



SUSTAINABLE SOLUTIONS FOR USED TIRES

Scrap Tire Recycling Conference
December 5, 2019

LafargeHolcim - U.S. at a Glance

U.S. Headquarters: Chicago, IL



+7,000 across 43 states

employees



13 cement plants

103 cement/fly ash terminals

2 slag facilities

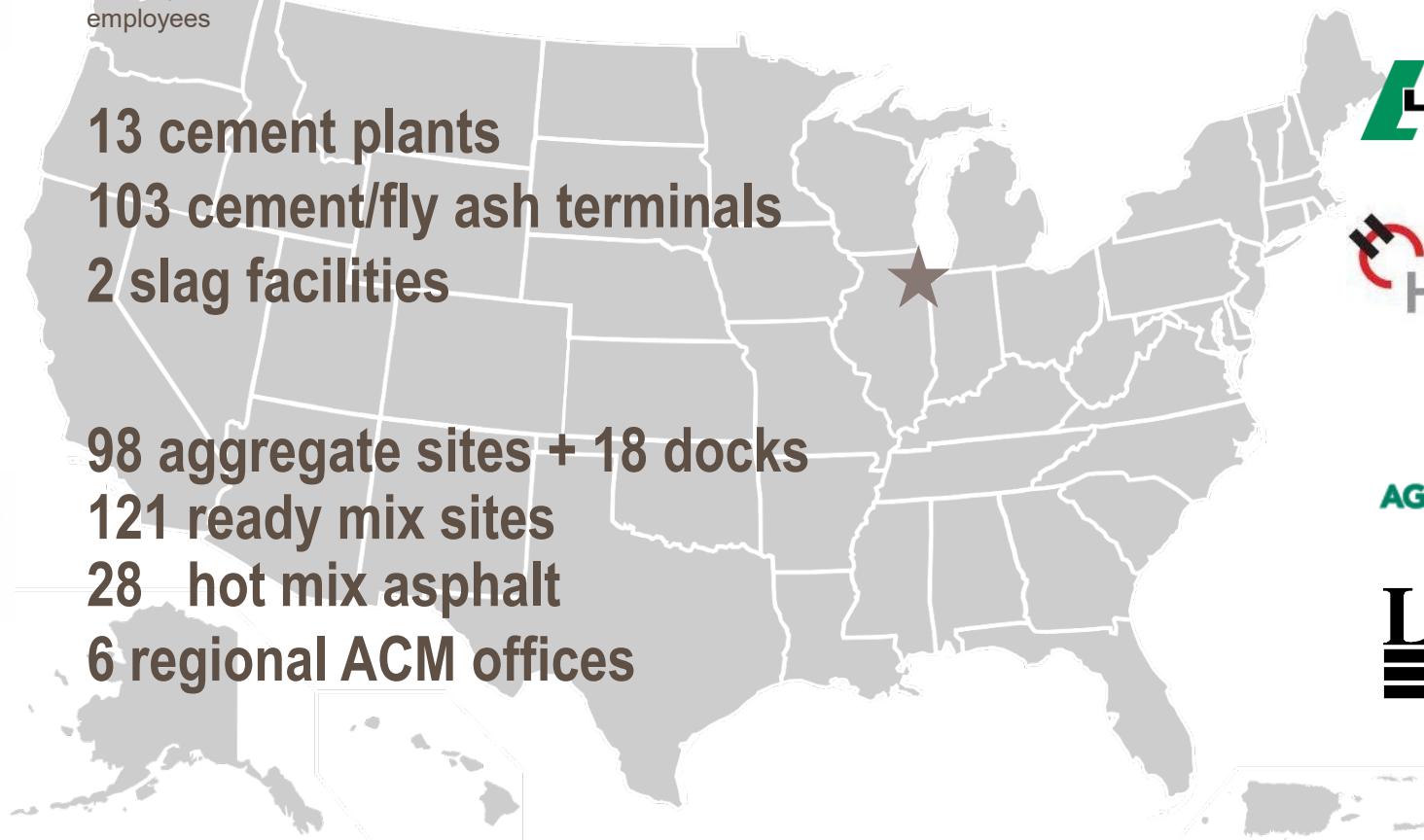


98 aggregate sites + **18** docks

121 ready mix sites

28 hot mix asphalt

6 regional ACM offices

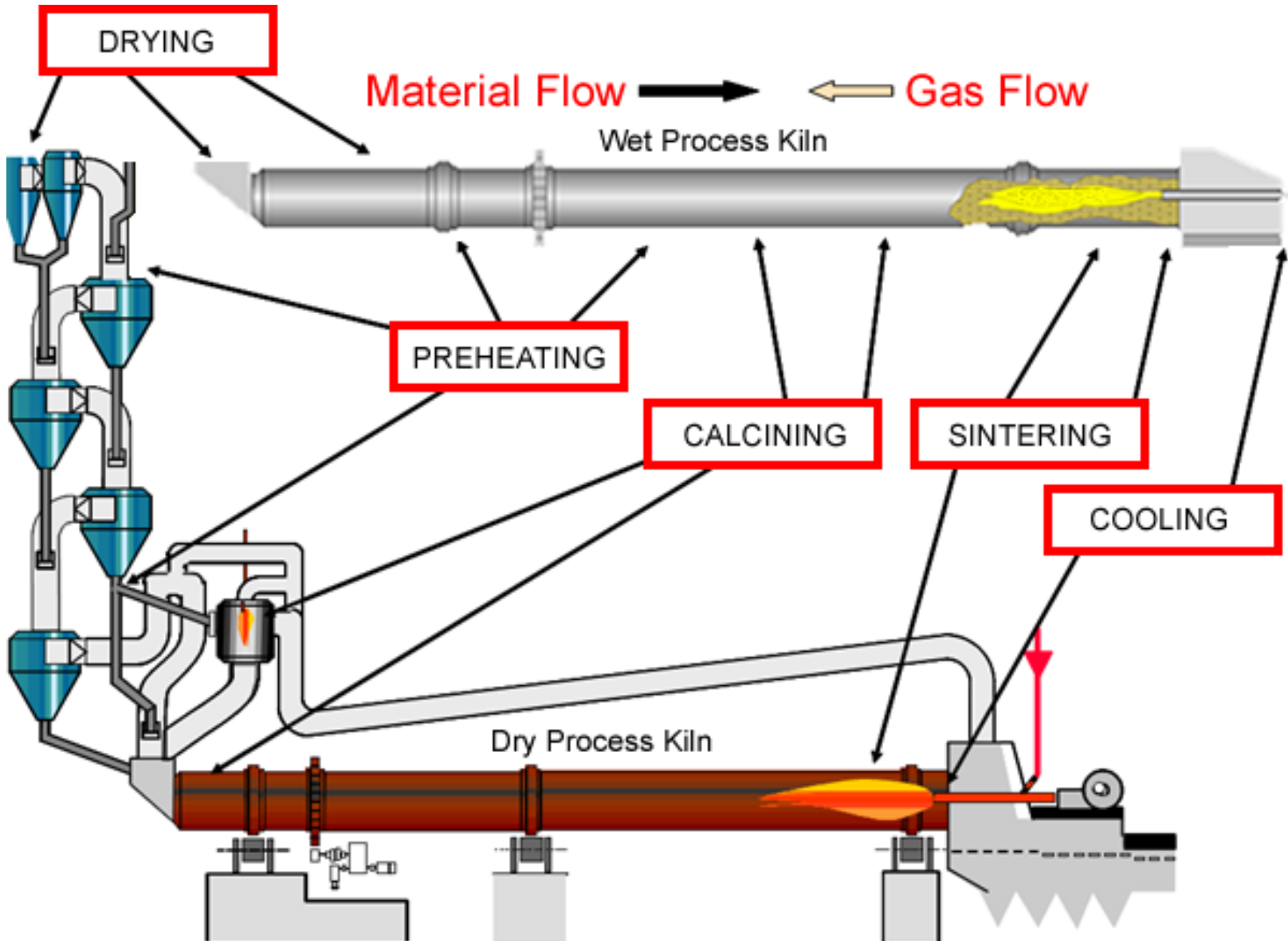


Cement or Concrete?

