



# An Overview of the Lime Industry

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DOE Cement & Lime Decarb Workshop  
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# Overview of NLA

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- NLA represents 99% of commercial lime production
- Membership consists of 12 lime-producing companies, as well as associates and affiliates
- Most are privately held
- Several are small businesses



# Carbon Neutral by 2050

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- Yesterday July 18<sup>th</sup> the NLA Board of Directors approved our Sustainability Pledge – carbon neutral by 2050
- Similar to the existing cement pledge



# What Is Lime?

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- High purity limestone (Calcium Carbonate) is heated in a kiln
- This “calcining” process results in calcium oxide, or quicklime
- “Dolomitic” quicklime also contains magnesium
- Hydrated lime is quicklime + water



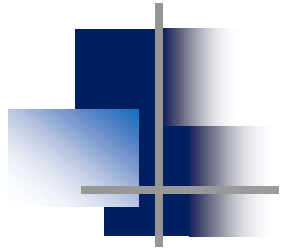
# Importance of Lime

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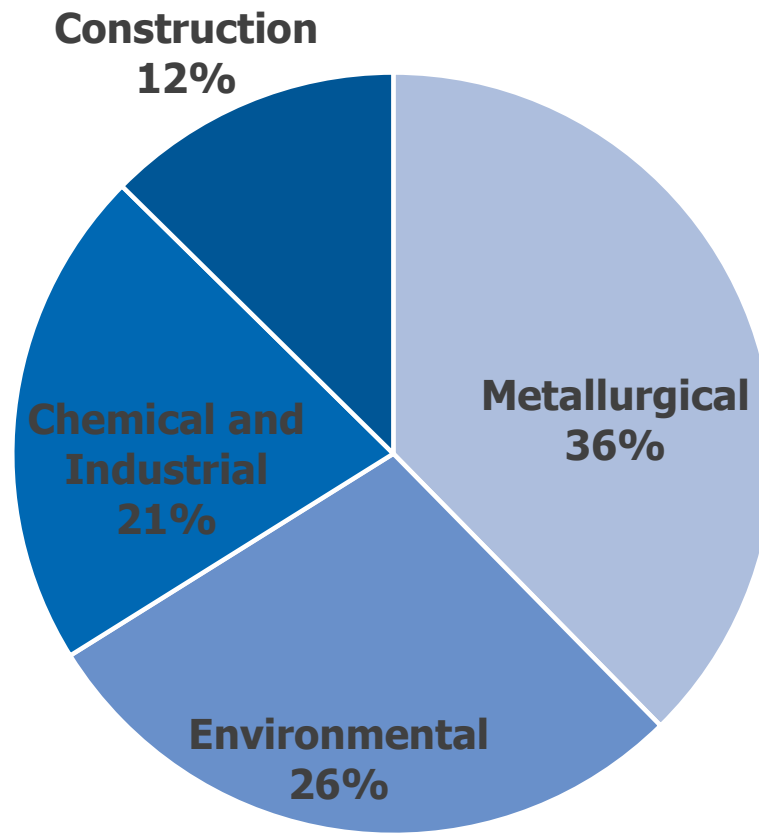
- Critical infrastructure
- Environmental: drinking water & wastewater treatment, flue gas desulfurization, treatment of mine drainage, neutralization
- Steel, construction, manufacturing

# Uses of Lime

(Source: USGS, 2019)



- ✓ Steel Making
- ✓ Power Generation – Flue Gas Desulfurization
- ✓ Drinking Water Treatment
- ✓ Wastewater Treatment
- ✓ Road Construction
- ✓ Land Development
- ✓ Masonry and Mortars
- ✓ Non-Ferrous Mining



- ✓ Coal Mining – Acid Mine Drainage
- ✓ Neutralization
- ✓ Roofing Shingles
- ✓ Paper Production
- ✓ Glass Manufacturing
- ✓ Carpet Manufacturing
- ✓ Chemical Processes
- ✓ Animal Feed
- ✓ Agriculture and Farming



