

---

가  
(IGCC: Integrated Gasification Combined Cycle)

# IGCC



Year	'91-'94	'95-'98	'99-
SO <sub>x</sub> (ppm)	700	500	270
NO <sub>x</sub> (ppm)	350	350	350
Particulates(mg/m <sup>3</sup> )	250	100	50

2003  
NOx 80 ppm



가

” “ ”

가

- 가 : No SOx / NOx
- : H<sub>2</sub>S , / 가
- : NH<sub>3</sub> ,
- : slag ,

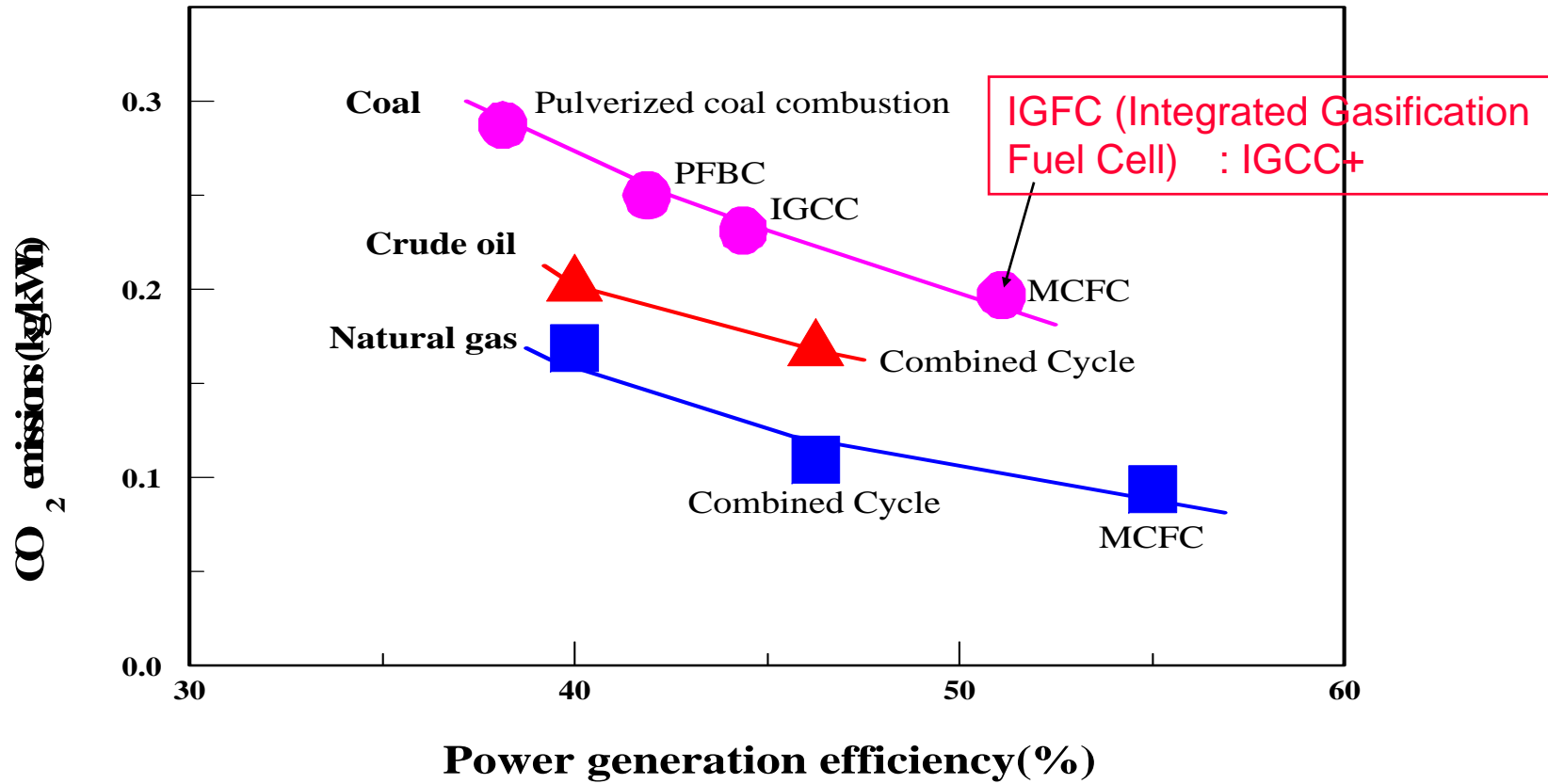


## IGCC

- SOx : 25 ppm
- NOx : 60 ppm
- Particulates : 5 mg/m<sup>3</sup> 이하
- ( ) : 42%
- CO<sub>2</sub> 15-30% 가

