

Don't Stop Thinking About Tomorrow – But Today, Focus on Fly Ash!

Cement Energy & Carbon Reduction

Opportunities Meeting

San Francisco, CA

September 29, 2009



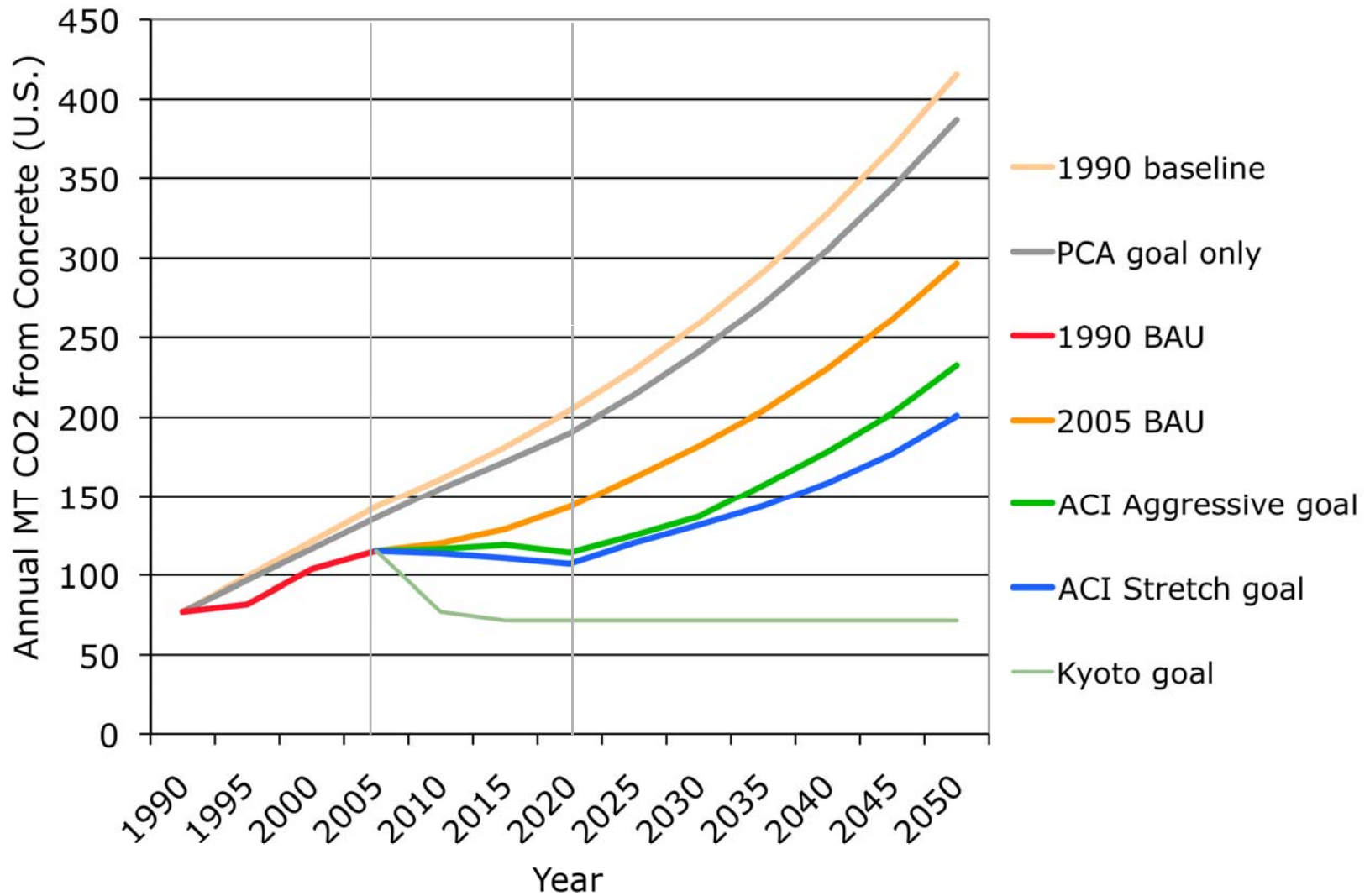
Thomas M. Pounds
Chief Operating Officer
CalStar Products, Inc.



