纖維酒精產業推廣平台及加值化生質精煉技術之研發

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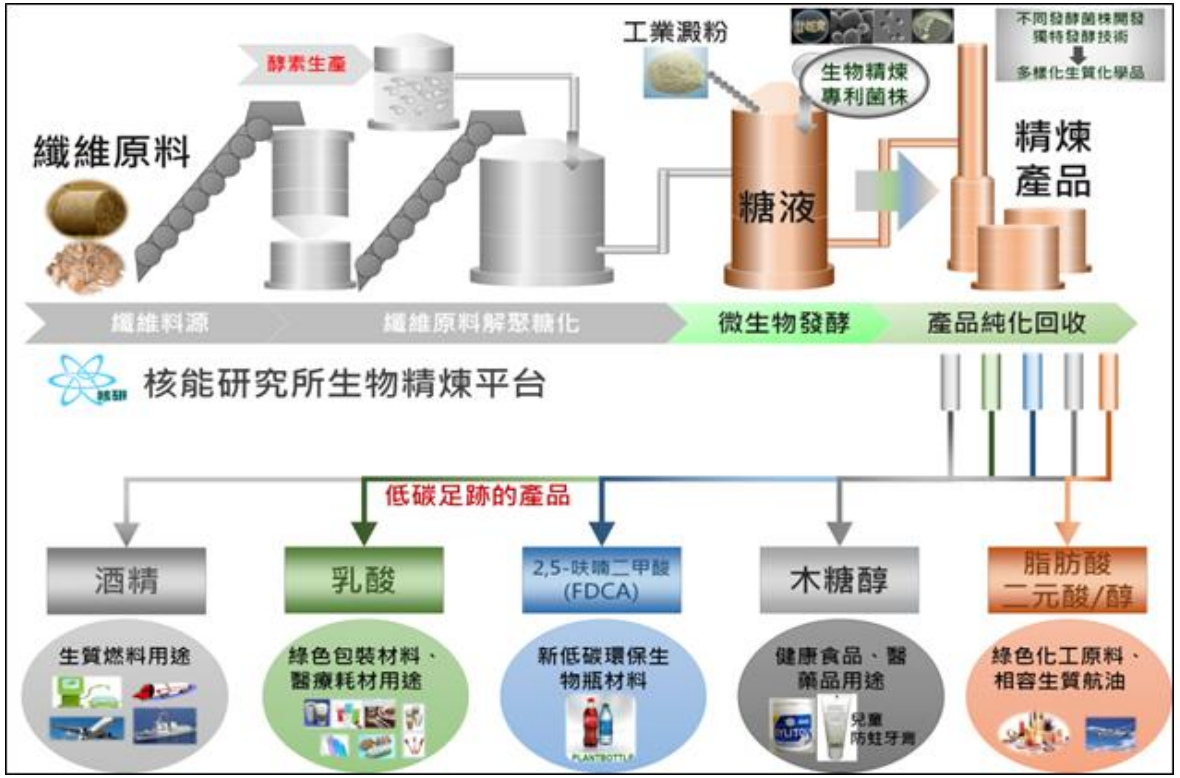
- 計畫已完成纖維酒精技術開發，除可為生質燃料，亦可與氫重組/燃料電池整合應用，並建立纖維聚乳酸製程，用於生產低碳環保生質材料；另設置大型生質精煉測試廠及實驗設施，提供多元生質精煉技術之測試驗證。

- 目前纖維聚乳酸技術已完成包括泰國、馬來西亞及印尼等東南亞區域布局，累計申請東南亞專利23件，涵蓋纖維原料預處理、前處理、酵素生產及水解、乳酸發酵菌株等製程技術
- 配合新南向政策及印度新能源公司申請技術授權之需求，近期纖維酒精製程技術將另新增印度為區域佈局重點



