

Global Challenges at the Intersection of Trade, Energy and the Environment

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Implications of Climate Change Policies for Trade and Investment in Energy- Intensive Industries

Lafarge analysis and views¹

Vincent Mages²

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² Vincent Mages, Climate Change Initiatives VP, Lafarge

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Short Introduction to Lafarge

Lafarge began operations in 1833 in the South of France and has since developed to become by end of 2008 a €19 billion sales company in 79 countries through three business lines: cement, aggregates & concrete, gypsum.

Emerging markets represent today 46% of Lafarge total sales and 63% of our cement activity. Lafarge ranks n°1 in the cement industry.

In the manufacturing process of cement, limestone is heated up to 1450 °C to produce clinker. The simplified formula is heated limestone (CaCO₃) resulting in reactive lime (CaO) and carbon dioxide (CO₂). Decarbonated additives are then mixed with clinker to produce cement.

Carbon dioxide comes 60% from embedded carbon dioxide in the limestone, and 40% from the fossil fuels used in the combustion process. Energy represents 40% of our production costs.

Cement is then mixed with aggregates and water to produce concrete and mortar. Concrete and mortar are used as building materials for housing and infrastructure. Concrete has thermal inertia properties that make him a material of choice for energy efficient buildings.

The demand for building products including cement will continue to grow, driven in particular by economic growth in developing economies and by the increase in urbanization. Today, 50% of the world population lives in an urban environment and this figure will continue to rise, increasing the need for infrastructure and housing. The demand for cement is likely to double by 2030 globally.

Climate change is a key challenge for the cement industry (5% of total man-made emissions) and for Lafarge: we also strongly believe that cement and concrete will be part of the solutions in mitigating the growing energy consumption and CO₂ emissions in the building sector as well as in designing, where necessary, adaptation to climate change.

Lafarge has been a pioneer in committing to CO₂ emission reductions, within the framework of its partnership with WWF and as early as 2001, with voluntary, public and verified commitments

- - 20% in CO₂ per ton of cement emissions worldwide between 1990 and 2010
- -10% in absolute total emissions in industrialized countries between 1990 and 2010

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We are confident we will achieve these commitments on time.

These commitments together with other environment, social, governance related commitments constitute the “**Lafarge Sustainability Ambitions 2012**” (see www.lafarge.com)

In 2009, Lafarge has been ranked by the Carbon Disclosure Project n° 3 in the “materials” sector and belongs the Carbon Disclosure Leadership Index (the best 50 companies).

Lafarge positions on climate changes policies

Lafarge supports the design and implementation of cap & trade schemes in developed countries (EU-ETS in Europe, under design in US and some other countries)

We expect from governments and regulators that:

- Developed countries have similar objectives and equivalent time scales
- These schemes are designed and monitored in the fairest and the most predictable ways allowing each sector and each company to dedicate its investments, its R&D and performance improvements towards emission reduction actions
- These schemes do not create any distortion of competition between markets under CO₂ constraints and other markets. The necessary policy measures to prevent carbon leakage must be designed and implemented: we support the concepts of border adjustment mechanisms or mechanisms aiming at including importers into these schemes if distortion of competition was to happen
- The developed countries dedicate significant efforts to link their schemes, embark developing countries towards comparable efforts

Lafarge expects that the UN driven process will deliver, through the Copenhagen conference, an international policy framework enabling industry in general and the cement sector in particular to develop further their contribution to the fight against climate change at national levels without generating distortion of competition

- developed countries should all commit to reduce their CO₂ emissions on a similar basis;
- economically more advanced developing economies should commit to implement a harmonised system of monitoring, measurement and verification (MRV) of their CO₂ emissions by 2011, stabilize emissions growth in the medium term through nationally appropriate mitigation actions and thereafter, make a firm commitment to reduce absolute emissions.
- least developed countries should contribute to the global effort by implementing a harmonised MRV system by 2015 and defining sectoral CO₂ intensity reductions targets in selected industries by 2012

When climate policies interact with trade and investment issues

The issue of the climate change policies' impacts on trade and investment has been largely documented at macro and micro levels.

In July 2009, The OECD RoundTable dedicated a full session to this issue with a comprehensive supporting paper exploring the challenges and potential solutions:

1. *“The arithmetic of competitiveness is simple, easily expressed and readily digested by a wide audience of taxpayers and workers concerned about job losses or lower incomes. If a firm faces higher costs in its home country it may struggle to compete, move offshore or lose its business to offshore companies, and jobs will be lost. This resonates with many constituents and cannot be refuted in its entirety. The case for making some adjustment at the border appears to be persuasive.*

2. *The arithmetic of competitiveness is made more challenging for policy makers by emissions “leakage”. If a firm loses business to foreign competitors or moves offshore then policy may not reduce emissions and emissions could even increase. As a result the effectiveness of climate policy can be called into question, at least in part.*

3. *Policy makers have struggled to respond. The trade policy community has drawn attention to the risks such measures pose for the integrity – and liberalisation – of global trade rules. The climate policy community has responded to these issues by resorting to modelling exercises that, at the level of the economy as a whole, cast doubt on the scale of the problem. Neither response can decisively answer the particular concerns of an enterprise.”*

The Cement Sustainability Initiative, which Lafarge is currently co chairing, undertook in 2008 and 2009 an economic and policy modelling project, coupled with a series of stakeholder dialogues to better understand the potential benefits and pitfalls of different policy scenarios and their impacts on international trade.