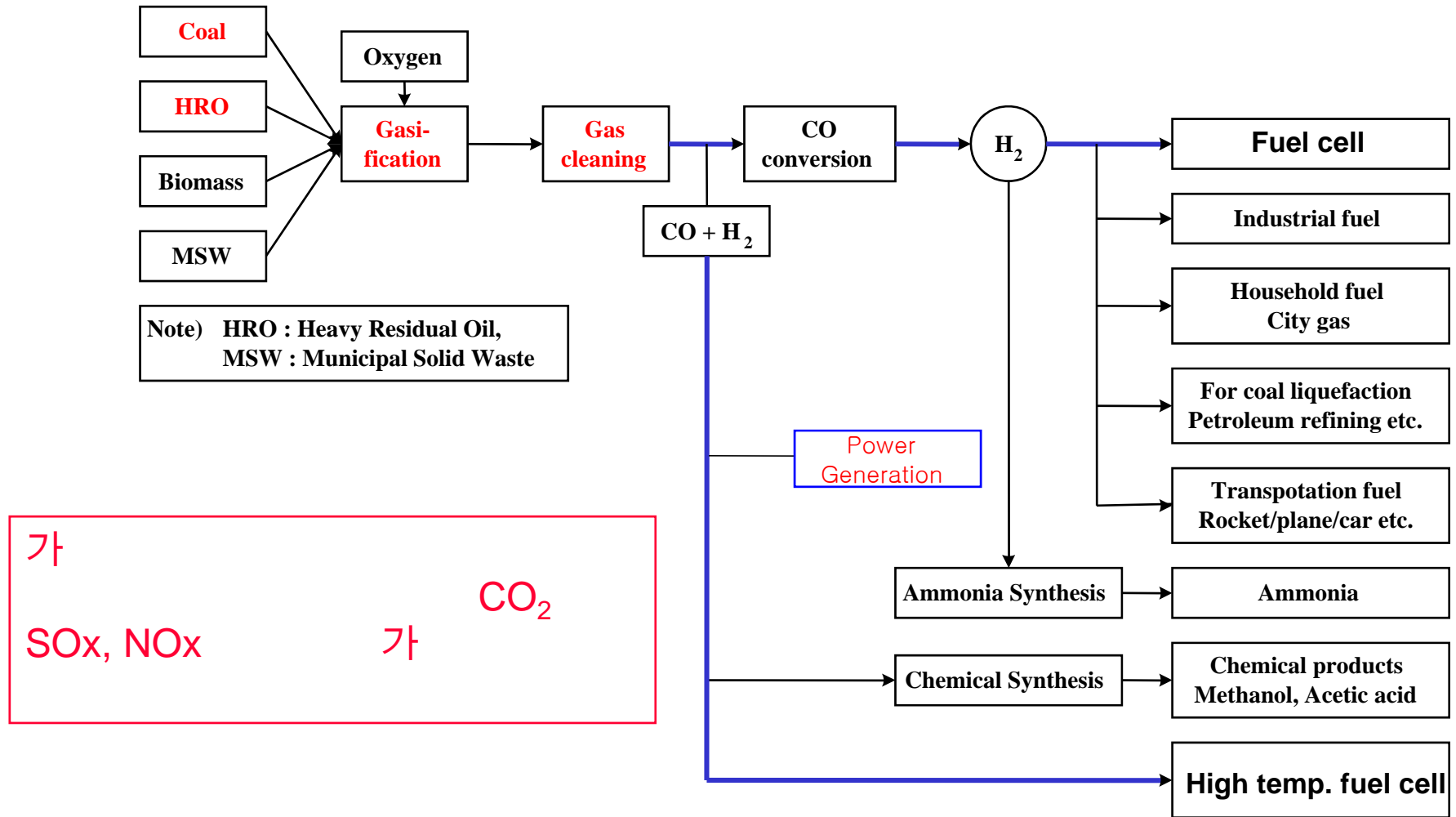
IGCC , 20-30 .

