IIGCC Briefing Note
Climate Change and the Construction Sector

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1. Purpose:

The engagement work stream of the IIGCC will engage with the construction sector on the issue of climate change to
- Highlight material SEE issues that may affect share price performance
- Understand adaptational and strategic responses of companies to climate change
- Identify and encourage best practice

ISIS will lead the work supported by Morley, but the engagement will be carried out by members of IIGCC's engagement work stream. This note will set out the rationale for engaging with the sector by discussing the sectors' relationship to climate change impacts. In order to determine the potential impact on individual companies, trends in the sector are discussed as well as an analysis of individual companies' businesses.

The IIGCC work-stream will focus on the heavy (construction materials) and the light (Building products) side. Cement, glass and clay products are most significantly impacted since they have to cut CO2 emissions or buy CO2 allowances under the EU trading scheme. All stocks would also be impacted by expected rises in electric power prices.

2. General climate change issues for the sector:

Key Impacts of construction on climate change

- The cement sector alone accounts for 5% of global man-made CO2 emissions.
- Highest impact is the mining/manufacture of materials and chemicals.
- Transport of heavy materials such as cement is energy-intensive, but most building materials tend to be sourced from close-by facilities.
- The chemical processes and use of fuel/electricity account for the major portion of the sector's CO2 emissions.
- On-site construction of buildings is relatively low-impact, mainly energy use; influenced by choice of building materials, construction techniques, and modes/ distances of transportation.
- The maintenance of buildings is higher impact due to significant energy use (esp. heating, lighting); New building regulations impact on requirements for maintenance and demolition.

Key impacts of climate change on construction

- Weather related impacts: flooding, coastal erosion, subsidence, drainage systems require new building techniques and materials to withstand adverse weather conditions; influence the choice of site
- Cost of finance/insurance: Insurance sector beginning to factor impacts of climate change into premiums. Sector has yet to put systems into place to discount climate-change related risk mitigation, but could be pushed to do so through building industry initiatives.
- Business interruption from wetter winters.

Key risks

- Reduced raw materials (if quarries are not rehabilitated)
- Regulatory risk in EU (emissions, building specs, environmental protection, planning etc)
- Rising power prices
- Rising cost of construction due to delays
- Emerging market competition
- Less space available for development
- Reputation risk/ NGO backlash for laggard companies

Key opportunities

- New materials/ technologies: ex. Photo-catalytic coating, shotcrete, concrete 'eco-columns'
- Sustainable Business Materials Exchange (see below)
- Other adaptive responses – use of fuels, emissions trading, eco-design (reducing energy use in construction/maintenance stage of building)
- Use of waste products for raw materials in fuels

General strategies to address climate change in construction

- Government taxation and regulation e.g. Tax breaks or rewards for energy efficiency; raised energy efficiency standards for construction and refurbishments; calls for increased transparency in property energy use which could effect valuations
- Voluntary targets - Industry sets reporting metrics, individual companies set targets
- Process/technology innovation
- Switching to lower carbon fuels
- Identifying alternative raw materials (e.g. lower clinker-content cement)
- CO2 capture and sequestration (although very costly)
- Emissions trading

Emerging markets

The building materials sector is recognising a growing potential in emerging markets and is diversifying into developing countries. This is a result of:

1) Increasing regulation in EU (although this can be of advantage, e.g. building regulations)
2) Low growth in developed markets has triggered search for high growth markets;
3) Growth potential in emerging markets (requiring more input into developing infrastructure providing greater opportunities in these less mature markets; population growth and economic development; change in building techniques).
4) Lower costs of production in emerging markets.

Developing countries (DCs) are not constrained by the Kyoto protocol and industrialising countries are becoming greater contributors to climate change. Low-income housing in DCs tends to be in locations adversely exposed to weather-related impacts of climate change (i.e. flood-prone areas). In shift towards internationalisation, construction is both affected by and contributing to climate change. For example, China is a key growth market and its energy policy increasingly promotes renewable energies. Demand for building materials is surging.

3. The Cement Industry

The cement industry employs about 850,000 workers in facilities in 150 countries, producing about 1.5 billion tonnes of cement a year. It has an estimated annual turnover of $87 billion and has grown by nearly 4 percent a year over the past decade. (WBSCD Cement Industry Initiative 2003)

Sector Sustainability Issues:

WBCSD Cement Sustainability Initiative (Holcim, Cemex, Cimpor, HeidelbergCement, Italcementi, Lafarge, RMC Group, Siam Cement Industry, Taiheiyo Cement, Votorantim) commissioned research report by the Battelle Institute on "Towards a sustainable cement industry" with recommendations on key sector sustainability issues, such as climate change.

Agenda for Action by the Cement Industry following the report:

Commitment on CO2 emissions:

- Each company will use the tools set out in the CO2 protocol to define and make public their baseline emissions by 2006.
- Each company will develop a climate change mitigation strategy, and by 2006 will publish targets and progress.

- As a result of implementing the CO2 protocol, each company will report annually on:
  - Total gross and net CO2 emissions as tonnes CO2 (as defined in the protocol www.wbcsdcement.org/sub_C02.asp)
  - Amount of CO2 emitted for every tonne of cementitious product (kg CO 2 per tonne of product)
  - Changes in the amount of CO2 emitted compared to a 1990 baseline (tonnes CO2)

- Work with relevant stakeholders to develop a Carbon Dioxide Protocol for the cement industry. (Commitment already delivered in parallel with the Battelle Institute's study).
- Work with competent authorities, WBCSD/WRI and other organisations to investigate public policy and market mechanisms for making meaningful reductions in CO2 emissions in the most effective way.

Exposure under the EU ETS
The Cement industry is estimated to contribute 5% of global manmade CO2 emissions. 50% of these stem from chemical changes of raw material, 40% from fuel combustion and 5% from both electric power and transport. Under the ETS, only direct (on-site) emissions are covered, i.e. chemical changes and fuel combustion.

3 ways to reduce CO2 emissions:

1. **Lower clinker content:** 50% of CO2 emissions occur during the process of producing an intermediate product called clinker. Reductions can be achieved by diluting the clinker content and grinding the cement finer to maintain 28 day strength. Problem: there is limited demand for low-clinker cement and customers may perceive it to be of lower quality. Since it should cut costs, we should ask companies why they do not use more of it?

2. **Increase fuel efficiency:** The wet process consumes nearly twice as much fuel as the precalciner process for each tonne of cement. However, changing the process is very expensive, and unlikely to be justified solely by fuel savings.

3. **Alternative fuels:** Cement manufacturers use waste fuels, however, under the ETS, waste fuels are not favoured over conventional fuels except biofuels (wood chip and rice husks) which are hardly used by the industry.

As the above actions to reduce CO2 emissions would also result in a reduction of major production costs (fuel and clinker content), we would hope that companies have pursued these avenues already.

4. Glass companies

Glass companies have already made significant cuts without being credited for the reductions. This subsector is more protected from imports than cement and glass as the product is a higher value-added product. As a commodity, float-glass is more tradable than clay, but less tradable than cement. One upside/ opportunity for glass companies has come through the new building regulations which require higher spec and therefore higher value glass products.

5. Clay companies

Clay companies suffer the least margin impact as they can pass it on to customers, despite a 10% cut under the UK National Allocation Plan for the ETS.