

Status and Future of FINEX[®] Process for Reducing CO₂ Emissions



5 November 2013
POSCO

Contents

- 1. Introduction of FINEX[®] Process**
- 2. Direct Reduction of CO₂ Emissions**
- 3. Indirect Reduction of CO₂ Emissions**
- 4. Future of FINEX[®] Process**

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1. Introduction of FINEX[®] Process

- Scale up History
- FINEX[®] Process Flow
- Characteristics of FINEX[®] Process

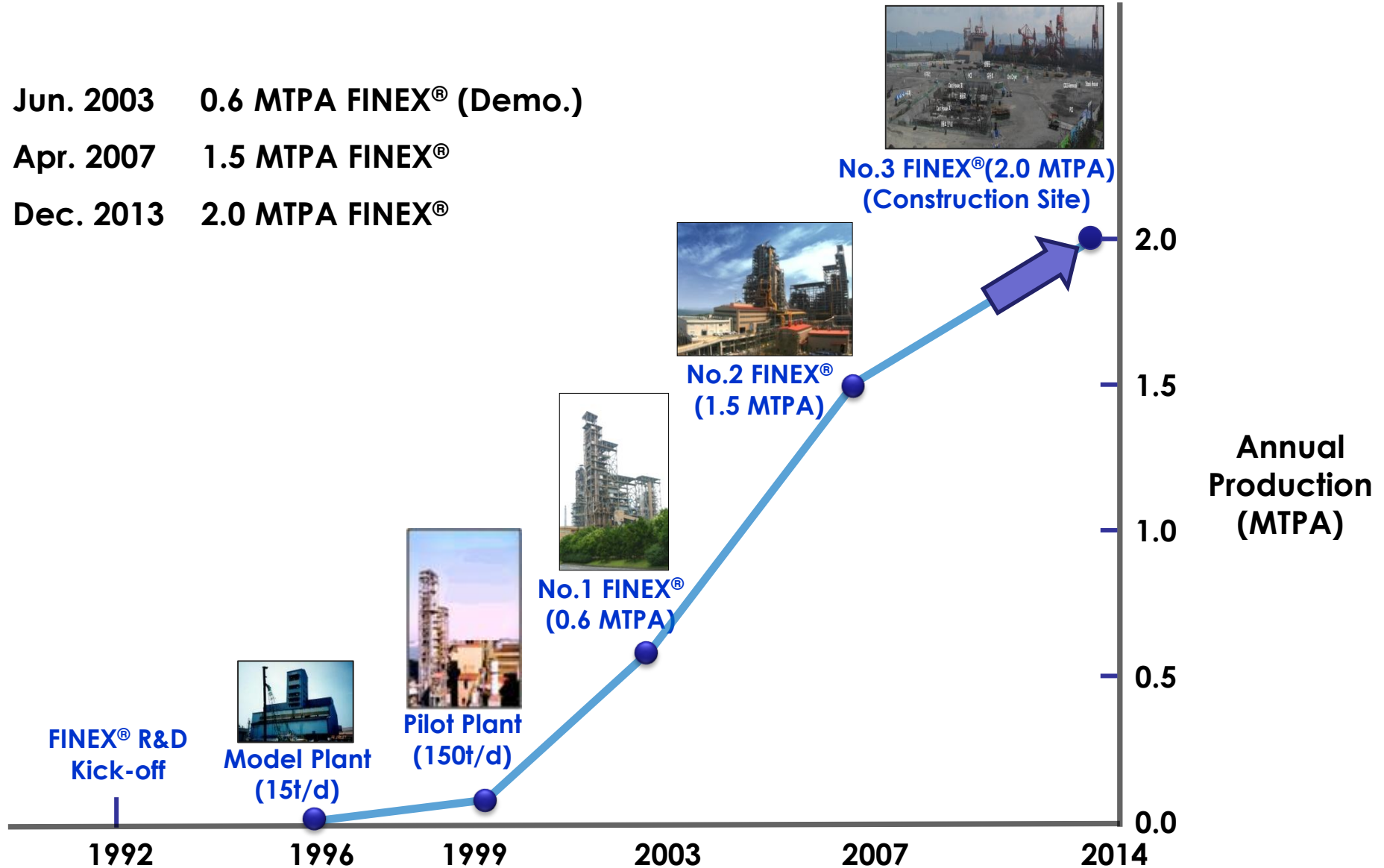
2. Direct Reduction of CO₂ Emissions

3. Indirect Reduction of CO₂ Emissions

4. Future of FINEX[®] Process

Scale-up History

- Jun. 2003 0.6 MTPA FINEX® (Demo.)
- Apr. 2007 1.5 MTPA FINEX®
- Dec. 2013 2.0 MTPA FINEX®





