15 kWh low-carbon economy

15 kWh low-carbon economy

After modeling, economic efficiency, such as industrial output and profit, of the whole industry improved, environmental impacts, such as carbon emission and solid waste output, decreased, and...

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

Section 5 presents the low carbon and economic benefits of the proposed seasonal carbon trading mechanism for the integrated energy system. Additionally, it is demonstrated that combining electricity sharing with inter-seasonal carbon quota sharing can further improve the system"s low-carbon and economic performance.

With a declining cost of production, green hydrogen will progressively become a clean alternative to fossil fuels in many applications. At $1/kg - equivalent to $7.5 per million British thermal units of heat (MMBtu) - it will be economically viable to decarbonize even the most challenging sectors without a burdensome carbon price.

Thank you for visiting nature . You are using a browser version with limited support for CSS. To obtain the best experience, we recommend you use a more up to date browser (or turn off compatibility mode in Internet Explorer). In the meantime, to ensure continued support, we are displaying the site without styles and JavaScript.

From the entire sectorial and technological view of the regional chemical industry, substantial potential for optimizing the utilization of local resources could be obtained by applying diverse technologies under the RRIEDOM framework.

There is a discernible shift in economic contributions when examining this transition from an industry perspective. The original structure, predominantly SLI-dominated with a contribution of 76.32% amounting to 7.2 billion USD, is transformed into an LDPI-dominated structure, where the LDPI contributes 49.7%, which is equivalent to 26.3 billion USD. Furthermore, carbon emissions are transitioning from being primarily attributed to SLI, accounting for 80.4% and totaling 32.3 million tons, to being driven by OCI, which now accounts for 36.4% and totals 6.52 million tons.

The results of the optimal structure exhibited significant potential for energy savings, resource savings, and environmental protection. It is essential to investigate the possible transition path from the original structure to the optimal structure to reveal the properties of the different paths concerning the environment, resources, and the economy.

In addition to technological optimization, the potential of alternative carbon reduction measures (ACRMs) must be addressed. We further discussed the variation in carbon reduction measures in terms of the method, cost-to-benefit ratio, and effectiveness (Fig. 5). Implementing carbon reduction technologies yields substantial reductions in carbon emissions across different scenarios. The emission reductions in these scenarios range from approximately 1.35 to 4.16 x 108 tons, constituting approximately 27% to 56% of the total actual carbon emissions for each scenario.