GAS TURBINE

The hot flue gases exiting the combustor spin the gas turbine. The gas turbine rotates at 3,000 revolutions per minute (rpm) and is mounted on the same shaft with the generator and compressor. The turbine's kinetic energy is used partly to run the compressor, and partly to spin the generator. Exhaust gases exit the turbine at a temperature of 560°C and a pressure of 1.5 bar.

COMBUSTOR

Natural gas, injected at a pressure of 30 bar, and compressed air join here. The gas and air are mixed and burned, producing combustion gases which have a temperature of about 1,500°C and a pressure of 17 bar.

FILTER

COMPRESSOR

NATURAL CAS

The compressor compresses air from its normal pressure of around 1 bar to 17.2 bar.

GENERATOR The gas turbine spins the electricity at a voltage of 19 kV.

COMBUSTION

STEAM TURBINE

HEAT RECOVERY STEAM GENERATOR

HEAT RECOVERY BOLIER

can be utilized by producing steam in the heat recovery vaporized into steam by the cooling combustion gases.

STEAM TURBINE

The steam turbine is spun/driven (at 3,000 rpm) by steam Here, just as in the gas turbine, thermal energy is converted into kinetic energy.

GENERATOR The gas turbine spins the generator at 3,000 rpm, which generates

R

electricity at a voltage of 19 kV.



GAS TURBINE: 36–40% efficiency **STEAM TURBINE:** 16–20% efficiency **OVERALL EFFICIENCY OF THE COMBINED CYCLE:** 52–60%

About 52–60% of each 1 MWh of energy is turned into electric power, which means it generates 0.52–0.6 MWh of electricity.