# NLA Member Kilns in Operation (2021)

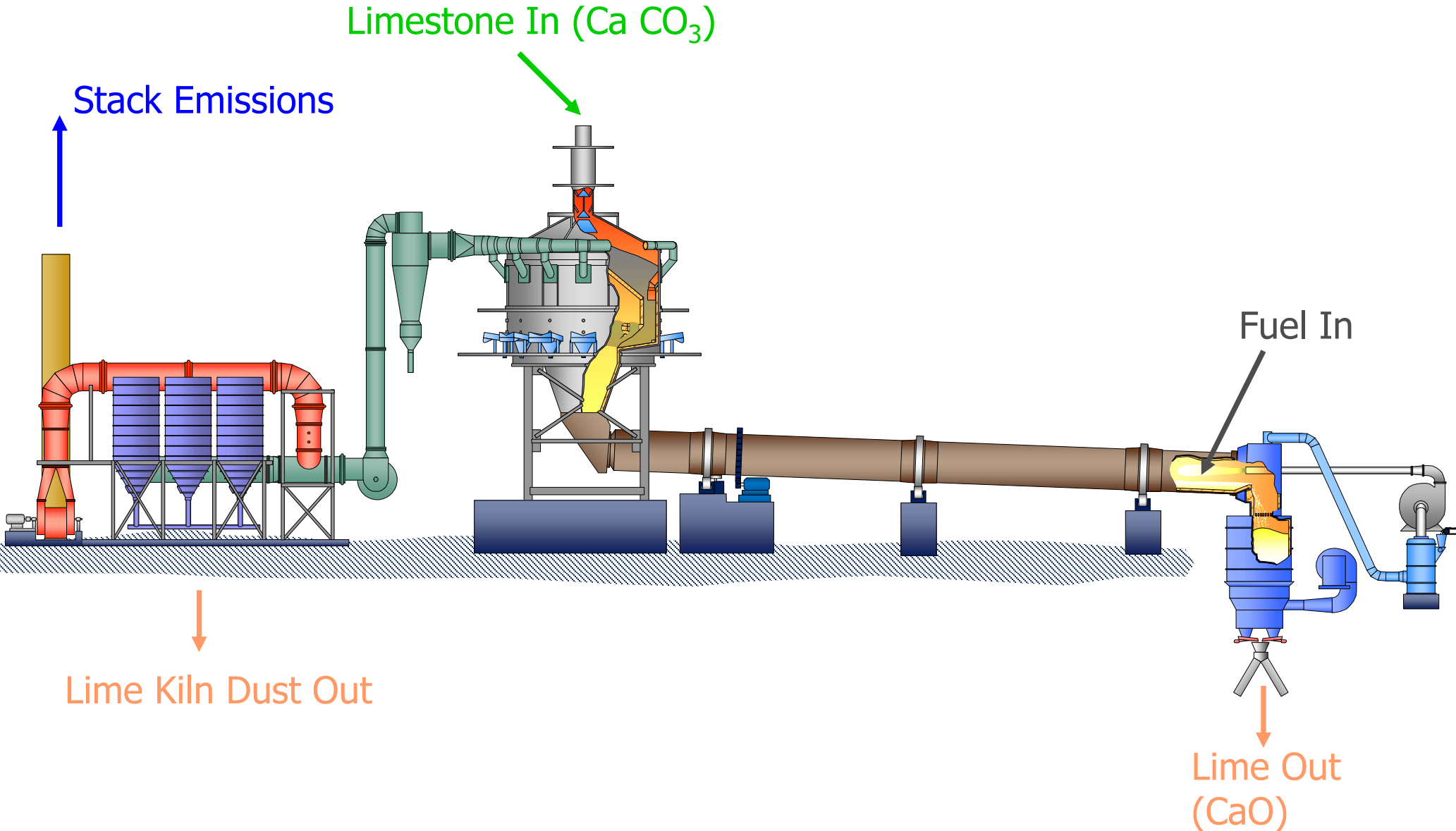
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Preheater Rotary: 56

