

# POSCO Gwangyang Project for Substitute Natural Gas (SNG)

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 ConocoPhillips

 E-Gas™  
Technology for Gasification

# Introduction to POSCO

***POSCO is the 4<sup>th</sup> largest steel company in the world***

***POSCO also has a strong presence in the Energy Sector***

## Infra-Structure

- Operate 4,610MW at 20 POSCO owned power plants
  - 1,650MW using blast furnace gas and coke oven gas
  - 2 LNG power plants (500MW at Gwangyang, 345 MW at Pohang)
  - IPP Power Plant 1,800MW (POSCO-POWER)

## Experience

- Three decades of steel making experience
- Expertise in coal use (20 MM tpy), gas treatment, and ASU
- EPC, owner, operator of LNG re-gas terminal
- Direct LNG purchase for POSCO use
- IPP business through POSCO-POWER

## Related Subsidiaries

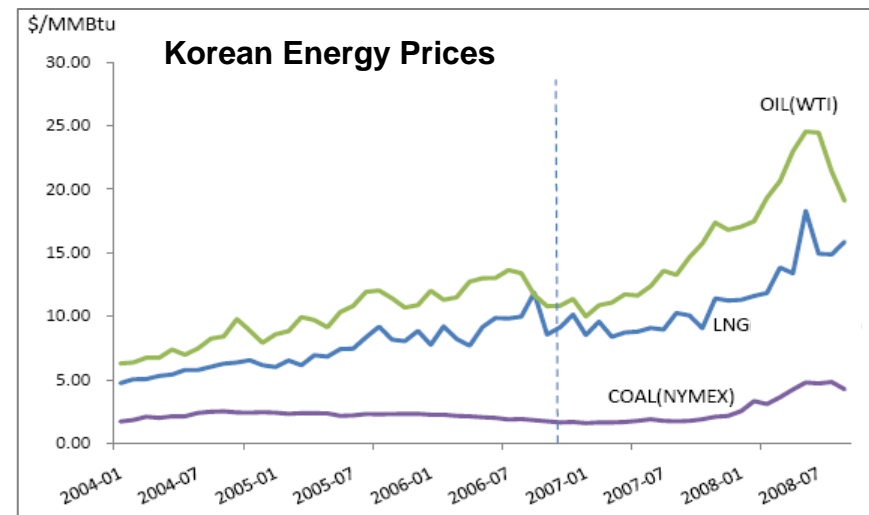
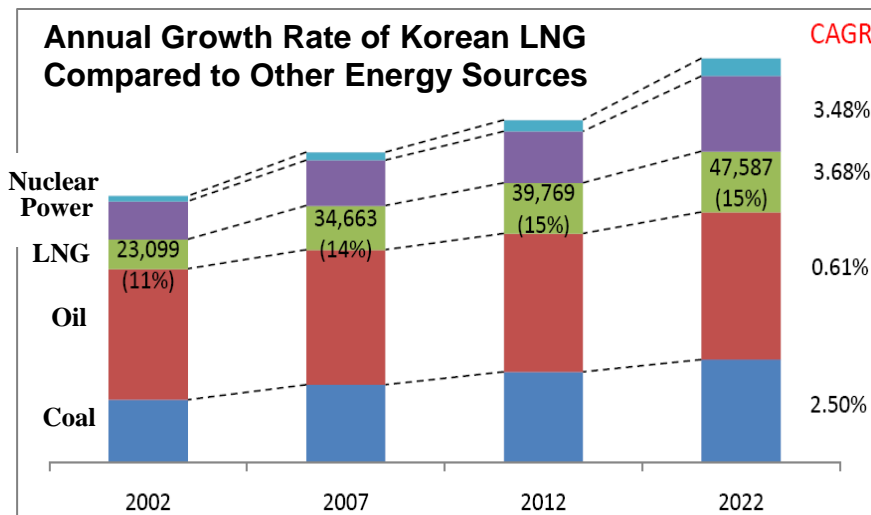
- POSCO-POWER : Power plant operations, fuel-cell marketing developed first and largest Korean IPP
- POSCO-ICT : EIC engineering, control/power system
- POSCO E&C : Integrated construction
- RIST & POSTECH : R&D on power system

