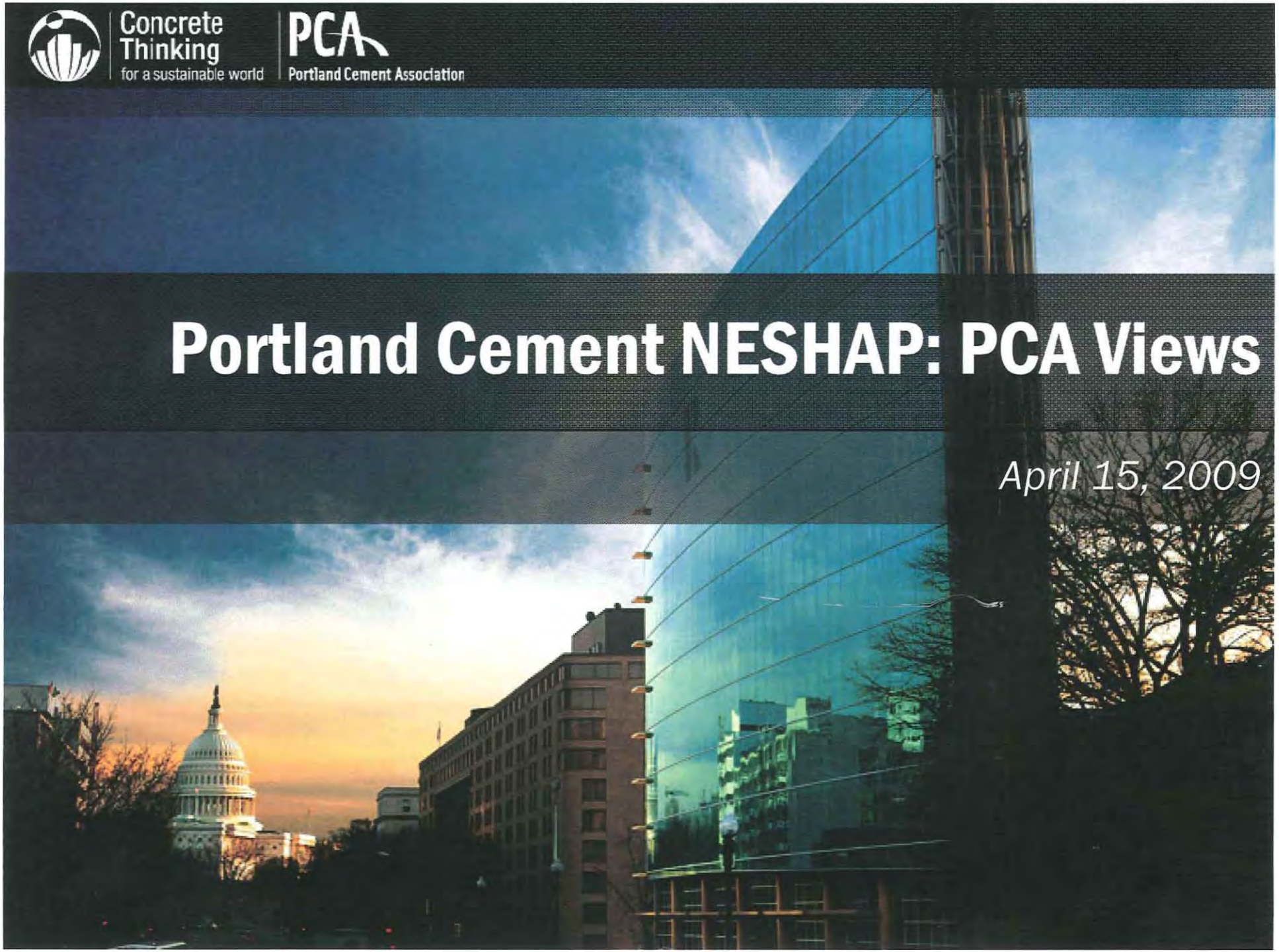
Concrete Thinking for a sustainable world

