The primary subject of this paper is to investigate the coal gasification-based integrated power process for multigeneration aim, such as electricity, heating, cooling, fresh and hot water, hydrogen production and liquefaction. This suggested work consists of the gasification process, Rankine cycle with two turbines, organic Rankine cycle, single effect absorption cooling cycle, membrane distillation process, PEM electrolyzer and hydrogen liquefaction cycle. The thermodynamic assessment is utilized to examine the investigated system efficiency, and also the effects of some process indicators on the energetic and exergetic performance of integrated plant and its sub-systems are investigated. The energy and exergy efficiencies of the proposed plant are calculated as 58.47% and 55.72%. In addition, the overall irreversibility of system is found as 65126 kW. The outcomes of thermodynamic evaluation show that the varying temperature of coal gasifier, combustor and exhaust gas affect the whole system performance.