

# EGYPT

# VOICES FROM THE FIELD



## Key Messages

- Egypt is seeing an average annual increase of 5.1 percent in greenhouse gas emissions.
- It is estimated that by 2030 emissions from important national industries such as cement, fertiliser, iron and steel will grow substantially unless action is taken.
- An industrial sector analysis carried out by the LECB project shows that these sectors also have the most possibility for significantly reducing emissions, with the cement sector having the greatest potential.
- The analysis also established the overall context for implementing mitigation strategies, including the identification of key stakeholders and focus areas.
- This work opened up important dialogue on the business case for energy efficiency, since the industries have seen increases in energy prices since the beginning of 2012.



## Many Opportunities Identified for Reducing GHG Emissions in Industrial Sectors in Egypt

Egypt became a party to the United Nations Framework Convention on Climate Change (UNFCCC) in 1994. In its Third Assessment Report in 1995, the Intergovernmental Panel on Climate Change (IPCC) identified Egypt's Mediterranean coast and the Nile delta, with its extensive infrastructure and fertile, cultivated lands, as particularly vulnerable regions to sea-level rise. An assessment of greenhouse gas (GHG) emissions for Egypt for 2000 revealed that the total emissions were about 193 MtCO<sub>2e</sub>, compared to about 117 MtCO<sub>2e</sub> in 1990, representing an average increase of 5.1%, annually. The energy sector, including transport, is the primary contributor to GHG emissions in the country.

The LECB Programme helps to build the public and private sector capacities needed to scale up country-driven climate-change mitigation actions in 25 countries, primarily by providing focus in five areas: GHG Inventory Systems; Low Emission Development Strategies (LEDS); Nationally Appropriate Mitigation Actions (NAMAs); Measuring, Reporting and Verification (MRV); and strategies for including the private sector. More information can be found at [www.lowemissiondevelopment.org](http://www.lowemissiondevelopment.org).



Egypt has framed its vision of its energy future in its National Energy Policy, which promotes enhanced use of natural gas, an energy price adjustment, and the removal of subsidies, as well as energy conservation and more efficient energy use. Goals are to supply 20% of the nation's electricity through renewable energy (solar, wind and biomass) by 2020 and to reduce future energy consumption by 10% by enhancing conservation and efficiency.

In support of these ambitious goals, Egypt's Low-Carbon Economy Strategy aims to redirect the country's economy towards investments in clean technology.

In this context, the industrial sector is an increasingly important sector with respect to climate change mitigation. Based on current trends, it is estimated that by 2030, GHG emissions in important national industries such as cement, fertiliser, and iron and steel will increase substantially unless action is taken. However, research undertaken through the Low Emission Capacity Building (LECB) project in Egypt shows that these same sectors have the most potential for producing significant reductions in GHG emissions.

Egypt is one of 25 developing countries working with UNDP through the LECB Programme to identify ways to reduce (or mitigate) climate change causing GHG emissions, while still delivering development benefits to citizens, in line with national development priorities. The US\$ 40 million Programme is funded by the European Commission and the governments of Germany and Australia.

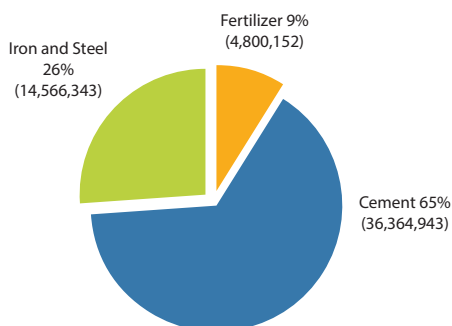
In Egypt, the project is implemented by the Egyptian Environmental Affairs Agency, in collaboration with several other key ministries. As a result of a nationally-driven process, the LECB project in Egypt is developing Nationally Appropriate Mitigation Actions (NAMAs) in the energy and transport sectors; elaborating a Low Emission Development Strategy; and working with industry on mitigation action plans. This requires collaboration among policy makers and industry leaders in order to understand the potential of Egypt's industries for enhancing profitability while improving energy efficiency.

As part of the decision-making process, the LECB project supported an analysis in 2012 of three of Egypt's most important industrial sectors: cement, fertiliser (especially ammonia production), and iron and steel. This study not only provided information on areas in which NAMAs might be developed, but also established criteria for evaluating the viability of potential NAMAs and focusing joint efforts in order to achieve the most significant economic impacts. The analysis concluded that the cement sector should be given the highest priority for implementing NAMAs in Egypt, followed by fertiliser and iron/steel. The work also opened up important dialogue on the business case for energy efficiency, since the industries have seen increases in energy prices since the beginning of 2012. However, it was argued that this financial burden may act as a strong driving force to push investors in the industries towards energy efficiency, resulting in GHG emission reductions.

## Key outcomes of the industry analysis

The following chart shows the relative contributions to overall GHG emissions of the three industries, with cement representing the highest source of emissions (approximately 36.4 Mt CO<sub>2</sub>/yr).