- Cement is the fine, gray powder that, when mixed with water, sand, and gravel or crushed stone (fine and coarse aggregate), forms the rock-like mass known as concrete.
- When concrete is mixed in the right proportions, water triggers a chemical reaction in cement called hydration, which causes the cement to harden and bind the aggregate into a solid mass.
- The process of hydration is the key to concrete's strength and versatility.



The Cement Making Process

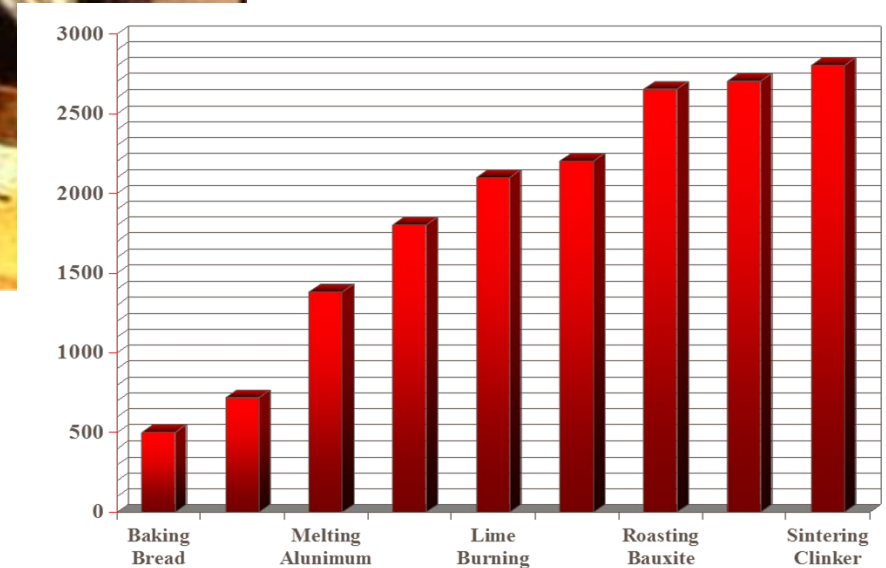


The Cement Kiln

The largest Moving Equipment in any Manufacturing Operating



And also the hottest!



Our contribution: The 2030 Plan - *Building for tomorrow*

- **The 2030 Plan focuses on how we can improve the sustainability of our operations and industry** and come up with innovative, sustainable solutions to make the world build better. The 2030 Plan is our roadmap to get there.
- **We will focus our efforts on 4 areas** where we can make the biggest contribution (supportive of 14 of the 17 UN Sustainable Development Goals).



Waste recovery and recycling for sustainable construction

- **Geocycle works with regulatory bodies, governments, communities and other groups** to increase awareness about and to solve waste issues.
- **Once captured and processed, the waste is mostly used by the Group's cement plants as alternative fuel and raw material.**
- **Today, LafargeHolcim substitutes 15% of fossil fuels by alternative fuels globally. Our commitment is to double this percentage by 2030.**



Co-processing

- The cement production process offers the possibility of a simultaneous energy recovery and material recycling.
- It completely destroys waste materials – even hazardous types – through high temperatures, oxygen excess and long residence time.

The benefits of tire-derived fuel

- Produces **equivalent energy** as other fuels
- Leaves **no leftover residue** to be landfilled
- Can **reduce emissions** from CO₂, sulfur and nitrogen
- **Completely destroys scrap tires**
- Incorporates minerals into the new product, **keeping them out of the air**
- Is a **proven, widely recognized technology** regulated by many states

The process of TDF: co-processing

From scrap tires to fuel



After tires are delivered to a plant, they are used for fuel whole or first shredded into scraps.



