

A method for transformation of heat energy to mechanical energy includes the processes: the air compression, its separation to primary and secondary air in combustion chamber; secondary air is mixed with water vapor, with following mixing of vapor-air mix with combustion products; expansion of the gas-vapor mix formed, with its potential energy transformation to mechanical energy; the used gas-vapor mix (worked-out gases) heat utilization, with formation of overheated vapor and saturated water; additional cooling of worked-out gases with water vapor condensation, condensate supply to the boiler-utilizer and saturated water supply to mass-exchanger, this after partial evaporation and cooling is extracted from the mass exchanger and mixed with condensate; saturated water in heat exchanger is brought to contact with fuel gas, this is at that heated and saturated with water vapor, extracted from the mass-exchanger, mixed to primary air in combustion chamber and burned. This method is realized by the gas-turbine unit. The gas-turbine unit includes air compressor, combustion chamber with primary and secondary zones, gas-steam turbine, this is connected to the mechanical energy consumer, and arranged in sequence in direction of motion of the worked-out gases boiler-utilizer with drum-separator and condenser, this by its outlet by condensate, through deaerator and pump, is connected to the inlet of the boiler-utilizer; and heat-mass-exchanger, this is by its inlet by water connected to the drum-separator, and with the outlet, through deaerator and pump, to the inlet of the boiler-utilizer; heat-mass-exchanger is with its inlet by gas connected to the control system for fuel gas to gas-steam turbine unit supply control, and with the outlet it is connected by gas-steam mix it is connected to the primary zone of combustion chamber.