

Synfuels China CTL Technologies

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SFC Background



Synfuels China (SFC)



SYNFUELS CHINA

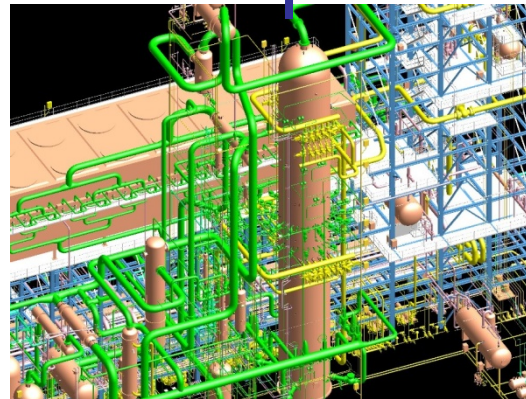
- Established in 2006
- Registered Capital: 1b RMB

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

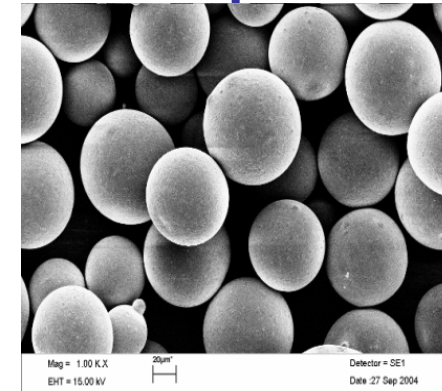


SFC R&D Centre
Beijing & Taiyuan

- more than 80 patents



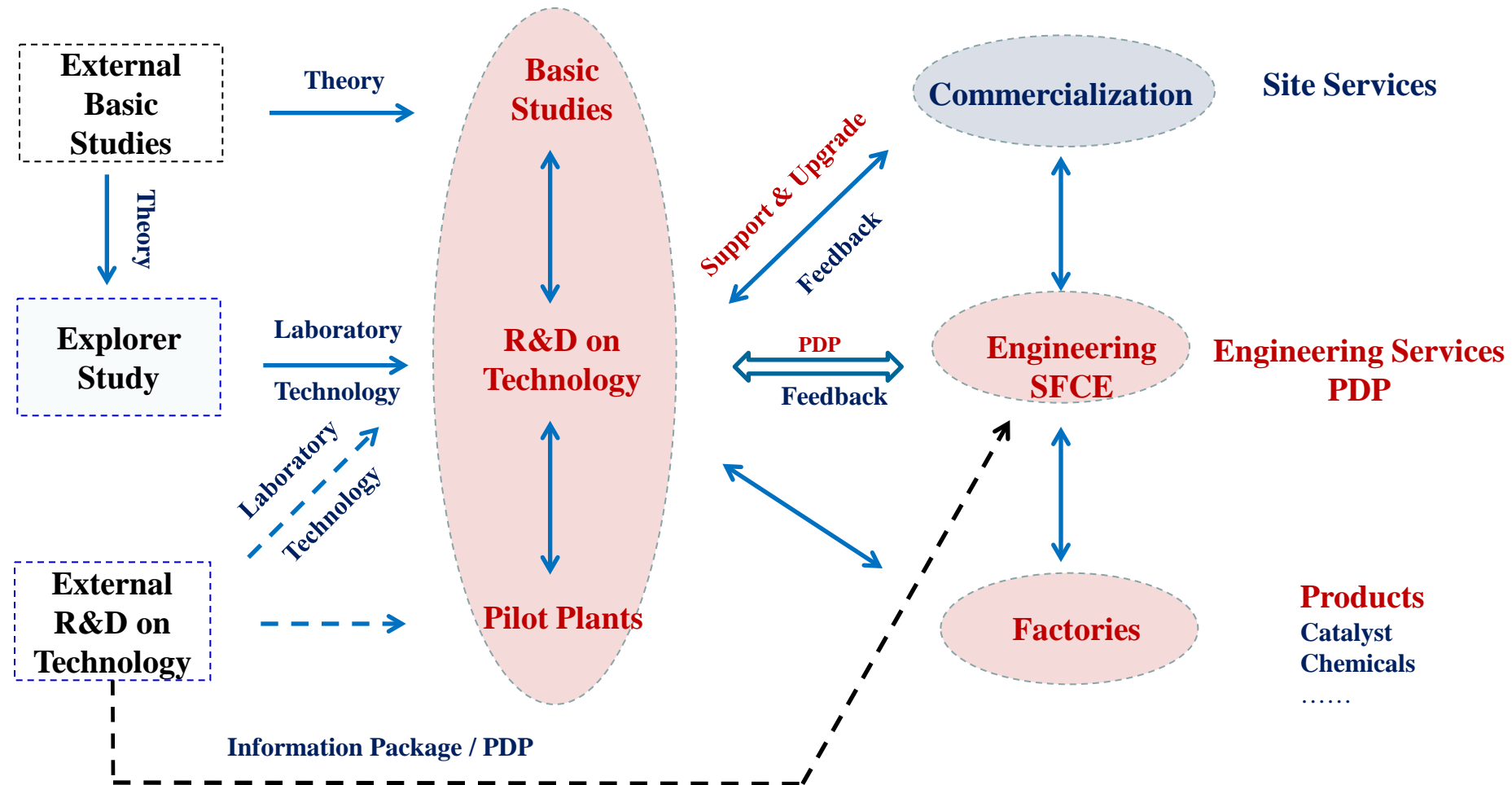