# CO<sub>2</sub>



Note) Coal + MCFC = IGFC, PFBC : 가 , MCFC :

2010 가  
IGCC .



# IGCC



:

- '98
- 3 / IGCC
- 2007 , 2013 , 2014 30 kW Clean Coal Technology
- 2 30-60 kW IGCC



:

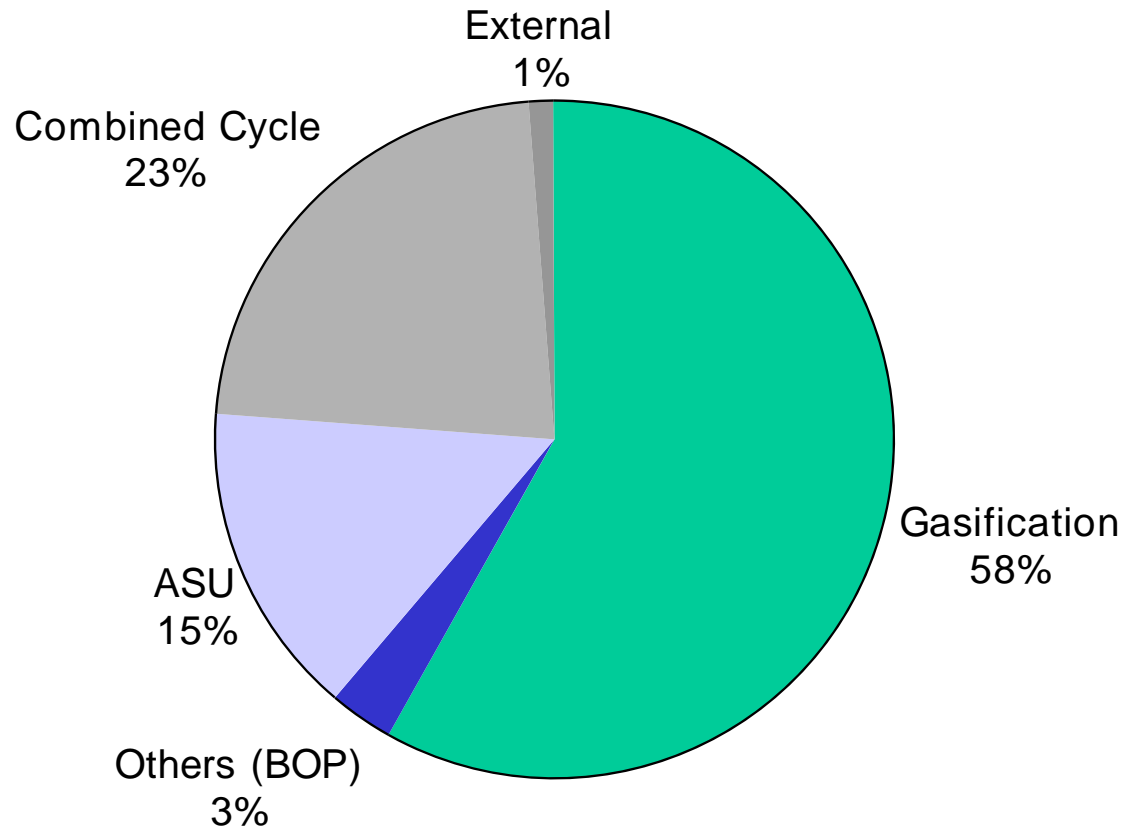
- 30 kW demonstration
- Vision 21 가 /가 21
- IGCC
- : 2004 25 kW IGCC (1 , 1/3 )
- Heavy Residual Oil IGCC
- plant process availability가 90% 가 . IGCC

# IGCC

Plant /	가	(MWe)	
Wabash River/ Indiana	Destec	262	95 10
Tampa Electric Co./ Florida	Texaco	250	96 9
Sierra Pacific Pinon Pine/ Nevada	KRW	100	98 1
Demkolec/ Buggenum	Shell	253	1994
Elcogas/ Puertollano	Prenflo	310	97 12

