

ENERGY SAVING TECHNOLOGIES

Illia Yanhol

*Educational and Research Institute of Nuclear and Heat Power Engineering,
National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute”*

With the rapid development of manufacturing, research, and entertainment technologies, the world faces energy management issues due to the extremely high electricity consumption required. Wise energy saving may be a perfect solution for both the insufficient electricity generation problems and the depletion of energy resources. The average household consumer can save significant energy at the same efficiency by taking the following steps:

1) setting insulation of the house by replacement or sealing of windows, thermal insulation of the roof (Competently insulated household may save you up to 20-30% of heat!);

2) modernization of the ventilation system by installing heat exchangers;

3) replacing a gas boiler with a solid fuel one;

4) transitioning to LED lighting can significantly reduce your energy consumption from lighting;

5) “Smart house” system and smart thermostats may also be useful companions, which will analyze your energy consumption and prepare an optimal solution;

6) switching to an alternative energy source such as solar panels or domestic wind turbines.

Businesses, government institutes, and small and huge industrial manufacturers can also use the same technologies to prevent inefficient energy loss. Industrial facilities use more complex energy-saving technologies such as variable speed drive in motor-operated systems, highly efficient motors, efficient nozzles in a compressed-air system, waste heat recovery systems in boilers, etc. Another important branch of energy consumption is transportation, which is widely used both for civil and industrial purposes. A modern solution for energy consumption of transportation is

switching to electric and hydrogen vehicles. Hydrogen-powered vehicles are already being produced by such companies as Toyota, Honda, and Hyundai. In 2016, the first hydrogen train was presented in Germany. Electric cars are known for their high efficiency which is around 90-95%, while the efficiency of the internal combustion engine is around 20% (25% for diesel).

From their side, the government is obliged to support and encourage everyone to use energy resources wisely and to transition to more energy-efficient technologies. Standards established by the state are a guideline not only for household consumers but also for factories and enterprises of all kinds. The main measures of state policy in the field of ensuring energy efficiency are giving preference to energy-efficient measures that reduce energy demand; popularization and use of highly efficient technologies, energy management systems, energy consumption monitoring systems, and facilitating the conduct of systematic comprehensive research in the field of energy efficiency for the development of scientific foundations for the creation of the latest energy-efficient processes and technologies.

References:

1. State Agency for Energy Efficiency and Energy Saving of Ukraine (State Energy Efficiency). Retrieved from <https://saee.gov.ua/uk>
2. Law of Ukraine “About energy efficiency”. Retrieved from <https://zakon.rada.gov.ua/laws/show/1818-20#Text>
3. Searchable web-based bibliographic database ScienceDirect. Retrieved from <https://doi.org/10.1016/j.rser.2010.09.003>
4. Gnatov, A.V. Synopsis of lectures on the discipline ENERGY-SAVING TECHNOLOGIES IN TRANSPORT, pp 25-37, 2021. Retrieved from <https://dspace.khadi.kharkov.ua/handle/123456789/4809>