

Electric Power via NET Power

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Abstract

NET Power is a promising recent development in the search for zero-emissions dispatchable power. It utilizes the NET Power cycle, formerly known as the Allam-Fetvedt cycle, which is a modified Brayton cycle using supercritical carbon dioxide (CO₂) as the operating medium to support the oxycombustion of natural gas. The technology is being commercialized by NET Power (Durham, North Carolina), a company owned by Baker Hughes, Constellation, Occidental Low Carbon Ventures, and 8 Rivers Capital. NET Power has built a 50 megawatt (MW) thermal input demonstration plant at La Porte, Texas, the United States. This facility has been used for testing since early 2018. Several parties have publicly announced prospective utility-scale commercial implementations of this technology in the 300 MW net output range (550 MW thermal).

In this review we examine the economics of generating electric power from natural gas via NET Power. Our basis of design is an Nth-of-a-kind (NOAK) implementation at 325 MW. We present capital cost and levelized cost of electricity (LCOE) estimates. We also present a side-by-side comparison with a natural gas combined cycle (NGCC) plant by which we estimate the cost of CO₂ avoided.

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