90

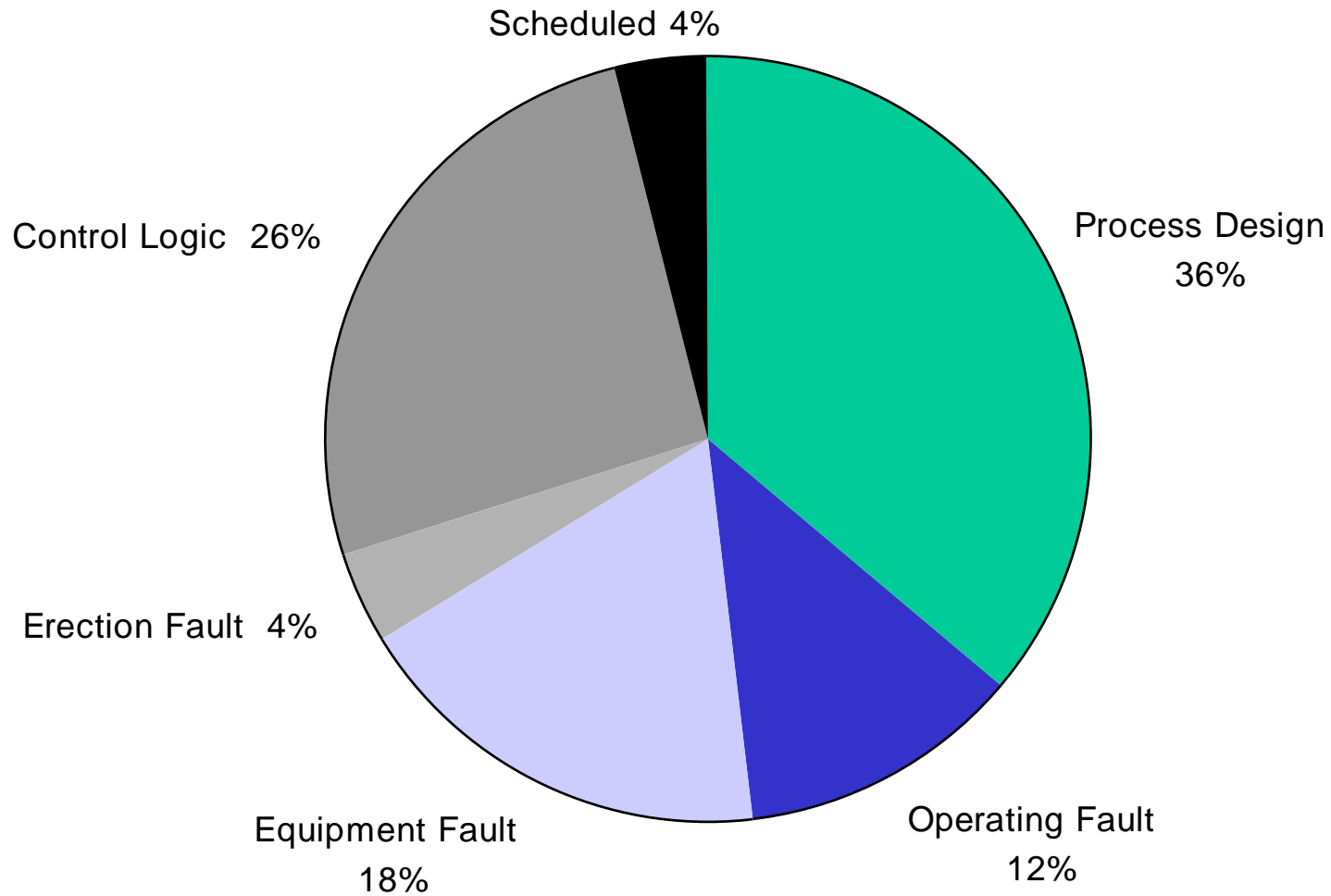
# 스페인 335 MWe Puertollano IGCC 발전소 문제발생 부분 - IGCC Trip (Area별) -



IGCC 가 , .  
(Air Separation Unit)