PCA Portland Cement Association

Portland Cement NESHAP: PCA Views

April 15, 2009



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Meeting Agenda

- Overview of Cement Manufacturing Process
- Timeline of Portland Cement NESHAP
- Key Issues Under Reconsideration
- Overview of Industry Concerns
- Potential Economic Impacts
- Other Issues
- Recommendations

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Cement Manufacturing Process

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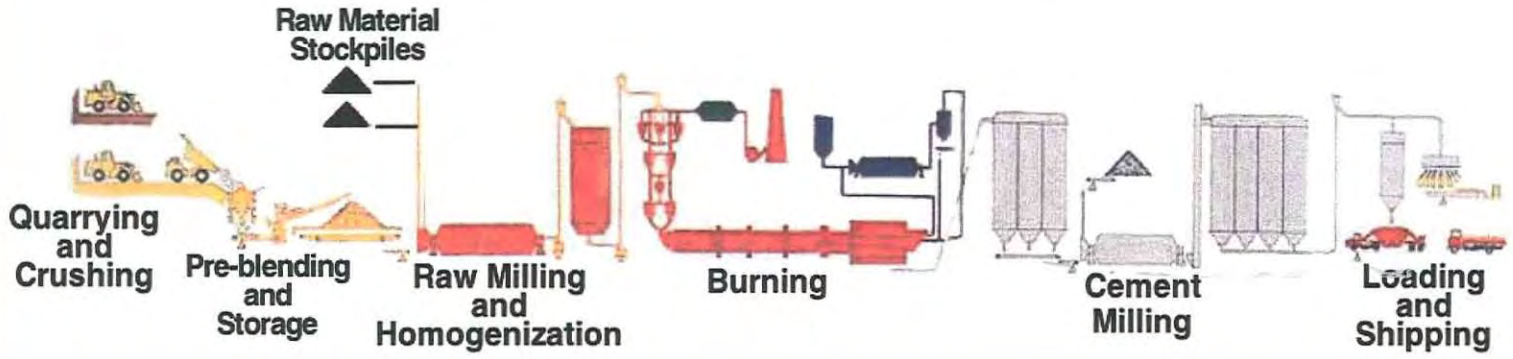
Cement Manufacturing Overview



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Timeline for Portland Cement NESHAP

- March 1998: Initial Proposal
- June 1999: Final Rule - particulate matter, dioxin/furan stds and total hydrocarbon (THC) std (greenfield plants only)
- August 1999: Challenged by Earthjustice, PCA and NLA
- December 2000: D.C. Circuit Decision; Remand back to EPA
- April 2002: Final Rule implementing PCA/EPA settlement of litigation
- December 2005: Proposed Revisions
- December 2006: Revisions Finalized – mercury and total hydrocarbon stds for new and modified facilities; work practices for existing facilities; 112(d)(4) petition granted for HCl
- December 2006: December 2006 rule reconsidered
- 2007: Extensive 114 data request; testing of scrubbers
- April 2009: Anticipated proposed changes

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Key Issues Under Reconsideration

- Mercury (Hg) standards
- Total hydrocarbon (THC) standards
- Hydrochloric acid (HCl) standards
- How to factor in variability of inputs and control technology when determining an appropriate emission limit or limits
- How to apply subcategorization approaches to reflect the reliance on limestone raw materials and to develop achievable standards

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Overview of Key Concerns

- Limestone quarries integral part of manufacturing process
- Hg and THC emissions derived principally from limestone raw materials
- Creative approaches to considering variability necessary when computing an emission limit
- Cement industry very exposed to international competition; Subcategorization approaches are imperative to mitigate dire impacts and to avoid Hg "leakage"
- Successful 112(d)(4) petition obviates need for HCl standards
- Control technology performance will vary considerably
- Operators need flexibility when determining whether to employ technology or other solutions to achieve emission standards
- Cross media impacts of potential control technologies of significant concern

