

多元燃料流化床純氧燃燒減排關鍵技術開發與整合

執行單位

國立成功大學

計畫主持人

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本計畫建置並維運自主之工業先導級多元燃料燃燒節能減排核心設施，提供產業相關技術開發與導入驗證之測試平台；並整合示範200 kW工業先導級多元燃料純氧燃燒技術、開發10KW 多元燃料氣化結合化學迴路純氧燃燒系統。

專利獲證

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| 1. 「用於有機生質之熱解系統」 | 中華民國發明專利：證書號碼I444462 |
| 2. 「用於有機生質之熱解系統」 | 大陸發明專利：證書號碼1406010 |
| 3. 「微生物燃料電池」 | 中華民國發明專利：證書號碼I407622 |
| 4. 「碳水化合物之生產裝置」 | 中華民國新型專利：證書號碼M478026 |
| 5. 「高碳水化合物之生產方法」 | 中華民國發明專利：證書號碼I437095 |
| 6. 「高溫爐內攝影系統」 | 中華民國新型專利：證書號碼M537201 |
| 7. 「奈米熱劑及其製造方法」 | 中華民國發明專利：證書號碼I592476 |

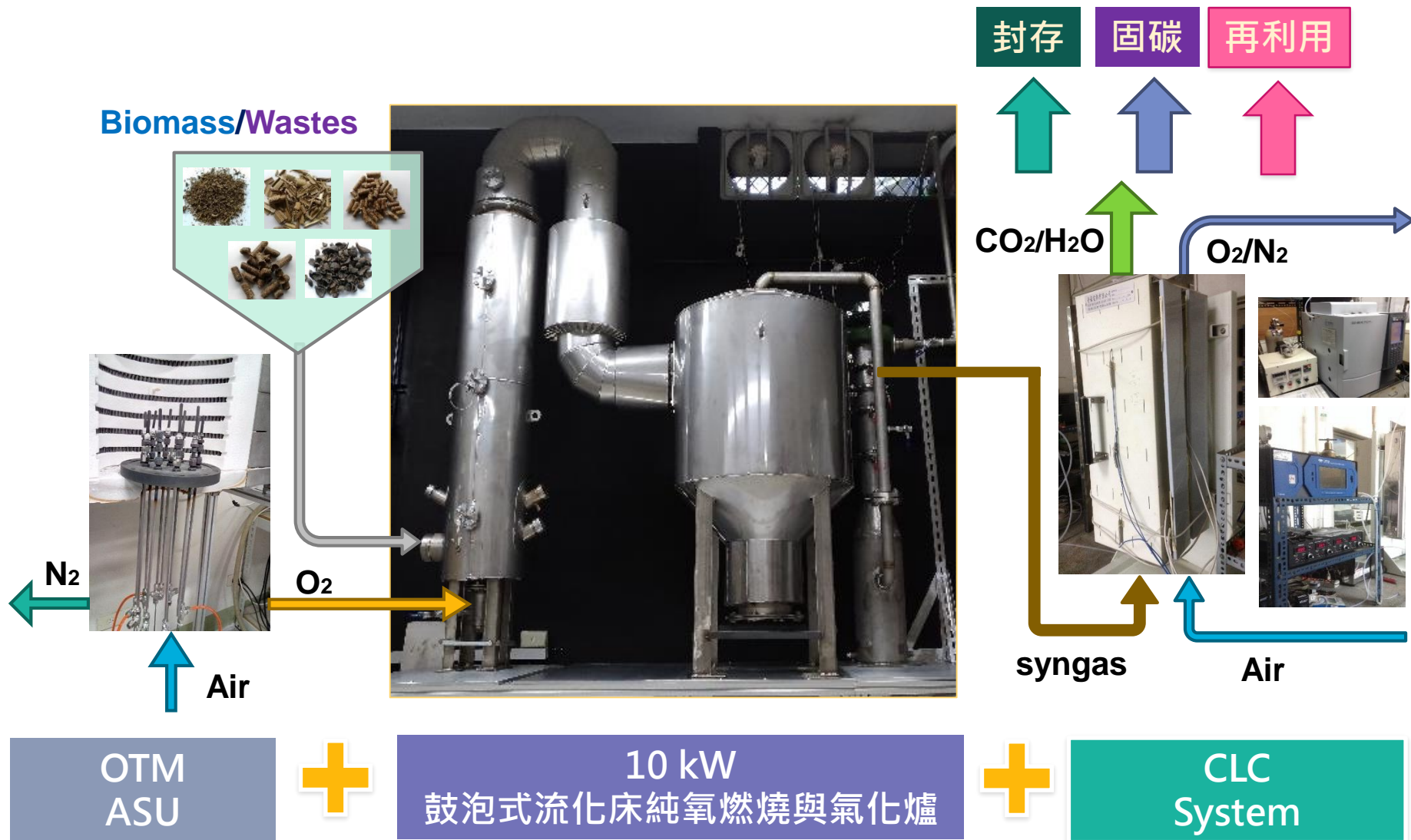
工業先導級多元燃料燃燒節能減排核心設施



200 kW工業先導級多元燃料純氧燃燒整合示範



10 kW多元燃料氣化結合化學迴路純氧燃燒系統



● 技術介紹：



280 kW固態與液態燃料燃燒實驗爐



100 kW氣態燃料實驗爐



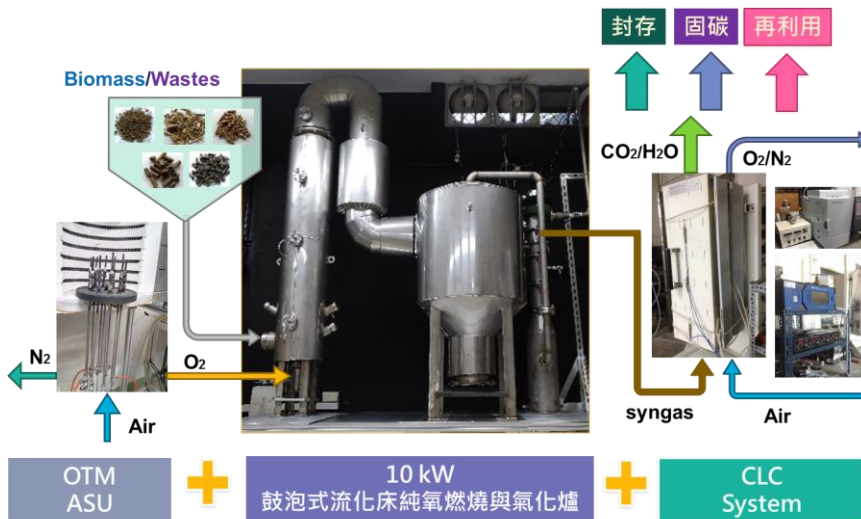
200 kW
流化床實驗爐

工業先導級多元燃料燃燒節能減排核心設施

- 目前發展情形：本計畫建置之設施近5年來已提供近十家廠商進行產學合作研究或測試服務。在國內禁燃生煤與減排目標之壓力下，未來業界勢必更加需要這些工業先導級實驗設施以研發與驗證相關技術，對於產業發展有不可或缺的價值。



200 kW工業先導級多元燃料純氧燃燒整合示範



10 kW多元燃料氣化結合化學迴路純氧燃燒系統

Development and Integration of Key Flexi-fuel Fluidized Bed Oxy-Combustion Technologies for Emission Reduction

Execution Unit

National Cheng Kung University

Project Director