**No.2 FINEX®
(1.5 MTPA)**

**No.1 FINEX®
(0.6 MTPA)**

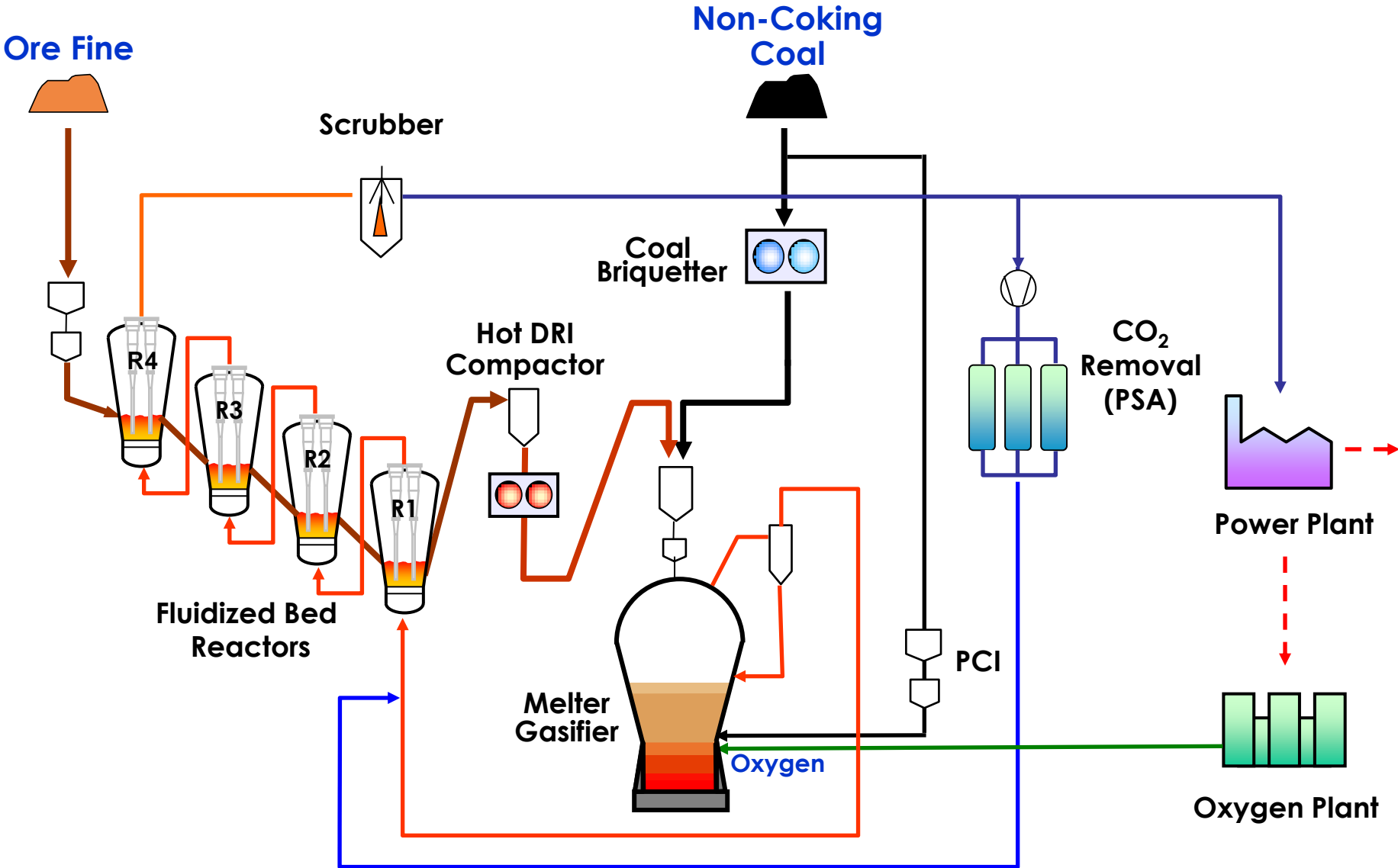


**No.3 FINEX®
(2.0 MTPA)**

Fluidized bed Reactor

Melter-gasifier

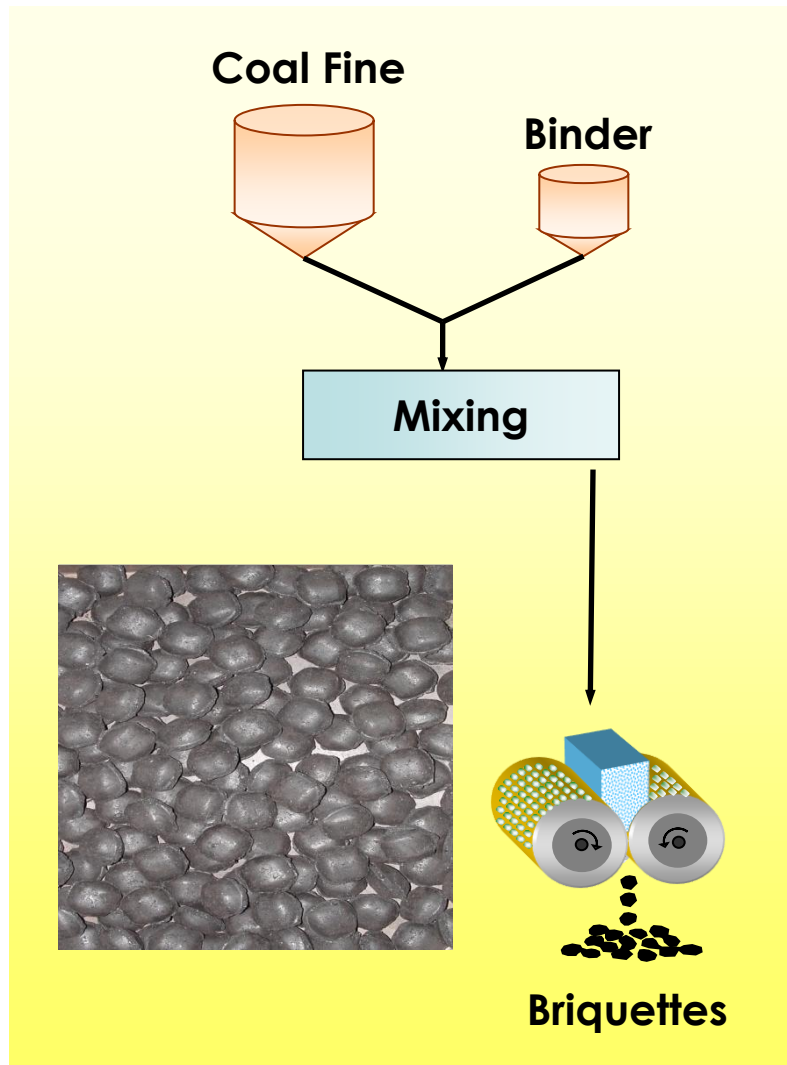
FINEX[®] Process Flow



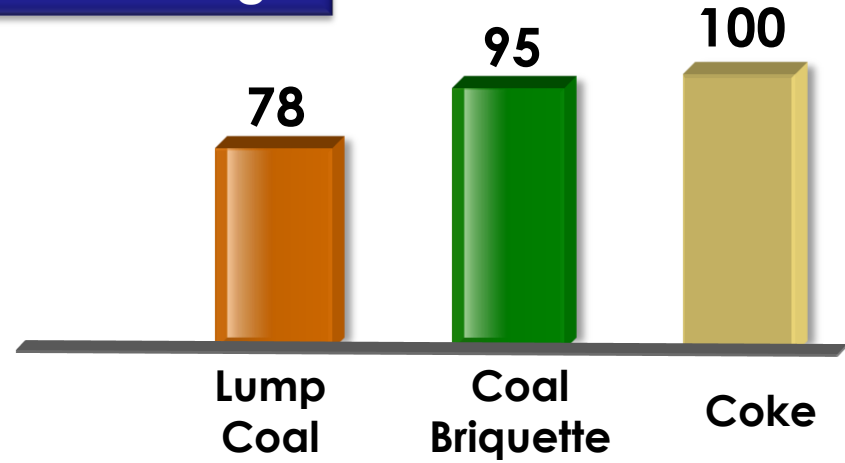
- **No pretreatment plants**
- **Flexibility of raw materials in use**
- **Environmentally-friendly process**