Takeaways

- Reduce use of cement
- Track CO₂/CY concrete
- Focus on fly ash
- Take the lead in advocacy

CO₂ from Concrete, 1990 to 2050

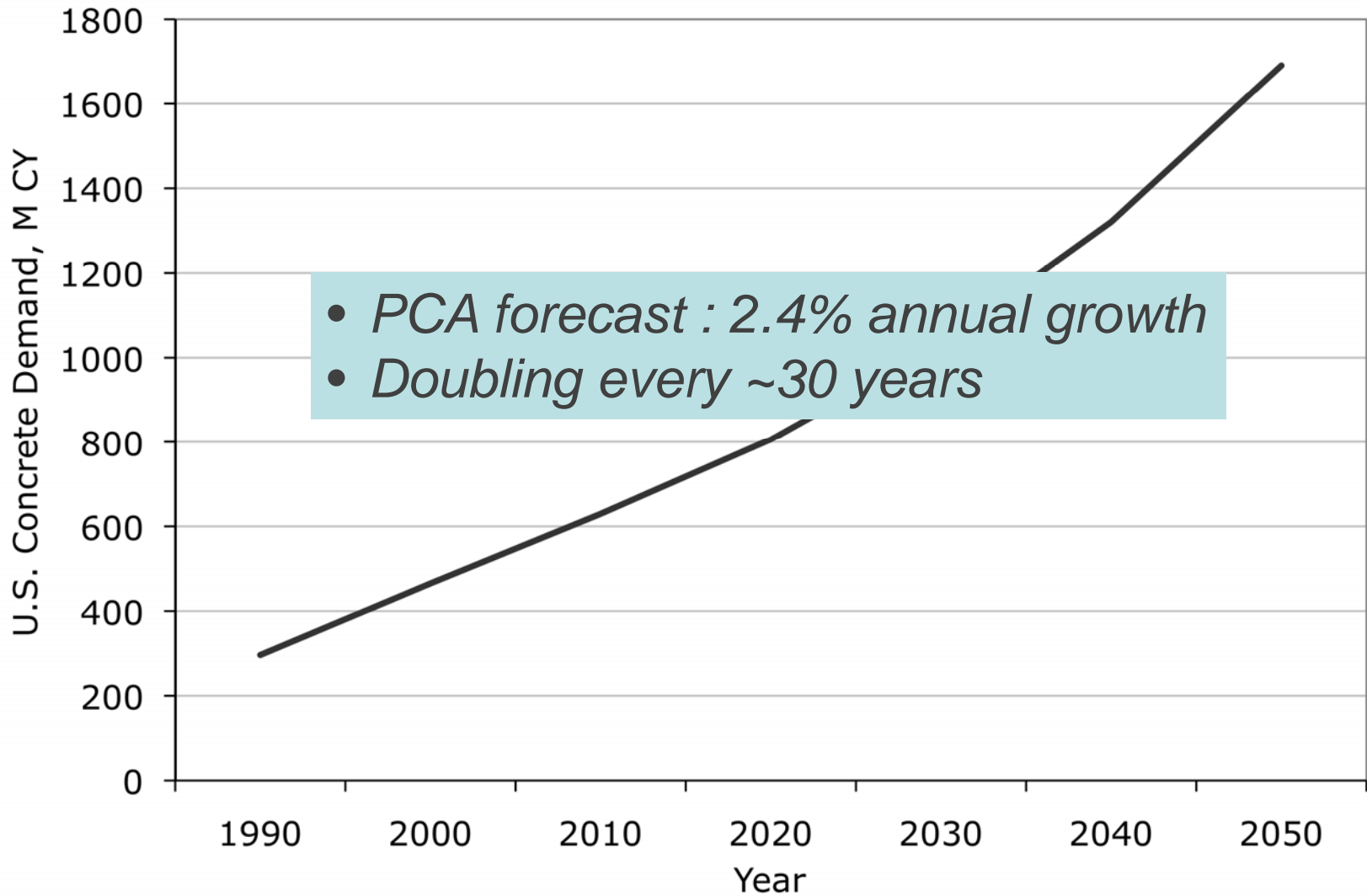




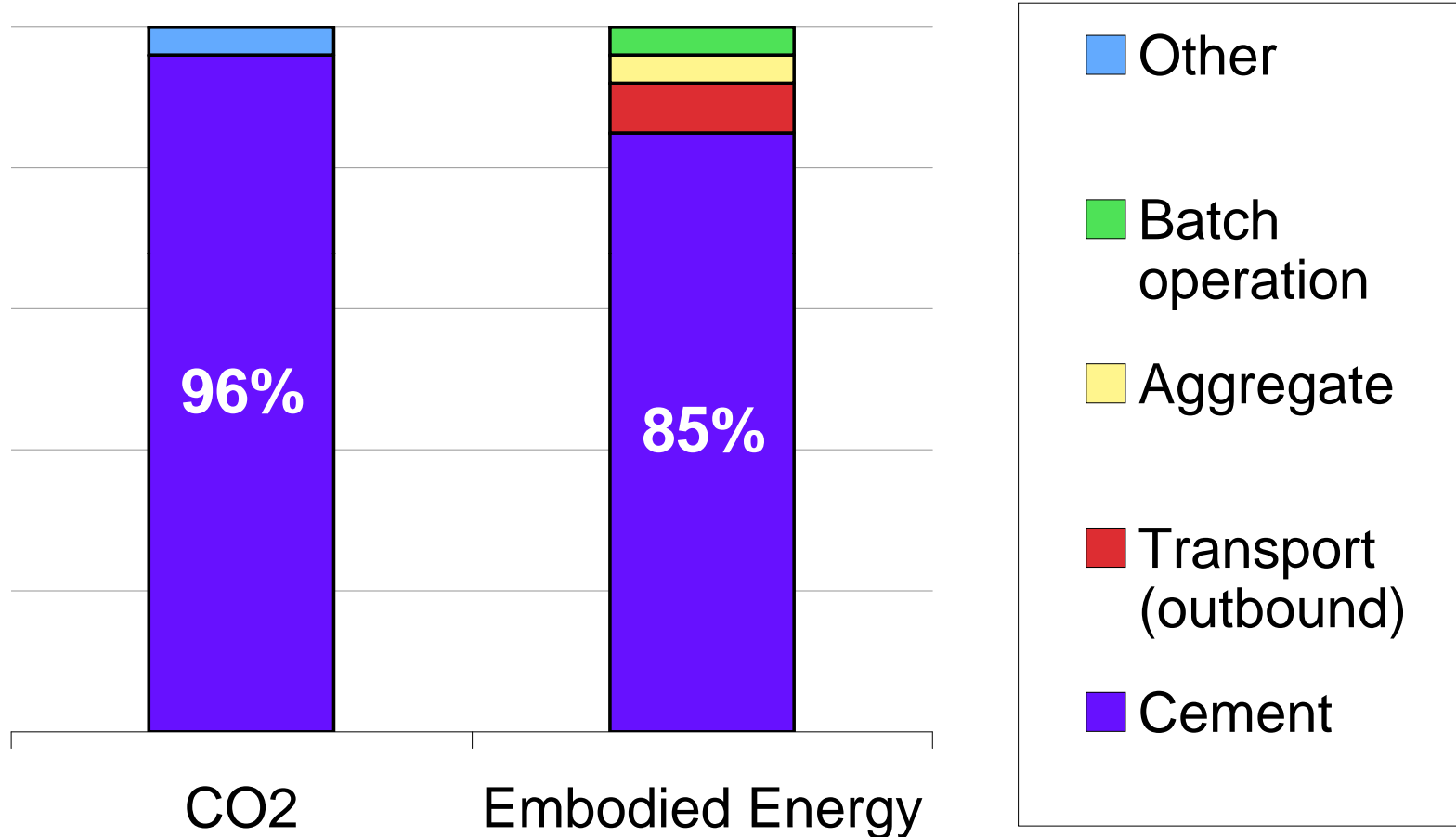
American Concrete Institute SDC Environmental Footprint Group

Dick Stehly	American Engineering Testing, <i>Champion</i>
Alan Sparkman	Tenn. Concrete Assoc., <i>Facilitator</i>
Cesar Constantino	Titan America
Prof. David Darwin	University of Kansas
Rich Gibson	Recycled Materials Company
Dave Goss	American Coal Ash Association
Steve Kosmatka	Portland Cement Association
Lionel Lemay	National Ready-Mix Concrete Association
Dennis Phillips	Baker Concrete
Tom Pounds	CalStar Products
Julie Rapoport, PhD	CalStar Products
Dave Weber	Slag Cement Association
Prof. Larry Sutter	Michigan Tech
Rusty Winters	Propex

