

# Lime Industry Snapshot, 2011

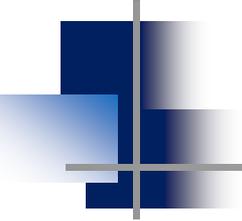
Energy, Emissions, Intensity, LKD,  
Benchmarks

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NLA Sustainability Committee

April 20, 2021

Via Zoom

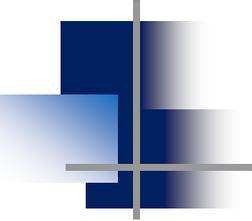


# 2010 U.S GHG Protocol Responses 48 Plants, 16 Companies

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	<u>MM Short Tons</u>
Quicklime	18.7 (+21.8%)
Byproducts Recycled	1.2 (30.3%)

Percentage based on comparison to 2009

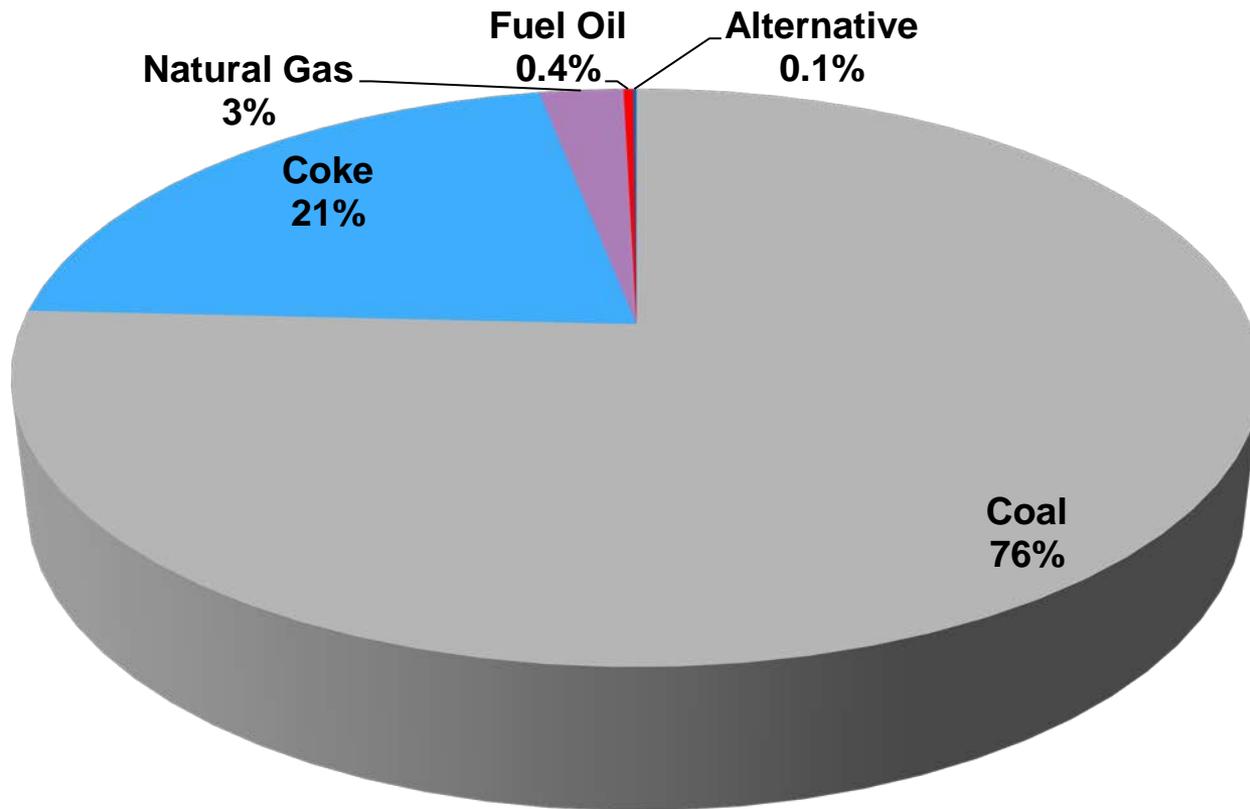


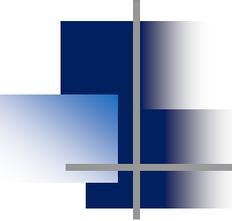
# Industry-wide Coal Use 2010

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	Coal Consumed (Metric Tons)	Lbs CO <sub>2</sub> per MMBtu
Anthracite	307,300	205
Bituminous	2,244,000	213
Sub-Bituminous	79,300	218