- **Flexibility of hot metal production**

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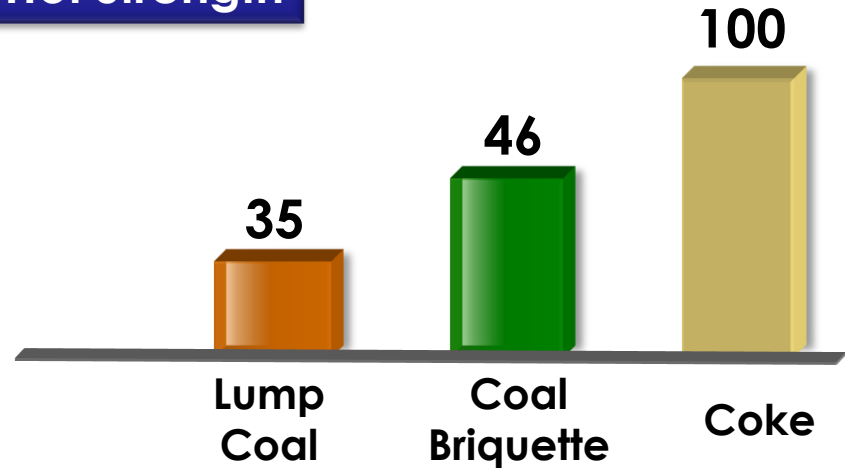
1. Introduction of FINEX[®] Process
- 2. Direct Reduction of CO₂ Emissions**
 - Coal Briquette
 - CO₂ Removal Process
 - Pulverized Coal Injection
3. Indirect Reduction of CO₂ Emissions
4. Future of FINEX[®] Process

