FRAZER LINDSTROM
Climate Change and Energy Sector Strategic Advice

The Impact of Global Warming on the Concrete Industry

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Climate Change | Energy Sector | Strategic Advice

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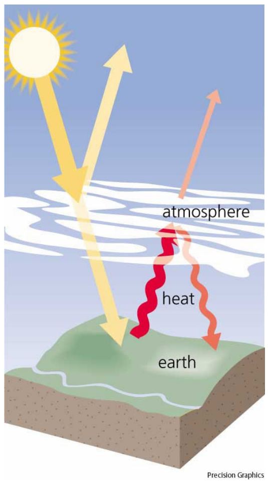
The Impact of Global Warming

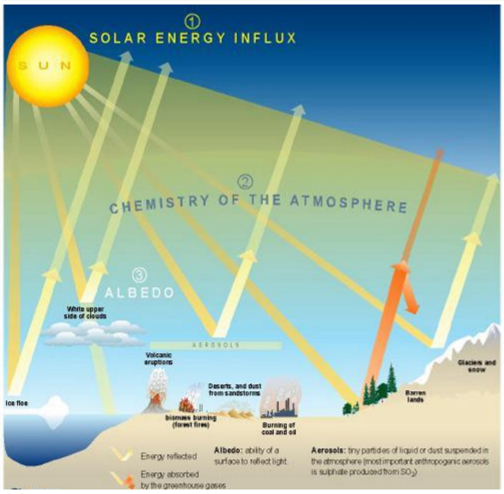
- What is it?
- How are the cement and concrete industries affected?
  - Part of the problem => solution
  - Need for adaptation
- The policy debate
- What to watch for in the future…

What is Global Warming?

- Life on earth depends on the greenhouse effect
- The question is are we changing its magnitude?



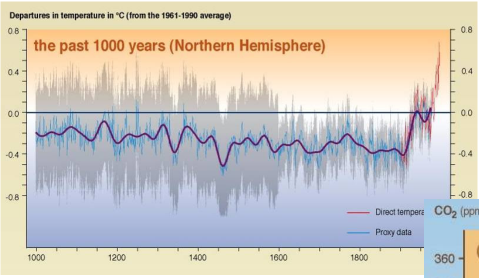
Three key drivers of the greenhouse effect:



1. Solar Influx
2. Chemistry
   - The role of Greenhouse Gases (GHG); CO_2, CH_4, N_2O, SF_6, PFCs, HFCs
3. Albedo Effect

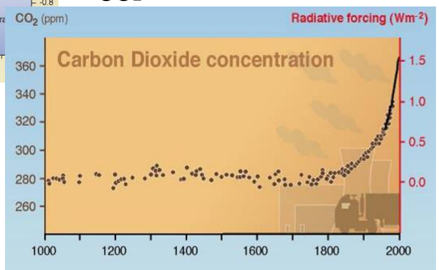
The Climate Scientist's View

Temperature



"There is strong evidence of a correlation between temperature And CO_2 emissions"

CO_2

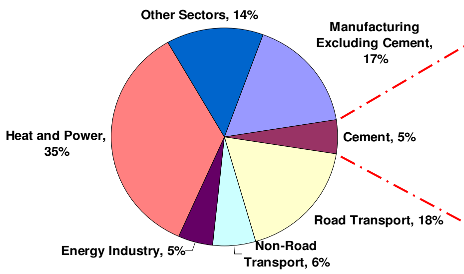


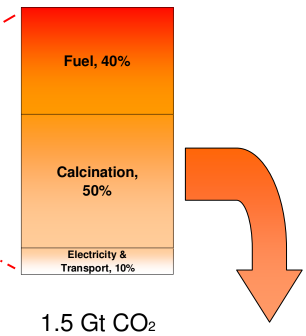
Source IPCC

Cement's Role? 5% of global man-made CO_2

Global CO_2 Production

Cement





Source IEA, Battelle

30 Gt CO_2

1.5 Gt CO_2

5 CaCO3 +	2 SiO2 →	(3CaO,SiO2)(2CaO,SiO2) +	5 CO2
(Solid)	(Solid)	(Solid)	(Gaseous)
(1.0 kg)	(0.56 kg CaO)		(0.44 kg)

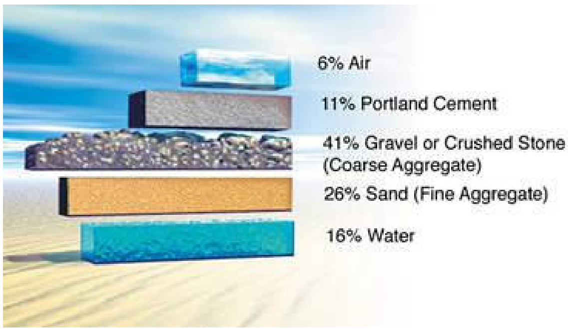
The Dilemma

Concrete is a fundamental construction material
BUT
Making cement (a component) makes a nearly equal quantity of CO_2 a greenhouse gas…

Perspective Check:

Cement is only one component of concrete ~11% by mass.

