

Synfuels China CTL Technologies

Yongbin Cui

Synfuels China Technology Co., Ltd.

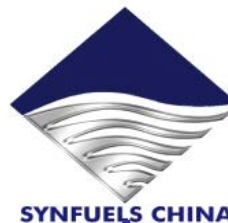
cuiyongbin@synfuelschina.com.cn

SFC Background



Synfuels China (SFC)

- Established in 2006
- Registered Capital: 1b RMB



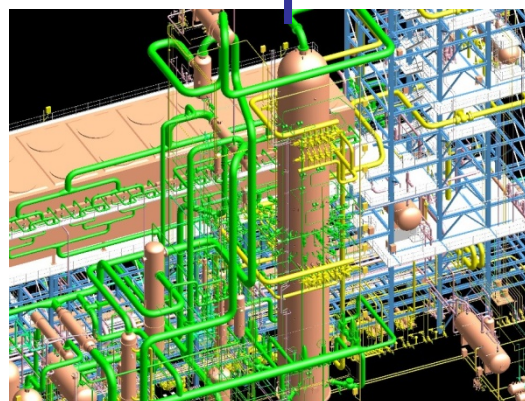
SYNFUELS CHINA

□ PhD	41	□ Bachelor	252
□ Mater	121	□ Others	150

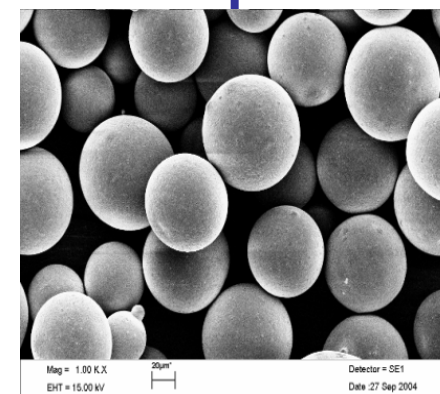


**SFC R&D Centre
Beijing & Taiyuan**

- more than 80 patents



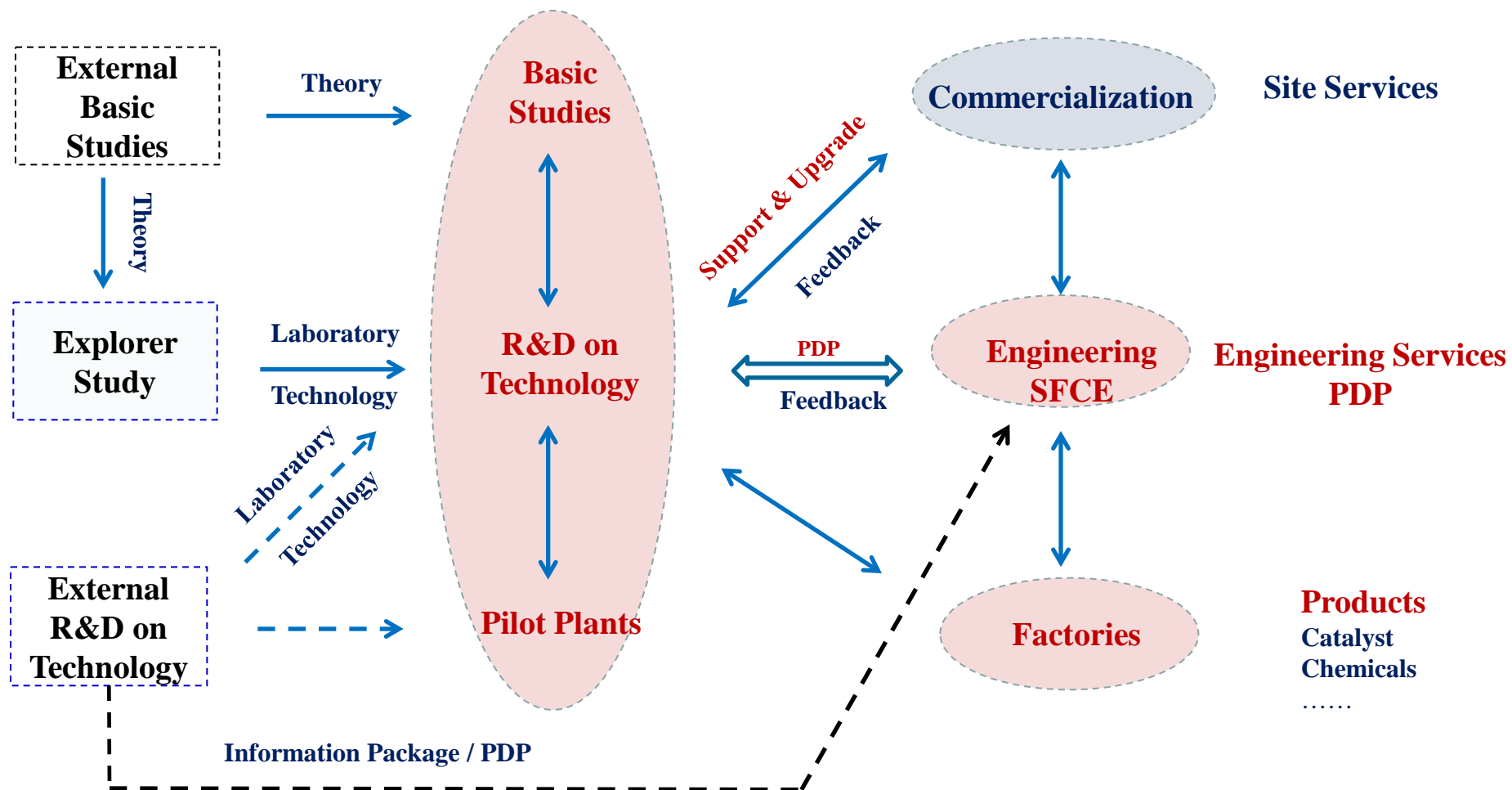
**SFC Engineering Co., Ltd.
Beijing**



**Catalyst Factories
Anhui & Inner Mongolia**

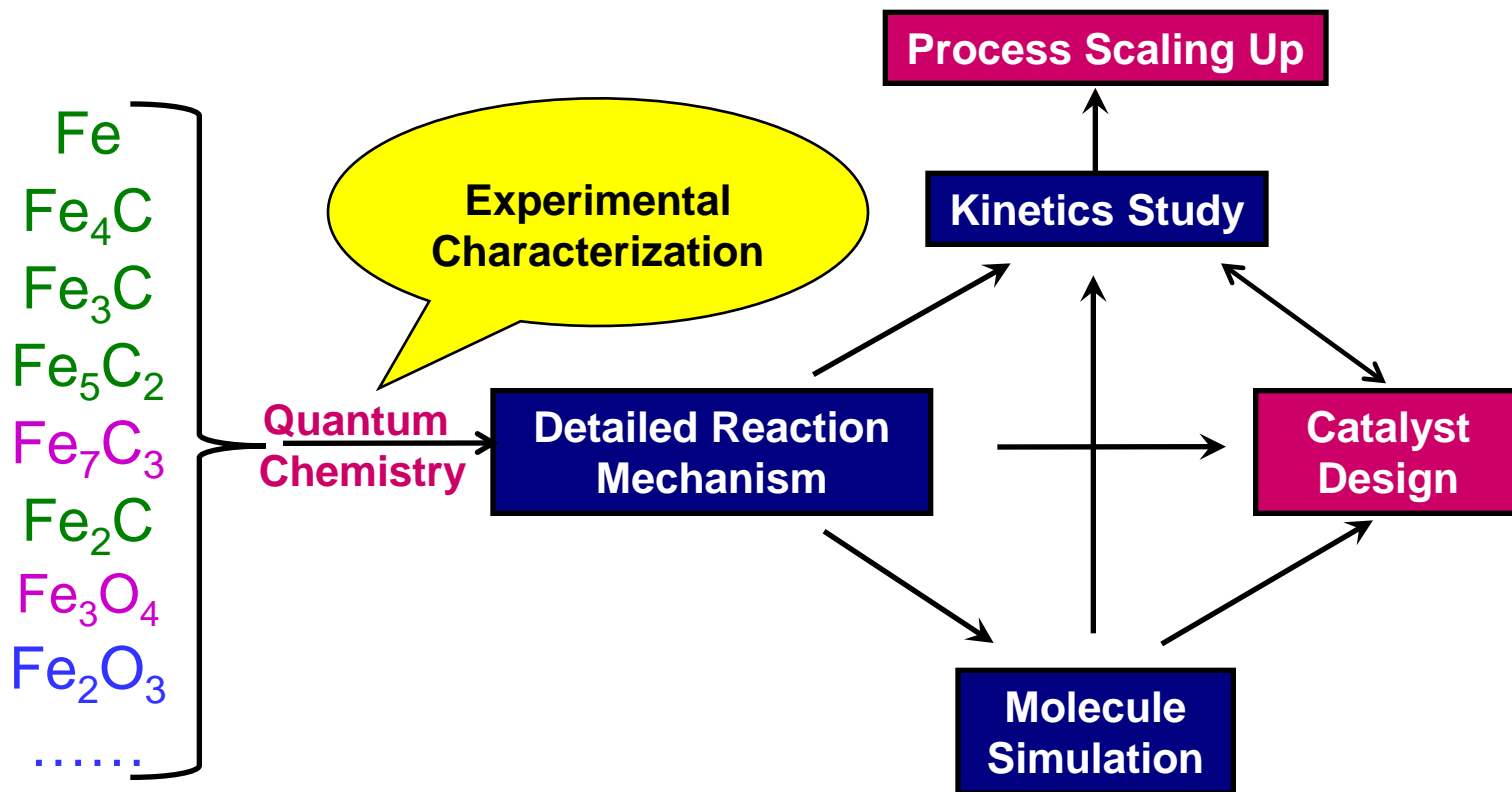
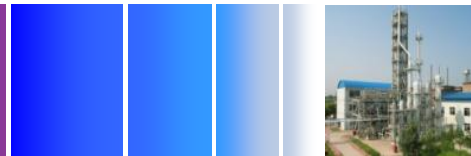
SFC Inner Mongolia Co., Ltd.

