

ENERGY CONSERVATION IN COAL CONVERSION

Coal Conversion Process Selection

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SELECTION PROCESS

Our initial studies on energy conservation in coal conversion were performed by investigating the commercial concept design of the PETC Synthane Process. These studies developed methodologies that can be used to conserve energy in other coal conversion processes. The next step was to select another process where our methods could be applied.

The following table is a summary of the processes that we examined and the reasons listed in the remarks column were used to screen the systems. Both the Fischer Tropsch and the SRC II were acceptable systems to study and we arbitrarily chose the SRC II system for further study.

<u>PROCESS</u>	<u>DEVELOPER</u>	<u>CLASSIFICATION</u>	<u>REJECTED:</u>	<u>REMARKS</u>
Lurgi	Lurgi	Low btu	Yes	Powerton project in Illinois is oriented towards system integration, and of proprietary nature.
Coalcon	Coalcon Co.	Multi	Yes	Plans for a four phase project to construct a 2,600 TPD plant have been cancelled. Accelerated Program Candidate
Coalgas			Yes	In initial design stage.
Koppers-Totzek	Heinrich Koppers' GmbH	Low btu	Yes	Proprietary
Koppers-Totzek	Heinrich Koppers' GmbH	High btu	Yes	Proprietary
CO <sub>2</sub> Acceptor	Consolidated Coal Co.	High btu	Yes	Design developed for comparing various process. Energy conservation was not a design criterion.
Bi-Gas	Bituminous Coal Res., Inc.	High btu	Yes	Energy conservation not a design criterion.
Hygas	Institute of Gas Technology	High btu	Yes	Energy conservation not a design criterion. Accelerated Program Candidate.
Fischer-Tropsch	Fischer Tropsch	Multi	Yes	Developed with energy conservation as a design criterion. Accelerated Program Candidate - see discussion.

TABLE 1

<u>PROCESS</u>	<u>DEVELOPER</u>	<u>CLASSIFICATION</u>	<u>REJECTED</u>	<u>REMARKS</u>
SRC II	ERDA	Multi	No	The oil/gas complex is an Accelerated Program Candidate. Developed with energy conservation as a design criterion.
Wellman-Galusha	Wellman-Galusha	High btu	Yes	No large-scale plans available.
Air Products & Chemicals	Air Products & Chemicals	Low btu	Yes	Initial design stage.
Wellman	Land O' Lakes Applied Technology	Low btu	Yes	Pilot plant.
Woodhall-Duckham	Holly Kennyshtot	Low btu	Yes	Pilot plant.
Wellman-Galusha	Mason Hanger	Low btu	Yes	Pilot plant.
Stoic 2 stage	Foster-Wheeler- Univ. Minnesota (Duluth)	Low btu	Yes	Pilot plant.

TABLE 1

Processes that weren't immediately rejected because of a lack of size in the scale of the conceptual designs or lack of development were then followed-up with conversations with the process developer, sponsor, or engineering subcontractor.

The conversations with various developers led to meetings with Raymond L. Zahradnik, former Director of the Division of Coal Conversion and Utilization with ERDA. Following Dr. Zahradnik's suggestion, a meeting with Neal Cochran, who served as Senior Technical Advisor on several coal conversion conceptual design analyses, followed.

Neal Cochran provided us with documents describing the proposal for the Coal Synthetic Fuels Demonstration Plant Accelerated Program. The primary objective of the proposed Accelerated Program is to reduce the time required to achieve readiness of broad spectrum coal conversion process by increasing the level of government involvement. Developments and improvements in coal conversion processes have reached the stage where commercial-scale demonstration facilities must be constructed to establish the environmental acceptability of those processes that have the best chance of eventually achieving a competitive cost. The proposed program includes those processes indicated in the table.

The Oil/Gas Conceptual Design/Economic Analysis utilizes the SRC II process. This conceptual design developed by Ralph M. Parsons Company is for a commercial scale oil/gas coal conversion complex. The Accelerated Program chose this process as a candidate because it is capable of handling all coal ranks and does not require a reaction catalyst or a solid-liquid filtration train. Additionally, it is capable of accepting product slate modifications in response to changes in the market picture.

For these reasons, and because an extensive effort has been made to maximize the thermal efficiency of the complex, plus the ease of accessibility concerning the design, it has been selected as the process that we examined in this report.