

## ARTIFICIAL INTELLIGENCE WILL REVOLUTIONIZE RENEWABLE ENERGY PRODUCTION

Electricity generation from wind, solar, geothermal, biomass and water power is rapidly increasing in Turkey and around the world. With the pandemic, which began affecting Turkey since March, the importance of energy that the countries need has become ever more evident. The solution to address the growing need for energy in all areas is renewable energy, says Dr. Füsün Tut Haklıdır, Secretary General of Association for Renewable Energy Research (YENADER), and adds: "To maximize the efficiency of renewable power plants, we must drive rapid adoption of new control technologies, predictive maintenance and artificial intelligence applications for renewable power plants." It has become an inevitable necessity for countries to achieve self-sufficiency on their energy supplies which their industries and manufacturing sectors need. Particularly during the pandemic, Turkey has shown that it can be self-sufficient, with its capacity for electricity generation from renewable energy sources, as evident in the data released by the Ministry of Energy and Natural Resources, which highlight record levels of energy production from renewable sources. Also, based on the reports released by the International Energy Agency, oil, which carried a strategic value since the 1990s, will be gradually and largely replaced by electricity from 2020, says Dr. Füsün Tut Haklıdır, Secretary General of Association for Renewable Energy Research (YENADER), and adds: "The growing importance of renewable energy has highlighted the need for adapting new control technologies, predictive maintenance and artificial intelligence applications to power plants without delay, to ensure they operate to maximum efficiency. Also, the combined use of hybrid energy systems using multiple sources of energy and in particular, the combined use of "binary organic rankine cycle geothermal power plants" and "solar power systems" will enhance the efficiency of air-cooled geothermal power plants in summer months. These hybrid systems will be therefore diversified according to the energy needed and renewable energy potential of regions. Legislation governing this matter has been recently announced to energy sector stakeholders." **STORING ENERGY VIA MICRO-NETWORK SYSTEMS.** Micro-network systems are a new system involving storage of electricity and use of electric charging stations which allows combined use of multiple renewable energy sources, Füsün Tut Haklıdır says and adds: "These systems can be designed to enable providing electricity to regions far from the main network, and any surplus is fed back into the main network. Legislation allowing use of such micro-network systems is being introduced in Turkey." **BOTH HEATING AND COOLING IS POSSIBLE WITH RENEWABLE ENERGY.** Today, we can derive both heating and cooling from geothermal, bioenergy and solar power. Examples of such uses exist around the world. The hot and arid months, which are becoming more common with climate change, is driving up energy use for cooling and use of renewable energy sources for this reason will help contain carbon and other harmful emissions. In these systems, as with natural gas, it will be possible to simultaneously generate electricity, heating and cooling, so called "trigeneration applications." **NEW TECHNOLOGIES TO ADDRESS ENERGY NEEDS AGAINST DROUGHT.** Roof-installed solar panels, use of off-shore wind turbines and installation of small hydropower plants in regions where rainfall and water are critical, channeling water to reservoirs during the arid season, enabling pumped hydropower plant systems are among the potential technologies in renewable energy. In conclusion, the new technologies will enable meeting the demand for energy completely against drought.