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Variability

- Hg and THC emissions derived primarily from limestone, the principal raw material
- Significant range of variability of Hg and THC emissions across the industry reflecting limestone concentrations
- Hg variability compounded by that associated with other inputs, such as fuels
- Variability profile for "best performers" not reflective of universe of facilities; only those with the lowest Hg concentration in their limestone
- Without realistic consideration of variability, emission standards not likely to be achievable by many facilities, even for those employing the most advanced controls

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Example Hg Variability Analysis

Case	Emissions in lbs/million tons of feed (No Fuels)
EPA's Estimate	15.67
Results of effort to duplicate EPA's figure, using average mercury contents and accounting for CKD wasteage	15.73
Revision reflecting two changes: •Switched ratios of materials to match a Type III cement production scenario that occured and has a larger portion of the higher mercury materials •Elimination of coke as a fuel and replacement with coal. (Still using average mercury contents in the 114 submittal)	22.11
Same as the prior case but accounting for the variability in the 30 days of data by adding two std. deviations (95th percentile) to each input containing mercury, except for the CKD waste removal credit.	64.93
Same as the prior case but substituting higher mercury local coal (Powder River Basin coal at the 95% for high mercury coal at 150 ppb) and tripling the mercury content of the CKD wasteage to account for higher mercury coal.	92.22

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Subcategorization

- Wide range of Hg and THC emissions directly related to concentrations of Hg and THC in limestone raw materials
- Statistical breakpoints evident in the universe of sampled facilities
- At least 3 subcategories are supportable for both Hg and THC
- "Brick MACT" suggests the use of subcategories to make the standards both achievable and reasonable

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Control Options

- Control technology performance will vary across the industry. For Hg and scrubbers, it will depend on oxidized Hg concentrations, which range from 5 - >95% of total Hg
- A combination of approaches may be employed to limit a particular pollutant, including process design modifications, add on technologies (both individually and in combination) and input changes (except limestone)
- Facilities need the flexibility to determine which approach or combination of approaches will be most effectively employed, though changes to cement specifications or the amount of CKD removed cannot be presumed.

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Cross Media Impacts

- Wet scrubbers require large sources of water and significant amounts of electricity. Water may be scarce or not available and electricity generation produces greenhouse gas emissions
- Wet scrubbers and activated carbon injection for Hg control create solid wastes needing management
- Regenerative thermal oxidizers for THC control require natural gas for the combustion of organic air pollutants producing significant greenhouse gas emissions

