

● R& D on Multiple Purpose Coal Utilization Technology

(Technology Development to promote Sub-bituminous Coal Utilization)

1. Outline of the Project

Sub-bituminous coal is generally cheap in price and has such excellent environmental characteristics as low NOx emitting nature, etc. However, its ash melting point is generally low to cause operation troubles by some adhesion of ash on the heat-conducting surface of the boiler. Furthermore, it accompanies some demerits of its high indigenous water contents; lower calorific values, as well as, disadvantageous lower handling features. Owing to these reasons, its consumption amount in Japan stays low, almost several million tons per annum. To the contrary, in those countries like the United States of America, the use of their own lowly carbonized coals have been long promoting the introduction of their sub-bituminous coal in overcoming miscellaneous technical issues for its much more expanded uses.

On the other hand, **the amount of good quality bituminous coal (High Rank Coal) is limited of its global reserve, which we are chiefly using in Japan. Then, we have to promote the use of such lowly carbonized coal as sub-bituminous coal, etc. in order to promote the use of those abundant Low Rank Coals in the world.** In addition, from the viewpoints that we need to secure the energy supply to Japan and to reduce her own environmental burdens, we believe that introduction of the low carbonized coal is an important issue, because of the fact that it occupies about a half of the global coal reserves (Please refer to the following table based upon data published by the World Energy Conference).

This project aims at increase of use of sub-bituminous coal at those existing pulverized coal fired boilers in Japan, and its purpose is to establish an “Optimum Utilization Guideline for Sub-bituminous Coal” consisting of settings on optimum mixing conditions for combustion of the low rank coal with normal bituminous coal, as well as its operation conditions.

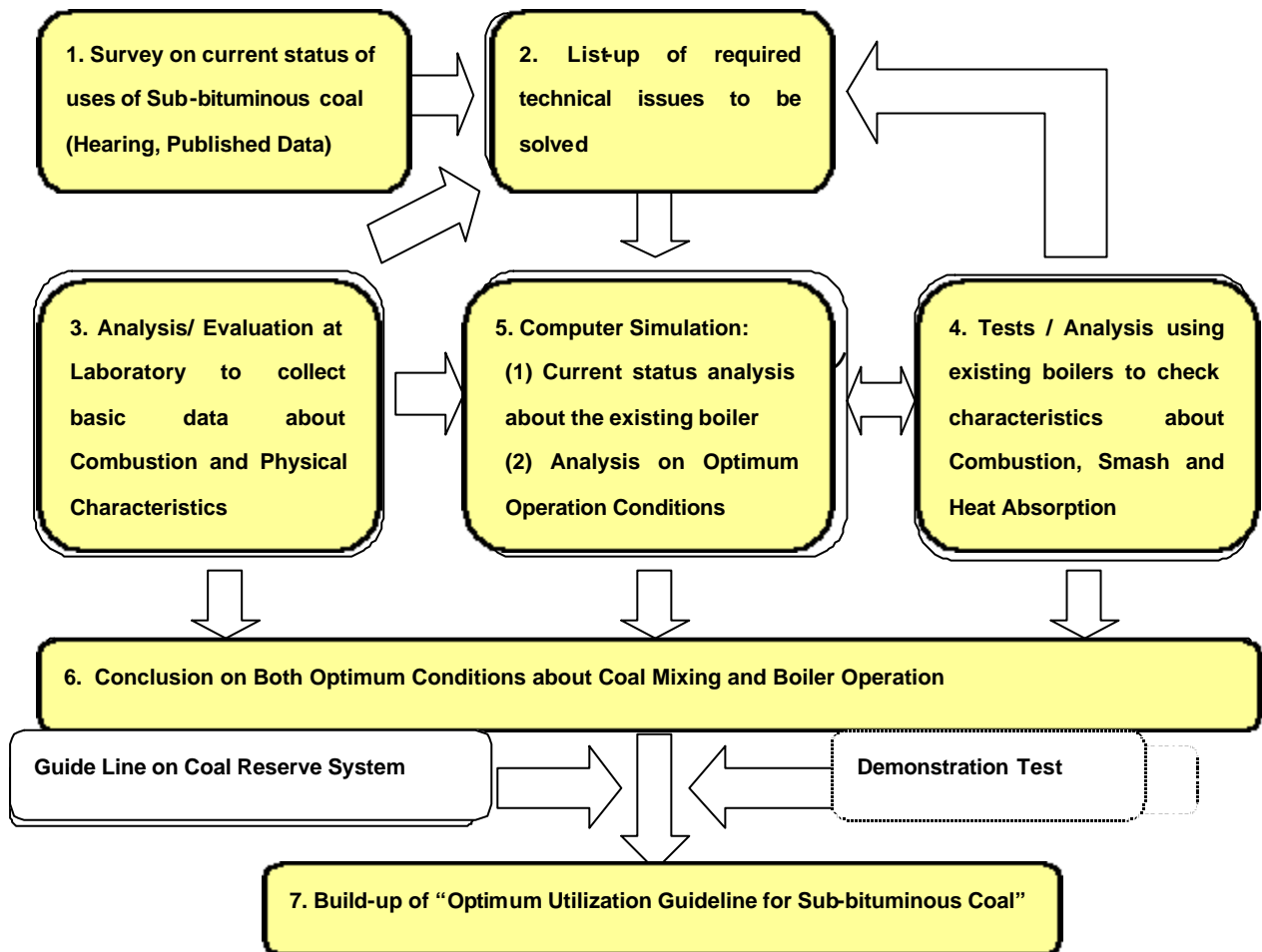
(Bt: Billion Ton, MT/y: Million Ton per year)

	High Rank Coal		Low Rank Coal			
	Bituminous Coal		Sub-Bituminous Coal		Lignite Coal	
	Reserves BT	Production MT/y	Reserves BT	Production MT/y	Reserves BT	Production MT/y
North America	116	616	103	334	36	91
Middle/South America	9	37	14	12	-	-
Europe	41	283	8	73	73	505
Ex Soviet Union	97	258	113	132	19	18
Africa	61	215	-	-	-	-
Asia/Oceania	184	1,854	41	47	67	170
World Total	509	3,265	279	598	196	784

Development targets of the project are as follows,

- (1) **Mixing Ratio of Sub-bituminous Coal: 50% using existing pulverized coal fired boilers**
- (2) **Build-up of “Optimum Utilization Guideline for Sub-bituminous Coal”**

Flow Sheet to build up the Utilization Guide Line



2. Duration of Research:

From FY1998 until FY2001

3. Cooperating Companies:

Electric Power Development Co., Ltd.

Idemitsu Kosan Co., Ltd.

Idemitsu Engineering Co., Ltd