

Qatar Boosts Production

MIDDLE EAST

Introduction

Although only a small country with a total population of less than 340 000 Qatari citizens, Qatar is in the fortunate position of being in possession of the world's largest single reservoir of natural gas, the least polluting fossil fuel. The country is able to supply 17 billion m³/year of this fuel and has the third greatest reserve in the world after Russia and Iran. With energy costs (and corresponding revenue) quadrupling in the last few years, and all these natural assets, it is no surprise that the economy is booming. The State Ruler has initiated a long-term development policy, implemented by the Minister of Energy and Industry, which contributes to the country's success.

QNCC

Qatar National Cement Company (QNCC), a semi-private Company linked to the Ministry of Energy and Industry, is playing a key role in satisfying the demand for cement from the local market, which has arisen as a result of infrastructure, housing and industrial developments in the country. In 2006, its total sales will reach more than 4 million t of cement, which equates to 5 t per inhabitant, or 12 t per Qatari citizen, which must surely be a world record.

Back in 1995, QNCC, who at that time had an old plant with a total production capacity of less than 300 000 tpa, issued an international tender for a greenfield turnkey plant with a capacity of 2000 tpd. Eventually, FCB won this bid, having a significant track record of complete cement plants in countries including Morocco, Algeria, Libya, Egypt, Turkey, Iraq, Iran and Saudi Arabia.

Since the successful commissioning of this project in 1998, the 600 000 tpa plant has been producing at full capacity. In the meantime, the country has invested drastically to exploit the gas fields, to build gas liquefying plants and to implement a fleet of liquefied gas carrying vessels.

E. Simon, FCB Ciment, France, provides details of the projects undertaken and ongoing at the Qatar National Cement Company plant.

4000 tpd turnkey plant

In 2004, an international tender was released for a new 4000 tpd line and, in mid-2004, FCB Ciment won the contract. To meet the increasing demand of the market, it was decided to anticipate commissioning the cement grinding section ahead of the burning line by using imported clinker, enabling cement production to begin by the end of 2005. The erection of the rest of the plant is currently being completed and clinker will be produced from November 2006.

The main data of this 4000 t turnkey plant is listed below.

Plant site

The plant is located in Umm Bab on the west coast of the Qatar peninsula, 75 km from the capital city, Doha, and is erected parallel to the previous 2000 tpd plant built by FCB ten years ago. The new plant takes advantage of the existing facilities, such as the administrative building, stores, workshops, control room and laboratory. A limestone and shale quarry is adjacent to the plant, whilst a clay quarry is some 15 km from the plant.

Raw materials preparation

Limestone, shale and clay are crushed by a double rotor impact crusher with a capacity of 900 tph. Crushed materials are then transported by belt conveyor and by a stacker to a longitudinal preblending storage. On the way, raw materials are analysed online through a gamma-ray neutron analyser.

The covered stockpile consists of 2 x 30 000 t piles of limestone and 2 x 10 000 t piles of shale and clay. Additives (sand and iron ore) are stored in a specific building. Two frontal bridge reclaimers are used to extract pre-homogenised materials that are transferred to raw-meal feed bins with the following capacities:

- Limestone: 1000 t.
- Shale and clay: 600 t.