Tires are fed into a kiln with high heat that breaks down long-chain hydrocarbons, reducing the tires to their basic elements.



Temperatures up to 2000°C ensure the tires quickly and completely combust and are incorporated into our product.

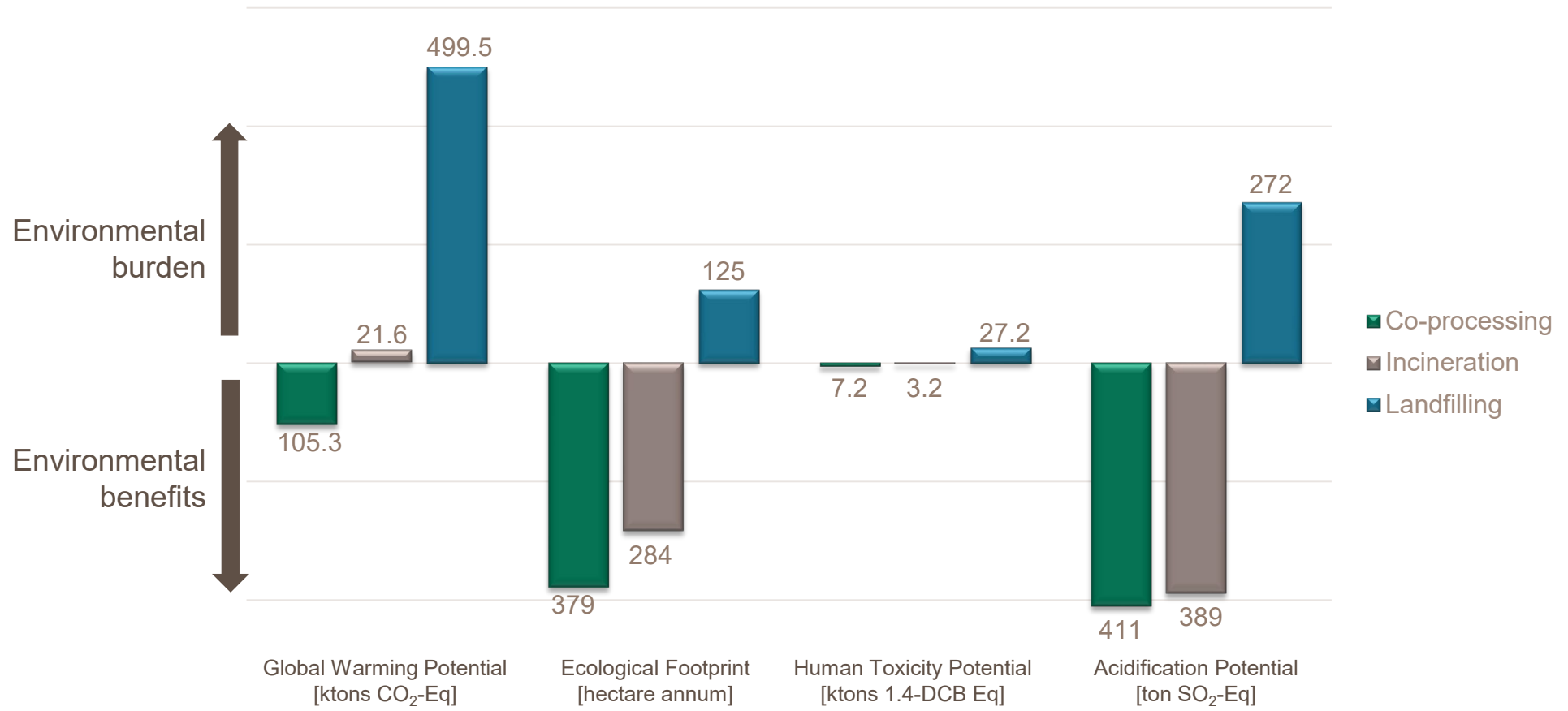


The recovered energy provides fuel to the kiln.