The CSI has worked with the international consultancy, ERM, to develop an economic model of the global cement business which helps in thinking through different business and policy scenarios. The model separates the world into eight different regions and calculates regional production and interactions between regions to meet the predicted global cement demand.⁴ Model inputs, generally drawn from public information, describe the features of each region including GDP growth rates, the energy performance and the mix of cement-kiln technologies, costs, and materials availability. These are combined to meet the forecast global cement demand at minimum cost. The model results include calculated cement production, trade, and CO₂ emissions in each region over the period 2005 – 2030.

⁴ Based on data from the Global Cement Report (2007) and forecast analysis by JP Morgan.

Carbon policies and emission goals can be set across regions (and over time). The model incorporates the goals and costs associated with different carbon management approaches into its analysis. Different policy scenarios (described in a separate note) are applied to calculate differences in carbon emissions as a result of different policies. In this way, the impacts of different carbon policy choices can be analyzed and compared on a consistent basis. For example, it is possible to see how changing cement demand is met through a dynamic combination of regional production, imports and exports. These comparisons can be used to help inform decision-makers about the relative merits, costs, and impacts of different carbon and trade policy choices.

China plays a major role in the world's cement markets, today producing nearly half of all cement. Data from China is changing rapidly as the industry modernizes and grows, and is also difficult to collect. To address this uncertainty, we have included a number of sensitivity studies to address the different growth rates in Chinese cement demand and the mix of technologies used to meet this demand.

To ensure fair and accurate treatment of the many different variables involved in such a model, the CSI requested and received formal peer review of the model by several organizations, including:

- Lawrence Berkeley National Laboratories (USA)
- The International Energy Agency (Paris, France)
- Research Institute of Innovative Technology for the Earth (Japan)

A detailed set of specifications for the model, and a summary of how the different model elements are assembled are available for those interested in further information. See www.wbcdcement.org.

Model projections indicate that:

- (1) Cement production, driven by growing demand, is expected to more than double by 2030.
- (2) A Sectoral Approach, as a combination of cap&trade in developed countries and intensity (CO₂ per ton of product) goals in developing countries, could reduce cement sector emissions significantly compared to business-as-usual.
- (3) While regional differences exist, a Sectoral Approach could significantly increase access to the major greenhouse gas mitigation levers available to the sector by proper design of national policies.
- (4) With current cement-making technology, carbon capture and storage (CCS) will likely have a strong role in reducing the sector's emissions. Substantial public and private investment is required to make CCS commercially viable for the sector.
- (5) **Differentiated carbon policies cause potential trade distortions. They can be managed by one or a combination of tools including allowance allocation policies, border carbon adjustments and import/export tariffs and rebates.**

- (6) Exploiting the full potential of the Sectoral Approach requires supporting government policies in the participating countries, covering cement standards, building codes, and waste management practices among other areas.

Conclusion

As a result of this modeling exercise, it is clear that, in order to be efficient, global climate policies must include:

- Local measures to facilitate access to and to incentivize the use of all relevant drivers towards CO2 emission reductions (biomass, decarbonated additives etc. in the cement sector)
- National or regional measures to deal with their impacts on trade and subsequently on investments: inclusion of importers, border (export or import) adjustment mechanisms, at least for those sectors at risk of carbon leakage.

The current absence of trade consideration in the climate debate could represent an obstacle to success in the upcoming implementation phase.

As we are now entering into a transition period, characterized by differentiated climate policies with different level of stringency, industry in general and energy intensive industries in particular need predictability in order to design and implement their investments while maintaining their competitiveness: the World Trade Organization has a role to play in this debate!

The Graduate Institute's **Centre for Trade and Economic Integration** fosters world-class multidisciplinary scholarship aimed at developing solutions to problems facing the international trade system and economic integration more generally. It works in association with public sector and private sector actors, giving special prominence to Geneva-based International Organisations such as the WTO and UNCTAD. The Centre also bridges gaps between the scholarly and policymaking communities through outreach and training activities in Geneva. Its goal is to provide an innovative research basis for solutions that address the medium-term challenges facing the world trade system broadly defined and economic integration more generally.