# Puertollano IGCC

- IGCC Trip (Failure Type별) -

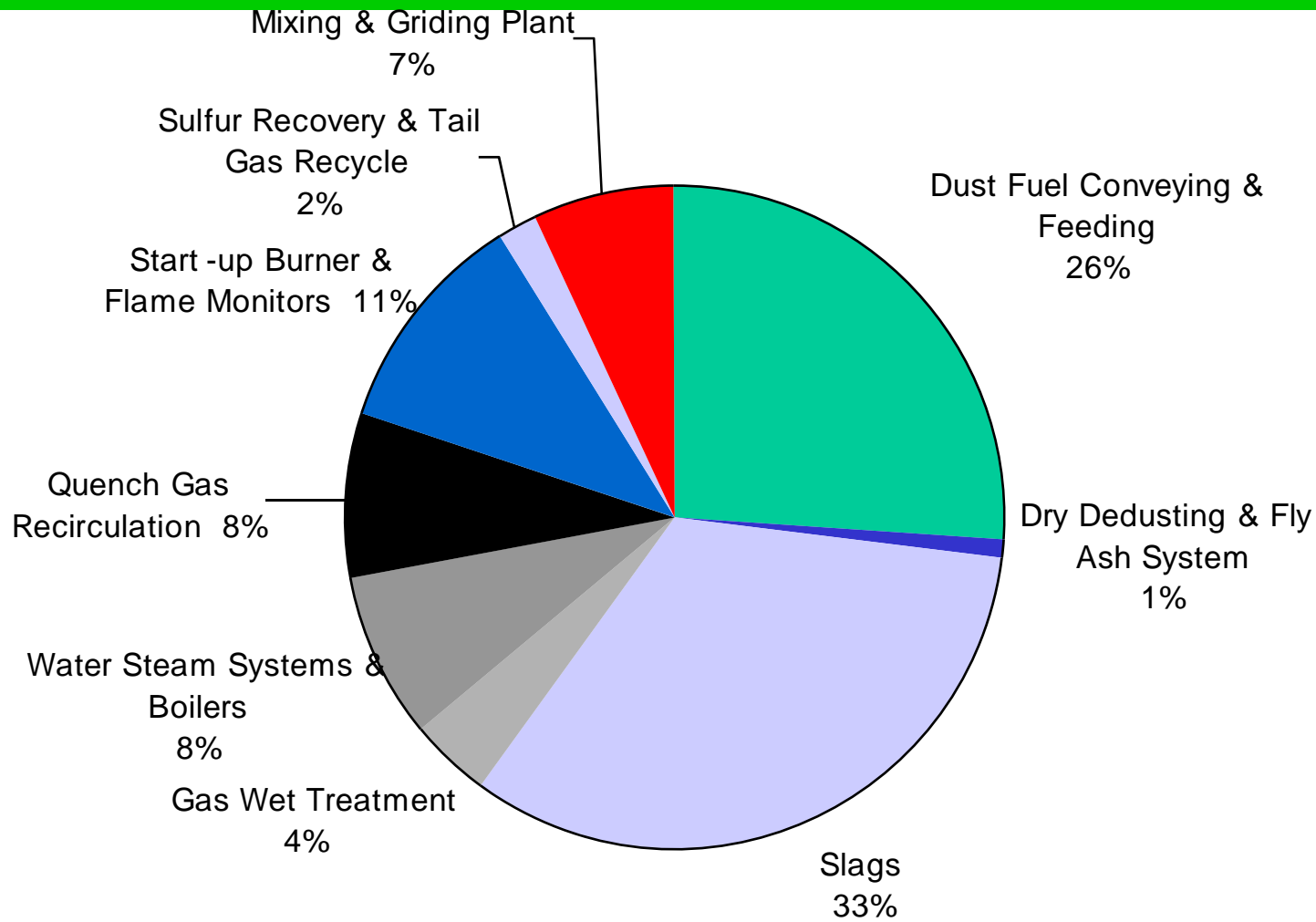


IGCC 가 가 .