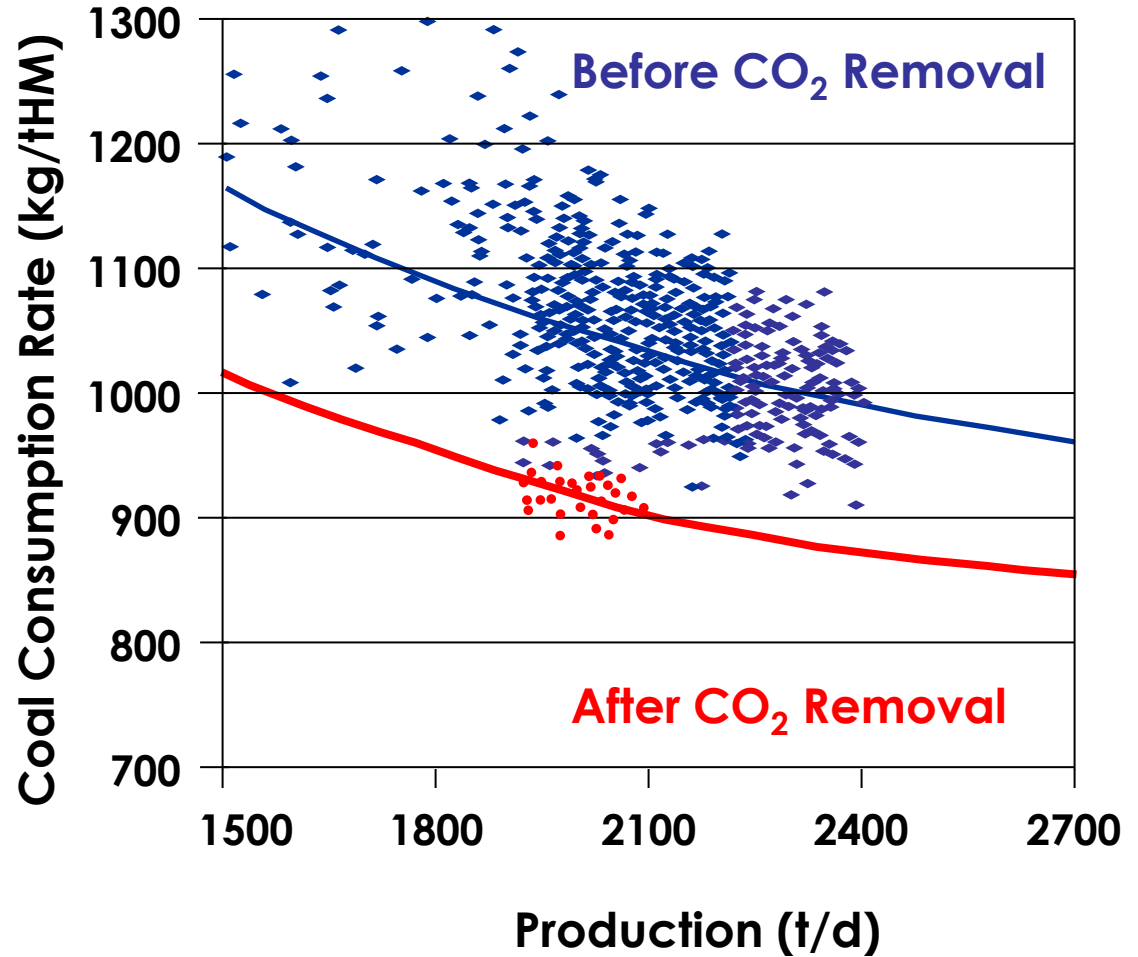
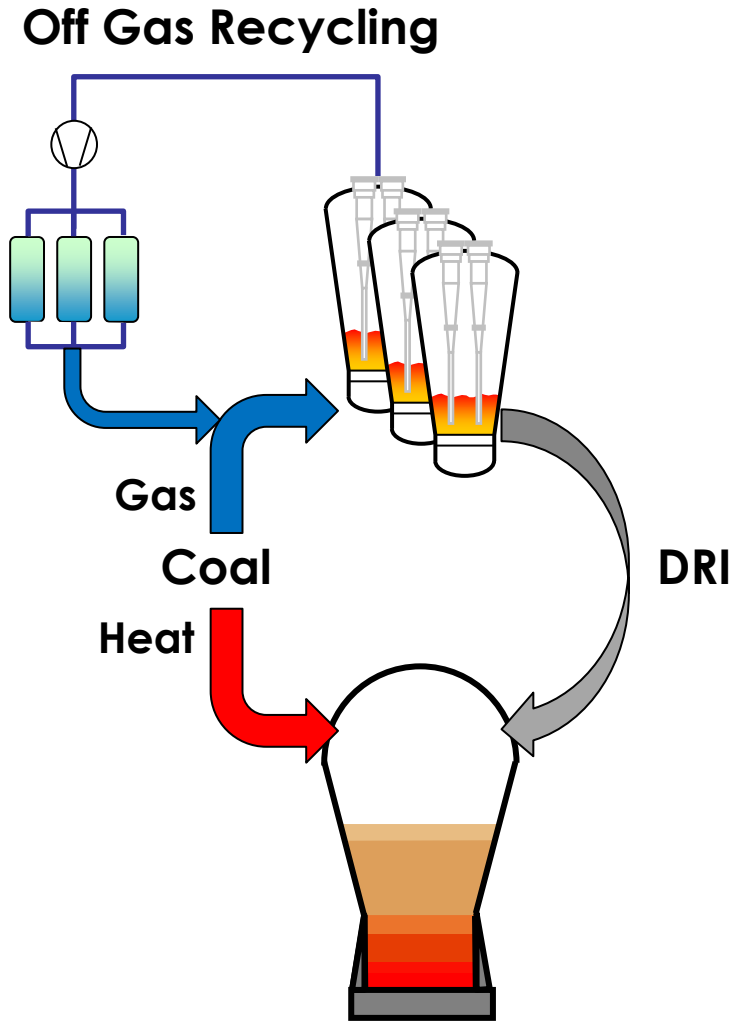