SFC Methodology

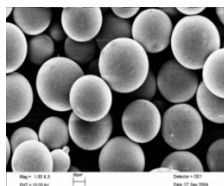
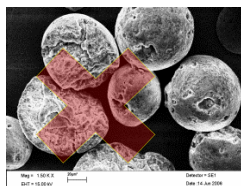
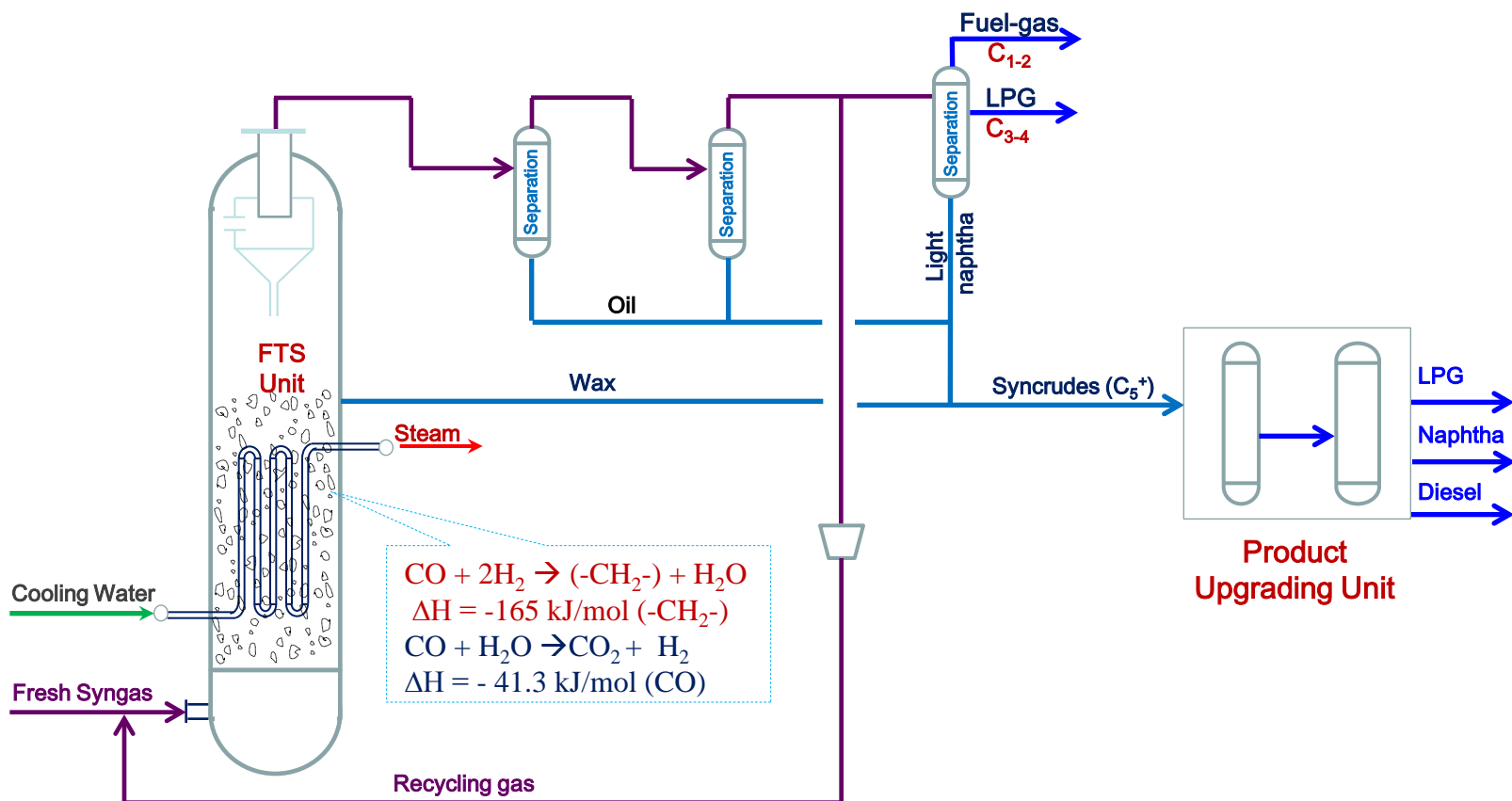