# Puertollano IGCC

## - IGCC Trip (Gasification System별) -

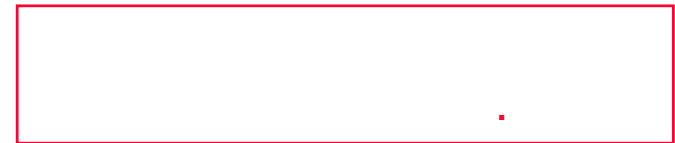


가 가 , 가

# 가



- DMT 2.7M  
\$(22 ) ,  
'99 7
- '99 9  
stage  
2000  
6



## Gasification Project Specific Incentives

Project	Specific Incentives
SASOL	Gasoline & Diesel fuel price supports
Great Plains	Guaranteed loan - defaulted
Cool Water	Syngas price supports
Plaquemine	Syngas price supports
Demkolec	Capital & operating cost sharing
Wabash River	Capital & operating cost sharing
Puertollano	Capital & operating cost sharing
Polk County	Capital & operating cost sharing
Pinon Pine	Capital & operating cost sharing
ISAB	Electricity price supports
api ENERGIA	Electricity price supports
Sarlux	Electricity price supports

incentive , incentive IGCC




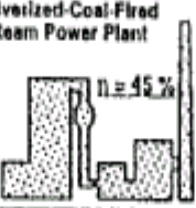
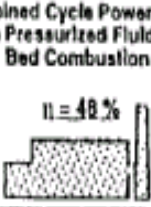
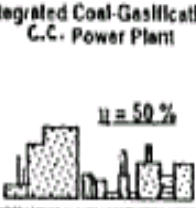
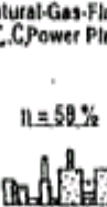
# 600MW

PC  
( )

PFBC

IGCC

NGCC  
( 가 )

Coal/ Natural gas	Limestone		CO <sub>2</sub>	SO <sub>2</sub>	NO <sub>2</sub>	Ash	Gypsum	Rejected heat (Cooling water)
[g/kWh]			[g/kWh]	[mg/kWh]			[g/kWh]	[MJ/kWh]
320	12		770	560 *	560 *	32	19	4.0
300	22 **		730	525 *	525 *	Ash / Gypsum / Limestone Mixture 56 **		3.2
285			700	140	275	Slag 29	Sulfur 4	3.0
125			345		315			2.3

\* 200 mg/m<sup>3</sup> Flue gas (STP, Dry basis, 6 vol. % O<sub>2</sub>)

\*\* Molar Ca/S-ratio = 2

IGCC가 가

Ref.: Power-Gen Asia

# 가

	가	가 (m <sup>3</sup> /kg coal)
	150°C / 10	13,600
가	840°C / 12	3,368
IGCC	540°C / 26	460
<b>IGCC</b>	540°C / 34	215

