

4 - 2 Development of Higher Efficient Hyper Coal direct firing Gas Turbine power generation system

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1.1 The Concept of Research and Development of this theme

As shown in Fig. .1.1, the ultimate goal of technical development is in the realization of a highly efficient gas turbine combined cycle power generation system that utilizes Hyper Coal (hereafter referred to as HPC) obtained from solvent extraction. Residue coal ash obtained from solvent extraction is controlled at about 15% so that it can be used as fuel for conventional pulverized coal-fired power plants.

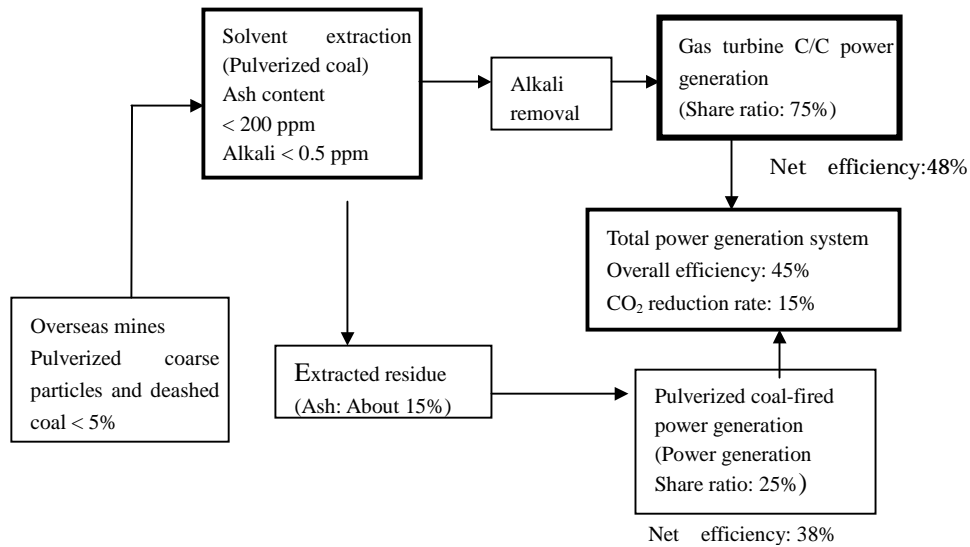


Fig. .1.1 Concept of Development of Highly Efficient HPC-fired Power Generation System

1.2 A brief results of research and development

The properties of solvent extracted coal called hyper coal are shown on table 1.1

Table1.1 Properties of Hyper Coal

The properties of solvent extracted coal, called Hyper Coal are shown on Table 1.1.

Hyper coal has 200ppm of ash , 36.8M J / kg and It is a good new fuel.

The burn-off time of Hyper coal pulverized by max. 10 μ m was simulated as 5 0 ms . And a life of GT-Blades were anticipated about 10000hrs .

So that, Higher efficiency Hyper Coal direct firing gas turbine Power generating system is possible to be accomplished. CO₂ Emission load of this power system is 0.198kg-C/kwh,and reduction rate of CO₂ oh Hyper coal power system is about 20%, compared with PCF power system.

	Stratford Coal(Aus.)		
	Raw Coal	HPC	R.C
Yield w%		72	
MoistureW%	1.6	0	0
Ash W%	5	0.02	16.01
V.M W%	35.1	38.8	23.7
Fuel Ratio	1.9	1.6	3.2
Ultimate Anal.W%			
C	82.75	87.6	73.33
H	5.2	5.33	3.65
N	2.16	2.1	1.9
S	0.66	0.69	0.67
Calorific value			
Gross MJ/kg	34.2	36.8	26.4
Net MJ/kg	33	35.6	27.6

HPC: Hyper Coal RC: Residue Coal