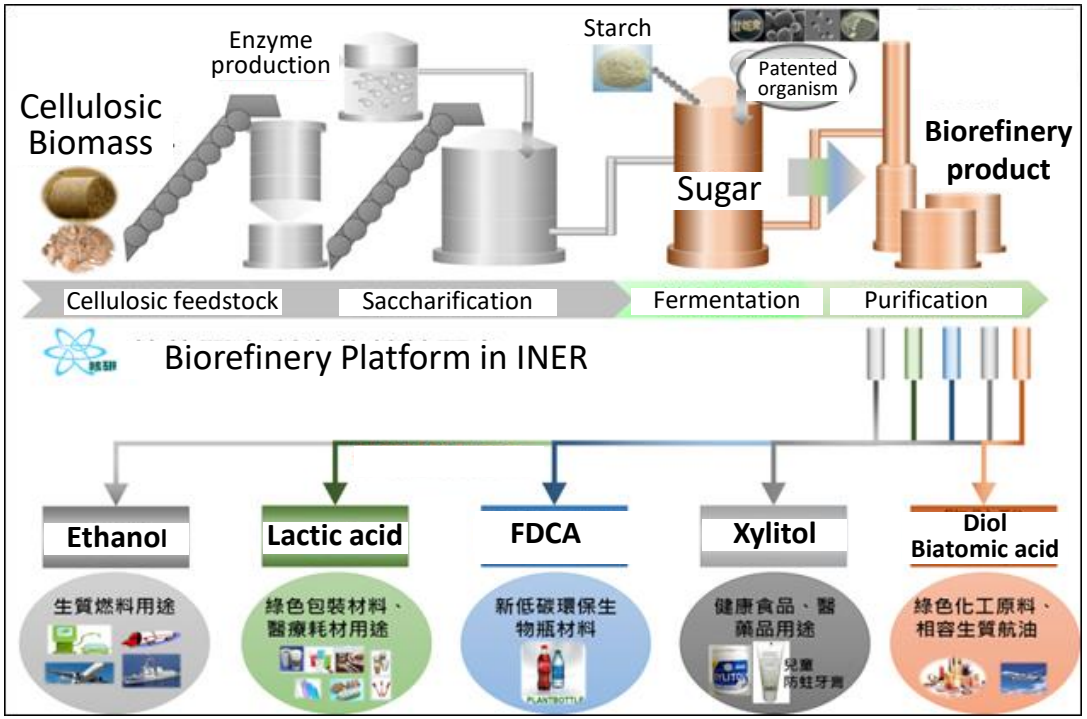
- 鑒於纖維原料為國內少數可自主掌握的天然資源，本計畫致力於開發纖維原料生產生質燃料及生質化學品之製程技術，並運用全國唯一之生質精煉測試廠進行技術放大驗證，協助發展具能源自主及減碳效益的生質物循環經濟產業
- 計畫所成功開發之纖維原料生質精煉技術，已與能專計畫之研發成果共同榮獲第12屆及13屆國家新創獎的殊榮，並多次獲得國家發明展獎牌，顯示計畫開發之製程技術兼具創新及產業應用價值。
- 目前已建立具商轉潛力之纖維酒精、纖維聚乳酸及多種纖維原料衍生之高值副產品等可交易技術，並已促成2件技術授權案，後續將協助產業建置併同生產生質燃料、再生能源及生質化學品之纖維生質精煉廠，落實技術於產業應用及促進循環經濟發展之願景。

Development of value-added Biorefinery Technology and Cellulosic Ethanol Industry promotion platform

Execution Unit	Institute of Nuclear Energy Research
Project Director	Gia-Luen Guo

- The project has completed the development of cellulosic ethanol technology, cellulosic polylactic acid process and establishment of a pilot plant and its facilities. Apart from biofuels, cellulosic ethanol can also be integrated with hydrogen reforming / fuel cell applications; cellulosic polylactic acid process is aimed to produce green, low carbon-footprint materials; pilot plant and the facilities are intended to provide multi-functional biorefinery technology validation.

- At present, cellulosic polylactic acid technology has completed building the patent portfolio in Southeast Asia including Thailand, Malaysia and Indonesia. Total of 23 patent applications have filed in this area emphasizing on process technologies ranging from biomass pretreatment and its depolymerization, hydrolase production, to microbial production of lactic acid and the microorganism.
- In line with government new South Policy and the requirement for the technology transfer to the Indian New Energy Company, India will be added into patent portfolio map of cellulosic ethanol process to strengthen regional distribution.



- Considering biomass is one of the few natural resources available domestically, this project is devoted to developing process technologies for biofuels and biobased chemicals production using non-food biomass materials. Scale-up process technology can be validated at INER's one of a kind biorefinery pilot plant, it is intended to promote development of domestic biomass industry, one of the circular economy technology featured on energy independent and carbon emission reduction
- The biomass refinery technologies successfully developed by the project have been honored with the 12th and 13th National Innovation Award and received many competition medals from Taipei Int'l Invention Show & Technomart. It demonstrated the core technologies developed by the project have the value of both innovation and industrial applications.
- At present, several tradable technologies have established and all have achieved commercial potential such as cellulosic ethanol, cellulosic polylatic acid and high value-added byproducts derived from versatile biomass. Among them, two licensed technologies have transferred to the commercial sector. Follow-up of the project will be focused on providing assistance to domestic industry to establish biorefinery plant for co-production of bioenergy and biobased chemicals, implementing technologies to facilitate industrial development with the vision of circular economy.