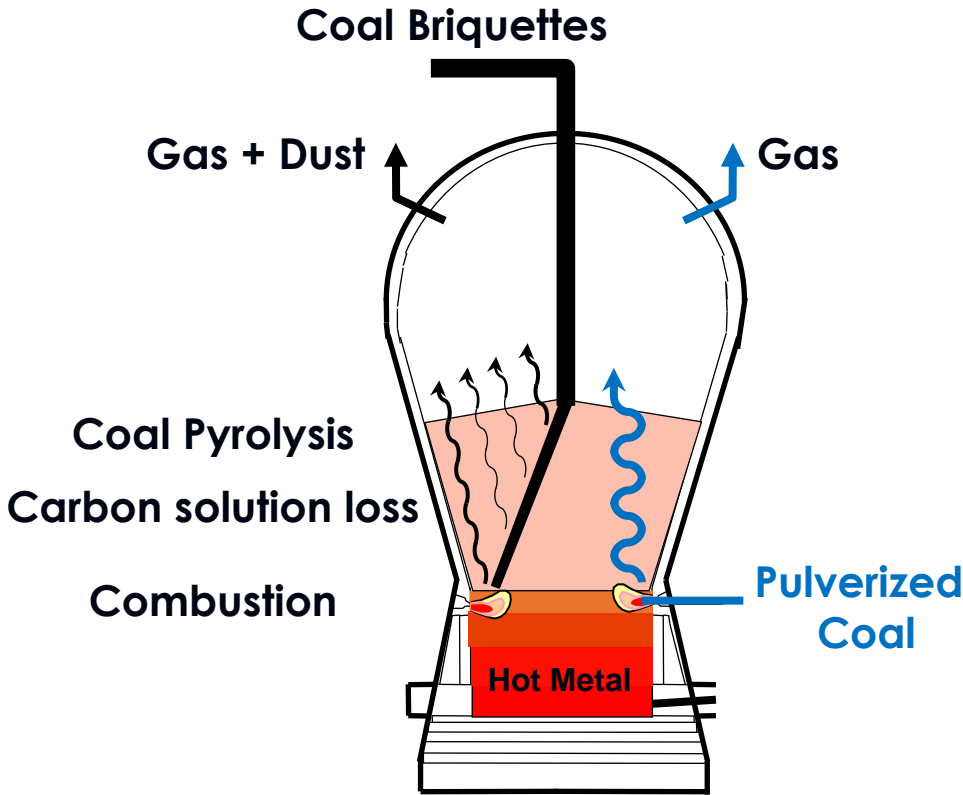
Cold Strength



Hot Strength

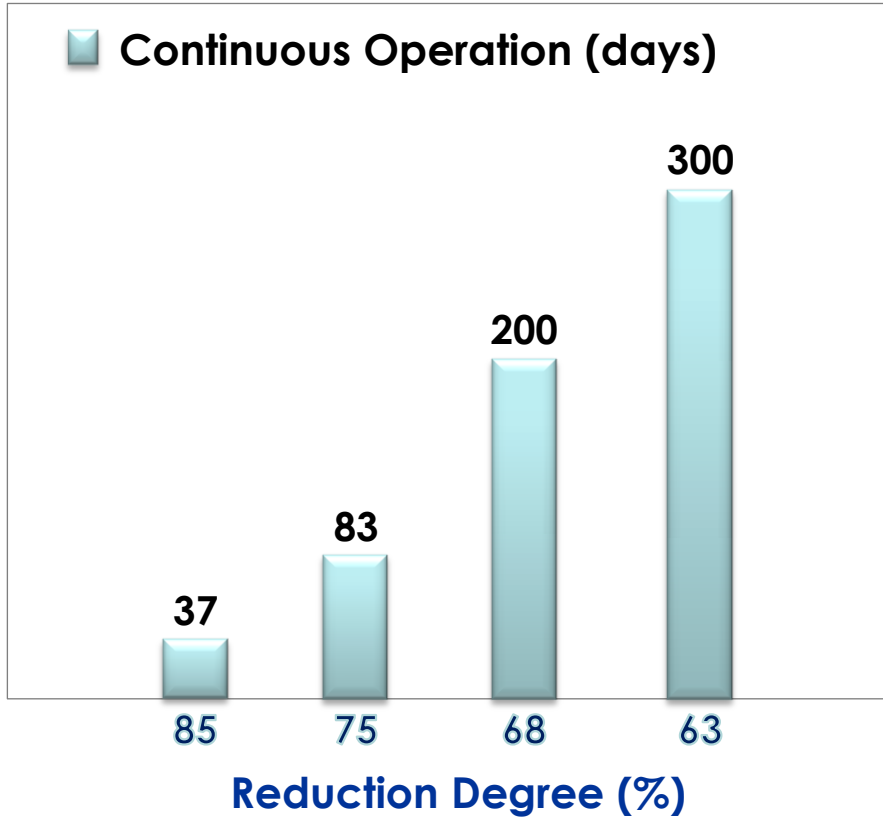




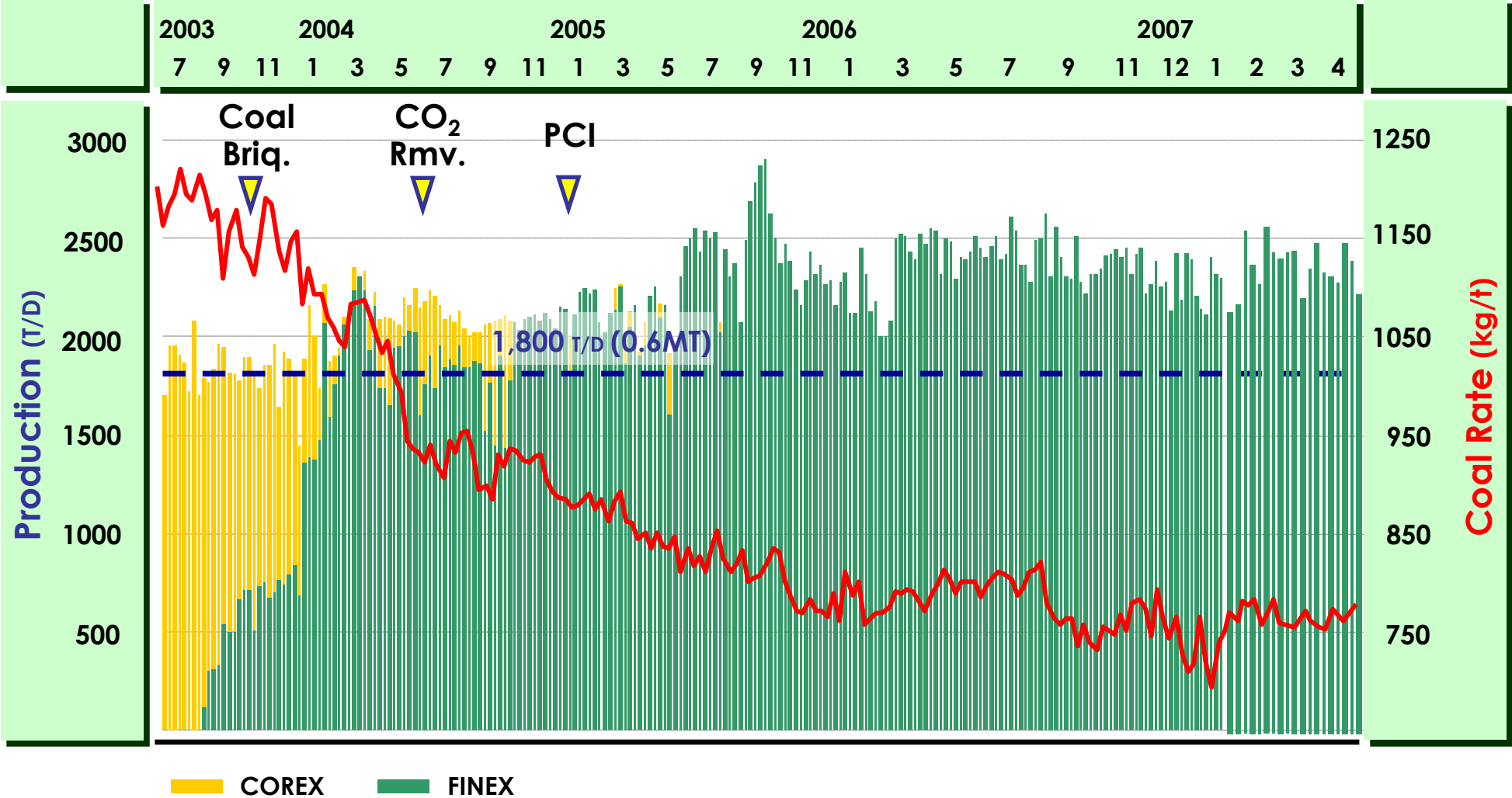


Coal Bq.	Coal	PC
Pyrolysis, Dust loss	Dome, Char Bed	-
56%	Raceway	100%

Fluidized Bed Reactor Availability



FINEX[®] Demo Plant Operational Performance