But not an excuse for the cement industry to not act on greenhouse gas emissions.

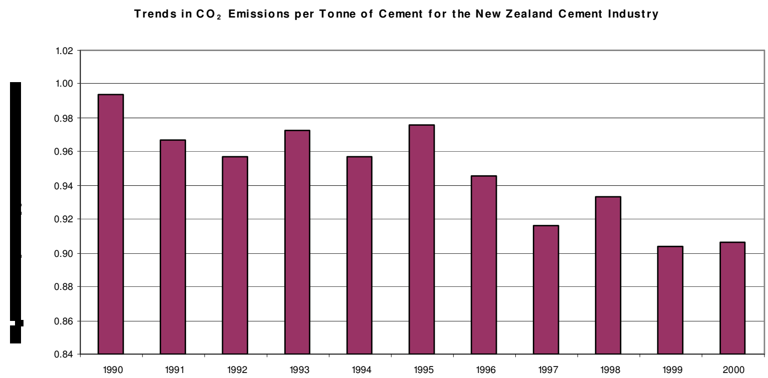


International Cement Industry Initiatives

- Cement Sustainability Initiative
    - >50% of cement manufacturing outside China
  - Measure to Manage:
    - GHG Protocol developed (WBCSD/WRI)
    - Common accounting reporting standard
    - Firms make public their baseline emissions
    - Firms develop CO_2 mitigation strategy and publish targets and reports
- In EU cement industry is in Emissions Trading Scheme (ETS)
- Kyoto CDM projects to reduce emissions

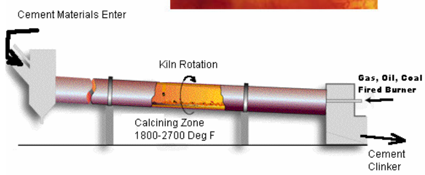
New Zealand Industry Actions

- Industry (GBC & Holcim) Voluntary Agreement with NZ Government to reduce GHG emissions



New Zealand Industry Actions

- Energy Efficiency Improvements
- Reduced carbon content “alternative” fuels
  - Waste oil
  - Wood waste
- Reduced clinker content
  - Limestone
  - Slag
  - Fly ash



Where to next?

Domestic & International Policy

Uncertain Times for the Cement Industry in New Zealand

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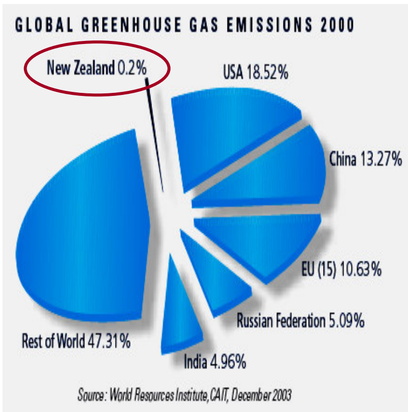
New Zealand's

Kyoto Obligations

- New Zealand Ratified 19th Dec 2002
- Obligation to:
  - reduce its 2008 – 2012 GHG emissions to 1990 level or
  - take responsibility for excess emissions



Progress to Date (2002-2005)

New Zealand’s Old Domestic Policies

Agriculture

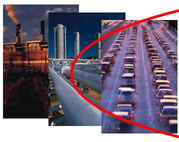
- Pastoral GHG Research Consortium

Plantation Forests

- NZ Government retains sinks (post 1990 planting)
- Takes on deforestation liability up to 21MtCO_2e cap

Indigenous Forests

- Permanent Forest Sink Initiative (PFSI)



