

高效率固態氧化物燃料電池技術開發暨產業化平台建構

執行單位

核能研究所

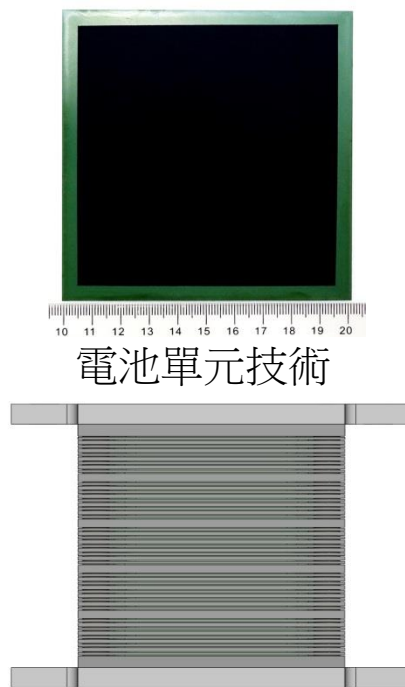
計畫主持人

李瑞益

- 計畫目前所研發之SOFC相關技術，除持續核心關鍵技術的精進外，將結合國內產學研之量能，開發及建置3-5 KW SOFC系統原型，進而推廣其應用端，可涵蓋家庭、超商及小社區之定置型發電。

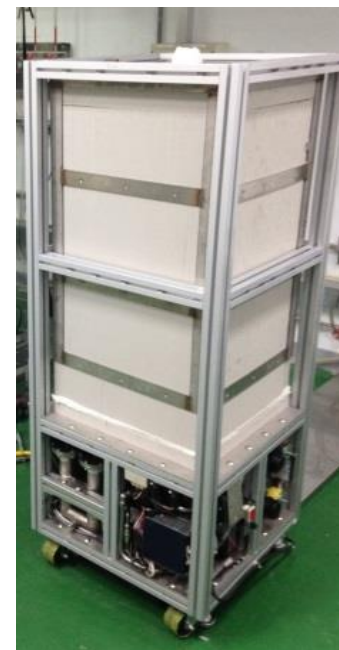
- 玻璃-陶瓷組成物之封裝材料 (US7897530B2)
- 用於燃料電池之密封材料 (US8012895B2)
- 高整合固態氧化物燃料電池膜電極組合元件 (SOFC-MEA電池片單元) 之創新複合增效製作程序與配方 (US7,914,636B2)
- 陽極創新處理程序以提升固態氧化燃料電池之膜電極組輸出電功率密度(US7,815,843B2)

共33件SOFC相關專利應用於國內業者之技轉案。



電池單元技術

電池堆技術



發電系統技術

- 核研所SOFC研發團隊建立從粉末→電池單元→封裝材料→電池堆→觸媒→發電系統之完整技術鏈，並具國際競合力之核心技術能量，系統發電效率大於42%。
- 獲得歐美日及我國的專利170件以上。執行3項技轉案、2項技術授權案及多項技服案，收入總額55,000千元以上，透過技轉、技術授權、技服等方式，將技術應用推展至產業界。
- 2015及2016榮獲第12屆及第13屆國家新創獎-學研新創獎；2016年獲德國紐倫堡發明展金牌獎。此外，2012年獲得台北國際發明暨技術交易展最高榮譽「發明競賽鉑金獎」；2013年榮獲「102年度國家發明創作獎-發明獎銀牌」。
- 團隊成員長期擔任歐盟燃料電池論壇國際諮議委員、美國陶瓷學會籌組委員、日本陶瓷學會編審委員、國際期刊審查委員、議程主席等等，提昇臺灣在國際間之聲譽及能見度。

Development of the high-efficiency solid oxide fuel cell technology and establishment of the industrialization platform

Execution Unit

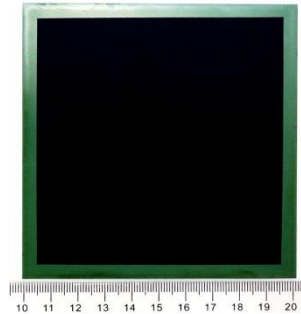
Institute of Nuclear Energy Research

Project Director

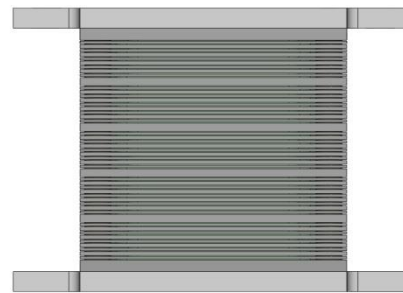
Ruey-Yi Lee

- The goal of the project is to develop the SOFC core technologies associated with a prototype 3-5 kW SOFC system so as to foster its industrial applications on stationary power supply for residence, convenient stores or small communities.

- Glass-ceramic sealant for planar solid oxide fuel cells (US7897530B2)
- Sealing material for solid oxide fuel cells (US8012895B2)
- A novel synergistic process and recipe for fabrication of a high integrity membrane electrode assembly of SOFC (US7,914,636B2)
- Over thirty SOFC-related patents have been employed to domestic companies for technology transfer.



Cell



Stack



System

- Institute of Nuclear Energy Research (INER) has established the powder-to-power core technologies on material powder, sealing material, stack, catalyst and power system. The electrical efficiency of INER's SOFC system is over 42%.
- Over 170 SOFC-related patents have been granted from Europe, Japan, USA and Taiwan. Technology authorizations, technology services, and technology transfers have been conducted on cells, stacks, and power systems.
- National Invention medals in 2015, 2016, a gold medal in iENA international trade fair 2016, a platinum medal in Taipei international trade fair 2012, and tens of medals have been awarded in different patent contexts.
- Team members are obligated to serve as an international board advisor of European Fuel Cell Forum, an SOFC symposium organizer of International Conference and Expo on Advanced Ceramics and Composites, session chairs of conferences, reviewers for international journals.