■ COREX ■ FINEX

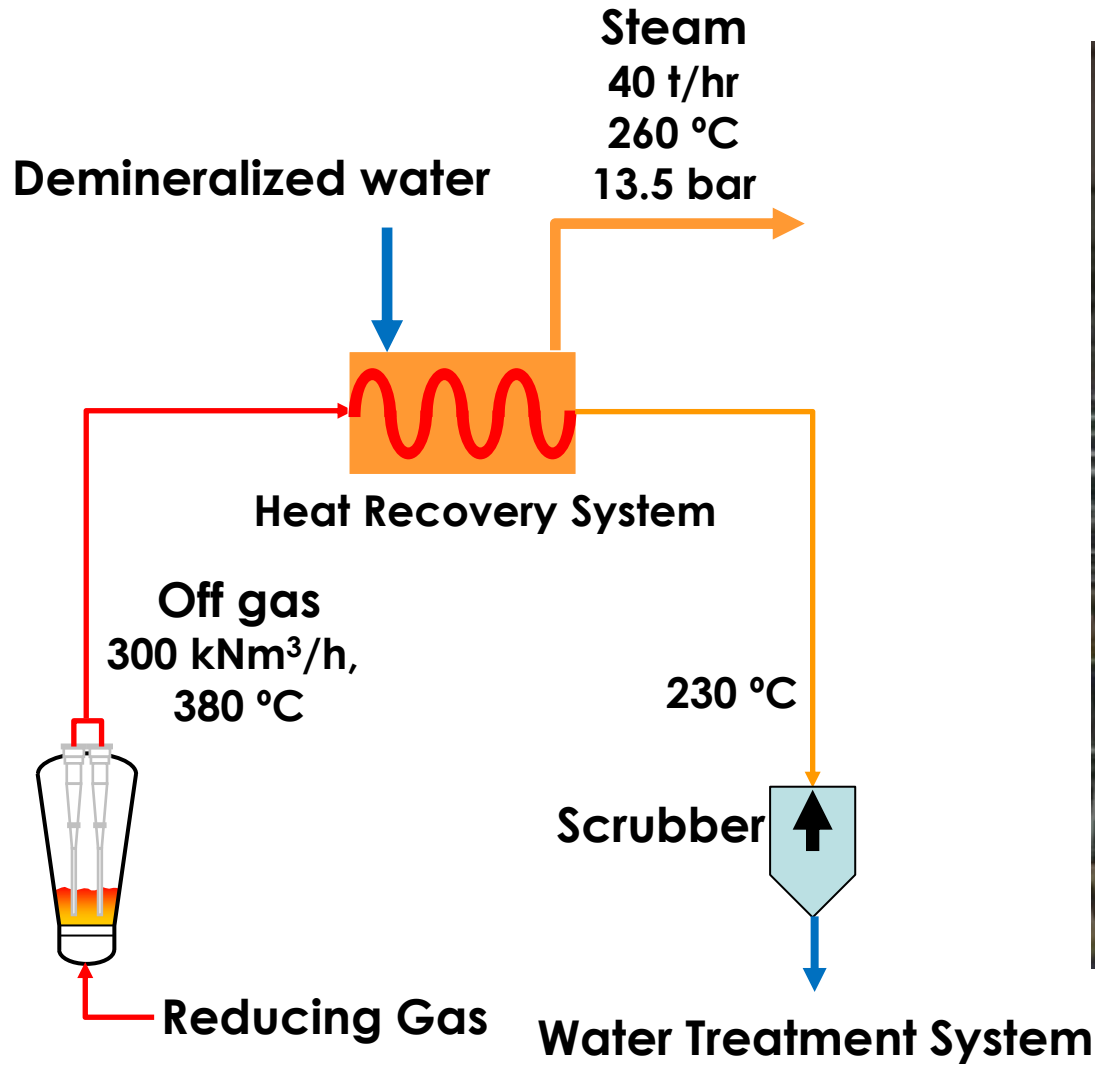
Operating Parameters of No. 2 FINEX[®]

Indices			Target (designed)	Operation (2008)
Production	Mt/y		1.5	1.5
	t/d		≥ 4,200	4,300
Coal Rate		kg/t-HM	≤ 730	720
	Coke		≤ 70	60
	PCR		≥ 140	150
Hot Metal	[S]	%	≤ 0.030	0.027
	[Si]	%	≤ 0.80	0.81