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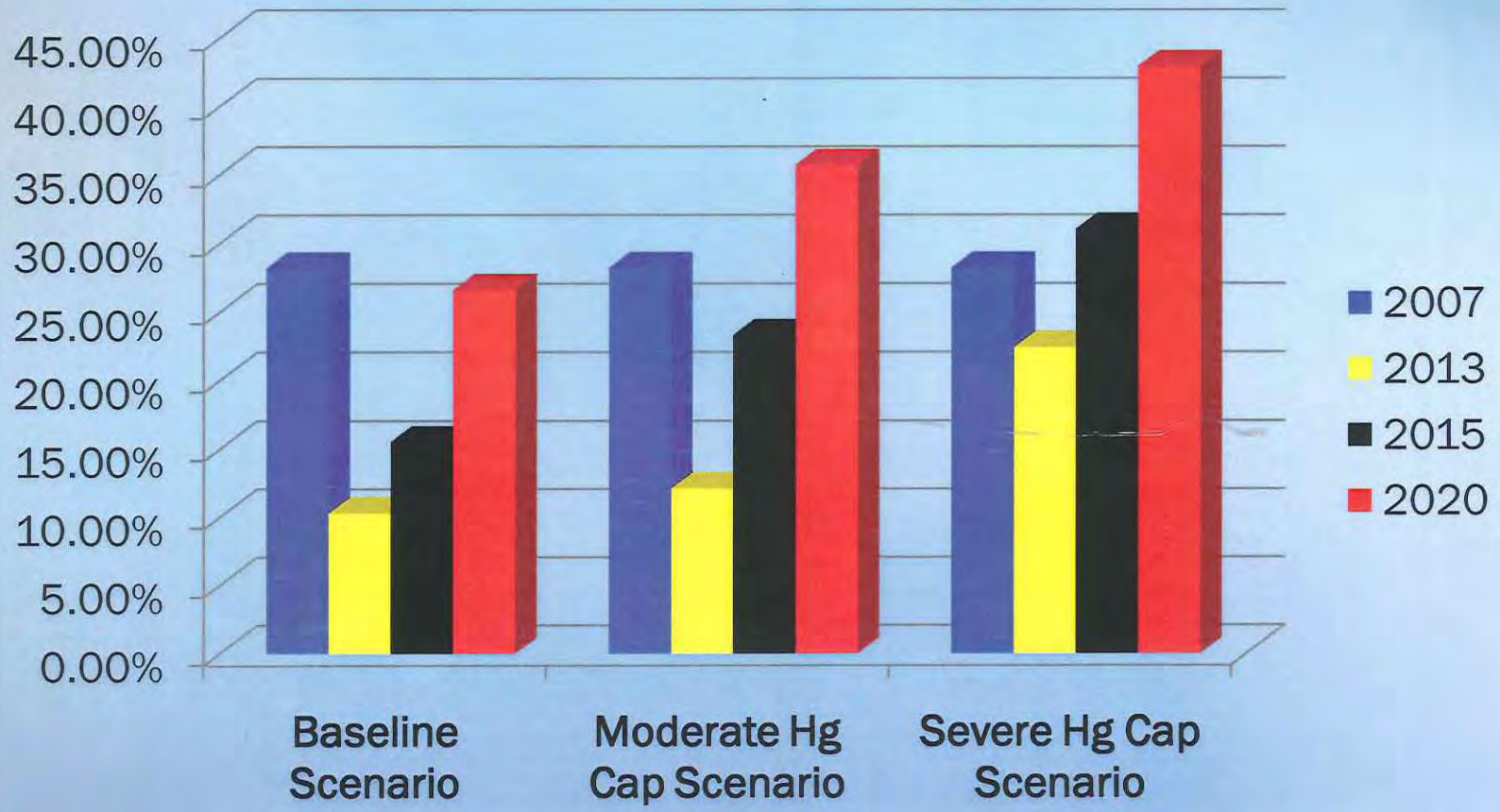
Potential Economic Impacts

- Hg emission control costs could add $10-13 per ton to domestic cement manufacturing costs, thereby incentivizing mercury "leakage"
- Under moderate scenario, U.S. capacity reduced by 8%; imports account for 35% of market in 2020
- Under severe scenario, U.S. capacity reduced by 18%; imports soar to account for 43% of the market

