plants in Bangladesh may be divided into two categories: Hydro and Thermal. In the eastern zone, five hydro-power plants are operating, having installed capacity of 250 MW. Excepting these units, the rest of generation is on thermal source.

The thermal power stations include steam turbine compression turbine and combined cycle comprising of steam turbine and compression turbine. All of the thermal power plants are operating on gas. All of the power plants in the western region except Baghabari are operating on liquid fuel including furnace oil, SKO, HSD, and LDO, because of non-availability of gas in that area.



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Based on the type of fuel being used, either gas (85%), liquid fuel (10%) or hydro (5%), the Power Plants can be divided into the following:

The installed generating capacity including public and IPO is about 5,000MW. The IPO has been excluded from the exercise, which means the generating capacity in the public sector is 3,500-4,000. As already spelled out, the thermal power plants running on gas use three modes of generation: Compression Turbine (CT) Steam Turbine (ST), Combined Cycle (CT+ST).

The CT and CC modes of generation have been excluded from the exercise as the built-in system does not allow to use liquid fuel in place of gas in operating such plants. Only the ST mode of power plants can be changed to liquid fuel. According to the estimate the total installed capacity of generation on ST mode is about 2,000MW, which means 60% of the thermal generation is based on steam turbine alone.

The steam turbine operates on a simple thermo-dynamic cycle. Steam generated in the boiler is fed into a steam turbine where it expands and produces mechanical power, which is converted into electrical energy by the generator coupled with it. The steam after expansion in the turbine condenses into water in the condenser and recycled in to the boiler for generation of steam for further feed into steam turbine. For economy, some turbines have multiple extraction stages of descending order of steam pressure down from superheated steam to saturated steam. The steam boilers have different kinds of heating sources for producing steam.

According to modern practice, boilers operate on four types of fuel--: Nuclear, Solid (coal), Liquid (furnace oil) and Gas.

The nuclear energy-based power plants have basically a reactor in which the chain reaction proceeds to provide means of using the released energy for heating a working substance (steam) in a heat engine (turbine) to produce power.

The traditional coal-based power plants are somewhat clumsy and dirty. They have moving chain grates, which are endless chains that move continuo usly during operation. A bed ofcoal of uniform thickness is fed to the grate at one end. The volatile matter is soon distilled and burning continues at such a rate that practically ash is left at the opposite end of the grate. Air for combustion enters opening the sides of the grates and passes up through the grates' bed of fuel.

The modern coal-fired boilers have been much cleaner and are free from such clumsiness. Presently pulverised coal is being used as fuel. The coal is ground into fine particles. The burners are designed in such a way that this powder is sprayed into the boiler furnace under controlled air fuel mixture and burns like a vaporised fuel.

The furnace oil-based power plants use a burner where furnace oil at a controlled air-fuel mixture burns and the burned gases heat the boiler tubes to produce steam for feeding the stem turbine at a controlled pressure and temperature where it expands to produce mechanical visa vis electrical power.

The gas-based power plants also use burners where the gas in conjunction with air at controlled rate burns and the burned gases produce steam and power in the same fashion. There is a close similarity with a gas-based power plants and furnace oil based power plants. The only difference is the type of the burners being used in the sys tem.

So, by replacement of the gas burner with oil burner, a gas-based power plant can be changed to furnace oil-based power plant. This will need no modification of the furnace or tubes of the boiler. For the gas-based power plants, no storage of fuel is required as the gas is fed from the grid line. In case of