Advantages of co-processing

Co-processing vs. incineration vs. landfilling

Comparison of how much each process could benefit or burden the environment by reviewing their Global Warming Potential, Ecological Footprint, Human Toxicity Potential and Acidification Potential.



Safe and environmentally responsible

A growing consensus

Based on around **30 years of TDF use** in the United States and manufacturing industry, the EPA has recognized that this fuel is a viable alternative energy source.



According to the US Tire Manufacturers Association (USTMA), “Scrap tire management in the US demonstrates **an environmental success story**,” noting the benefits of TDF.

The American Society for Testing and Materials (ASTM) developed TDF standards, **providing an industry-accepted strategy**, and stated that, “This recovery practice has moved from a pioneering concept in the early 1980s to a proven and continuous use in the United States.”



Challenges

- Access to markets
- Public perception
- Regulatory barriers
- Process limitations



Thinking sustainably at LafargeHolcim

LafargeHolcim offers industries and municipalities **responsible, zero-landfill solutions** to reduce their environmental footprint.

Global contribution

Safely recover energy from 1.9 million tons of hazardous waste each year.



Saves energy equal to heating **180,000 households**



Preventing GHG emissions equal to that from **250,000 cars**

What's next?

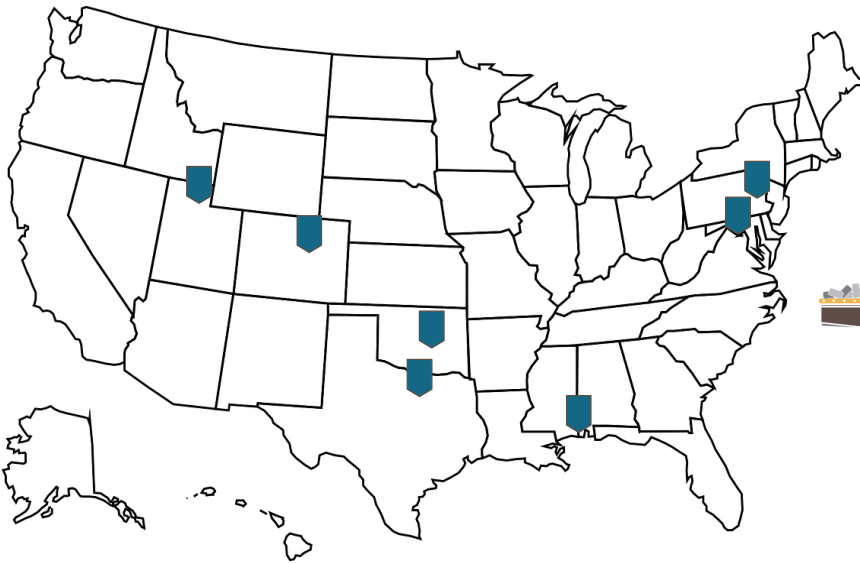
LafargeHolcim anticipates using alternative fuels to **replace 40-50% of fossil fuel** in cement kilns in the US in the next few years.

Reducing environmental footprint in the US

We work with municipalities, industries, agriculture and waste management companies, converting waste into fuel and raw material. For example, in the US, we work with major seed producers to co-process excess treated cottonseed, diverting seeds from landfills.

In 2017, we...

- reduced waste going to US landfills by **1.7 million tons**
- lowered cement plant emissions by more than **1 million tons of CO₂**
- co-processed various alternative fuels at **13 cement plants**.



Seven US plants use TDF for cement manufacturing. In 2018, through TDF, LafargeHolcim US...



saved **9 million tires** from landfills



reduced its **carbon dioxide footprint**



lowered **nitrogen oxide emissions**

Learn more @ tirederivedfuel.com

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Tire-Derived Fuel

Moving Closer to a Zero-Waste Future

A regenerative, circular economy is an integral part of the journey to a cleaner environment. That is why LafargeHolcim applies proven technologies to reduce emissions and work toward a zero-waste future. Globally, our ability to recycle materials has evolved over the years, and continued innovation allows us to sustainably recover energy, like using scrap tires as fuel.



[View Explainer Video](#)





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