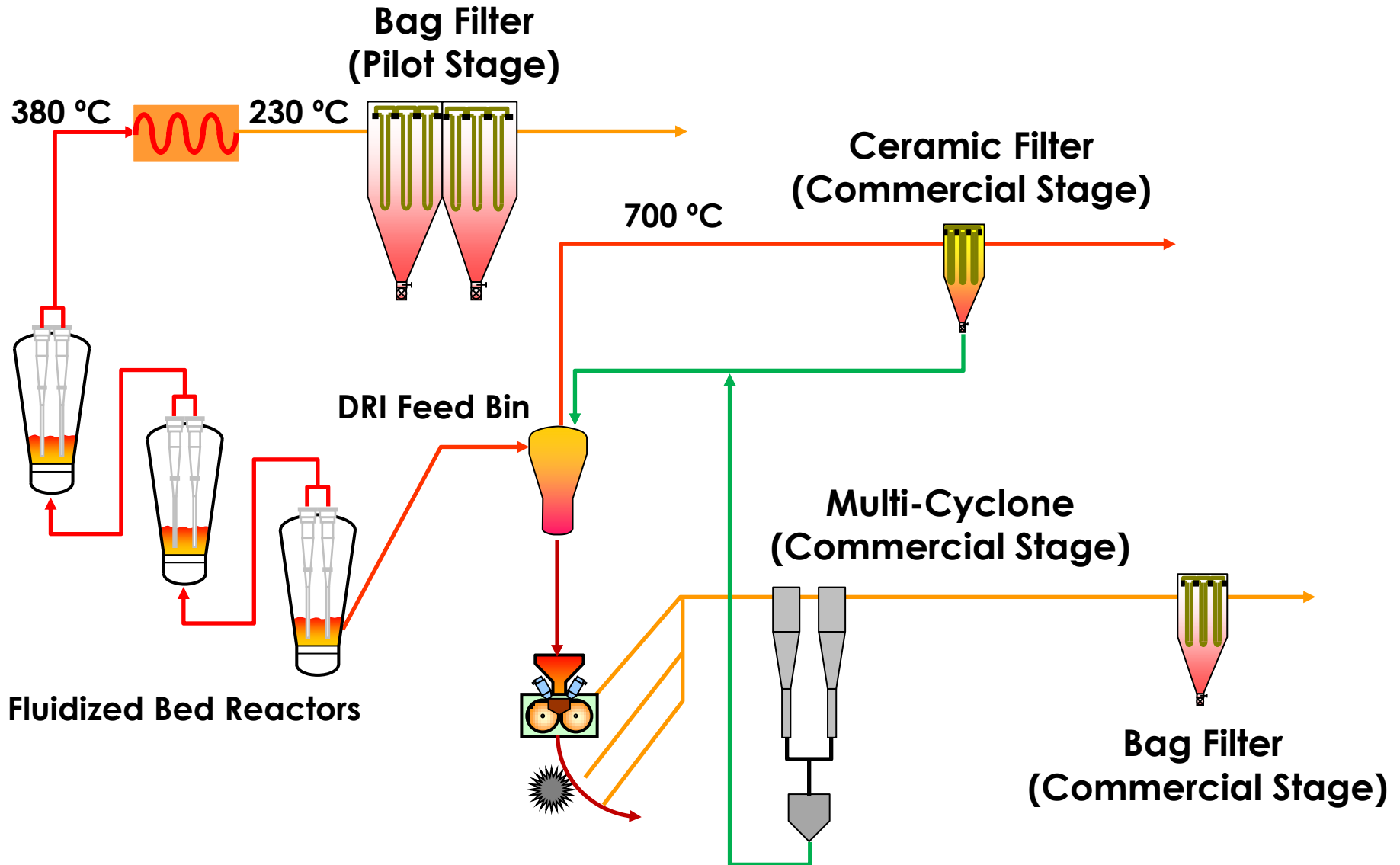
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1. Introduction of FINEX[®] Process
2. Direct Reduction of CO₂ Emissions
- 3. Indirect Reduction of CO₂ Emissions**
 - Heat Recovery System
 - Dry Dust Collectors
 - Recycling of By-products
4. Future of FINEX[®] Process