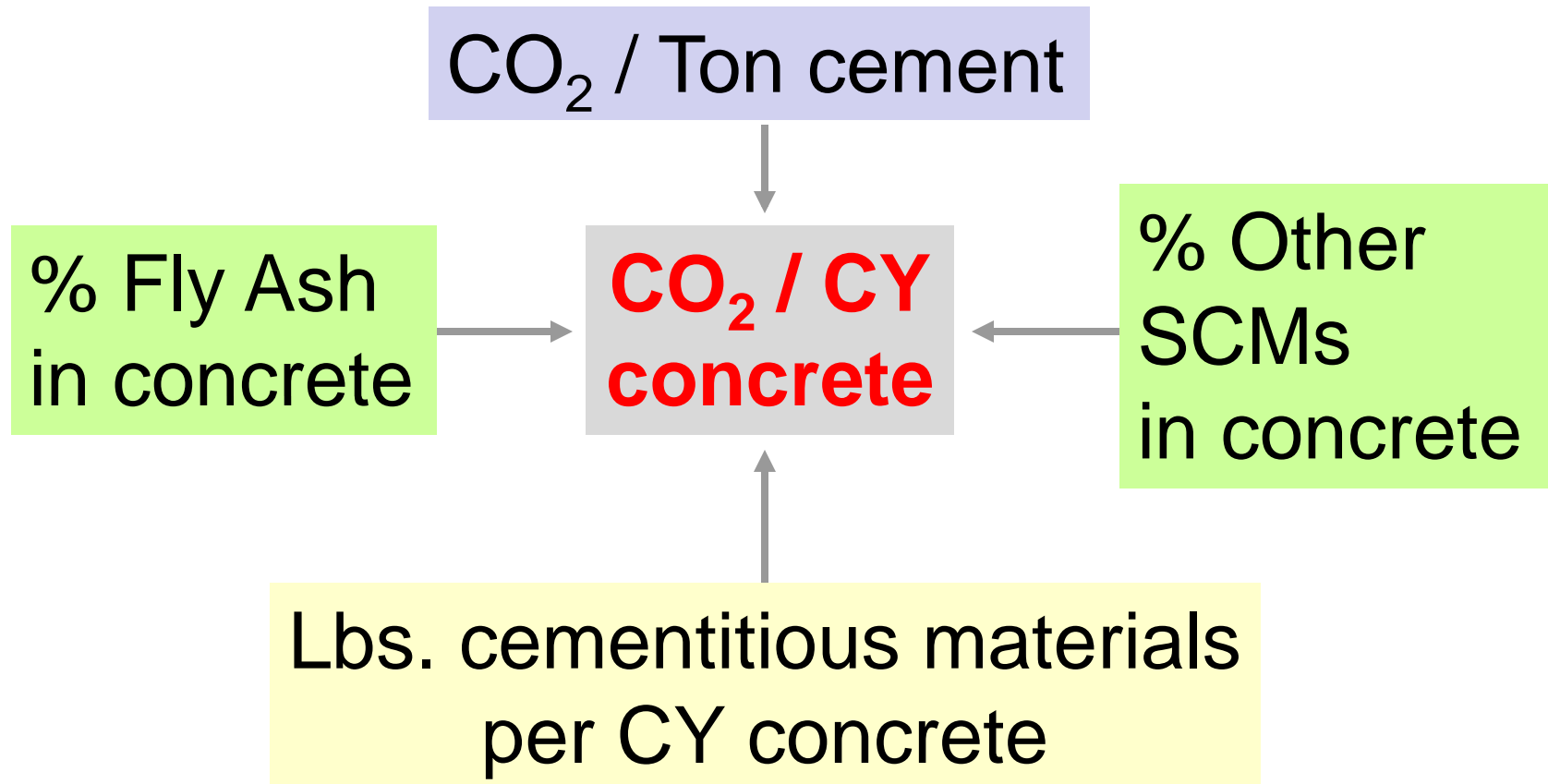
U.S. Concrete Demand



Concrete's Footprint



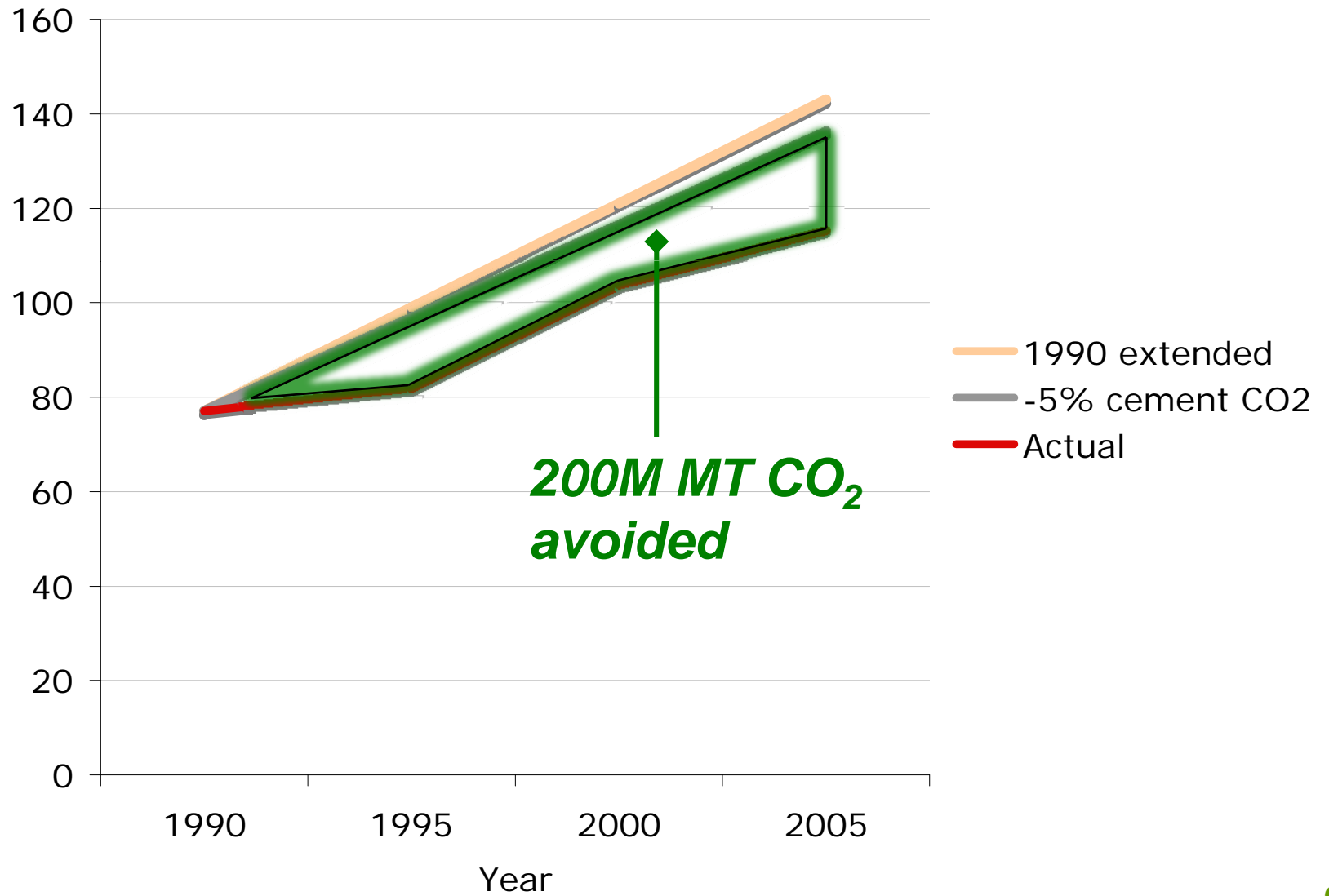
Concrete's CO₂ Drivers



1990 to 2005

Variable	1990	2005	$\Delta\text{CO}_2/\text{CY}$	
MT CO ₂ /MT of cement	0.99	0.94	-5%	✓
% fly ash, SCMs in concrete	4%	12%	-8%	✓
Lbs. cementitious material per CY concrete	600	550	-8%	✓
MT CO ₂ per CY concrete	.26	.21	-19%	✓
Total MT CO ₂ output	77	115	+49%	✗