Ming-Hsun Wu, Ta-Hui Lin, Yeh-Chin Chao, Hsin Chu, Guan-Bang Chen, Ting-Ke Tseng, Yueh-Heng Li, Kuan-Zong Fang / Shoun-Shurng Hou

- **Industrial pilot-scale flexi-fuel combustion research facilities for energy saving and emissions reduction are developed and commissioned through the project, and currently providing research and development services to relevant industries. 200 kW industrial pilot scale oxy-co-firing technology has been demonstrated using the facilities. A 10 kW biomass/wastes gasification with integrated chemical looping combustion system has also been developed.**

Patents

- 1.The pyrolysis system for organic biomass / R.O.C. Invention Patent : I444462
- 2.The pyrolysis system for organic biomass / China Invention Patent : 1406010
- 3.Microbial Fuel Cell / R.O.C. Invention Patent: I407622
- 4.Apparatus for Carbohydrate Production / R.O.C. Utility Model Patent : M478026
- 5.Protocol of high carbohydrate content material production / R.O.C. Invention Patent : I437095
- 6.Camera System for High Temperature Furnace / R.O.C. Utility Model Patent : M537201
- 7.Nanothermite and method for fabricating the same / R.O.C. Invention Patent : I592476

Industrial Pilot-scale Flexi-fuel Core Research Facilities for Energy Saving & Emissions Reduction



