

工業技術研究院

Industrial Technology
Research Institute

PEF與其相關材料技術發展

汪進忠

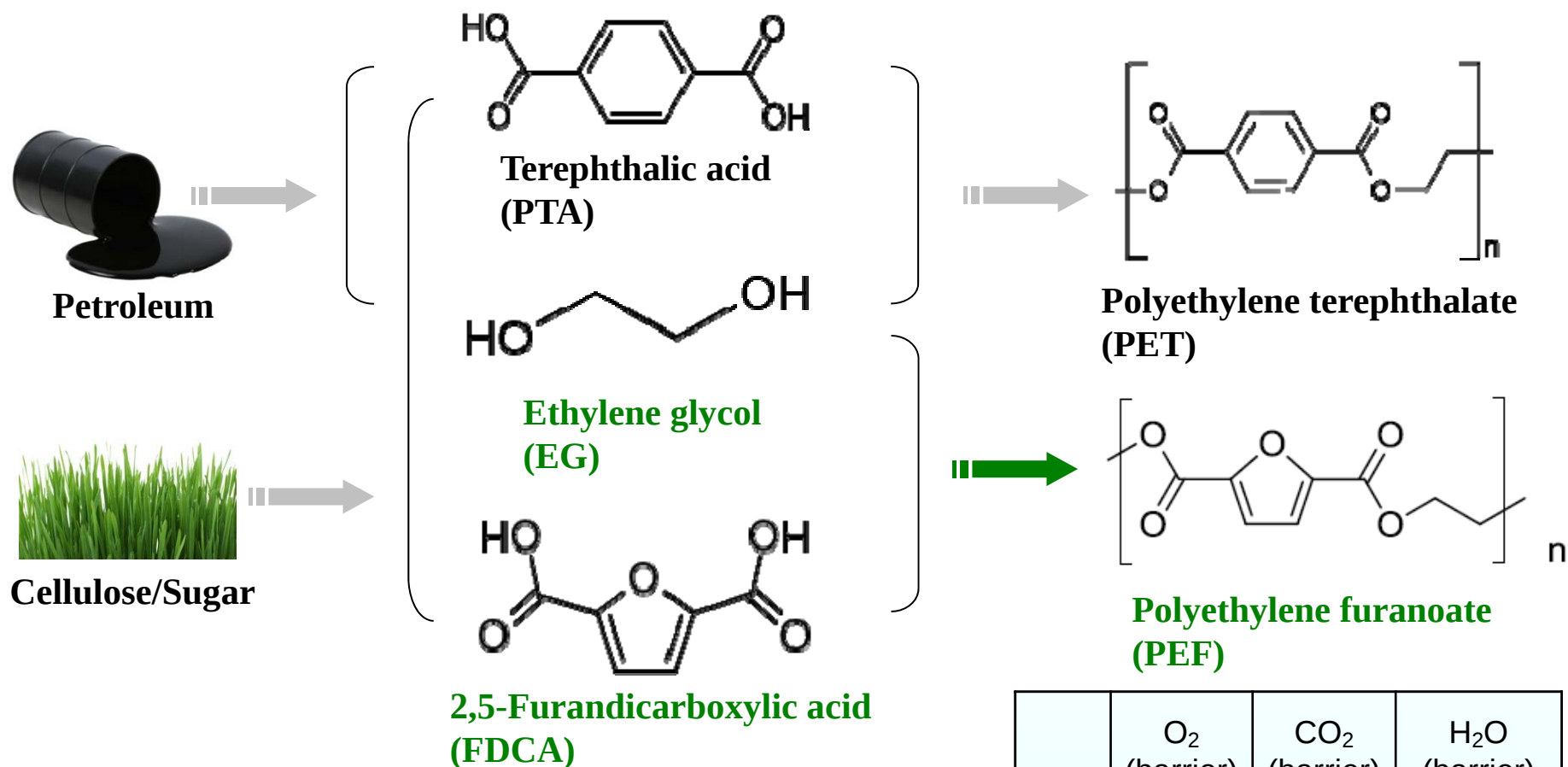
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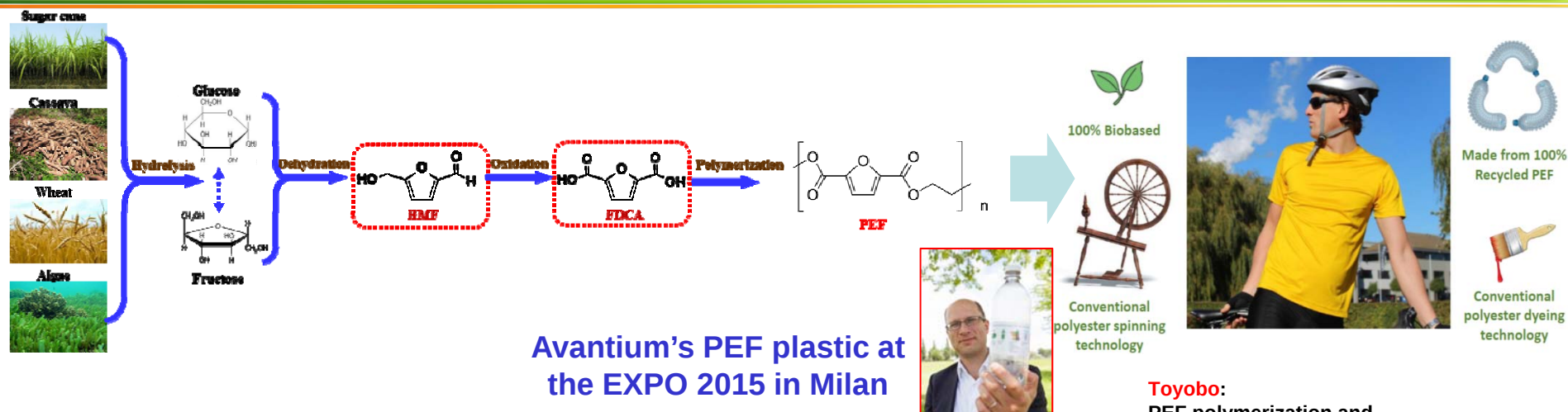
Polyethylene furanoate (PEF)