# 2010 Industry Fuel Use



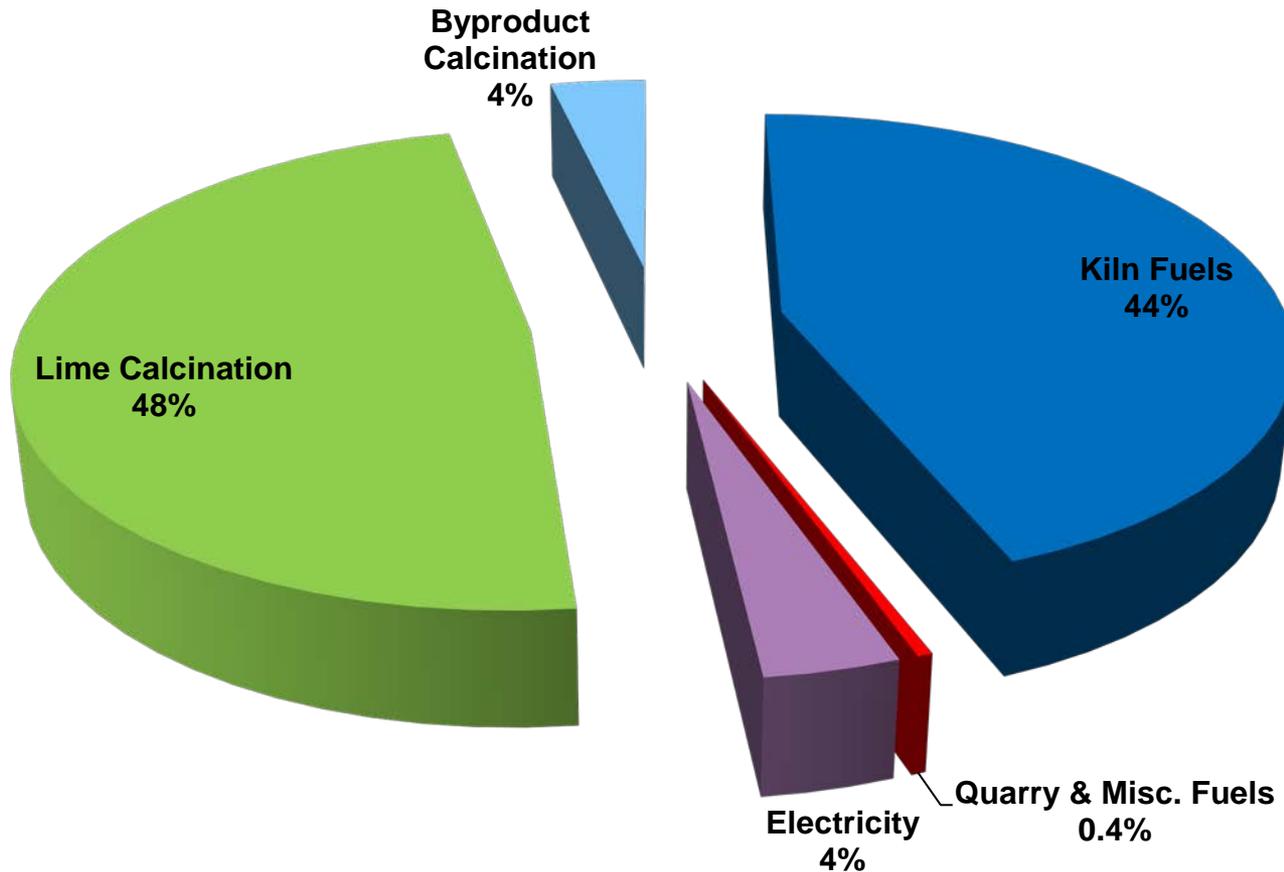


# Alternative Fuels

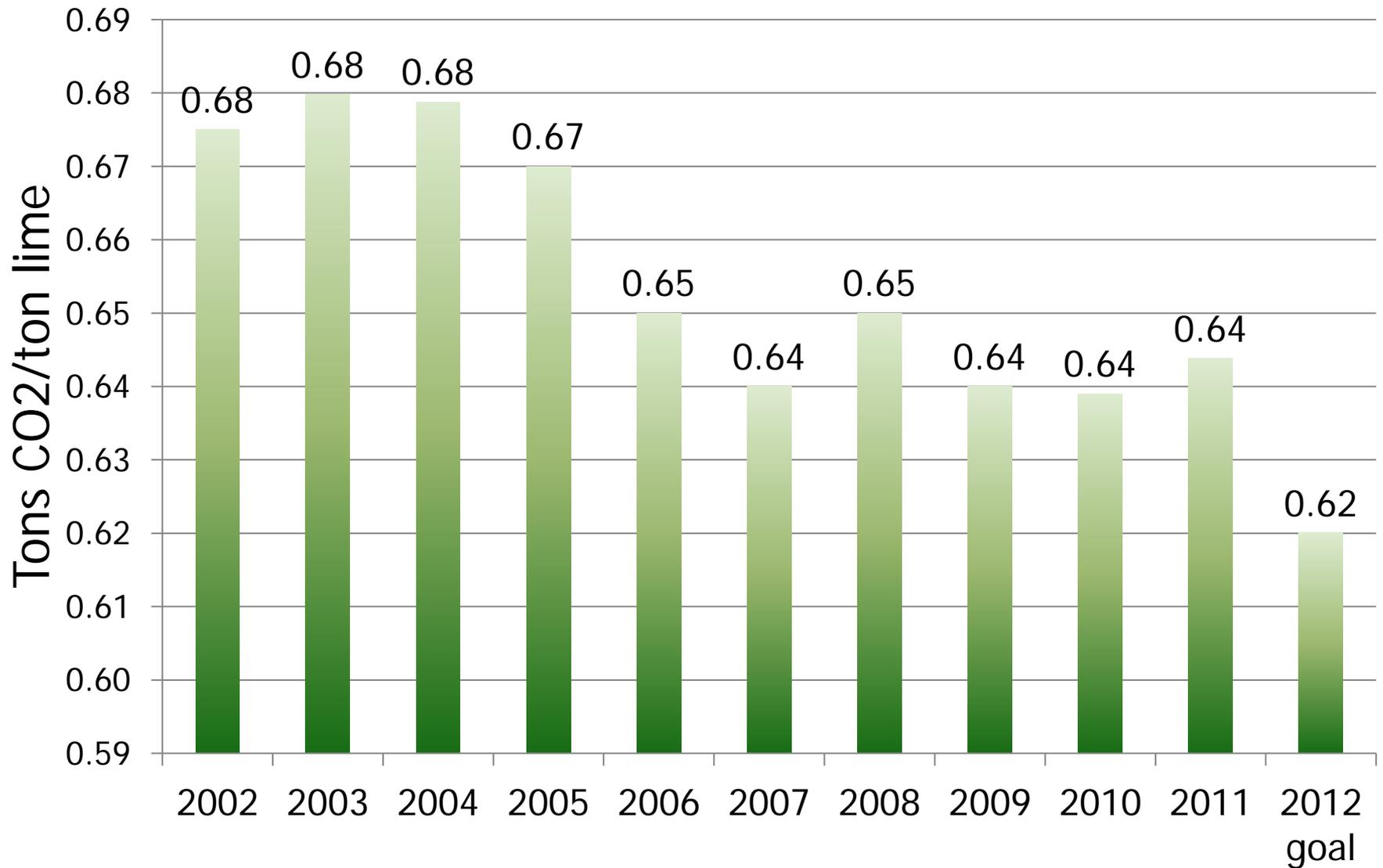
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- In 2009, 5 companies reported using alternative fuels
  - Alternative fuels included
    - Glycerin
    - Sawdust
    - Recycled motor oil
    - Landfill gas
    - Wood & plastic
- In 2010, just two companies reported using alternative fuel