A unique integrated system has been established in SFC to facilitate the R&D and commercialization of SFC technologies.

SFC R&D on F-T Catalyst



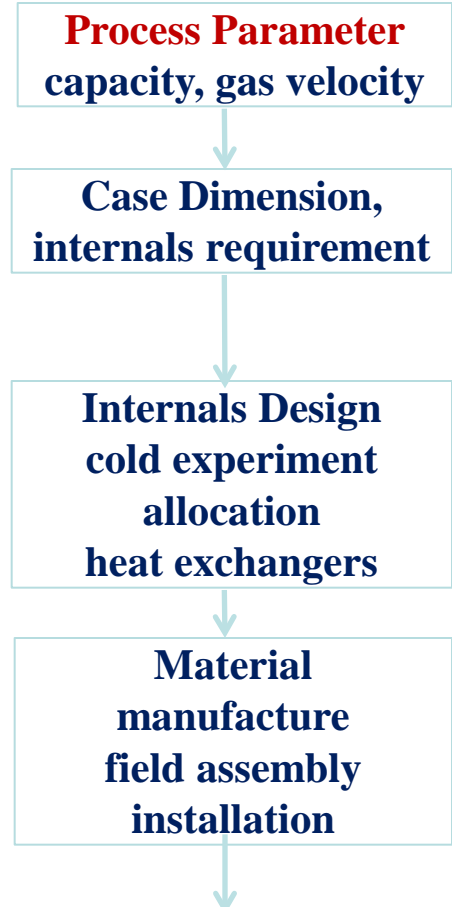
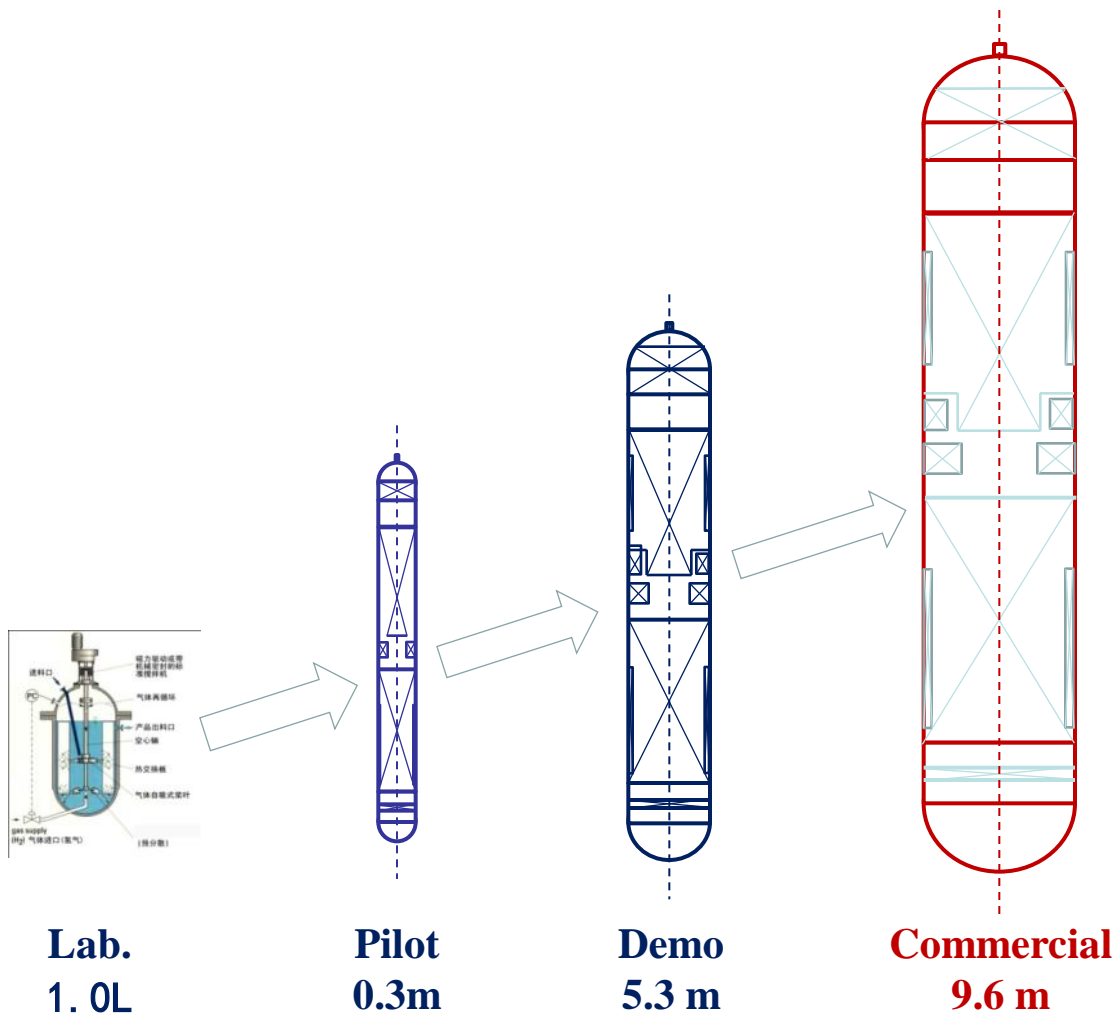
SFC HTSFTP