## Manpower

- more than 1,000 experienced personnel in energy sector

# POSCO Drivers for SNG Project

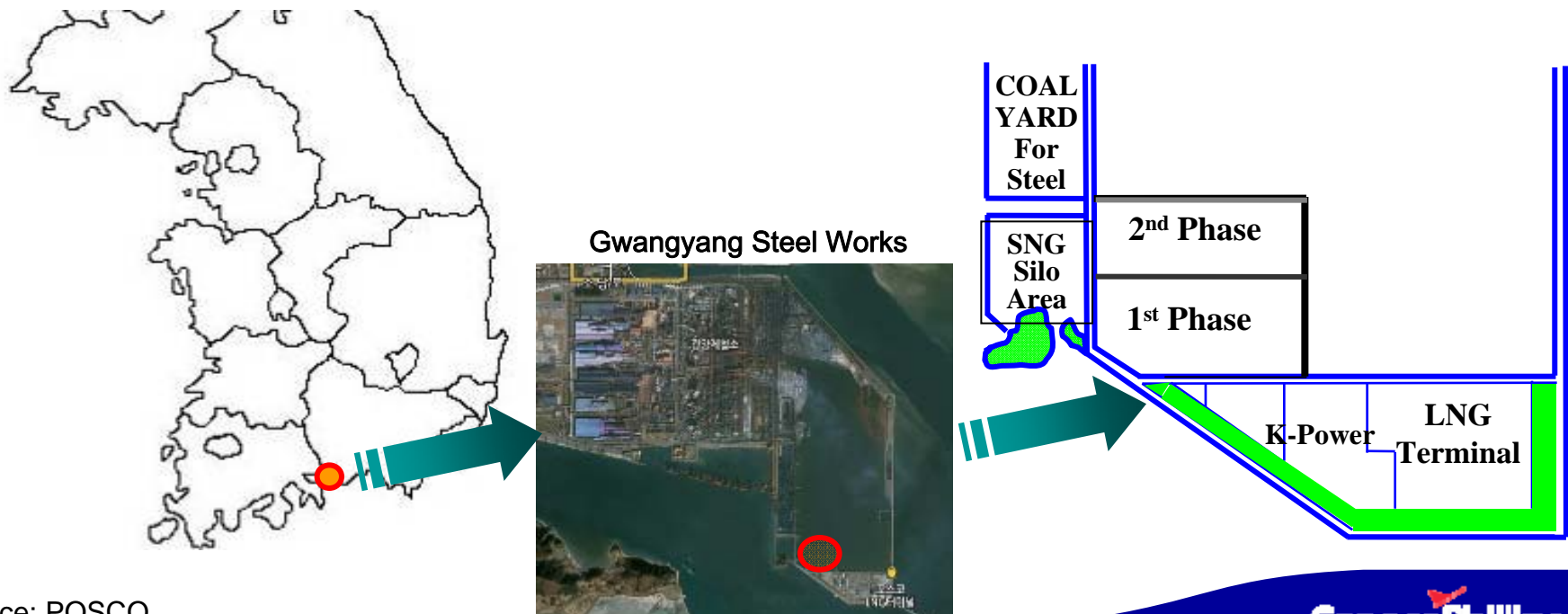
- **World natural gas demand will increase steadily at 1.8% annual growth rate.**(IEA,2008)
  - Emerging markets such as China, India : Around 4.0% AGR
- **The gas consumption in Korea is continuously increasing ( 3.7% AGR by 2022)**
- **Increase in oil price and demand has caused the fluctuation of Korean gas price and increased the anxiety of securing energy resources in the market**
- **Government support for Clean Coal Technology, as Korea's new growth engine**
  - Classified as Renewable Energy (2009) : Investment Tax Incentives 20%
- **In the long term, POSCO can expand their business portfolio into new areas**
  - Wholesale gas market, electric power generation (IGCC), Production of chemicals & oil
  - Participate in the engineering and construction market for gasification plants



Slide courtesy of POSCO

# POSCO SNG Project Overview

- **Location** : POSCO Gwangyang Steel Works 400,000m<sup>2</sup> (including 2<sup>nd</sup> Phase)
- **Capacity** : SNG 0.5 MM tpy (78 MMSCFD, phase 1)
- **Feedstock** : 5,500 tpd sub-bituminous coal, up to 20% petcoke blend
- **Market** : New demands for power generation and steel making
- **Schedule** : Land reclamation & design (2010-2011), construction (2011-2013)