**Note:** 600°C  
가

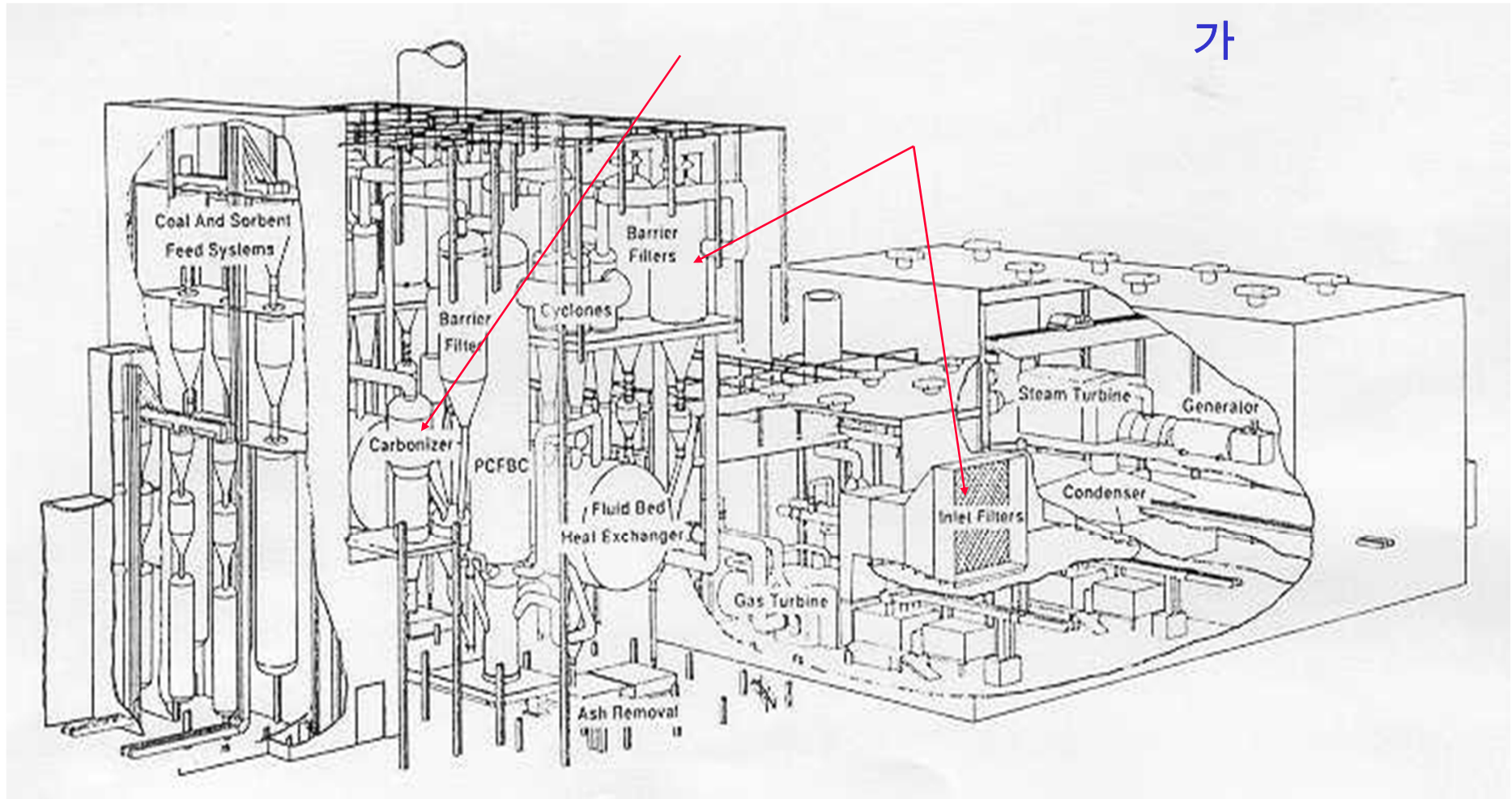
가  
(PFBC)

ceramic filter  
가

bottleneck .

IGCC가 가 .