280 kW Solid & Liquid Fuel Research Furnace



100 kW Gas Research Furnace

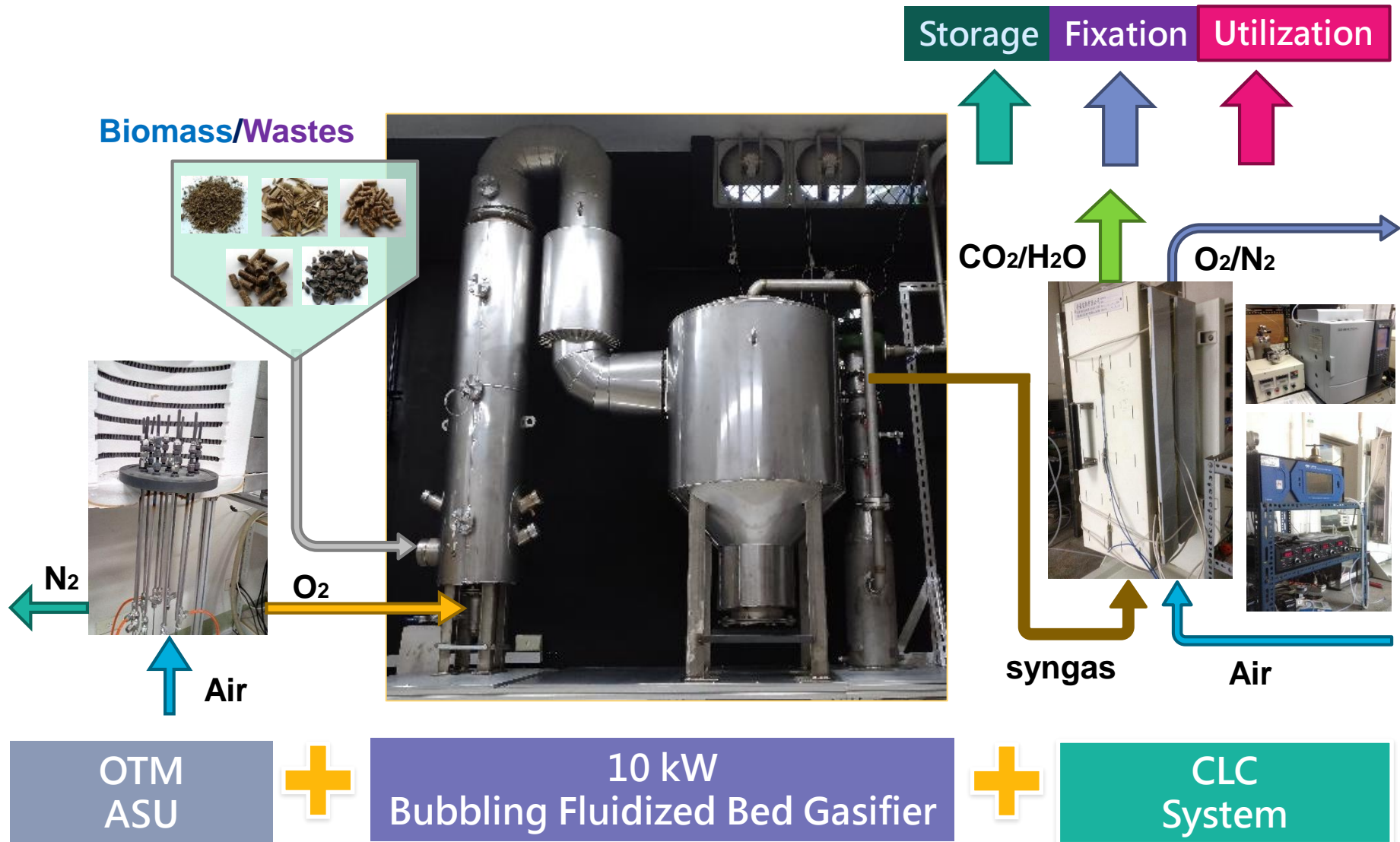


200 kW Fluidized Bed Research Furnace

Demonstration of 200 kW Industrial Pilot-Scale Flexi-fuel Oxy-Combustion



10 kW Flexi-fuel Gasification Integrated with Chemical Looping Oxy-Combustion



- Introduction

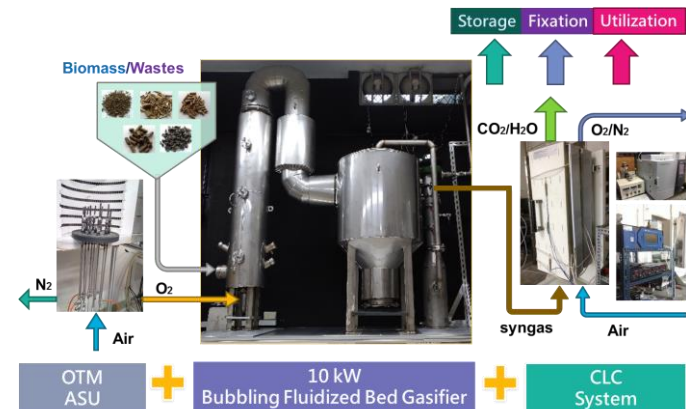


Industrial Pilot-scale Flexi-fuel Core Research Facilities for Energy Saving & Emissions Reduction

- **Current Status:** In the past 5 years, the facilities constructed through the project have already provided research and testing services to nearly 10 industrial partners. With the emission reduction targets and new regulations on coal utilization, we expect an increasing demand on relevant research and development services. The industrial pilot combustion facilities and related technologies are crucial for future growth of various industry sectors.



Demonstration of 200 kW Industrial Pilot-Scale Flexi-fuel Oxy-Combustion



10 kW Flexi-fuel Gasification Integrated with Chemical Looping Oxy-Combustion