SFC Engineering Co., Ltd.
Beijing



Catalyst Factories
Anhui & Inner Mongolia

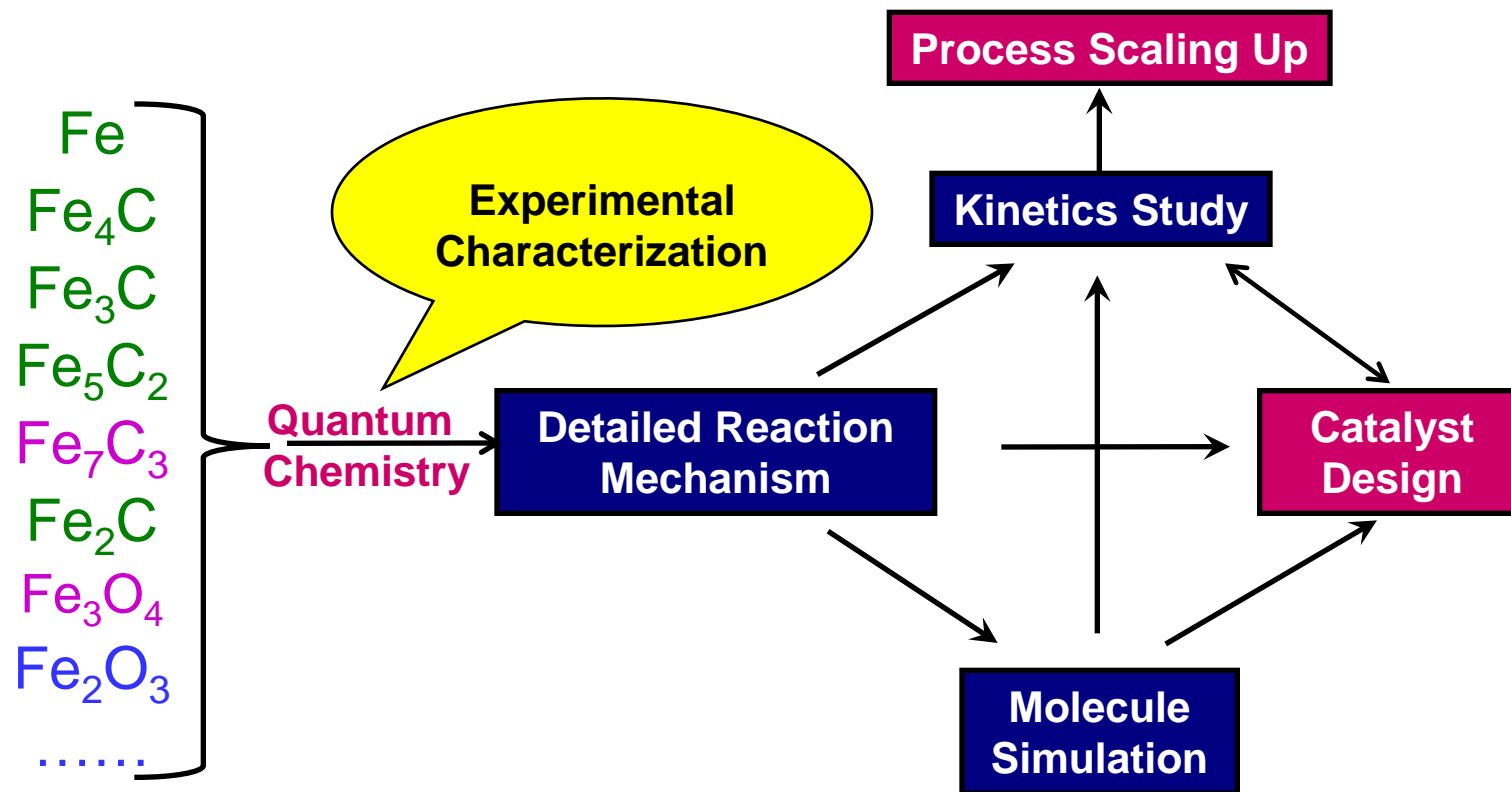
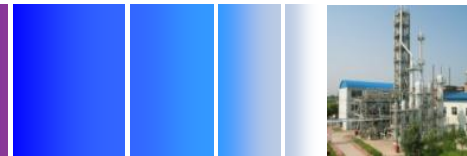
SFC Inner Mongolia Co., Ltd.

