CO2 capture기반 천연가스원료 발전소의 Zero Emission-LCA기반 환경영향 평가

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Different concepts for natural-gas-fired power plants with CO2 capture are investigated, and compared based on the net plant efficiency and CO2emission. The cycles were based on a six oxy-fuel, one post-combustion and two pre-combustion capture concept. To evaluate the system environmentally the Advanced Zero Emission Power Plant (AZEP) concept is compared with a conventional combined cycle power plant applying the Life Cycle Assessment (LCA) method using SimaPro model. The LCA study was built upon the calculation and the comparison of several impacts (CO2, CO, NOX, and SOX emissions, water consumption and primary energy) as well as several impact categories (climate change, acid rain, ozone depletion and Ecotoxicity). The results showed that for all studied impacts, the AZEP power plants have fewer impacts. However, compared to the conventional combined cycle power plants, the total primary energy consumption in the AZEP concept is bigger due to the lower electric efficiency.

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