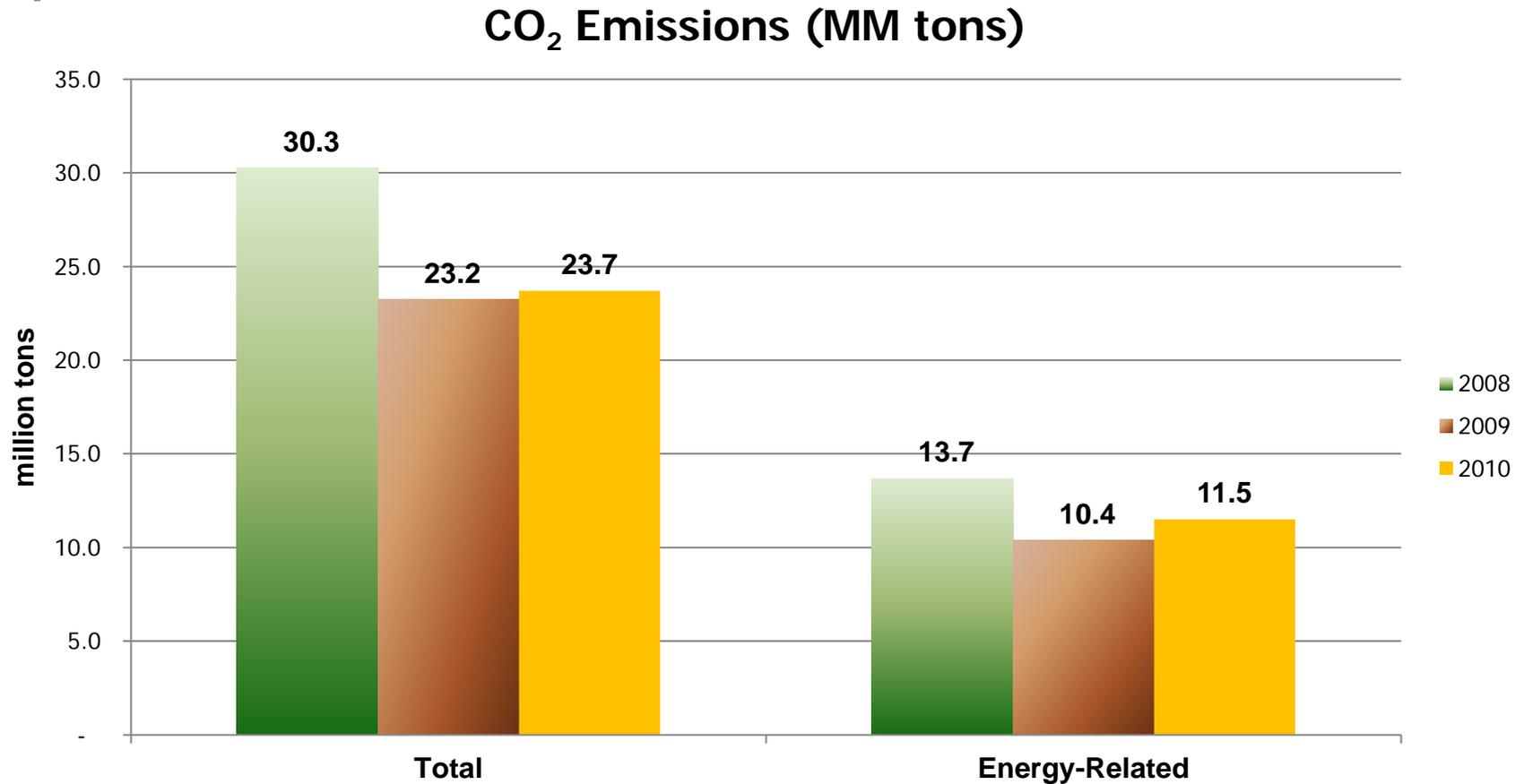
# 2010 CO<sub>2</sub> Emissions 23.7 MM tons