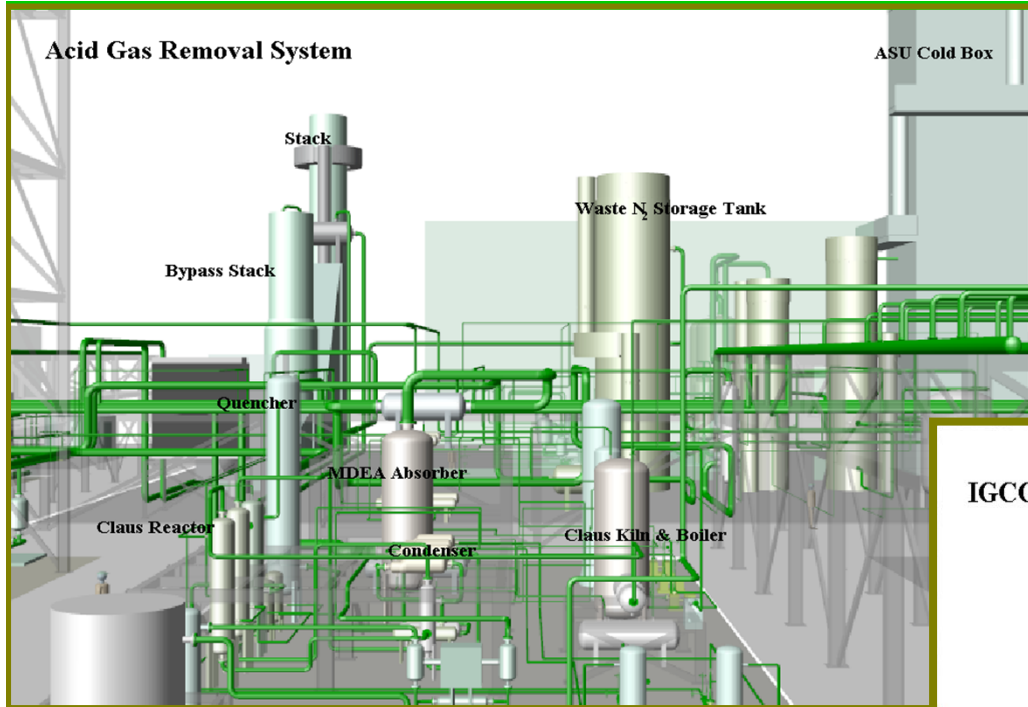
IGCC



가

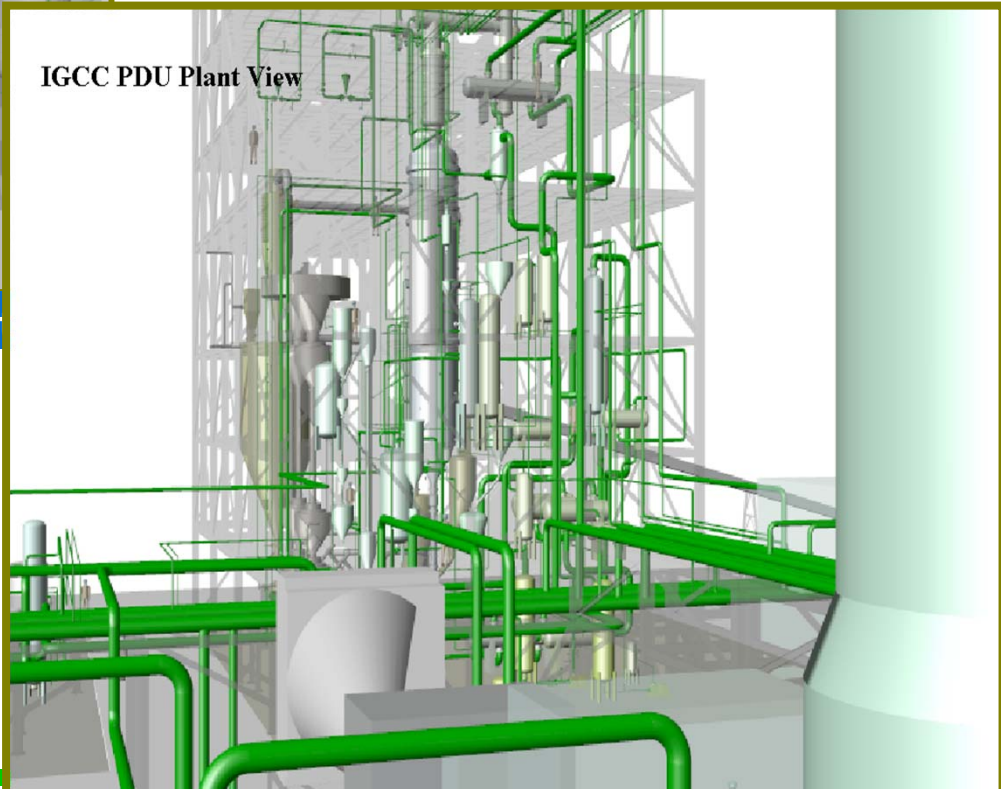
Note: 2010

가 .



IGCC PDU 3D Model of Acid Gas Removal Sys

3  
IGCC Plant



3D Model View of IGCC PDU Plant

# (1/2)

- /가
- , NOx 90% ) CO<sub>2</sub> ( SOx 95% )  
IGCC .
- 2003 NOx 가 80 ppm  
가  
( NOx 150 ppm ) , 가 가 .
- 1 300MW 600MW 1MW RDF(Refuse  
Derived Fuel)
- 가가 IGCC 50 /kWh ,  
103 /kWh incentive가  
가 IGCC ( 가  
270-360 /kWh) 가



□ IGCC 가 ( : 가 ,  
가 , , 3 , )  
가 .

□ 가 , biomass, ( : )  
가 ,

□ IGCC 1/1000  
,  
,  
IGCC .