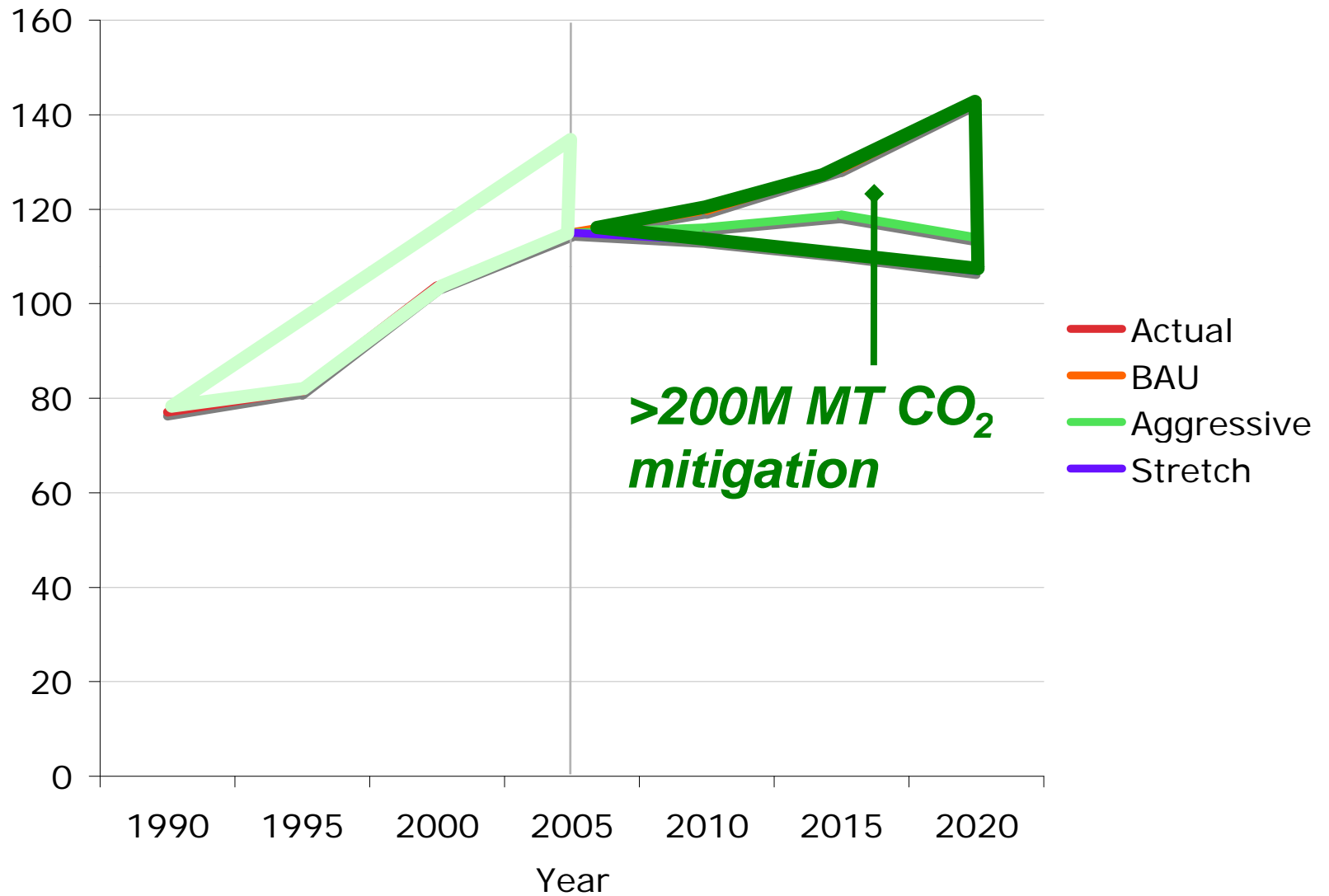
1990 to 2005



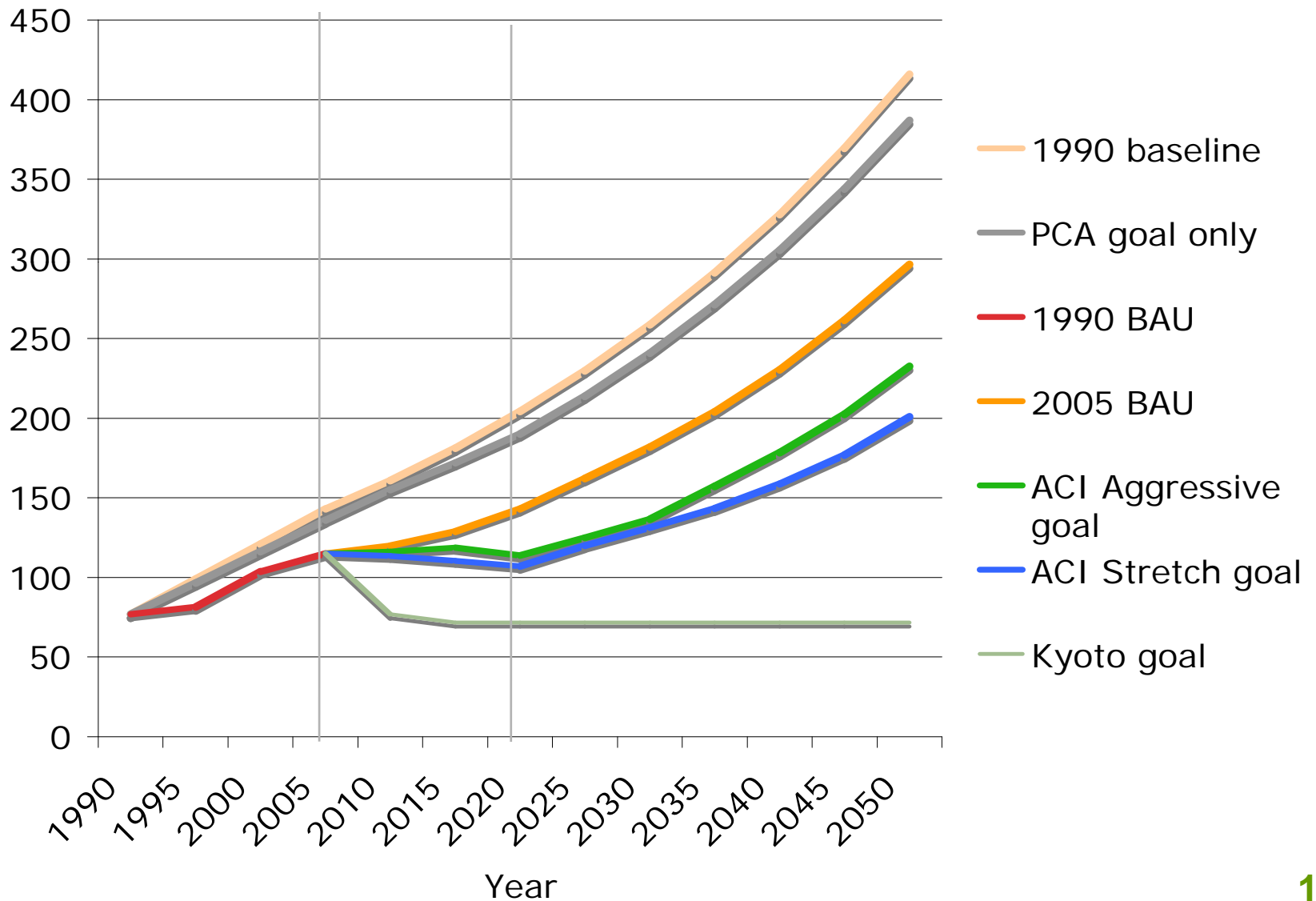
2005 to 2020

Variable	2005	2020		
		BAU	Aggr.	Stretch
MT CO ₂ / MT cement	0.94	0.90	0.85	.83
% fly ash, other SCMs	12%	15%	20%	23%
Lbs. cementitious per CY concrete	550	530	500	500
MT CO ₂ per CY concrete	.21	.18	.14	.13
Total MT CO ₂ output	115	143	114	107
		+24% ✘	-1%	-7% ✔