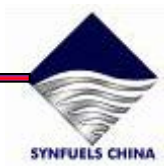
Catalyst Features:

- ✓ high activity
- ✓ excellent selectivity
- ✓ high attrition resistance

Scaling Up of F-T Slurry Reactor



9.6 m reactor technology



Three Demon Plants Using HTSFTP



- ❖ **Yitai CTL plant:** coal-water slurry gasifier, 160 kt/a, Inner Mongolia
- ❖ **Luan CTL plant:** fixed bed gasifier (Lurgi), 160 kt/a, Shanxi
- ❖ **Shenhua CTL plant:** Shell Gasifier, 180 kt/a, Inner Mongolia
- All three plants: constructed 2005 -2008, commissioned in 2009
- F-T Reactor Diameter: 5.3m (Yitai), 5.8m (Luan & Shenhua)

Luan CTL Demo Plant



Yitai CTL Demo Plant



Features of Yitai CTL Demon Plant



- **Total conversion of (CO+H₂): ~ 92%**
- **Total Heat Efficiency: 40.53%**
- **Running at 100-120% of full load since June 2010**
- **Catalyst productivity: 1,000-1,400 t oil/t catalyst**
- **Catalyst space velocity: 1.0-1.4 g oil /gcat h**
- **C₅₊ selectivity: 90 - 94%**
- **Oxygenates selectivity: 2.3 – 2.5%**



Main consumptions:

Feed coal: ~3.48 ETC/t oil

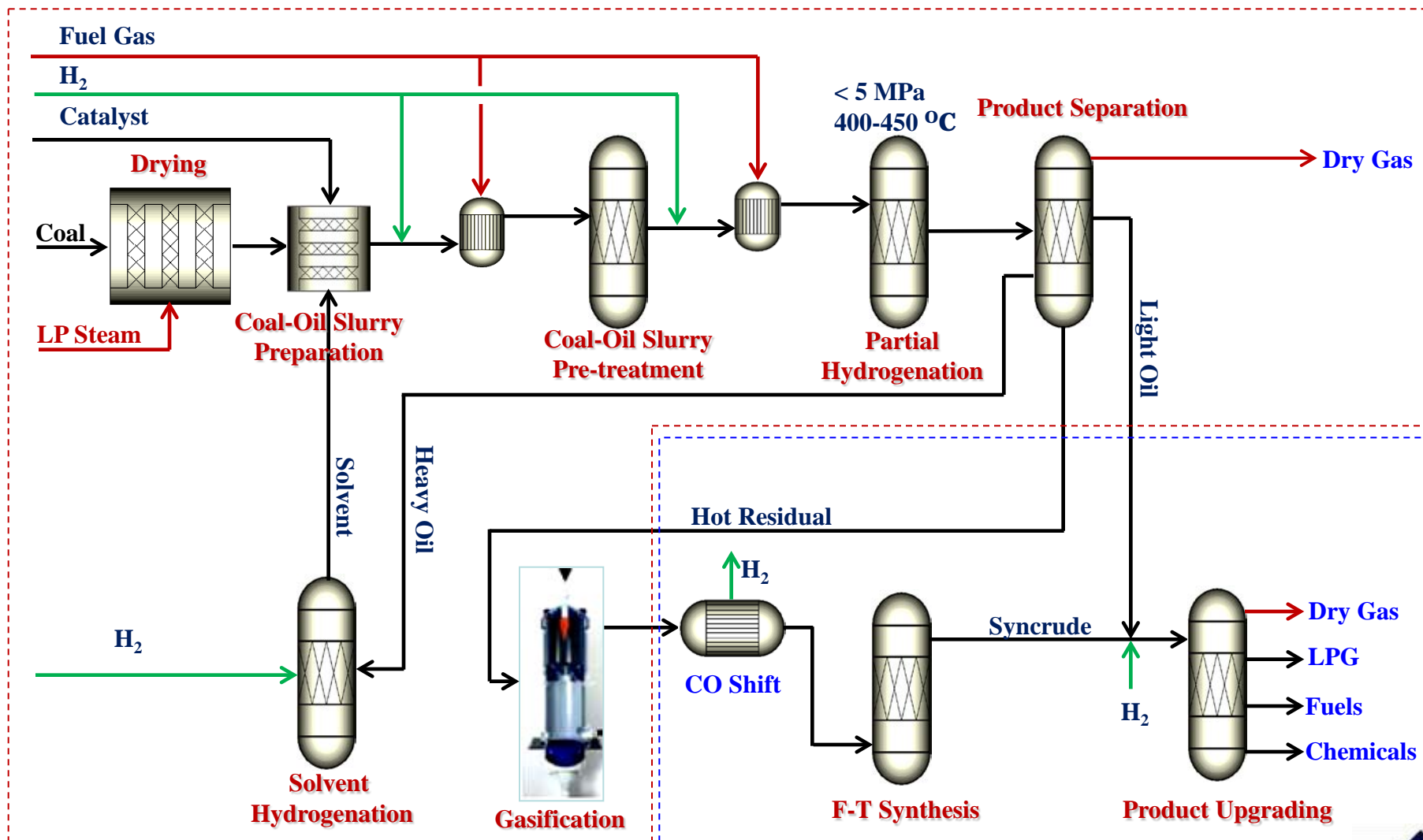
Fresh water: ~13.45 t/t oil

Electricity: ~794.67 kWh/t oil

Equivalent energy: ~109.86 GJ/t oil

Catalyst productivity: 176~185 g C₃₊/Nm³ (CO+H₂)
(Theoretical 208.3)