Source: POSCO

# POSCO SNG Project Participants

Project Location: Gwangyang, South Korea

**Project Owner: POSCO**

**EPC Contractor : POSCO E&C**

**Detailed Engineering Design (DED) Contractor: Daewoo Engineering**

**Front End Engineering Design (FEED) Contractor: Jacobs**

Gasification Contractor

ConocoPhillips  
E-Gas™ Technology

Gas Treatment Contractor

Linde  
Rectisol®

Methanation Contractor

(including catalyst)

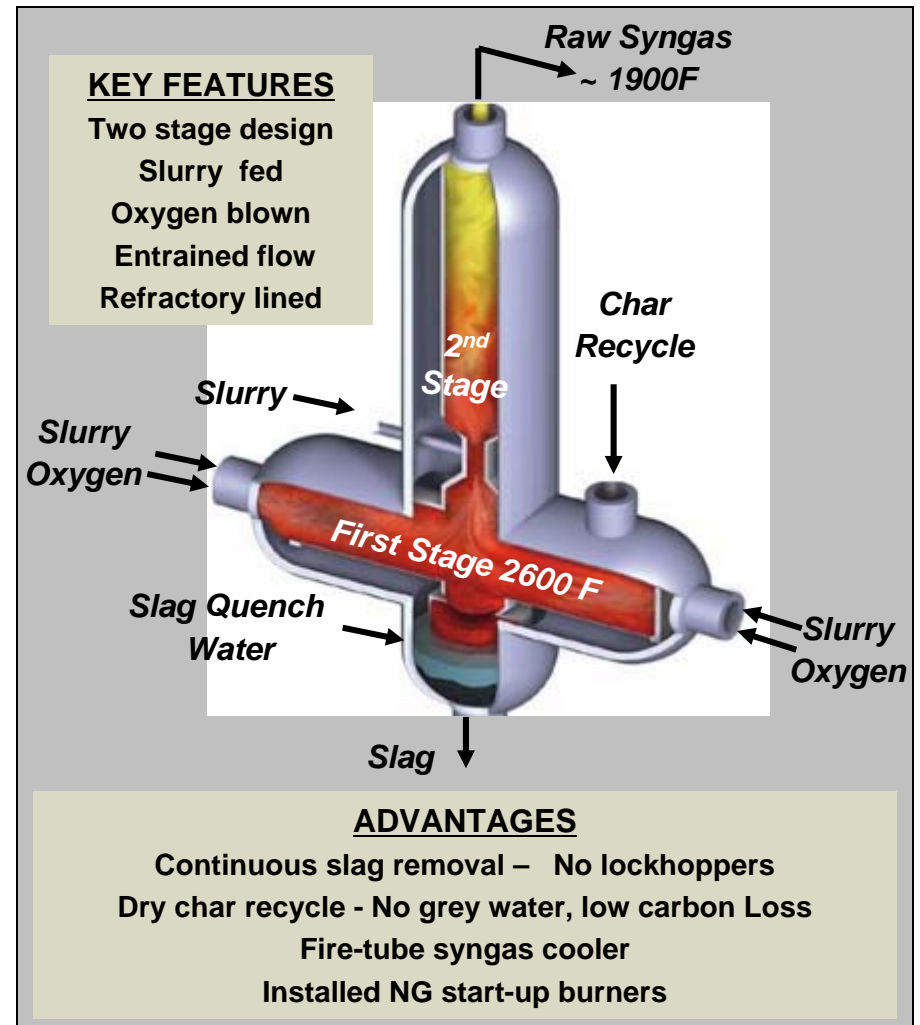
Haldor Topsoe

TREMP™

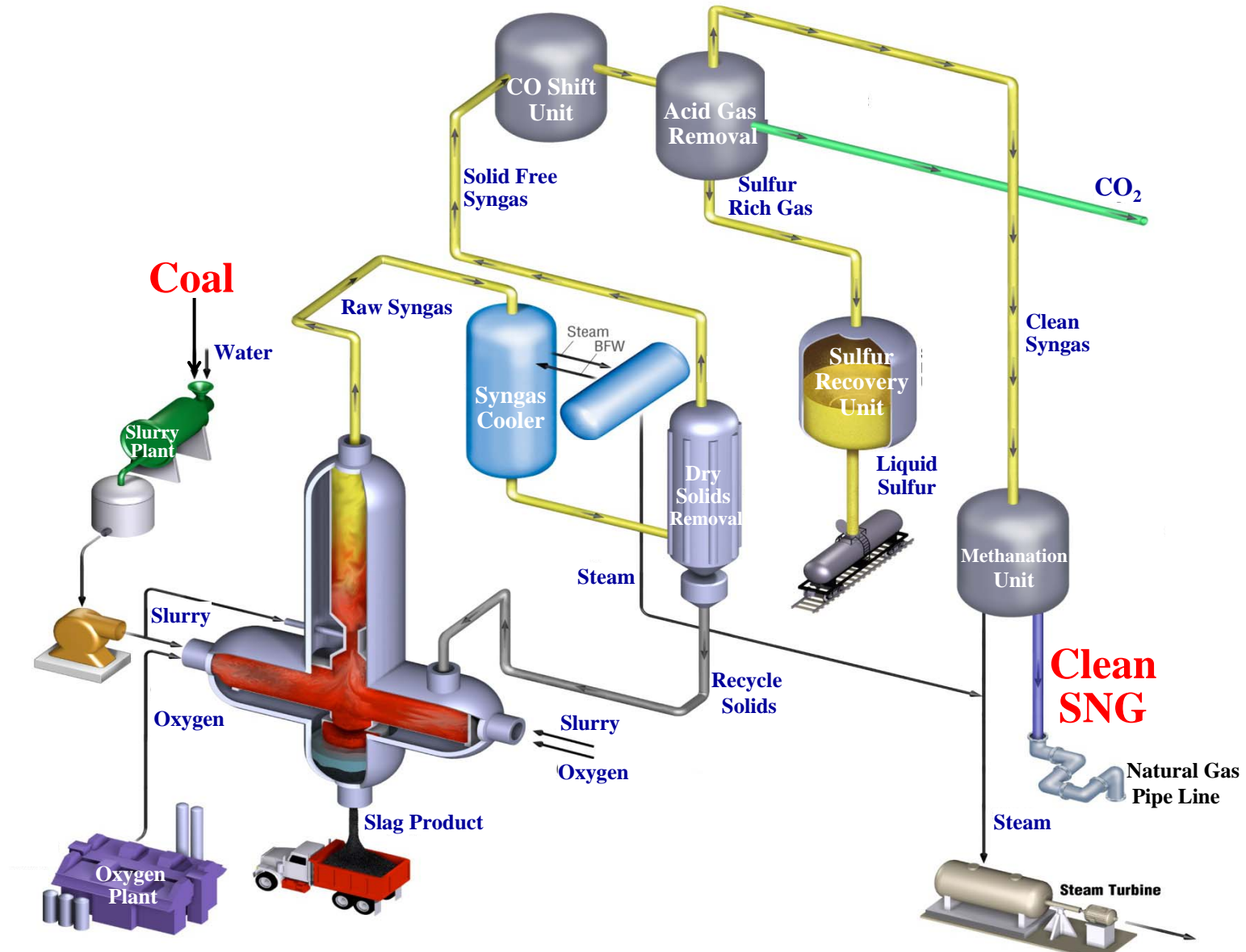
Source: POSCO

# E-Gas™ Technology Advantages for POSCO

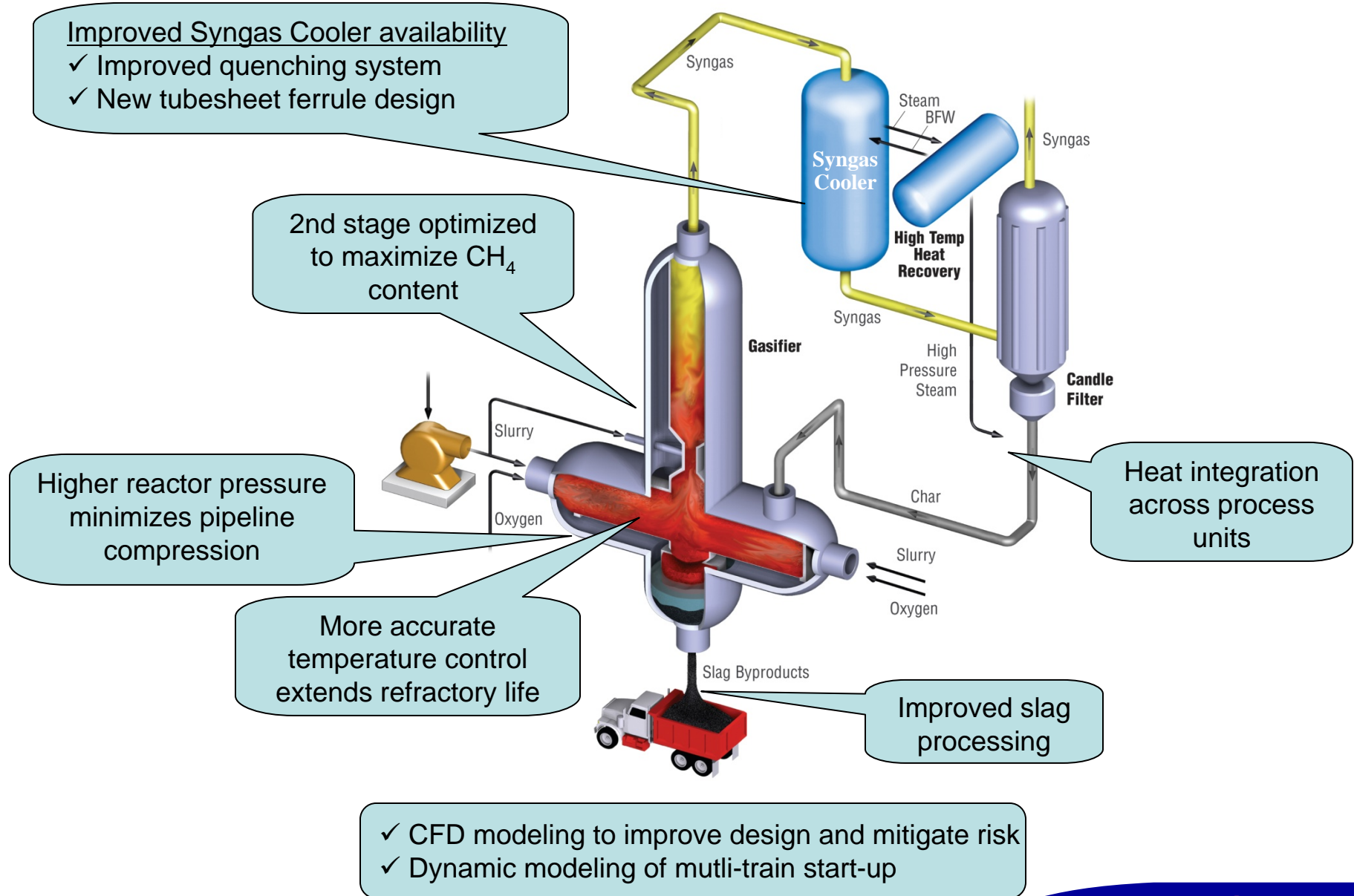
- Methane production in 2<sup>nd</sup> stage results in smaller shift, AGR & methanation units
- HP steam coupled with process heat from methanation enhances thermal efficiency
- Long operating experience with petroleum coke and sub-bituminous coal at world scale
- Low start-up emissions
- Higher capacity trains
- Lower carbon slag product
- Leverages KY NewGas design experience