### Greenhouse gas emissions by industrial sectors analysed in Egypt



**Cement:** Growing rapidly in developing countries, the cement industry accounts for 25% of the energy consumed by the manufacturing sector worldwide. Cement production is one of Egypt's most important industries, and by far the largest. This energy-intensive process is a significant source of GHG emissions, responsible for 65% of all emissions in the industrial sector. The industry's size and importance in Egypt mean that it has tremendous potential for reducing GHG emissions, which could be achieved by improving efficiency and shifting to alternative fuels. Equally importantly, an analysis of the cement industry's profitability, liquidity and debt ratios, shows that it is most attractive sector for undertaking mitigation actions without impacting upon competitiveness due to its very high profitability, good liquidity and relatively low debt ratio.

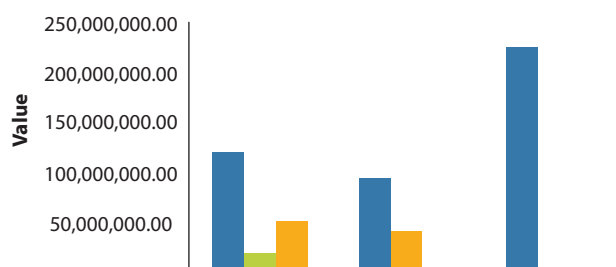
**Fertiliser:** The production of fertiliser for agriculture consumes 1.2% of total worldwide energy. In Egypt specifically, although it is the smallest contributor of GHGs of the three industrial sectors analysed, it is by far the greatest energy consumer, and of the amount of energy consumed in the sector, approximately 90% is used for producing ammonia. (See the chart on energy types.) Therefore, the sub-sector of ammonia production has the most potential for reducing energy consumption within the fertiliser sector. Although energy consumption in ammonia plants is down to half of what it was in 1960, further efficiency can be

gained by using more efficient, modern equipment and new technology. Furthermore, the fertilizers sector was also found to be financially sound, with an acceptable profitability, good liquidity and also relatively low debt ratio.

**Iron and Steel:** This industry has seen steady growth worldwide since the 1970s, due particularly to its rapid expansion in China. The bulk of this growth has involved the use of inefficient processes and out-dated technology only viable when energy costs are low. Fortunately, more efficient practices continue to emerge, including the use of less wasteful input materials, as well as the use of blast furnaces and coke for power, rather than gas. In Egypt, the most important steps identified for further GHG reductions in this sector include switching to these best-available technologies used worldwide, such as cleaner input materials, upgraded production facilities, implementation of CO<sub>2</sub> capture and storage and improved materials management. However, the iron and steel sector was found to be the least financially sound sector of the three in Egypt, due to low profitability, low liquidity and very high debt ratio.

The following chart shows the types and amounts of energy used in the three industrial sectors.

### Comparison of energy types consumed across the three sectors analysed in Egypt



	Cement	Iron and Steel	Fertilizer
■ Natural Gas (GJ/y)	119,132,897.00	94,512,623.60	226,588,632.60
■ Electricity (GJ/y)	18,497,700.00	40,942,964.20	-
■ Mazot (GJ/y)	50,310,884.39	-	-

## Next Steps

One of main objectives of the analysis was to identify target sectors for industrial mitigation actions in a systematic manner. Using criteria such as total GHG contribution, readiness of the industrial sector to cooperate, and future growth possibilities, the cement

sector was identified as having the greatest potential for reducing emissions and energy consumption. In addition, its high level of profitability, liquidity

and low debt ratio make the sector strong enough to implement mitigation actions without seriously affecting the competitiveness of companies involved.

## Potential GHG reduction across sectors

Industry	Current Emissions (Mt CO <sub>2</sub> /yr)	Specific Emissions (t CO <sub>2</sub> /t product)	Potential Decrease in Emissions (t CO <sub>2</sub> /t product)	Potential Final Emissions (t CO <sub>2</sub> /t product)	Percentage Reduction (%)	Reduction (Mt CO <sub>2</sub> /yr)
Cement	36.37	0.78	0.20	0.58	26%	9.30
Iron and Steel	14.57	1.29	0.30	0.99	23%	3.40
Fertilizer (Ammonia)	4.80	1.05	0.32	0.74	30%	1.44

The findings of this industrial sector analysis have been shared widely with industry leaders across Egypt and with national experts in the cement sector. But the analysis was only a first step in identifying key areas for further research. Recommendations for more in-depth studies include:

- a comprehensive survey of all of Egypt's cement plants to collect data on capacities, technology used, production rates and other technical data;
- energy audits of plants selected to pilot NAMA implementation;
- identification of potential improvements and best available technology; and
- a thorough financial and economic analysis of NAMAs implemented at selected cement plants.

The industrial sector analysis established the overall context for implementing mitigation strategies, including the identification of key stakeholders and focus areas. While it yielded a wealth of information on Egypt's major industries and their potential for reducing emissions, this analysis is only

a beginning for LECB efforts in Egypt. Government and the private sector must now respond to the opportunities identified in the analysis and work together to define NAMAs and build capacities for their successful implementation.

## Lessons Learned and Good Practices

In the process of gathering information about industries' needs and opportunities for increasing efficiency, this sector analysis was an invaluable tool for enhancing communication between government and the private sector. It allowed national experts to learn about the problems, needs and constraints faced by some of Egypt's most important industries. Such learning is crucial for achieving a discussion on how the private sector can contribute to overall national emission reduction goals. By opening up dialogue related to energy consumption and emissions reduction, Egypt's industrial sectors have become important partners in formulating effective mitigation efforts.



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