According to the Ministry of Environment and Urban Planning and Turkish Electricity Transmission Company (TEİAŞ) data there's been 244 MW biogas production in Turkey.

SOLAR PLANTS' 2023 AIM IS 5,000 MEGAWATTS

Coming into prominence with its sunshine duration advantage as against northern hemisphere countries, Turkey has a major solar potential as well. According to YEGM data, Turkey has yearly 2460 hours of sunshine duration. Considering yearly sunshine domination by region, with its 2993 hours of duration South-eastern Anatolia Region comes the first. Followed by Mediterranean Region with 2956 hours, and East Anatolia Region with 2664 hours. Due to the fact that it's clean and unlimited, solar power can answer the needs from heating to electric producing, from illumination to hot water extraction. If the necessary investments are made, Turkey



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**FEHMI TANRISEVER**

Research Center Director, TENVA

While energy policies are developed in Turkey, settling the deficit as well as maintaining the demand security must be our main concerns. Another crucial point in this regard is the use of national input. Turkey's incentive on solar power is set as 13.3 cent/kWs. This is a reasonable and feasible price regarding the sustainability of the new ventures.

While renewable energy venture and incentives are planned, long-term effects on other production resources and minimum ten years integrity plans must be made. In this regard, energy storage and incentives for production balancing systems must be prepared in parallel with renewable energy investment incentives. If new investments are planned by taking network balancing problem into consideration, 10% to 15% of Turkey's electricity can be obtained via solar, wind, and other renewable sources (except barrages) without increasing electricity prices too much.

**TÜLİN KESKİN**

Managing Consultant, Yeşil Güç Energy and Environment Consultancy

Turkey has been among the countries whose energy demand increased tremendously. As energy demand increased, new energy generation methods gained importance and thanks to Turkey's unique potential regarding renewable energy resources, this new phenomenon attracted investment and public interest.

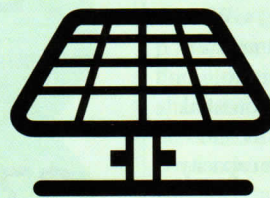
Turkey has been trying to reduce fossil energy usage in accordance with international agreements since 2009, and have set objectives to increase the share of renewable energy. To support this, purchase guarantees and other incentives as well as regulations to provide a convenient infrastructure are put into practice.

The positive developments make us optimistic regarding the future.

Renewable Energy State Guaranteed

Various incentives are presented in order to reduce Turkey's import and fossil-fuel dependency. One of these incentives is that from now on unlicensed electric power producers do not need to apply for a license for any production below 1MW, which increases new demands. According to the Ministry of Environment and Urban Planning, there has been 1275 unlicensed electric power producing appeals have been made since October 2012. 417 projects that are in decision phase are equal to 278 MW. There are 156 unlicensed accepted projects in the past two years which correspond to 56 MW energy power. 1142 people

applied for solar power plants, as 148 of the 156 plants on the run are solar plants. Other production plants include 5 biogas, 2 cogeneration units and one wind plant. Surplus products of renewable plants will be evaluated within the scope of Renewables Support Mechanism by retail sale licensed regional distribution companies. However, there should be a constant consumption in the production area. Renewables Support Mechanism is purchase mechanism under the courtesy of TEİAŞ. The system is not for state-run purchasing, but to guarantee the production flow by the government.



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According to Turkish Minister of Environment and Urban Planning, total installed solar power in the world has reached from 67 GW to 138 GW in 2011-2013. With its yearly 2640 hours of sunshine duration, Turkey shows a great potential. The report conducted by TEİAŞ in 2015 states that 44.8 MW electric energy is

been producing in Turkey thanks to the solar plants. Pulling new ventures in this regard, it's been planned to produce 5,000 MG energy from installed solar plants by 2023.

Turkey makes a claim in hot-watering systems as it's the second highest producer in the world after China. As geopolitical position is crucial in the sector, Turkey occupies the fourth position in terms of capacity and installed power, after China, United States and Germany.