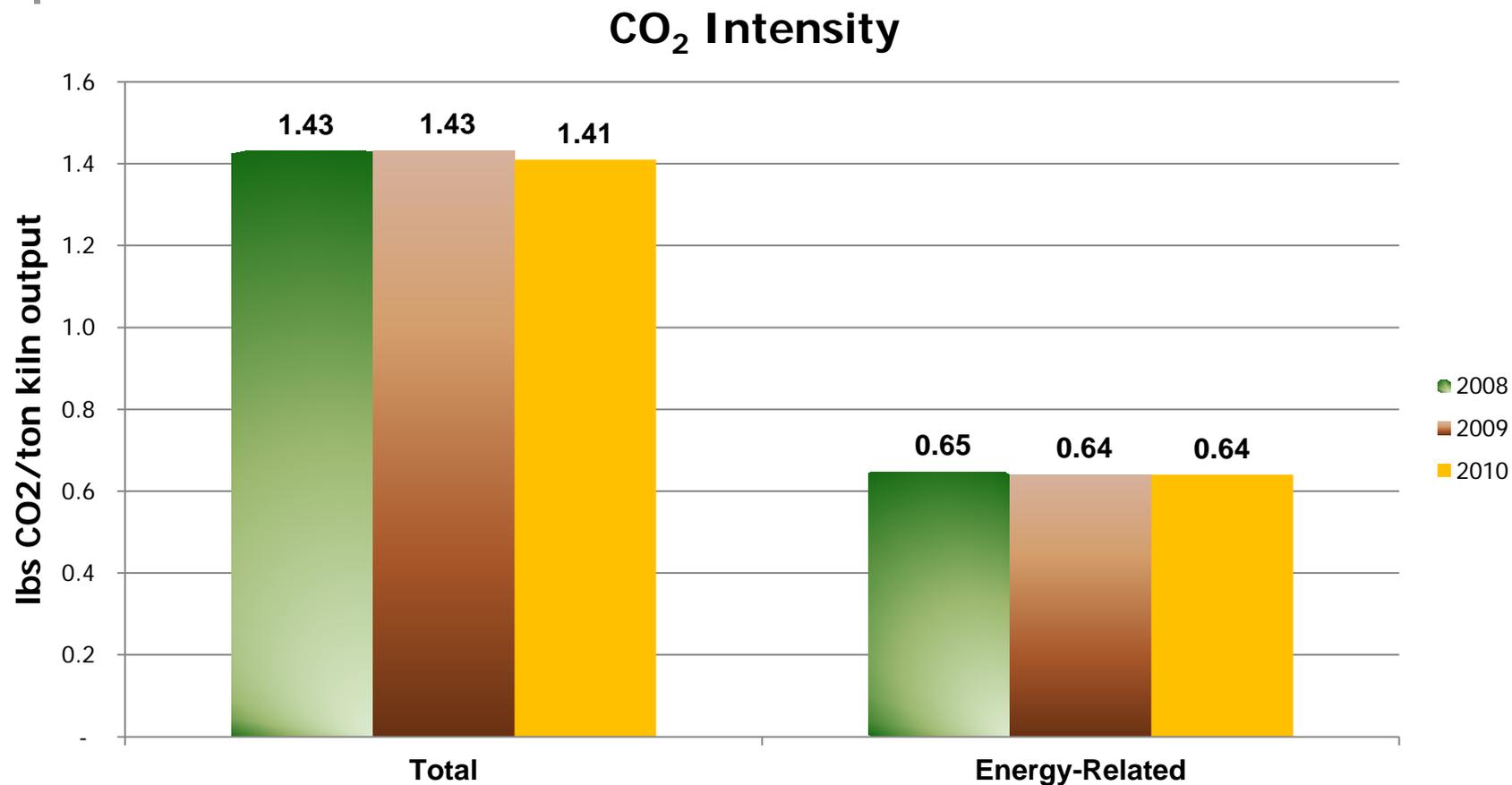
# CO<sub>2</sub> Energy-Related Intensity (2002-2011)