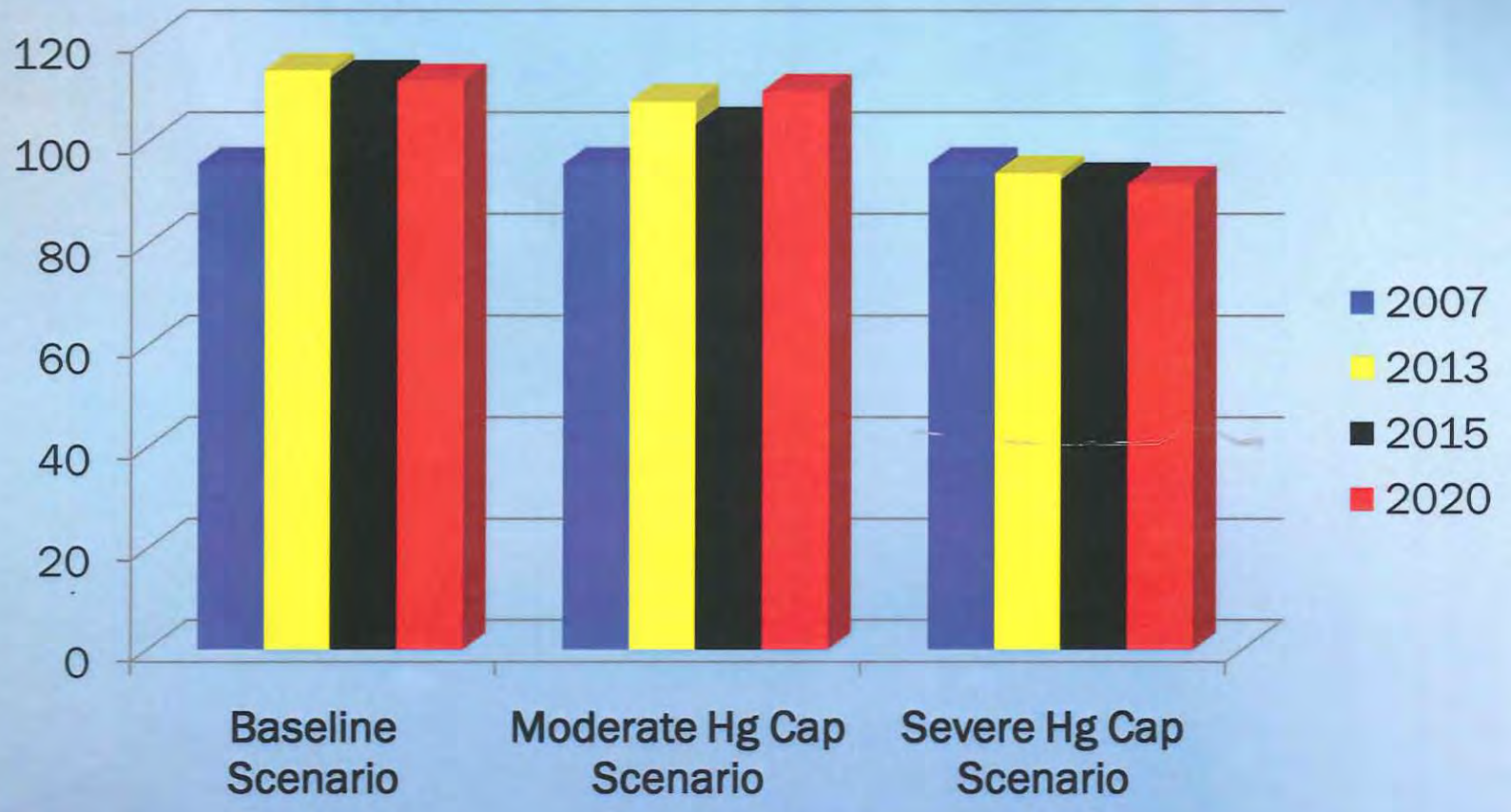
Estimated U.S. Cement Import Shares by Scenario

Share of Total Market (%)



Estimated U.S. Cement Clinker Capacity by Scenario

Million Metric Tons



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Other Issues

- Impact of recent DC Circuit decision on startup, shutdown and malfunction events on "MACT floor" calculations
- Need to apply same subcategorization approach used for Hg to THC
- PCA endorses the continued reliance on the successful 112(d)(4) petition for HCl, which confirmed no risk to health or the environment