Straight Rotary: 47

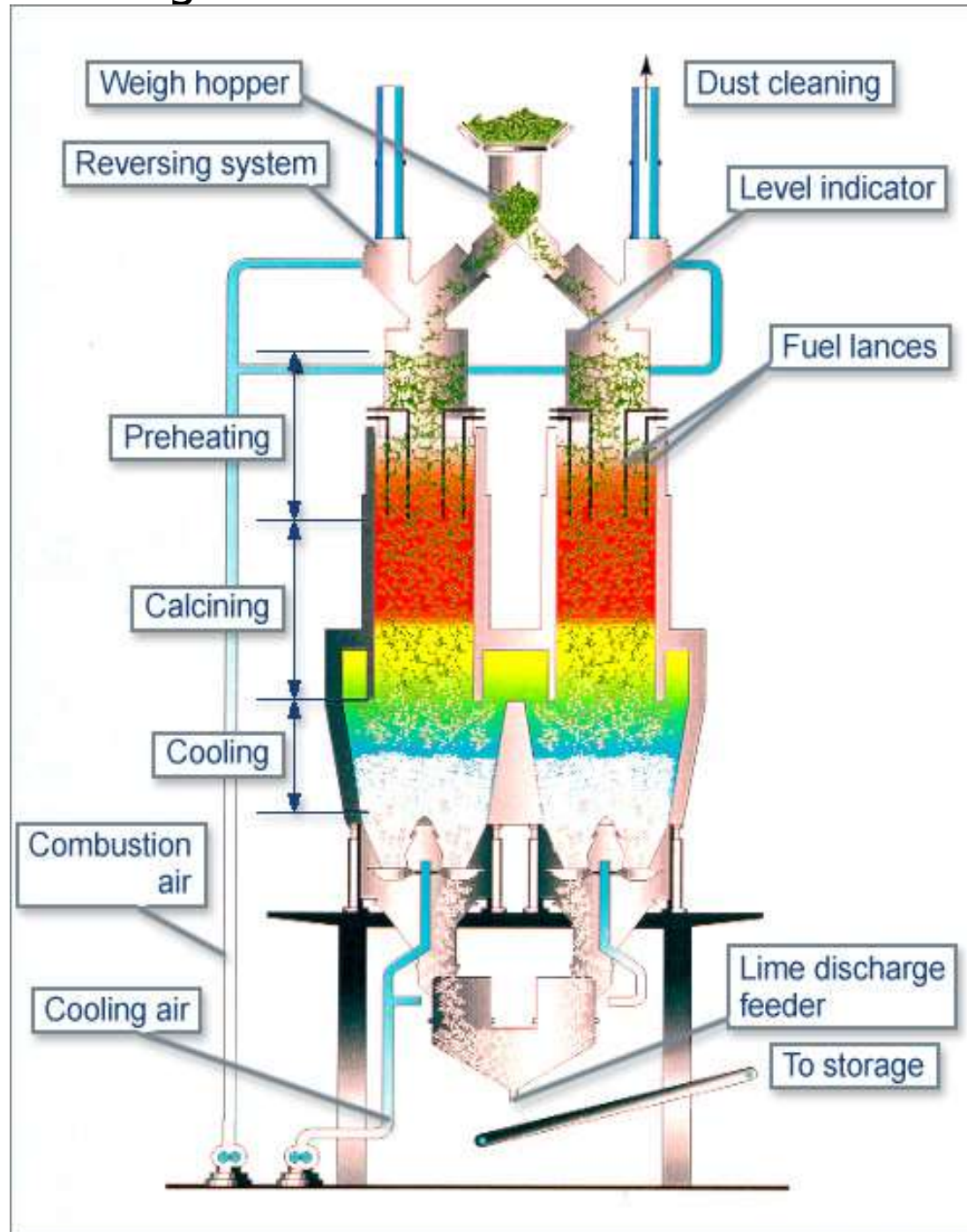
Vertical: 12

# Basic Lime Plant Configuration (Preheater Rotary Kiln)





# Diagram of Twin-Shaft Vertical Kiln



# Characteristics of Twin-Shaft Vertical Kilns



- Two, interconnected vertical shafts, fueled by natural gas for high efficiency

## Compared to Rotary Kilns

- Lower fuel consumption
- Lower maintenance costs
- Lower emission rates
- Higher quality lime



# Raw Materials

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- High purity limestone required
- Unlike cement, deposits with sand, iron ore, and clay content are not suitable for lime manufacturing
- Geology dictates quarry and plant locations



# Kiln Fuel

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- Most widely used fuels are coal and coke; natural gas is also used
- Hazardous waste fuel is not used in lime kilns
- Kilns use gas, No.2 fuel oil or diesel for startup
- Alternative fuels are infrequently used due to technical, economic and supply limitations
- Plant location is driven by suitable limestone reserve geography which limits fuel options



## Lime Industry Fuel Use as a % of MMBTUs (2021)

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■ Coal:	61
■ Coke:	19
■ Natural Gas:	18
■ Alternative Fuel:	0.6
■ Fuel Oil:	1.1



# Air Pollution Control Devices

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- Fabric Filter Baghouses
- Scrubbers
- Electrostatic Precipitators (ESPs)



# Who Makes Lime?

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- Subject to 2004 Lime NESHAP
  - Commercial Lime Producers: approximately 15.1 million metric tons annually
  - Steel (captive)
- Not Subject to 2004 Lime NESHAP
  - Sugar (captive)
  - Pulp and Paper (captive)

# COMMERCIAL LIME PLANTS IN THE U.S. & CANADA

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