SFC Methodology

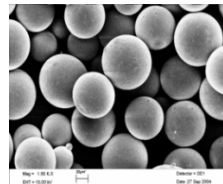
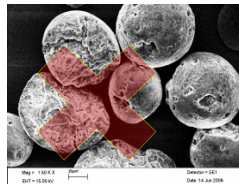
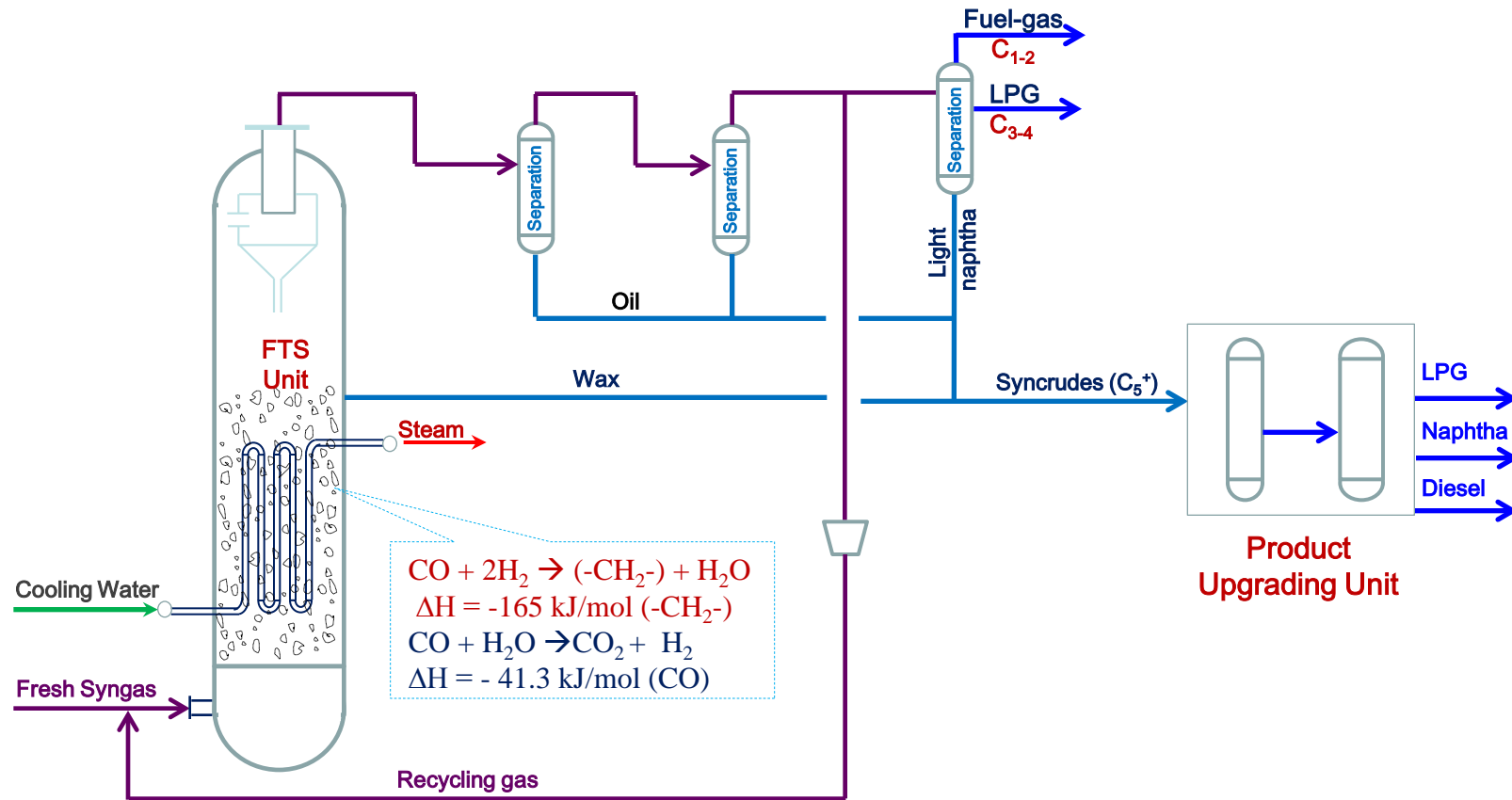


A unique integrated system has been established in SFC to facilitate the R&D and commercialization of SFC technologies.

