GE Gasification Project Update

Jason Crew, General Manager
GE Gasification
Gasification Technologies Conference
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GE ... Imagination At Work
Installed fleet by the numbers

145

85

15

25
Installed fleet by the numbers

GE has 145 gasifiers in commercial operation ... the largest fleet in the industry

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15
Installed fleet by the numbers

GE has 145 gasifiers in commercial operation ... the largest fleet in the industry ... with 85 additional gasifiers in design, engineering, or construction at 25 plants

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Installed fleet by the numbers

GE has 145 gasifiers in commercial operation ... the largest fleet in the industry ... with 85 additional gasifiers in design, engineering, or construction at 25 plants ... and a global presence in 15 different countries.
China Licensed Fleet Update
Licensed fleet growth in China since 2010
Licensed fleet growth in China since 2010

Shenhua Baotou
1.8MTPY MeOH, 2010 Start-up
5+2 900ft3 gasifiers

Methanol & Derivatives

Coal Coke Oil

In Operation

In Design/Construction
Shenhua Baotou
Licensed fleet growth in China since 2010

Methanol & Derivatives

Weihe Pucheng
4+2 900ft3 gasifiers @ 87 bar

Coal
Coke
Oil

In Operation
In Design/Construction
Licensed fleet growth in China since 2010

Coal Coke Oil

Methanol & Derivatives

China Coal Yulin
10+4 900ft³ gasifiers (2 phases)

In Operation
In Design/Construction
Licensed fleet growth in China since 2010

Methanol & Derivatives

Ammonia & Urea

Coal

Coke

Oil

In Operation

In Design/Construction
Licensed fleet growth in China since 2010

- **Methanol & Derivatives**
- **Ammonia & Urea**
- **Hydrogen & Other**

- **Coal**
- **Coke**
- **Oil**

- In Operation
- In Design/Construction
Factors driving China growth

- Low cost, flexible, highly **reliable** technology
- **Proven** at scale & pressure
- **Credible** technology introduction process
- Strong **DI relationships**
- Highly **localized** hardware
- Broad **installed base** with capable operators
- **Short build cycle** – 36 mo ...
- contract to first-fire
Technology Highlight: High Pressure

**IGCC:**
- Advanced Refractory*
- Operator Training Simulator
- Mark VIe Controls
- 7F Syngas Turbine
- High Conversion Feed Injector*
- Radiant Syngas Cooler
- Carbon Island - EOR

**Industrial:**
- Advanced Gasifier Configuration Tools
- Large Quench with High Pressure (HP)
- Raw gas Turboexpander

*Available in both IGCC & Industrial applications

**GE’s HP Quench Gasification Technology:**
- Pressures up to 87 bar
- 5 – 10% reduction in MeOH cost
  - Syngas compression Aux Loads, MP, LP Steam for shift / AGR
- 5% reduction in coal to MeOH capex
  - Number of trains
- HFO, Vac Resid, NG, and coal experience

5-10% reduction in methanol cost
Partnering for expanded growth in China

**GE-Shenhua Gasification JV**
- 50-50 gasification licensing in China
- GE technology + Shenhua project & market expertise
- Commercial platform for Industrial licensing + IGCC advocacy

GE and Shenhua Announce Formation of Cleaner Coal Technology JV in China
Venture to Advance Deployment of Coal Gasification in China
WASHINGTON, DC – January, 2011 – GE and Shenhua announced that they have agreed to form an industrial coal gasification joint venture to advance the deployment of “cleaner coal” technology solutions in China. The new company combines GE’s expertise in industrial gasification technologies with Shenhua’s expertise in coal gasification and coal-fired power generation.
Duke Edwardsport IGCC Update
Duke Edwardsport IGCC project
GE’s commercial launch world’s largest IGCC project

Duke Energy Indiana
- 618MW IGCC
- 2012 COD

Duke Energy overall manager
GE Process Design Pkg + Eqt (Gasification + Power Island)
Bechtel detailed design + construction support services

Meeting critical challenges ... our teams in action
- **Challenge:** Start-up and testing requirements within Air Permit guidelines
- **Solution:** GE Plant Control System and Engineering Simulator enabling virtual plant operation and testing prior to actual fired operation. Extensive risk mitigation through rigorous commissioning