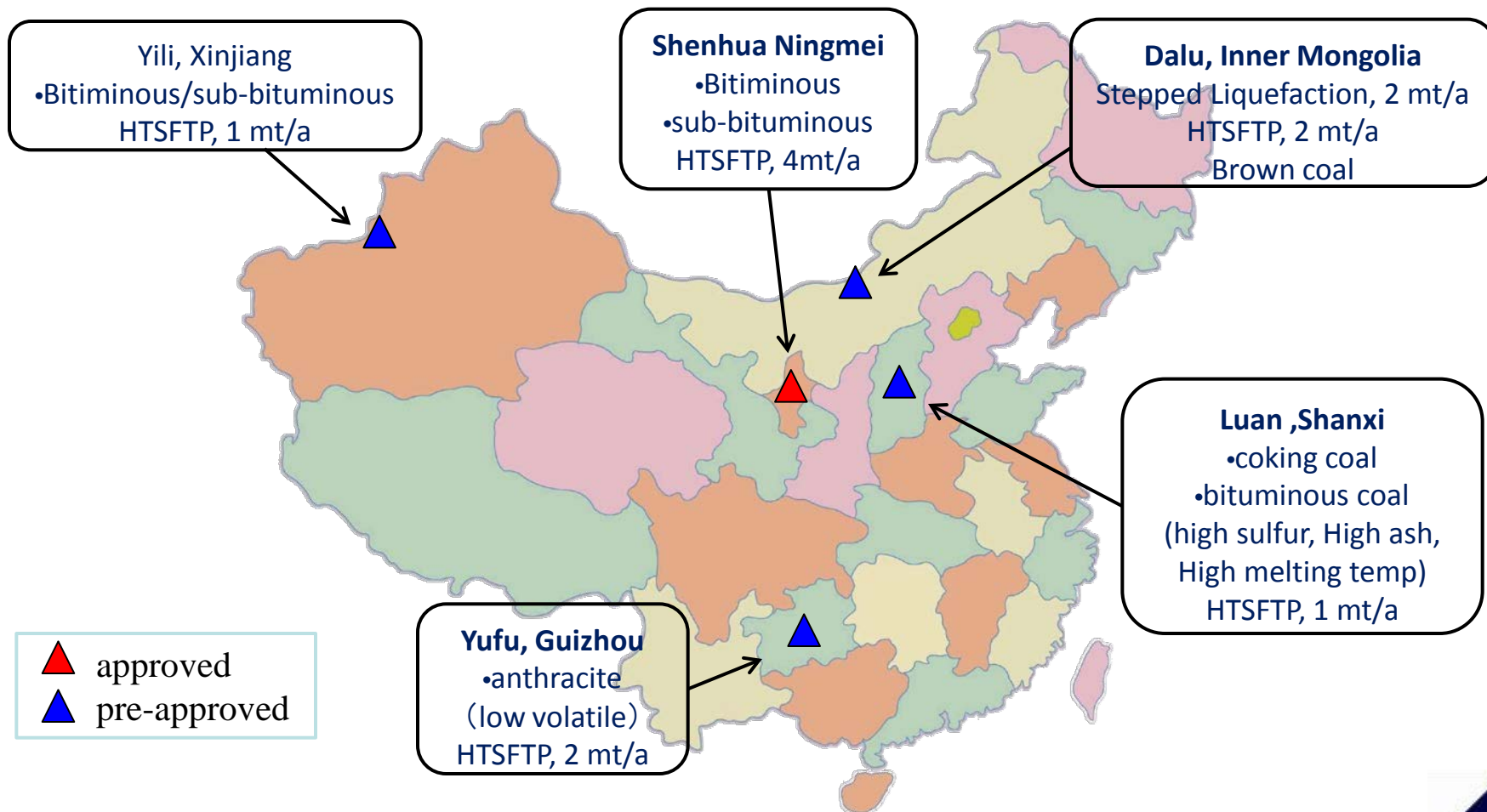
Stepped Liquefaction



Large-Scale CTL Projects



SFC CTL technologies have been selected for several large-scale CTL projects in China



Conclusions



- ◆ **A seamless integrated system has been established in SFC to facilitate the R&D and commercialization of SFC CTL Technologies.**
- ◆ **SFC's proprietary High Temperature Slurry F-T Process (HTSFTP) Technology has been successfully applied in three 160 kt/a CTL demon plants in China.**
- ◆ **Ningmei 4mt/a (100,000 bpd) CTL project using SFC HTSFTP technology is under construction in China, to be commissioned in 2016.**

A photograph of an industrial facility, likely a refinery or chemical plant. The scene features several tall, white distillation columns with complex metal scaffolding and ladders. Numerous pipes and smaller storage tanks are visible throughout the site. In the background, there are large industrial buildings with blue corrugated metal roofs. The sky is clear and blue. The text "THANK YOU" is superimposed in the center in a large, yellow, italicized font with a reflection effect below it.

THANK YOU

OUR EXPERTISE ENERGY IN FUTURE 我们的事业，能源的未来