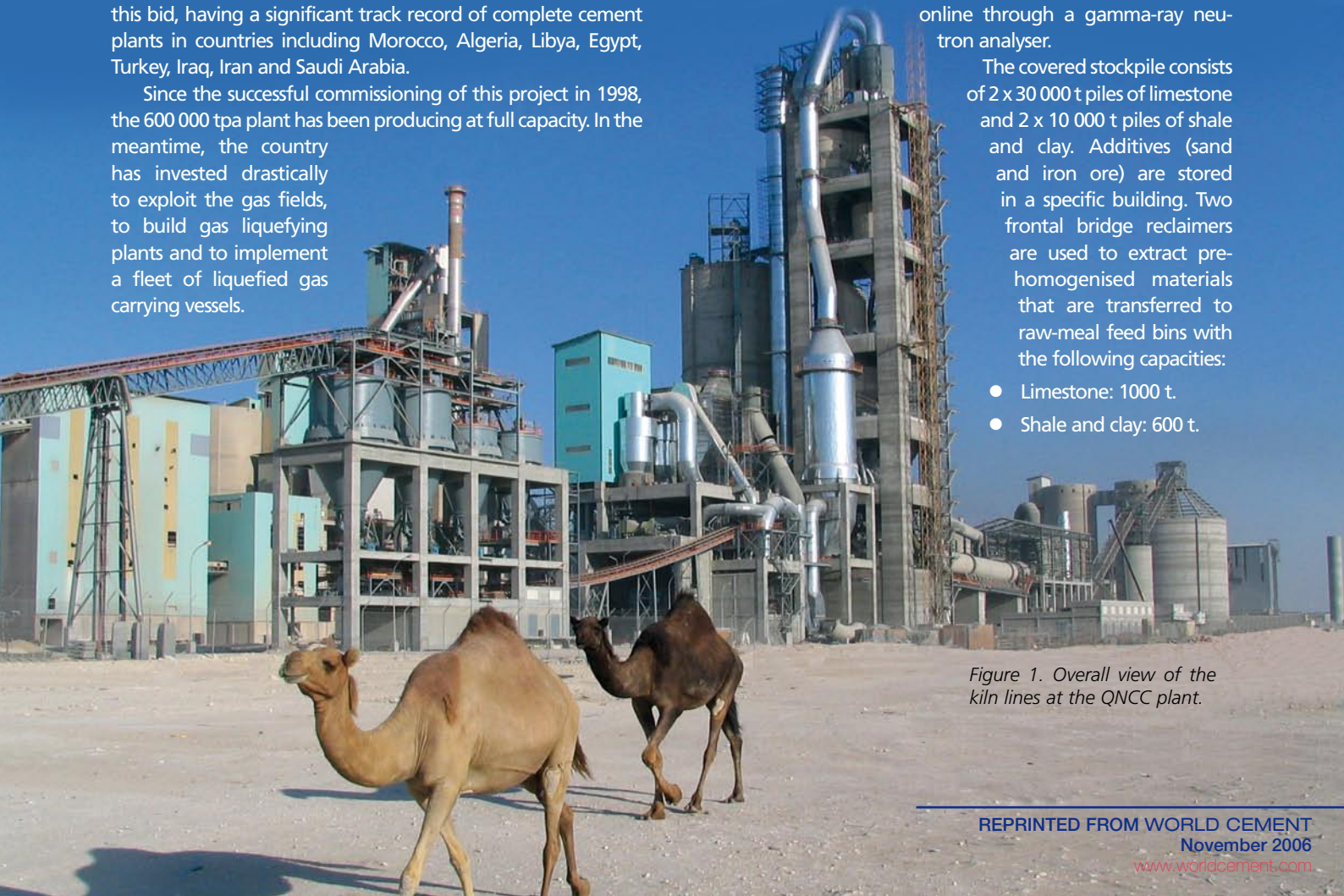


Figure 1. Overall view of the kiln lines at the QNCC plant.

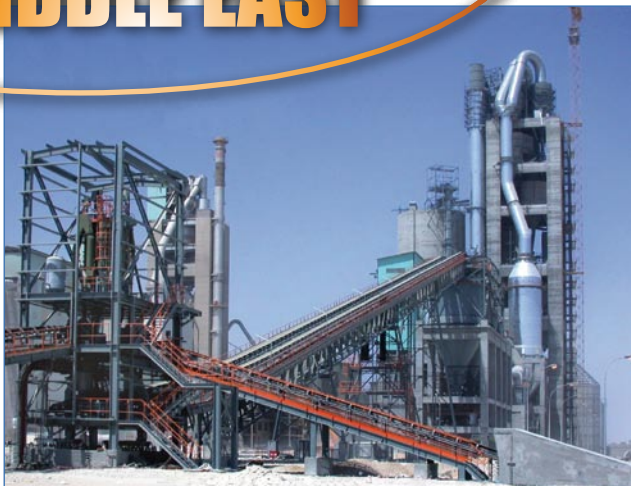


Figure 2. General view of the plant.



Figure 3. The signing ceremony for the contract for a new 5000 tpd extension.

- Iron ore: 400 t.
- Sand: 400 t.

Raw meal grinding

Raw meal grinding takes place at a rate of 340 tph in an FCB tube mill with integrated drying chamber (18.6 m length x 5.2 m dia.). The mill shell is supported by hydrodynamic shoe bearings. The mill is driven by a 5200 kW motor through a single side double lateral drive reducer. The product is classified by a 6.5 m dia. third generation FCB TSV classifier. A gas recirculation loop with cyclones, fan and damper maintain a constant flow at the separator outlet. Gases from the raw mill plant are dedusted in the kiln's main ESP. Raw meal is automatically sampled on the way to the 15 000 t blending silo.

Clinker production

The burning line consists of:

- One 5-stage single string preheater with low pressure drop cyclones with diameters ranging from 6.4 to 8 m.
- One FCB hot spot precalciner fitted with a new generation natural gas burner. The precalciner includes two chambers: the first (5 m dia.), which is working downflow, is designed to permit the formation of hot spots in the reducing atmosphere to eliminate NOx. The second (goose neck) works up flow after mixing with the kiln gases and provides the necessary total residence time of combustion.
- One FCB 3-support rotary kiln (4.5 m x 70 m) fired with a multi-channel low NOx burner.
- One clinker cooler with pendulum suspension and hydraulic drive with corresponding ESP.
- Considering the chemical composition of raw materials, a bypass system is provided with a design capacity of 25% of kiln gases.
- From the cooler, clinker is conveyed to a 40 000 t clinker silo through an inclined pan conveyor.

Cement grinding

The cement grinding plant consists of two FCB shoe-mounted ball mills with a capacity of 115 t of OPC cement each, together with corresponding FCB TSV classifiers and process filters. A 70 tph gypsum crushing plant supplies the necessary additive. The produced cement is stored in existing silos from the previous FCB 2000 tpd plant and is then dispatched through a new bulk loading plant.

It must be noted that the cement grinding department was commissioned 17 months after the contract entered into force and that since that time the two mills have been turning out 5000 tpd of cement.

New contract for a 5000 tpd turnkey extension

Considering the successful and reliable operation of the two lines supplied by FCB Ciment (2000 tpd and 4000 tpd) and in order to face the ever growing demand of cement in Qatar, Qatar National Cement Company and FCB Ciment signed a new contract on 10 September 2006 for a complete turnkey new line with a capacity of 5000 tpd. As with the previous 4000 t line, commissioning of the cement grinding department is scheduled 17 months after the award of the contract. This new achievement is the result of twelve years of close co-operation between the two companies. ◆

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