SFC R&D on F-T Catalyst

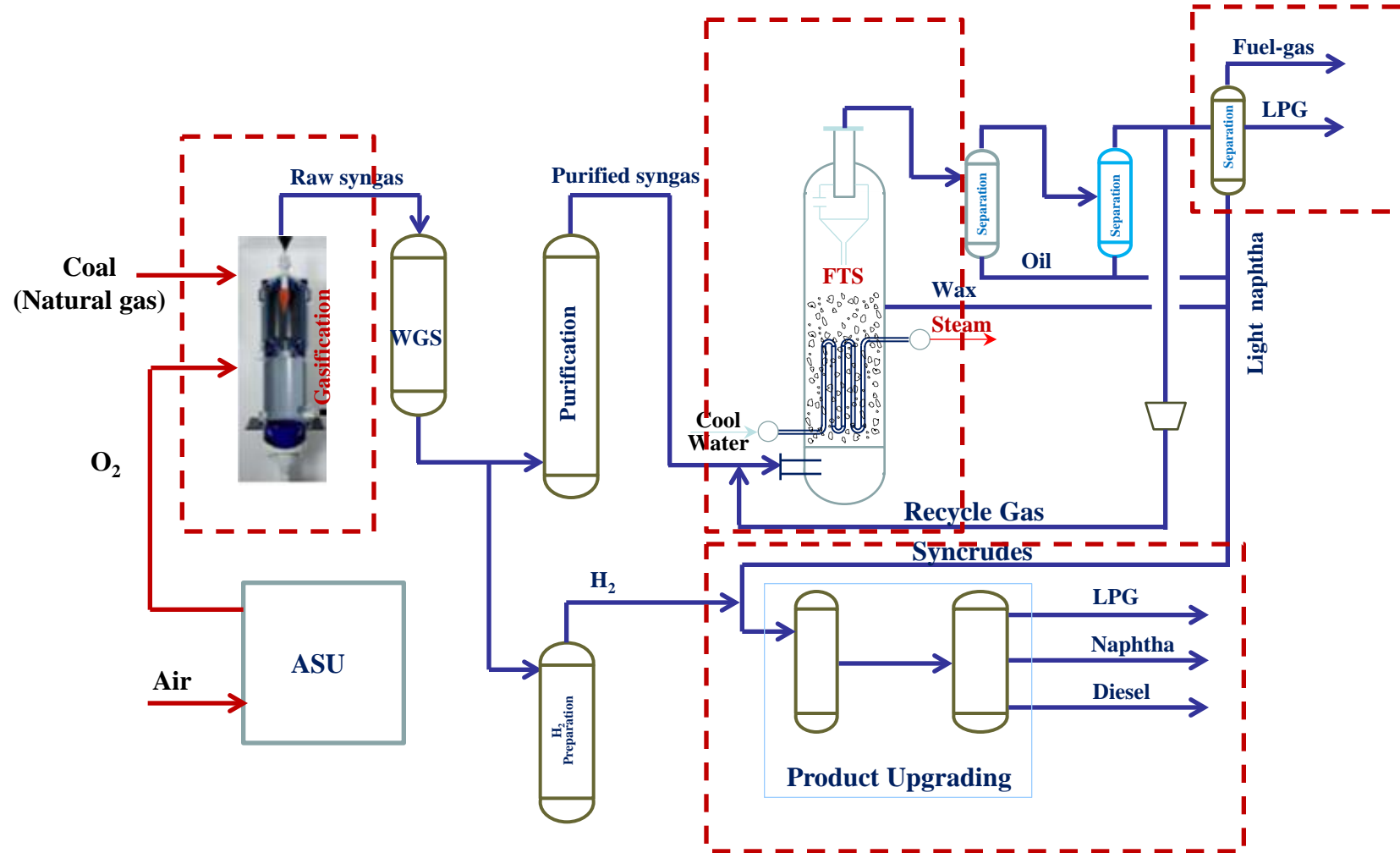


SFC HTSFTP



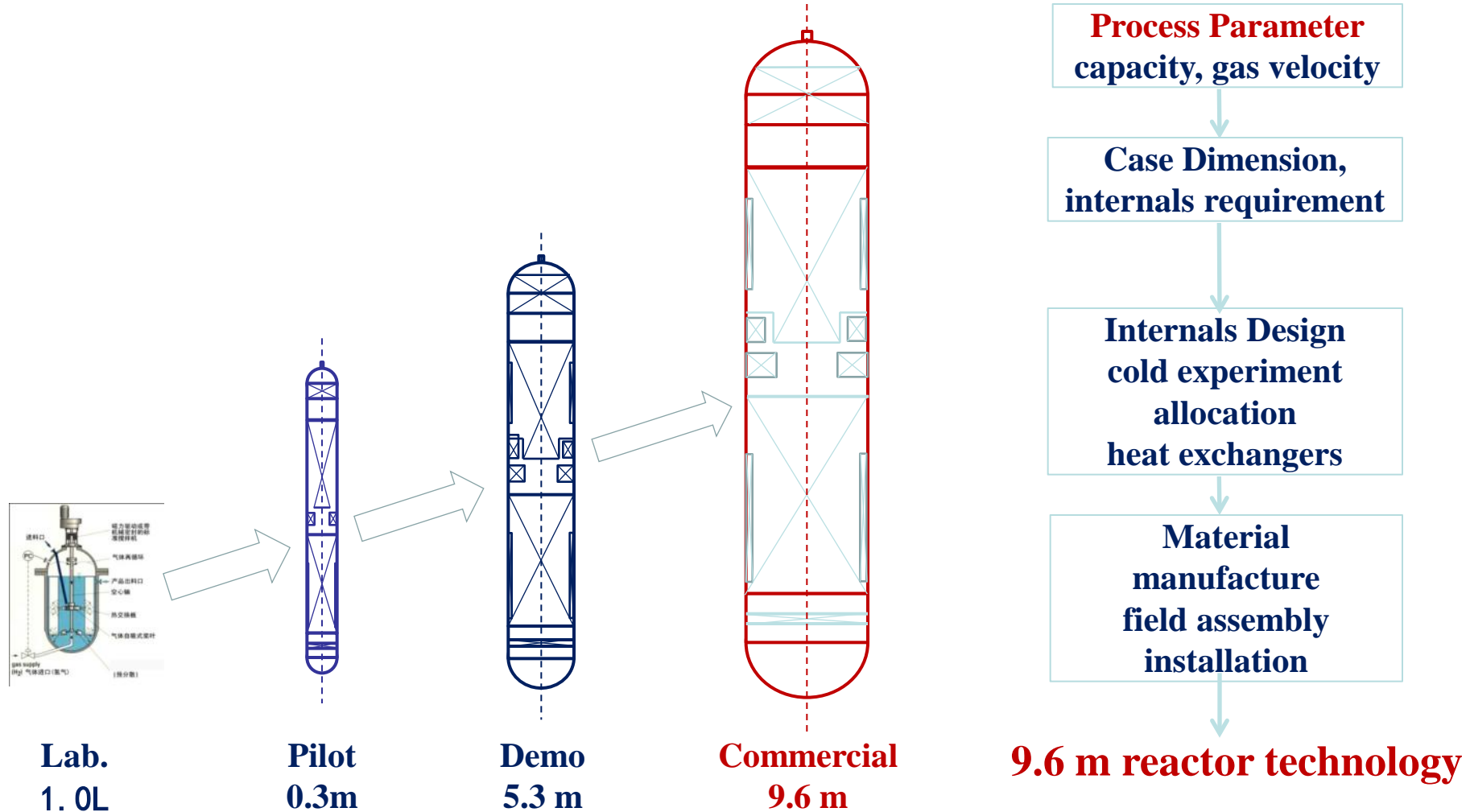
- Catalyst Features:**
- ✓ high activity
 - ✓ excellent selectivity
 - ✓ high attrition resistance

Optimized Integration of Processes



SFC HTSFTP can be integrated with various commercial gasification technologies using different feedstocks such as coal, natural gas, biomass, etc.

Scaling Up of F-T Slurry Reactor



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)



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%**

Features of Yitai CTL Demon Plant



Main consumptions:

Feed coal: ~3.48 ETC/t oil

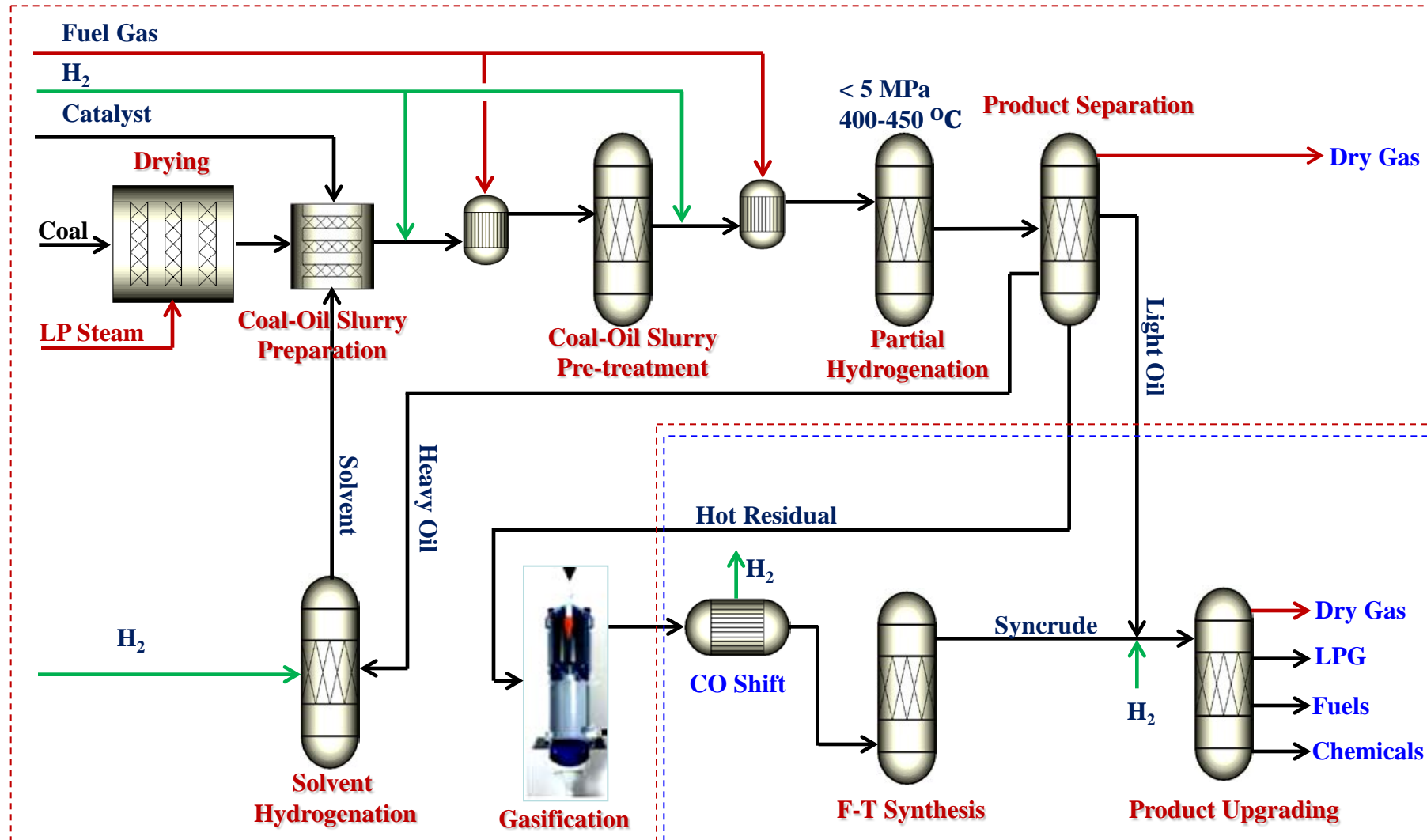
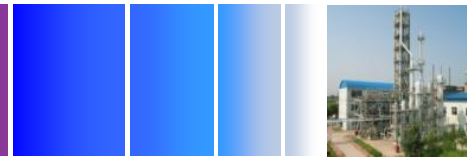
Fresh water: ~13.45 t/t oil