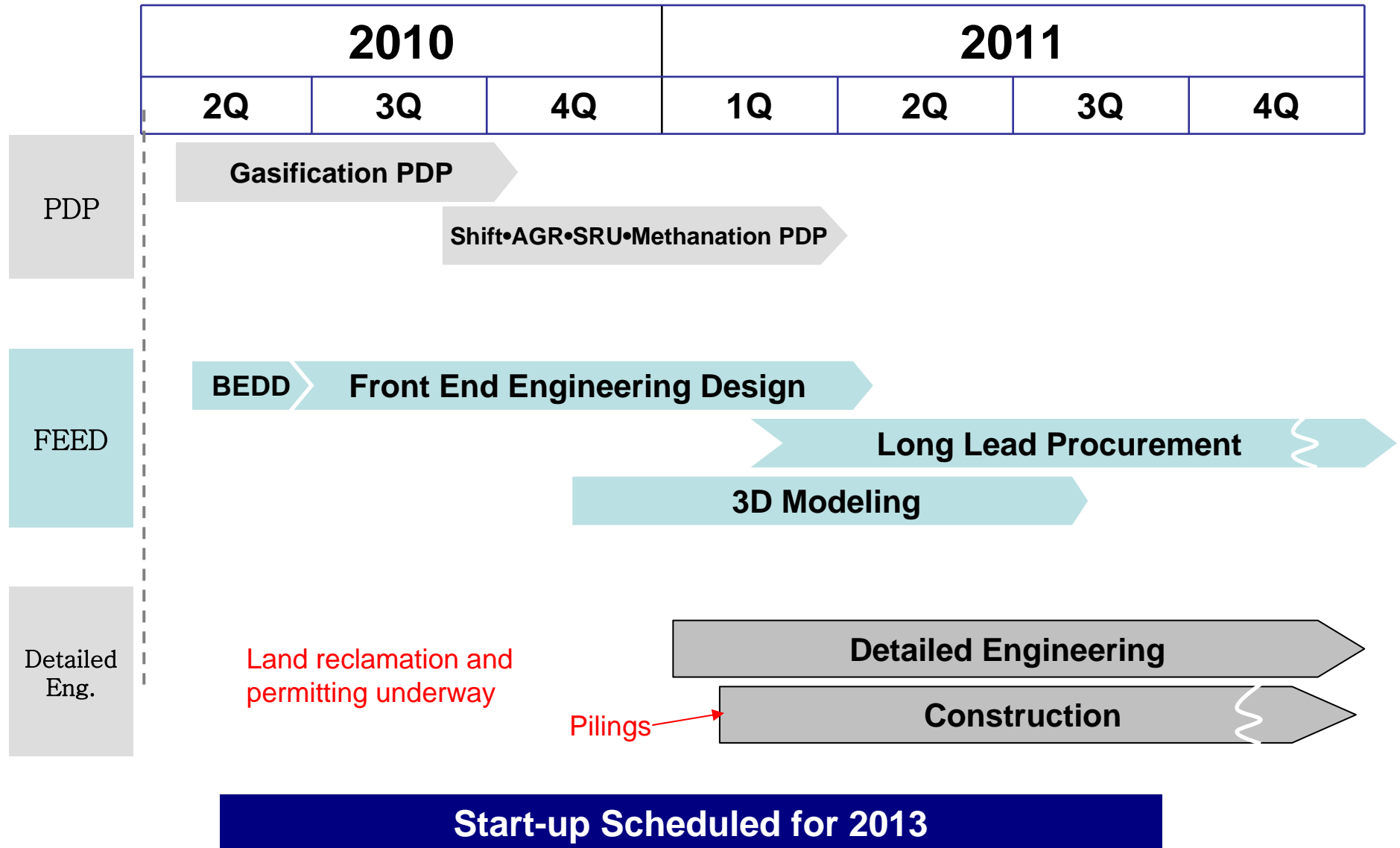
# POSCO SNG Process Overview



# E-Gas™ Enhancements for SNG Offering



# Near Term Schedule for POSCO SNG Project



Source: POSCO

# Scope of ConocoPhillips' Post PDP Services



Technical support during FEED  
And detailed design



Equipment procurement &  
inspection support services



Control and automation  
support



Operator training



Commissioning & start-up  
support

# Summary

- SNG from coal/coke offers secure and competitive energy diversification for key markets
- E-Gas™ Technology enhancements improve SNG project economics
  - Builds on lengthy E-Gas™ operating experience processing petcoke, sub-bituminous coal and bituminous coal
- Gwangyang SNG project using E-Gas™ Technology positions POSCO for success under South Korea's ambition to use clean coal as a New Growth Engine

# Thank you !

POSCO SNG Plant



Slide courtesy of POSCO