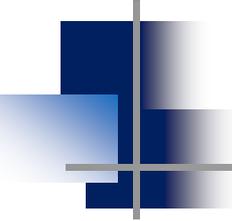


# U.S. Lime Industry CO<sub>2</sub> Emissions (2008-2010)



# U.S. Lime Industry CO<sub>2</sub> Intensity 2009-2010

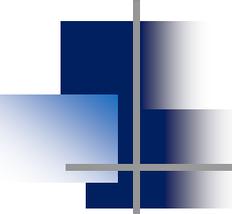




# LKD Recycling

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- Significant increase in quantity sold (increased 278,000 tons since 2009)
- Overall recycling rate increased from 46.0 % in 2009 to 48.5 % in 2010
- 2010 Quantity Recycled = 1.2 MM tons

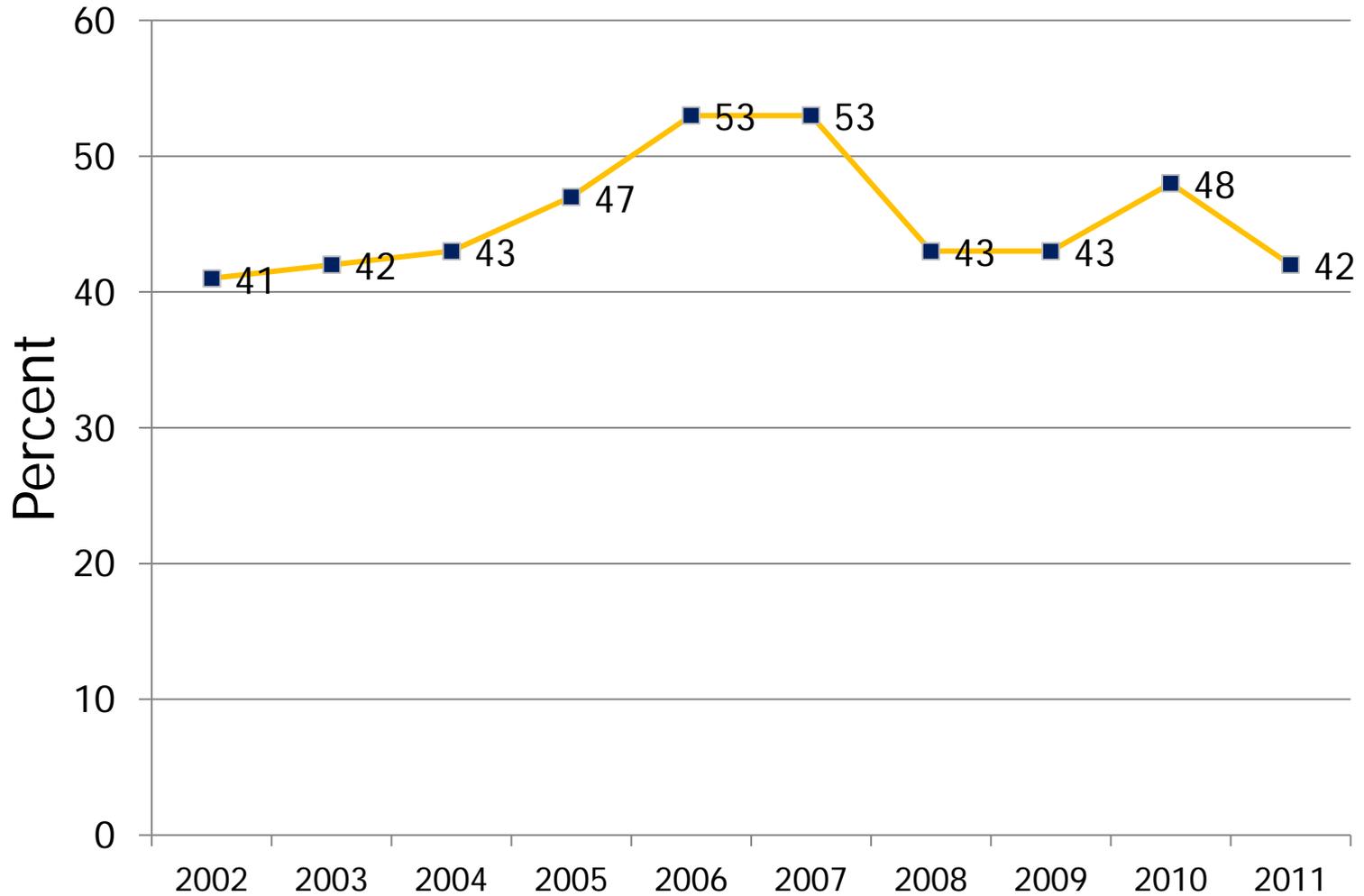


# How do your operations compare to the industry average?

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- Carbon Intensity lime 0.64 tons C/ton
- Energy Intensity lime 6.5 MM BTU/ton
- LKD recycling rate 48.5 %
  - Dolo 37.0 %
  - Hi Cal 53.0 %
- Pet coke use 21 % of BTUs

# LKD Recycling (2002-2011)

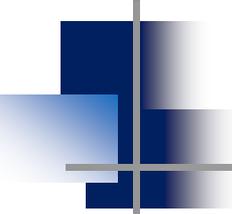


# 2011 Energy-Related Benchmarks: DOE vs EPA

	Lime & LKD	Lime Only
DOE (includes electricity)	0.64	0.68
EPA	0.60	0.64

# 2011 Total GHG Benchmark using EPA Approach

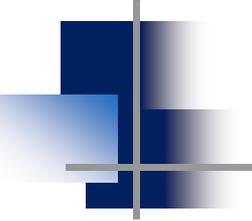
	All Lime	Hi Cal	Dolo
Lime Only	1.38	1.29	1.34
Lime + LKD	1.30	1.22	1.27



# Source of Calcination Discrepancy Errors Not Discernible

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- NLA Protocol provides data on
  - Type of quicklime and LKD produced
  - Oxide content of lime and LKD
  - Tons of lime and LKD produced
  - Scrubber sludge & Off-spec lime