Electricity: ~794.67 kWh/t oil

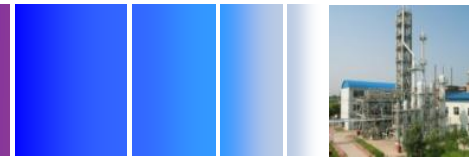
Equivalent energy: ~109.86 GJ/t oil

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

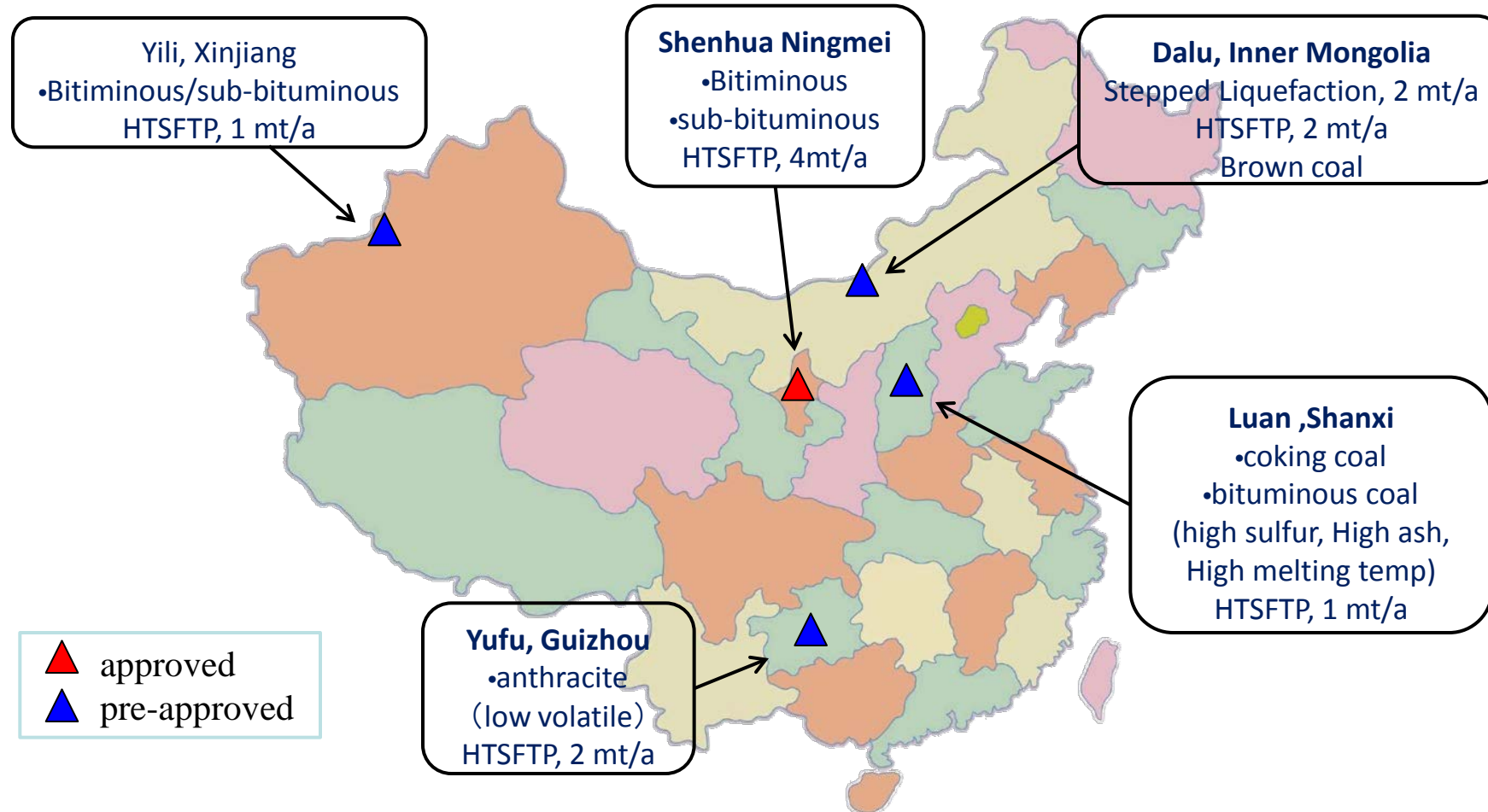
Stepped Liquefaction



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.**



THANK YOU

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