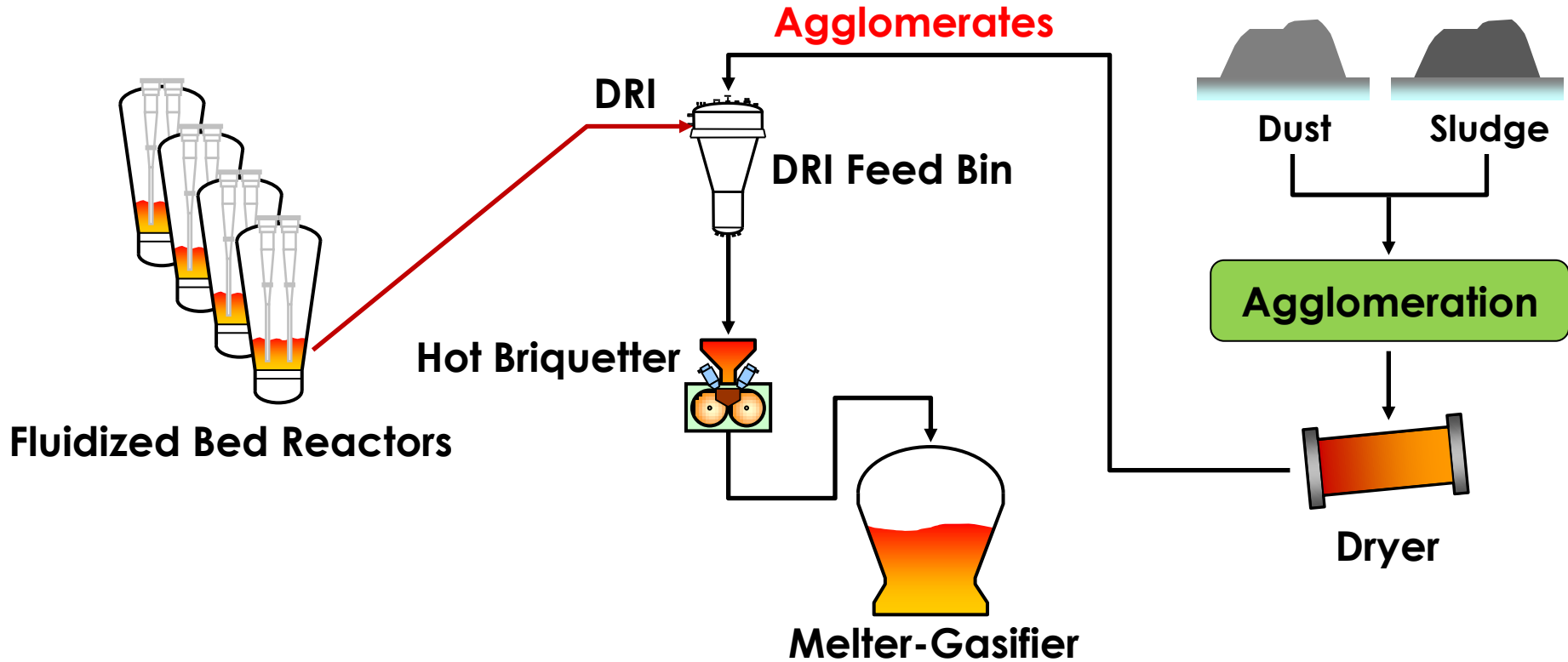
Heat Recovery System



Heat Recovery System



Recycling of By-products

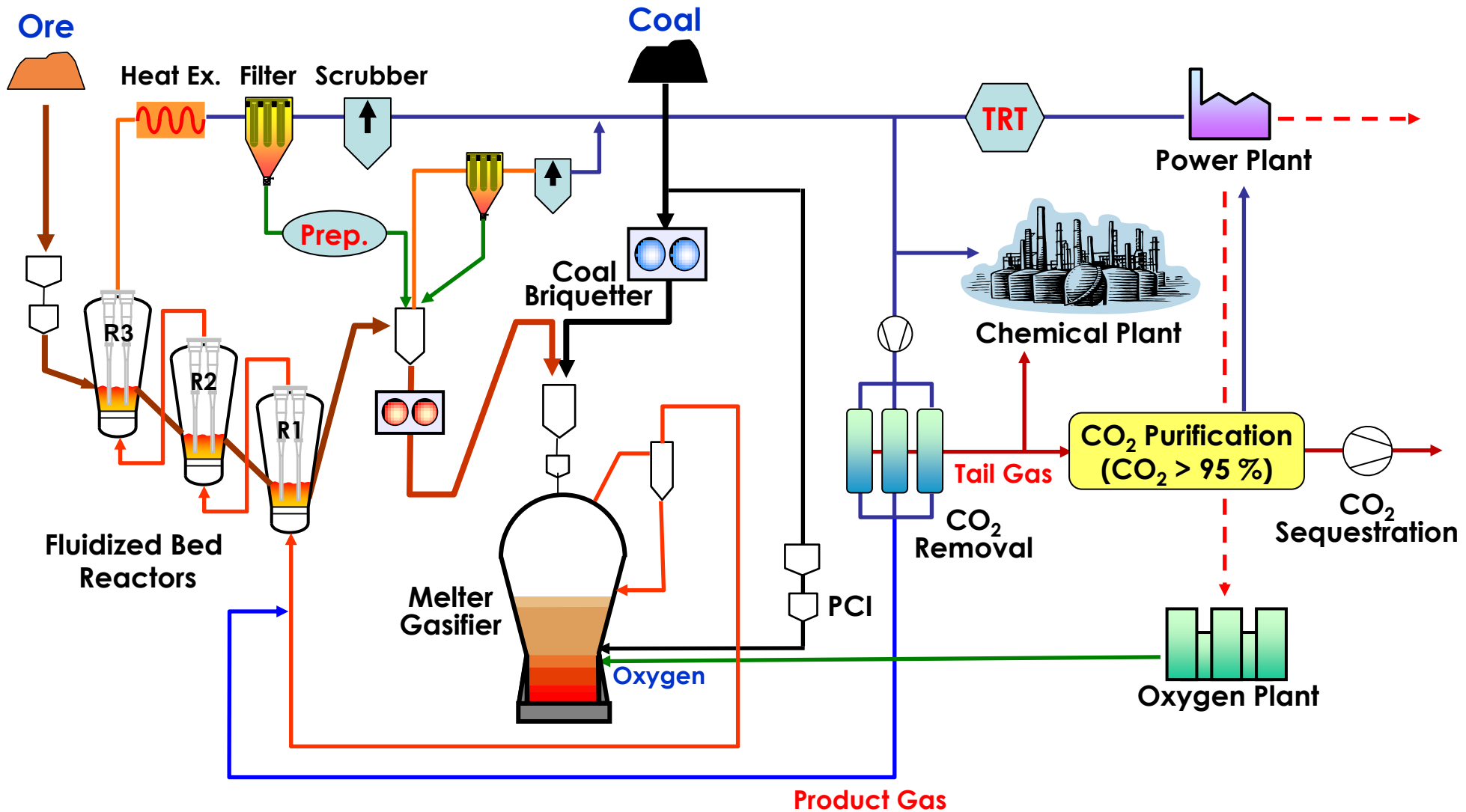


Composition(%)	Total Fe	RD	C	SiO ₂	CaO	Al ₂ O ₃	MgO
By-products	50~55	15~20	5~10	4~6	3~4	3~4	~ 1

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FINEX[®] Process Flow



- **After starting R&D activities of FINEX[®] in 1992, it is being scaled up to 2.0 Mt/y**
- **CO₂ emissions from FINEX[®] drastically fell down because POSCO has developed coal briquetting process and has optimized the FINEX process by adopting CO₂ removal system and pulverized coal injection**
- **A series of technical developments such as heat recovery system, dry dust collectors and recycling by-products could reduce CO₂ emissions furthermore**
- **FINEX[®] has lots of potential for lowering coal consumption rate and saving energy as a developing process**

Thank You

