

International examples show that it is justified to invest into these facilities - pumped-storage hydroelectric power plants can replace up to 50% of nuclear and coal-fired power plants, they are easy to control, and up to 75% more efficient in storing energy.

Pumped-storage hydroelectric power plants reduce electricity generation costs and maintain solar and wind energy unpolluted, resulting in power system stability and efficiency. The potential of pumped-storage hydroelectric power plants for efficient and economical storage of electricity generated by wind turbines and solar power plants, run-of-river hydroelectric power plants as well as thermal and nuclear power plants, was analysed by the authors of this paper Aleksandar Gajic, Vladimir Stevanovic, Stanislav Pejovic and Brian Carney at the 31st international conference Energetika 2015.

Nowadays, integration of wind turbines and solar power plants into power systems is becoming more frequent, considering that they represent intermittent renewable energy sources both daily and in the long run. Wind and solar are unpolluted and renewable sources of electricity, while their energy capacity is fastest growing and renewed. Nuclear and coal-fired power plants can change their capacity based on variable demand, but with high maintenance costs. Gas turbine plants and gas engines also pollute the environment and contribute to climate change, while their pollution levels are similar to the levels created by the coal-fired power plants.

Pumped-storage hydroelectric power plants are commonly used to store energy, and they are traditionally developed close to rivers and lakes. However, new solutions have recently appeared using natural resources for these purposes, such as using the sea as the lower reservoir in Japan or proposals to have the upper reservoir above ground and the lower reservoir below ground.

Various analyses show that it is justified to invest into the pumped-storage hydroelectric power plants. International examples demonstrate that solutions with underground reservoirs can be repaid in seven to ten years or even five years while achieving the maximum possible income, whereas the pumped-storage hydroelectric power plants with surface reservoirs can be repaid in as much as four to six years.

Pumped-storage hydroelectric power plants can replace up to 50% of nuclear and coal-fired power plants, they are easy to control, and up to 75% more efficient in storing energy. It may be wrong to conclude that these facilities are harmful to the environment, as harmful gases are realised during their operation. However, more detailed analysis shows that this is not the case, as harmful gases emissions may be reduced. It is interesting that plants and technologies used for over a century continue to face these challenges. Therefore, all the knowledge and experience is of crucial importance to improve their deficiencies, transmits Serbia-energy.eu