Energy, Industry and Transport

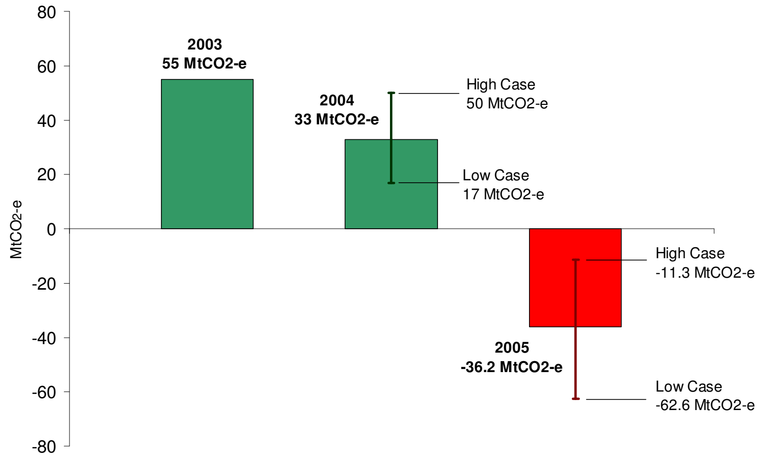
- Carbon Tax from 2007 at NZ$15/t$CO_2$e
- Negotiated Greenhouse Agreements (NGAs) to protect industry facing international competition

The NZ Policy Context – All Change?

- Both Golden Bay Cement & Holcim were seeking Negotiated Greenhouse Agreements (NGAs)
  - Binding commitments to reduce emissions intensity
  - In return get exemption from carbon tax

Domestic Uncertainties

Projected Balance by year of forecast



The 2005 Election

Climate Change

- Kyoto? - Yes
- Carbon Tax? - Yes
- Emissions Trading? - Likely

NEW ZEALAND Labour

- Kyoto? - Maybe
- Carbon Tax? - No
- Emissions Trading? - Likely

National

Authorised by Steven Joyce, 14th Floor, 57 Willis Street, Wellington

Climate Change Policy Review
June – November 2005

- Key Outcomes:
  - Revisit the "downward path by 2012 goal" now unrealistic
  - Cost effective domestic emissions reductions will be small
  - More cost effective to purchase emission units offshore
- Report Recommendations flowed into cabinet decisions…

Cabinet Decisions

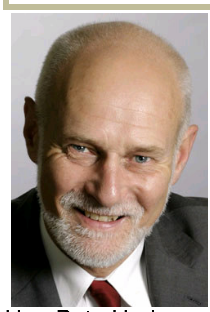
Cabinet Decisions announced 21 Dec 2005:

- Still committed to meeting Kyoto obligation
- Carbon Tax scrapped
- Programmes to be developed include:
  - Alternatives for industry include
    - voluntary agreements
    - narrow based tax with NGA type arrangements
    - emissions trading
  - Forestry policy options to give right signals
  - International unit purchasing strategies
  - Incentivising renewables / disincentivising fossil fuel electricity generation.
  - Need for future shape of a PRE programme

Since Then?

- 4th July 2006 announcements
  - New Zealand Energy Strategy
  - National Energy Efficiency & Conservation Strategy; and
  - Climate Change Work Programmes;
- But no details/substance/timeline

Win Hearts & Minds Mode



Hon Pete Hodgson

- Need a mandate from the voters for action.
- Election did not deliver this…

4 million careful owners

WWW.4MILLION.ORG.NZ

Win Hearts & Minds Mode

Hon David Parker

International Policy

What happens after 2012?
– the end of the first Kyoto Commitment Period?

AP 6

- USA, Aus, China, India, S Korea, Japan

Kyoto 37

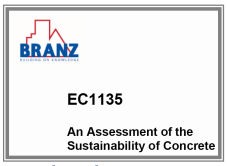
- EU, NZ, Japan… (Canada)

The Way Ahead

- Plan for Climate Change – Adaptation
  - Rising sea levels ; storm drain outlets heights?
  - Wind loadings?
  - Drainage requirements?
- Plan for a price on (marginal) GHG emissions
- Be open to reduced clinker content cement?

The Way Ahead (contd.)

- Support the BRANZ work on the sustainability of concrete (report of May 2006)


BRANZ
EC1135
An Assessment of the Sustainability of Concrete

  - essential for defence of concrete versus substitutes.
- OPPORTUNITIES also!
  - Quarry land potential for planting “Kyoto forests”
  - R&D on *new* concretes – insulating, high strengths etc. (attack substitutes in their strong areas)
  - Fleet fuel reductions
  - …….

Stay Positive

- Climate Change is a potential threat to the industry but the industry can adapt:
  - NZ is not alone in the policy conundrum
  - Competing building materials face similar threats (steel, aluminium, laminated timber)
  - NZ's cement manufacturers are proactive and are staying engaged on Government policy
  - Advocacy of concrete's benefits as a building material, e.g. insulation properties, need to be loud and clear.

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