Case Summary

Conversion of fuel used in Arab Abou Saeed Brick Factories (176) from Mazout to Natural gas

1. **Basic Information:**

1.1 **Main Products:**

Clay Brick — average annual production per kiln: 25,000,000 bricks

1.2 **Raw Materials:**

Clay	average annual consumption: 35,000 ton
Sand	average annual consumption: 53,000 ton
Water	average annual consumption: 5000 m^3
Mazot	average annual consumption: 1670 ton

1.3 **Project Location:**

The Arab Abu Saied area is situated approximately 40 km south of Cairo, where the largest cluster of brickworks in Egypt is located.

1.4 **Project Objectives:**

- Expected reduction of pollution loads of primary air pollutants due to the conversion of the participating kilns (176 kilns) from mazout to Natural gas is presented in the following table :

Fuel	No. of Kilns	Emission Loads (ton/year)						
		PM	PM_{10}	$PM_{2.5}$	SO_2	CO	NO	VOCs
Mazout	176	50,313	48,552	39,999	13,290	27,530	4,177	294
Natural gas	176	2,969	1,945	757	3,686	8,499	3,174	256
Reduction (t/y)		47,343	46,607	39,241	9,604	19,031	1,003	38
Reduction (%)		94%	96%	98%	72%	69%	24%	13%

1.5 **Project Description:**

- The bricks manufacturing process utilizes Open Hoffman Furnaces where fuel is combusted and exhaust gases are naturally drafted using tall stacks (60-80 m). The proposed project aims at converting about 200 kilns to operate with natural gas.The proposed sub-project involves replacement of heavy oil (mazout) burners with gas burners and control system. The new gas burning technology does not change the kiln

design or the brick production process in any way; it simply replaces the oil burner racks with gas burner racks. In addition, the electrical systems will be upgraded and kiln repairs conducted to ensure kilns are able to accept the new systems.

1.6 Project Components:

The project comprises the following components:

- Take-off from the national GASCO distribution pipeline.

- Construction of pressure reduction station to reduce gas pressure from 70 bar to 4 bar. For Arab Abu Saeed the pressure reduction station would have a capacity of 100,000 m^3/hr.

- External – installation of gas piping to carry gas from the pressure reduction station to the brick kilns.

- Internal (within the brick works) – installation of gas piping, replacement of oil burners with gas burners, pressure reducing stations (from 4 to 0.5 bar), protection room and control systems, electrical upgrade and kiln repair (where necessary).

1.7 Estimated Project Cost:

- The cost of external piping (EGP 70,000,000) will be divided equally between participating plants (about 200 kilns), which result in a contribution of EGP 350,000 for each kiln. Each plant will pay for its own internal investments (EGP 350,000), in addition to taxes (2.5%) and supervision cost (10%) of the total costs. The project cost will be covered by sub-loan of 700,000 (about USD 125,000) for each sub-borrower i.e. brickworks owner.

1.8 EPAP Technical Support:

- EPAP had hired a local consultant to prepare the Environmental Audit.
- Egyptian Town Gas had prepared the technical specifications.

2. Eligibility Criteria

2.1 Environmental:

- The brick kilns are a major source of air pollution. By switching from mazout to natural gas it is expected that brick kilns will become compliant with Law 4 for the Environment with an estimated reduction in pollution loads as follows:
  - 96% reduction in PM_{10}
  - 72% reduction of SO_x
  - 69% reduction of CO

2.2 Financial:

- Individually the brick factories are considered small scale and many may not be eligible for EPAP loans. The only feasible way to convert these factories is to bundle them into a cluster group, which makes the extension of the gas infrastructure economically feasible.

3 Current status of project procedures

3.1 Steering committee approval: approved

3.2 Co-financers approval: approved

3.3 Technical Procedures:

Technical Document	submitted	Approved	Date
Environmental Assessment	Y	Y	June 2009
Compliance Action Plan (CAP)	NA	NA	NA
Environmental Impact Assessment (EIA)	Y	Y	Dec 2006
Technical Agreement	Y	Y	Sep 2009

3.4 Implementation Procedures:

3.4.1 Procurement Procedures:

- With respect to the implementation of the project, ETG has been awarded a concession through the Gas Holding Company/Ministry of Petroleum for gas infrastructure and gas distribution in the area of the two brickwork clusters. Therefore, ETG was awarded the project (turn-key) directly by direct contracting.

3.4.2 Status of Implementation:

Technical Document	submitted	Date	
		Achieved	Planned
Credit worthiness certificate	Y	June 2009	
Financial Agreement	Y	June 2009	
Bidding document	NA	NA	
Technical and financial Evaluation	NA	NA	
Awarding and Contracting	Y	July 2009	
Installation and Commissioning	N		Aug 2012
Monitoring: Q1:	N		
Q2:	N		
Q3:	N		
Q4:	N		