Opportunity to 2020



Back on Trend after 2020





Challenges

- Advocacy
 - No logical lead: PCA, ACI, EPA C2P2
 - Opportunity for DOE!
- Regulation – EPA, States
 - RCRA
 - Mercury control
- Supply
 - Preserving quality
 - Incentives to invest
- Demand
 - Fragmented practices
 - Building code



Takeaways

- Reducing use of cement is the largest opportunity in the near term
- Need to track CO₂/CY concrete
- Continued progress will require advocacy
- DOE well positioned to lead

CalStar Products

- Building products based on fly ash
- Bricks, pavers to start
- No kiln, no cement
- 85% less energy, CO₂
- 40% recycled content
- Equivalent performance, price
- First plant on line Dec 2009
- www.calstarproducts.com

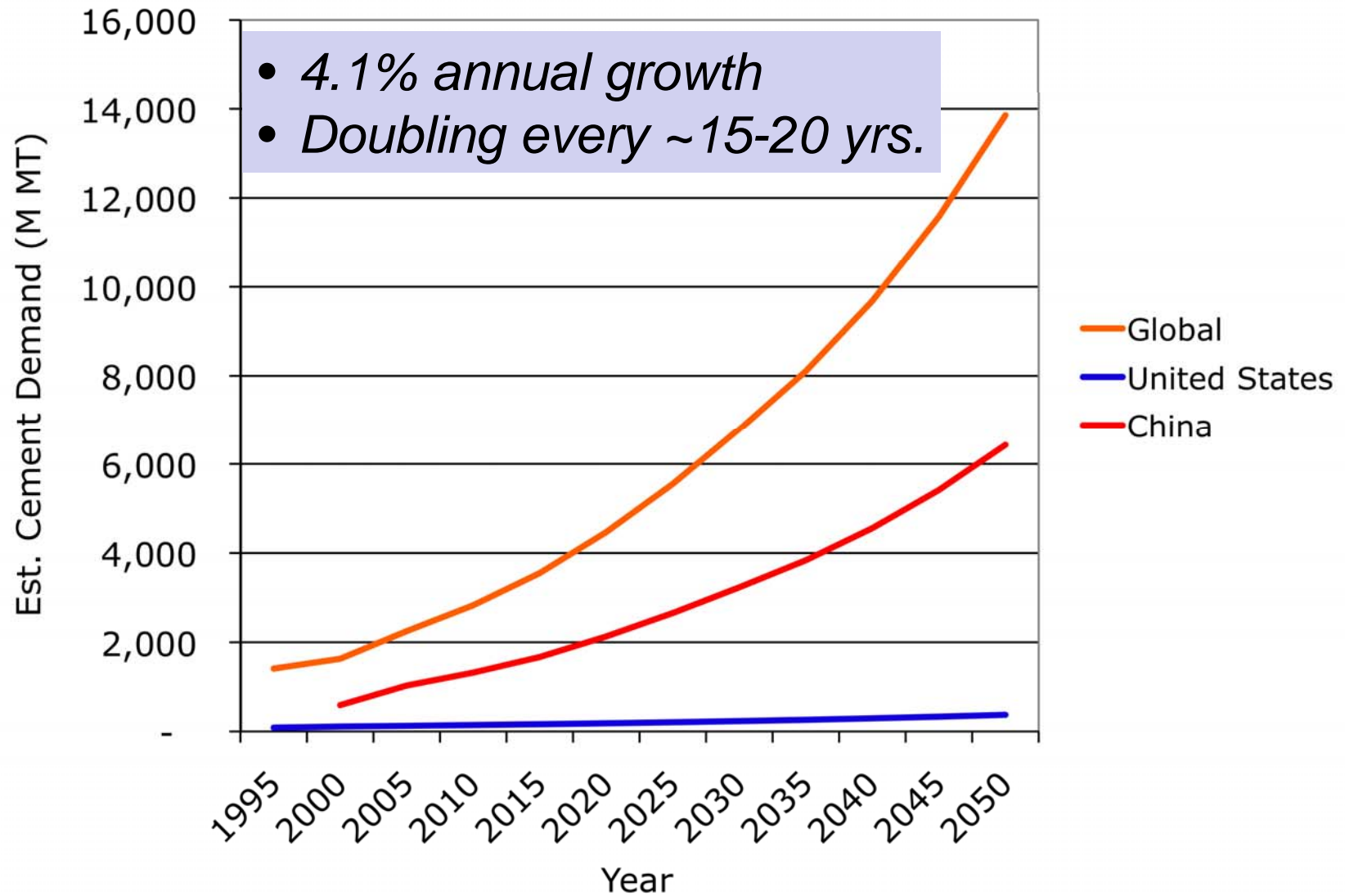




Thank You

Thomas M. Pounds
CalStar Products
www.calstarproducts.com

Global Context - 1



Global Context - 2

McKinsey&Company

“Pathways to a Low-Carbon Economy: Version 2 of the Global Greenhouse Gas Abatement Cost Curve”

