



<b>1. Project Data:</b>		<b>Date Posted :</b> 03/06/2001	
<b>PROJ ID:</b> P004802		<b>Appraisal</b>	<b>Actual</b>
<b>Project Name:</b> Clean Fuels & Environmental Improvement	<b>Project Costs (US\$M)</b>	370.0	40.6
<b>Country:</b> Thailand	<b>Loan/Credit (US\$M)</b>	90.0	38.1
<b>Sector(s):</b> Refining Storage & Distribution	<b>Cofinancing (US\$M)</b>	280.0	2.5
<b>L/C Number:</b> L3889			
	<b>Board Approval (FY)</b>		95
<b>Partners involved :</b> Bangchak Petroleum Company Ltd. (BCP)	<b>Closing Date</b>	06/30/2000	06/30/2000
<b>Prepared by :</b>	<b>Reviewed by :</b>	<b>Group Manager :</b>	<b>Group:</b>

**2. Project Objectives and Components**

**a. Objectives**  
To support the reduction of air pollutants attributable to petroleum fuels in Thailand, by assisting the Borrower in : (a) meeting reformulated gasoline and diesel oil specifications established by the Government; and (b) improving its refinery operations through the installation of appropriate facilities and equipment to further reduce refinery emissions and enhance safety.

**b. Components**  
*Original* components:  
(a) a Deep Gas Oil Hydrotreater (DGOHT) of 30,000 barrels stream per day (bpsd) capacity to enable the production of 0.05 weight percent sulfur diesel oil;  
(b) a Fluid Catalytic Cracker (FCC) of 16,000 bpsd capacity and modifications to existing naphtha reformer to produce high octane, low aromatic and low benzene content gasoline, in order to enable the refinery's gasoline pool to meet upgraded octane requirements, permissible aromatics and benzene levels, and other prescribed specifications;  
(c) the installation of equipment and facilities to further enhance the refinery's environmental mitigation system and safety;  
(d) the purchase of modern air quality monitoring equipment;  
(e) project engineering and management;  
(f) acquisition of technology and procurement of catalysts and chemicals; and  
(g) training.  
*Revised* components:  
The FCC unit, additional equipment and facilities to further enhance the refinery's environmental mitigation system and safety (with the exception of the sulfur recovery unit), training, and modern air quality monitoring equipment components were cancelled. The remaining components were:  
(a) a Deep Gas Oil Hydrotreater (DGOHT) of 25,000 bpsd capacity;  
(b) a sulfur recovery unit associated with the DGOHT;  
(c) acquisition of technology and procurement of catalysts and chemicals; and  
(d) project engineering and management.

**c. Comments on Project Cost, Financing and Dates**  
Due to cancellations of the biggest project components, the project cost and disbursements were only a fraction of those anticipated in the SAR. Intense competition by bidders and reduction in design capacity of the DGOHT reduced the estimated cost of the DGOHT, further reducing total projects costs. By closing, total disbursement amounted to 42.3% of the original loan amount. The project was financed by the Bank and internal cash generation by the Borrower, Bangchack Petroleum Public Company Ltd (BCP). The use of external sources such as supplier credits and commercial loans, although envisioned in the SAR, proved to be unnecessary.

**3. Achievement of Relevant Objectives:**  
To support the reduction of air pollutants attributable to petroleum fuels in Thailand, by assisting the Borrower in :

**(a) meeting reformulated gasoline and diesel oil specifications established by the Government** : This objective was partially achieved. By equipping BCP with the DGOHT, the project has assisted BCP in meeting reformulated diesel oil specifications. Production of this cleaner fuel will contribute to improving air quality and reducing air pollutants. The ICR, however, does not provide information on this contribution relative to the Government's broader Action Plan to improve air quality and reduce air pollution in Bangkok and other urban areas. The FCC unit, which would assist in meeting reformulated gasoline specifications, has been cancelled. Instead, FCC gas will be purchased from other producers.

**and (b) improving its refinery operations through the installation of appropriate facilities and equipment to further reduce refinery emissions and enhance safety** . This objective was partially achieved. A sulfur recovery plant was purchased to recover sulfurous gases produced by the DGOHT as a process by-product. Additional equipment and facilities to further enhance the refinery's environmental mitigation system and safety and modern air quality monitoring equipment were cancelled.

**4. Significant Outcomes/Impacts:**

The project is highly relevant to Bank strategy and the Government's development priorities. By equipping BCP with the DGOHT to produce cleaner fuels, it will help address air pollution, a serious environmental problem and threat to human health in Bangkok.

**5. Significant Shortcomings (including non-compliance with safeguard policies):**

Inadequate attention was paid to the risks associated with excess refining and conversion capacities. New conversion capacity in Thailand obviated BCP's need for constructing the FCC unit as it could satisfy FCC gasoline requirements by purchasing them from other producers. At project appraisal, the risk of excess conversion capacity was thought to be offset by the potential for exporting surplus products to nearby countries. This export potential did not materialize, partly due to the fall in petroleum demand with the onset of the East Asian financial crisis. Project analyses should have flagged excess capacity as a significant risk to the biggest component of the project, the FCC unit.

6. Ratings:	ICR	OED Review	Reason for Disagreement /Comments
<b>Outcome:</b>	Satisfactory	Moderately Satisfactory	The project did not fully achieve its stated objectives as some project components with their associated environmental benefits were cancelled.
<b>Institutional Dev.:</b>	Modest	Modest	
<b>Sustainability:</b>	Likely	Likely	
<b>Bank Performance:</b>	Satisfactory	Satisfactory	
<b>Borrower Perf.:</b>	Satisfactory	Satisfactory	
<b>Quality of ICR:</b>		Satisfactory	

NOTE: ICR rating values flagged with '\*' don't comply with OP/BP 13.55, but are listed for completeness.

**7. Lessons of Broad Applicability:**

- (1) While financial crises may not be foreseen, project design must incorporate rigorous risk analyses and sensitivity analyses that account for all external factors that could influence project viability.
- (2) Although the Borrower may be familiar with the Bank's Procurement Guidelines from previous projects, Bank staff should not assume that the Borrower is cognizant of any changes in the interim. Although it is the responsibility of the Borrower to ascertain all rules, it would only be reasonable to expect that Bank staff explain changes to the Borrower in the interest of better implementation.
- (3) The project's main contractor had only carried out one other contract in Thailand previously and had chosen a new project team for this project. The Bank may wish to consider including the track record in the country as a pre-qualification criterion, especially in the case of fast track projects.

**8. Assessment Recommended?**  Yes  No

**9. Comments on Quality of ICR:**

The quality of the ICR is satisfactory. It covers most relevant and important issues. However, to better assess the relative impact of the project, it would have been useful if the ICR provided information on project performance and impacts in the context of the Government's Action Plan for improving air quality. An Aide Memoire from the ICR mission is not included in the ICR but is listed as a supporting document.