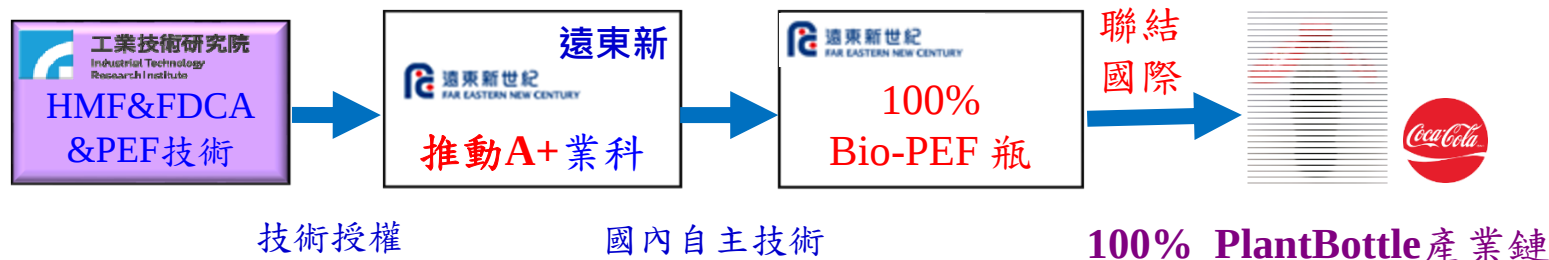
	O ₂ (barrier)	CO ₂ (barrier)	H ₂ O (barrier)
PEF	0.0107	0.026	180
PET	0.114	0.49	370

