



**Concrete  
Thinking**  
for a sustainable world



Portland Cement Association

# Government Relations Seminar

## *Nashville Tennessee*

*August 23, 2011*



# Industry – MIT Research on Sustainability

Industry (Portland Cement Association and the Ready Mixed Concrete (RMC) Research and Education Foundation) joined together in 2009 to engage MIT to conduct research on the sustainability of the cement and concrete industry.

The Genesis of Concrete project started within the CSHub with the aim of driving the development of the new generation of "green" cement-based materials.

# MIT Research:

- Life Cycle Assessment;
- Life Cycle Cost Analysis;
- Sustainability;

# MIT's research focus on 2 Areas:

➤ Buildings;

➤ Pavement;

# Buildings

- LCA, or Life Cycle Assessment, considers all life-cycle phases, from initial construction to demolition;
- LCCA, or Life Cycle Cost Analysis, considers costs associated with constructing and maintaining the structure;

# Building - LCA

- Life cycle assessment (LCA) offers a comprehensive approach to evaluating and improving the environmental impacts of buildings.
- This includes all phases of the building life cycle—materials, construction, use (including operating energy), maintenance, and end of life—allows for a representative characterization of cumulative environmental impacts over the life of a building.

# Building - LCA

- Comparison between traditional concrete, wood, and steel construction
  - Includes ICF;
  - Modeling based on Chicago and Phoenix environments;
  - Compared commercial, single- and multi-family buildings;

# Initial Findings:

- In general, concrete structures have lower annual operating GWP (Global Warming Potential) than the alternate designs in wood or steel (ranging from 2%-10% in savings).
- Increased substitution of fly ash or other SCMs, can reduce the embodied GWP of the concrete buildings considered by 4% to 14%.

Caveat: More research is necessary to further compare and quantify results.

# Pavement

- LCA, or Life Cycle Assessment, considers all life-cycle phases, from initial construction to demolition;
- LCCA, or Life Cycle Cost Analysis, considers costs associated with constructing & maintaining the pavement over its design life;

# Initial Findings:

- LCA & LCCA are important components in figuring pavement costs;
- Overdesign wastes resources – money, materials, and produces excessive CO<sup>2</sup>
- Using MEPDG may reduce costs upwards of 50% and reduce carbon emissions by 30%;
- 50 year design life of pavements is possible – this will produce more cost-effective pavements;

# Initial Findings:

- Pavements built in concrete may produce fuel savings for motorists;
- Concrete prices are expected to rise less than the rate of inflation;
- Asphalt prices are expected to rise dramatically more than the rate of inflation;

Caveat: With the current price of oil hovering around \$80/barrel, the price differential is minimal.

## Mercury – a public strategy firm

- Was retained to assist PCA efforts at the U.S. Capital in advancing efforts to position concrete as the building material of choice.
- Initiated H.R. 2602, the *Fiscal Accountability and Transparency in Infrastructure Spending Act of 2011*;
  - Requires that government agencies use LCA & alternate design/alternate bidding,
- Has assisted state level efforts in AL and PA;

# PCA's Think Harder Campaign

- Visit the website: [Thinkharder.org](http://Thinkharder.org)
- Conventional wisdom says asphalt is the cheaper solution for roads. But it ignores the fact that it's cheaper because it only lasts half as long as concrete.
- Conventional wisdom says build homes of wood. But it ignores the fact that today's concrete wall systems save up to 40% in energy.
- Conventional wisdom says that the world's tallest skyscrapers are structural steel. But the recently opened Burj Khalifa, the tallest building in the world, relies on a reinforced concrete frame.

# Federal Efforts

- Federal Transportation Bill;
- Industry – Environmental Regulatory Issues:
  - NESHAP;
  - Mercury;
  - Coal Ash;
- PCA PAC;

# State Efforts

- NY – ADAB;
- NYC – Defensive efforts;
- PA – ADAB; transparent LCCA;
- MN – Billboard campaign to pressure MnDOT to use more concrete;
- CA – Climate change issues;



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# Minnesota Billboard Campaign



# **Tying it All Together – Science, Policy & Politics**

How do we use the findings of MIT to pursue policy changes at the political level?

**SCIENCE**



**POLICY**



**MARKET IMPACT**

# Using all these resources to help you on the ground

- Adopt life cycle design in the early design phase of new buildings, through LEED, state building codes and other means;
- Pursue LCCA legislation;
- Advocate for ADAB policies with local and state agencies;

# Need Help?

- Utilize your association staff for help;
- Engage your lobbyist;
- Get involved!
- Your RPG is here to help too!

# It's All a Matter of Perspective



I CAN'T BE BOTHERED TO SEE ANY PESKY SALESMAN....I'VE GOT A BATTLE TO FIGHT!



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**Questions?**



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# Thank You!

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