

行政院原子能委員會
委託研究計畫研究報告

研究 SOFC 結合微渦輪機系統設計技術
Parametric Configuration Design
of
SOFC/Micro Turbine Hybrid System

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中文摘要

現今大規模的發電技術正面臨能源枯竭及環境污染等問題。世界上之高能源需求區域，特別是開發中國家，其工業與人口的成長加速石化燃料的消耗速率，全球各石化能源產區，總存量已漸漸枯竭，對於能源進口依賴度高國家，如台灣，在下一次能源危機出現時，將成為首當其衝的受害者。

二十世紀末，能源使用所面臨的挑戰為：尋求下一個世代的發電技術。該發電技術必須符合兩個特點：一、一個全新的能量轉換科技；二、相較過去的發電方式必須具有更高優勢或潛力，如分散發電、更高便利性與安全性、低氮化物與溫室氣體排放、低碳污染、能源再生性等特點。氫能源技術中的高溫固態氧化物燃料電池(Solid Oxide Fuel Cell)結合氣渦輪機混成系統，符合以上所有特點，頗具潛力成為下世代的新能源發電技術。

關鍵字：高溫固態氧化物燃料電池、混成系統、氣渦輪機

Abstract

Large scale and high efficiency power plants are facing two severe problems: energy crisis and fossil fuel pollution. Several regions have great demands for electric power, including developing countries. This is due to increasing consumption rate of fossil fuel by the industry. It is a warning sign that global fossil energy sources is in crisis, especially for countries depending on energy imports, such as Taiwan. We must find a solution for this crisis.

For decades, global energy markets are facing challenges of searching new power generating technology. Besides higher efficiency, the new power technology must meet the following requirements: a new transform process, distributed generation, mobile ability, safety, lower emissions, and multi fuel type capabilities. Matching all the above criteria, a solution rises from the hydrogen technology, which is solid oxide fuel cell combined with gas turbine. This can provide a powerful answer for the next generation power sources.

Keyword: SOFC, hybrid system, gas turbine