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Main Advantages of Applying Thermal Power Stations

Thermal power station is a power plant where heat energy is converted into electric power. The greatest variation in the design of thermal power stations is due to the different heat sources. Fossil fuel dominates here, although nuclear heat energy and solar heat energy are also used. The direct cost of electric energy produced by a thermal power station is the result of cost of fuel, capital cost for the plant, operator labour, maintenance, and such factors as ash handling and disposal. Indirect, social or environmental costs such as the economic value of environmental impacts, or environmental and health effects of the complete fuel cycle and plant decommissioning, are not usually assigned to generation costs for thermal stations in utility practice, but may form part of an environmental impact assessment.

However, thermal power plants are considered to be the main polluters of the environment. They provide a harmful effect on the atmosphere, hydrosphere and lithosphere, consuming a huge amount of oxygen during combustion of fuel. To avoid an environmental pollution, a thermal power plant are encouraged to apply a variety of solutions that, unfortunately require such significant costs as: enrichment of fuel, reducing ash content and sulphur content; supply of basic equipment in conjunction with environmental protection; application of mechanical, electrical and fabric filters for cleaning flue gases from solid particles; suppression of formation of nitrogen oxides by controlling the combustion process with the help of special burners and flue gas recirculation; reduction of sulphur oxides emissions by wet or dry lime method; use of slag as raw material for the production of building materials and road surfaces. The thermal power station, in comparison with other power stations, has a very low efficiency. For example: the hydroelectric power plant has the highest efficiency - 92-95%, the nuclear power plant - 80% and the thermal power plant has an efficiency of not exceeding 34%. To increase their efficiency some thermal power plants are switching to gas. It should be mentioned that gas has its advantages in comparison with coal.

Thermal power plants also make possible to use a new highly efficient environmentally friendly technology for coal combustion. Its essence is to abandon the ineffective technology of flare combustion of finely ground coal dust in conventional boilers and move to a fundamentally new technology for burning solid fuels in a circulating fluidized bed at atmospheric pressure. This technology ensures high profitability, reliability, as well as ecological purity and manoeuvrability of modern thermal power plants. Nowadays it is considered to be the most promising method of reconstruction and construction of new power units of thermal power plant.