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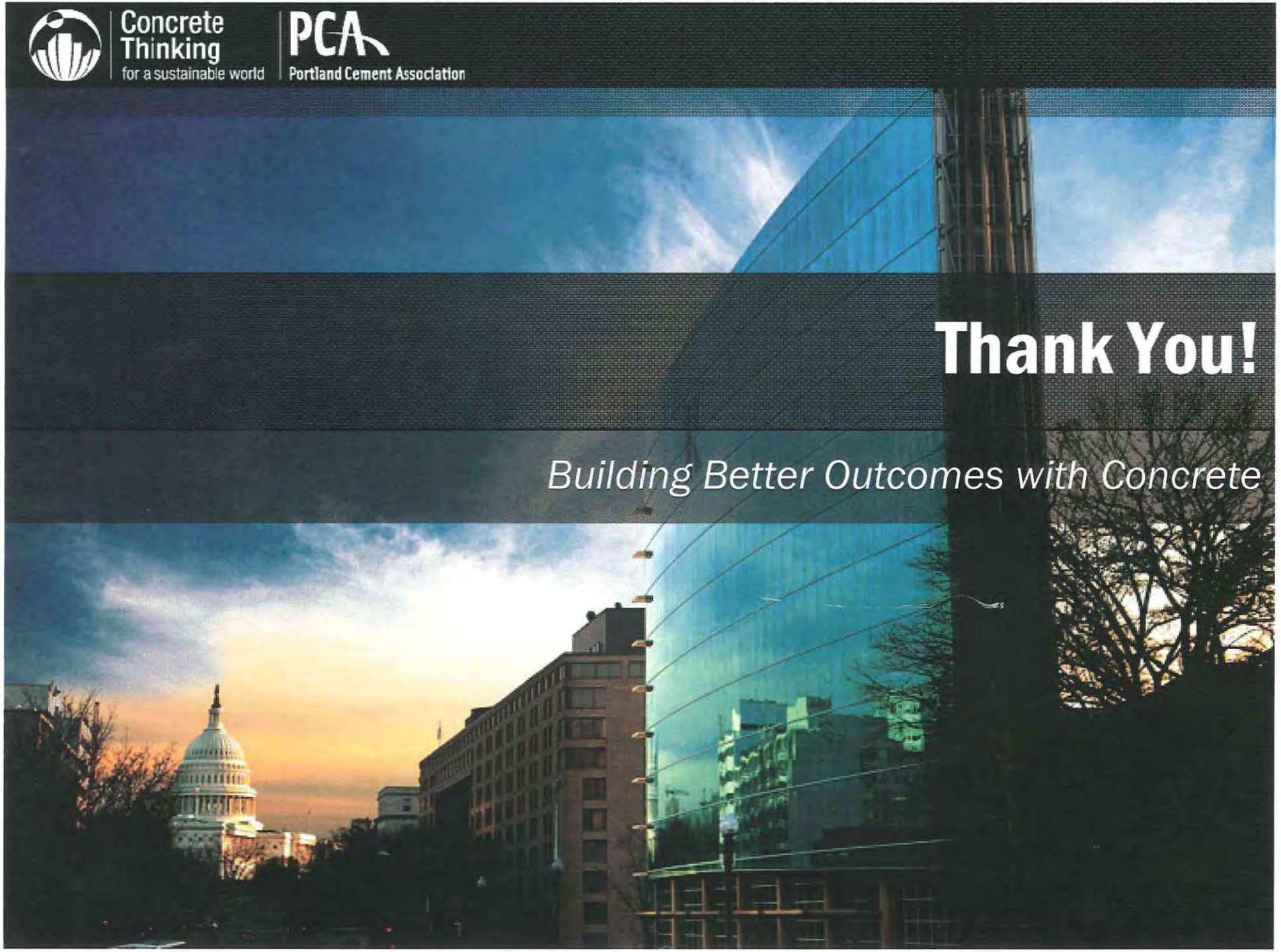
Recommendations

- More expansive consideration of variability when determining a specific emission limit
- Employment of subcategorization to mitigate impacts on subpopulations
- Avoidance of outcomes that create mercury "leakage"
- Endorsement of finding of 112(d)(4) petition addressing HCl (i.e., standard not warranted)
- Avoidance of specific technology mandates while allowing the option for percent reduction approaches
- Avoidance of increases in greenhouse gas emissions
- Avoidance of unnecessary transfers of air pollutants to other environmental media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Thank You!
Building Better Outcomes with Concrete