Macromolecules 2015, 48, 2184–2193

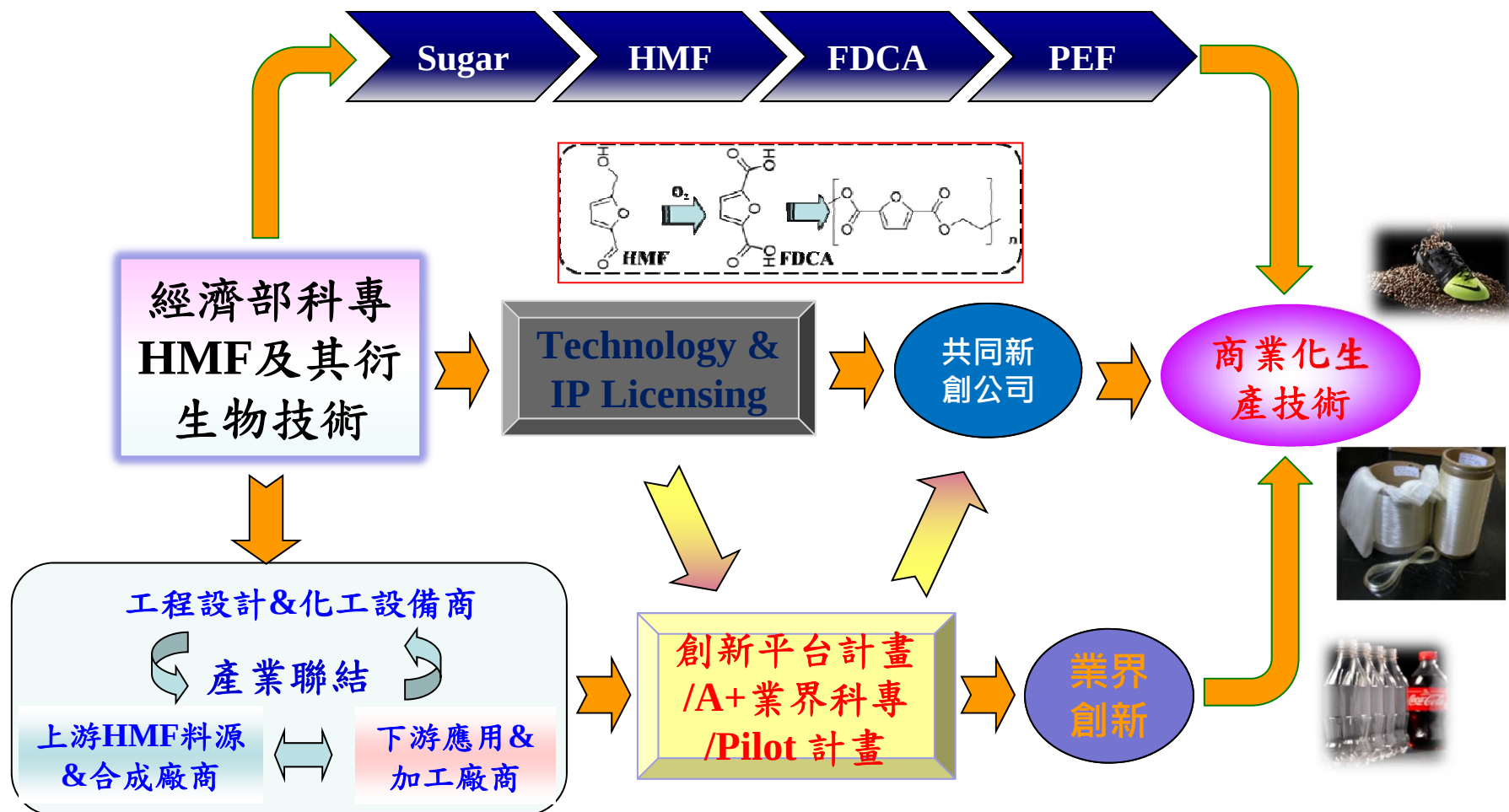
Current Status of PEF



Avantium's PEF plastic at the EXPO 2015 in Milan



PEF產業鏈之產業聯盟推動規劃

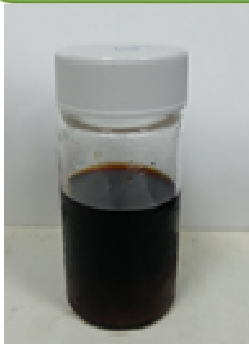


HMF試產能力---200 L (reactor)



Features of the HMF production system

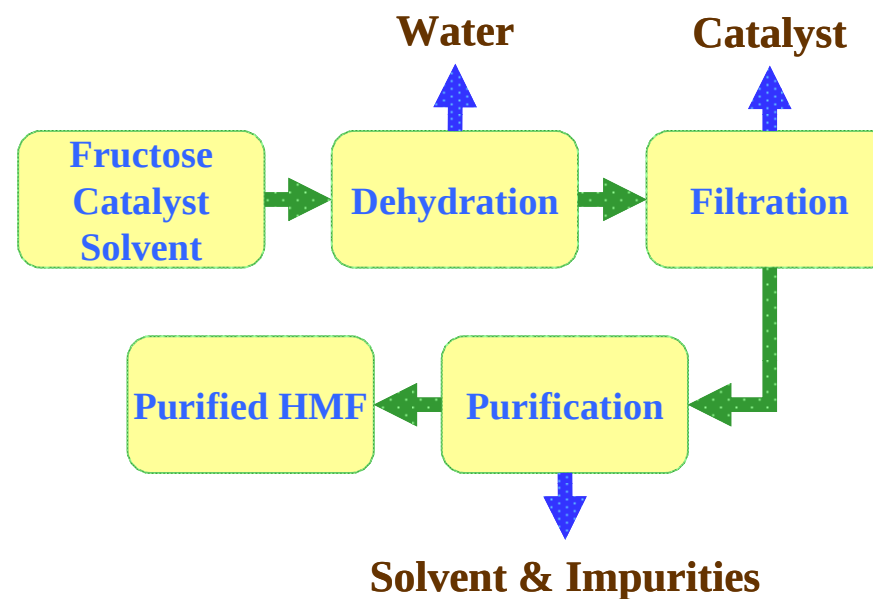
- Vessel volume : 200 L
- Vacuum (~0.25 torr)
- Max Temperature (~250°C)



Crude HMF



Purified HMF



Sample	Yield (%)	Purity (%)
Crude HMF	85	30.7
Purified HMF	60	>99

production: 15~20 Kg/batch
(half filled tank)

合成FDCA氧化反應系統---pilot scale

100L Titanium reactor



Titanium condenser



Vent gas treatment



Filtration system



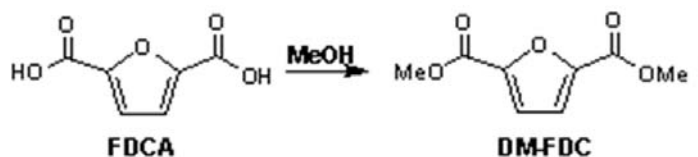
Features of the pilot oxidation system

- High Pressure (~50 bar)
- High Temperature (~300°C)
- Anticorrosive

批次FDCA試產能力：
cFDCA產能 $\geq 4 \sim 5$ Kg/批
cFDCA純度 $\geq 98\%$ ，
批次產率 $\sim 75\%$ ，



DMFDC小量試產系統



Crude DMFDC
>97%



Distillation

Purified DMFDC
>99.5%



Yield : 80-85%

Purity of crude DMFDC : 90%~97%

Purified purity of DMFDC >99.5%



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