

## 130 kWh low-carbon economy

To the authors' knowledge, this study presents the first comprehensive and optimised techno-economic analysis of a CCGT fitted with post-combustion CO<sub>2</sub> capture operating with a scope 1 carbon intensity of 0.0 gCO<sub>2</sub> e/kWh. This is achieved by designing the PCC plant to achieve a gross capture fraction of 99.16% in the absorber column.

The data collected in this study shows that solar, wind, geothermal, tidal, large and small hydropower, nuclear, and other low-carbon technologies vary in their lifetime costs, the amount of greenhouse gas emissions per kWh, air pollution and related health implications, as well as the amounts of required materials and minerals.

To achieve climate-adaptive energy resilience and low-carbon transformation, main challenges include socio-economic equality access, deployment of charging piles and smart charging development for electric vehicles, battery circular economy in integrated rural-city energy systems, and carbon intensity of battery circular economy.

For power supply from fossil fuels with CCS, bioenergy without CCS and hydropower, specific GHG emissions range from 78 to 109 gCO<sub>2</sub> eq kWh<sup>-1</sup>, while nuclear, wind, photovoltaics (PV) and ...

Low-carbon electricity or low-carbon power is electricity produced with substantially lower greenhouse gas emissions over the entire lifecycle than power generation using fossil fuels. [citation needed] The energy transition to low-carbon power is one of the most important actions required to limit climate change. [1]

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Web: <https://www.kary.com.pl/contact-us/>

Email: [energystorage2000@gmail.com](mailto:energystorage2000@gmail.com)

WhatsApp: 8613816583346