Cement industry CO₂ abatement opportunity #1:

Increased substitution of clinker by mineral components in cement

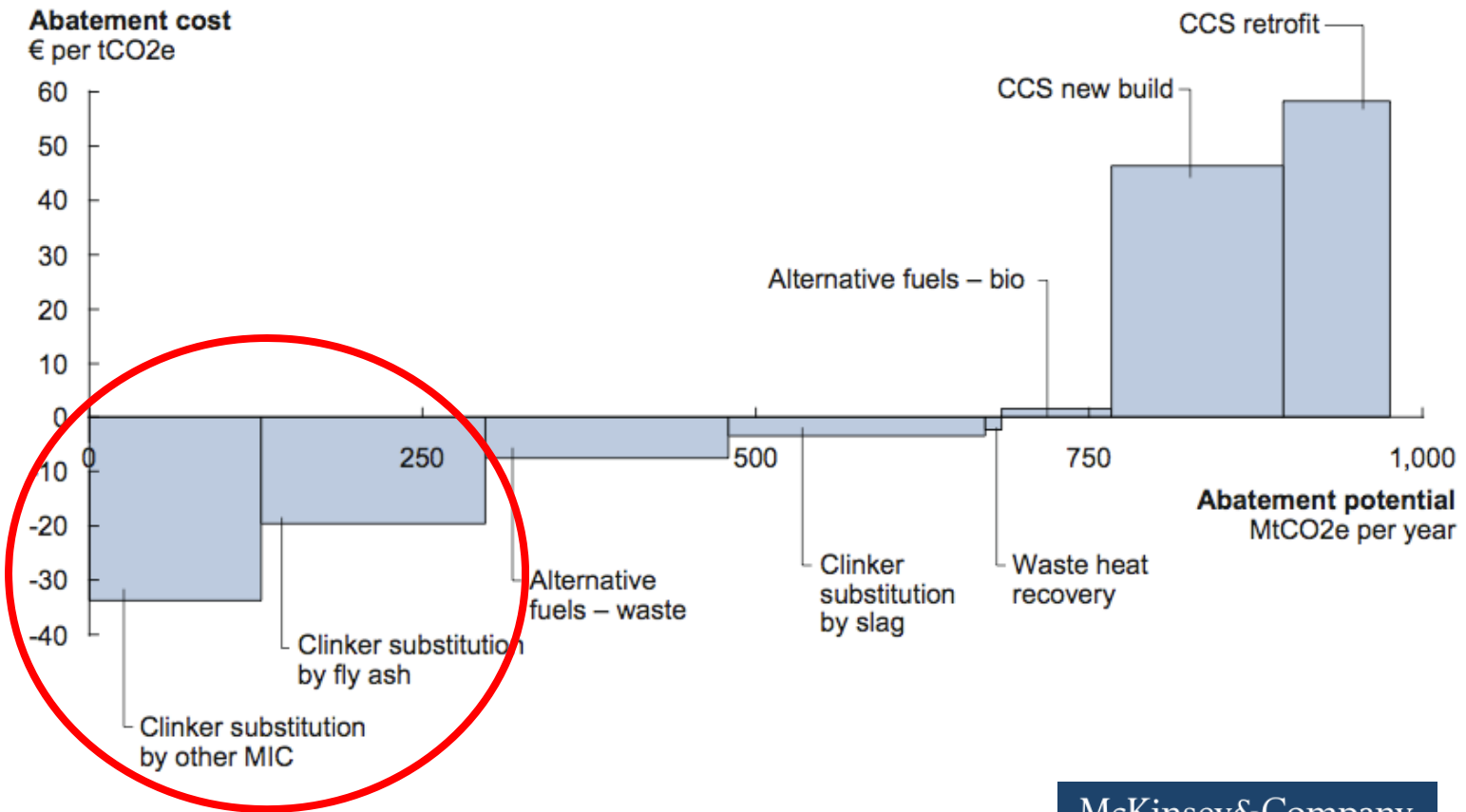
–50 percent of abatement potential

–490 MtCO₂e per year

Global Context - 3

Global GHG abatement cost curve for the Cement sector

Societal perspective; 2030



McKinsey & Company