In this study, the thermodynamic analysis of a combined geothermal energy based hydrogen production and liquefaction process is investigated in detail through energy and exergy approaches. The present hydrogen production and liquefaction process consists of the combined geothermal power system, the PEM electrolyzer, the hydrogen liquefaction and the storage sub-system. The exergy destruction ratios and exergy efficiencies of the entire system and its components are calculated through the balance equations for mass, energy, entropy, energy and exergy, and hence energy and exergy efficiencies. Finally, the effects of some design parameters and system indicators on the hydrogen production and liquefaction system exergy destruction rate and exergy efficiency are investigated for evaluation.