- By contrast, e-GGRT summary only contains
  - Lime production capacity
  - Beginning of year, and end of year inventory



# NLA Protocol

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- NLA Protocol served as useful QC tool to check and validate e-GGRT responses
- Although DOE Climate Vision ends in 2012, e-GGRT does not
- Resurrecting NLA Protocol may be advisable if/when EPA begins rulemaking to develop product-specific emission factors



# EU Climate Policies

## EU Emission Trading System (EU ETS) - initial learnings

- ❑ No difference between process and combustion CO2
  - ❑ But with a well designed benchmark, process is covered by free allowances
- ❑ Adaptation to output levels is essential
  - ❑ Avoid complicated systems of adjustments (but be prepared!)
  - ❑ Ensure a better level playing field amongst producers and with new entrants
- ❑ **The benchmark methodology is based on products, not on technologies**
  - ❑ The definition of the different products is key (in EU: lime/dolime/sintered dolime/ULCD)
  - ❑ No difference for RK and VK, while for example BOF and EAF have different benchmarks
- ❑ Biomass, despite lack of availability, defines the benchmark for post 2020!
- ❑ The system can create distortion between sectors competing in the domestic market
- ❑ The system must open the door for exemptions in cases where CO2 is captured and not emitted (CCS and CCU)
- ❑ **Strong database is essential prior to open discussion**