

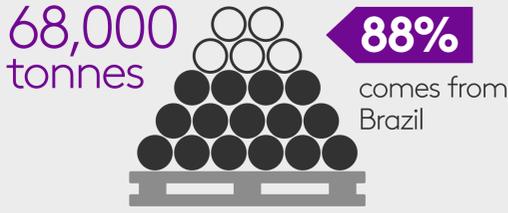
# Fortifying the Future with Niobium Alloy Optimization

Critical times call for structural materials that provide maximum performance and extended life at an affordable cost.

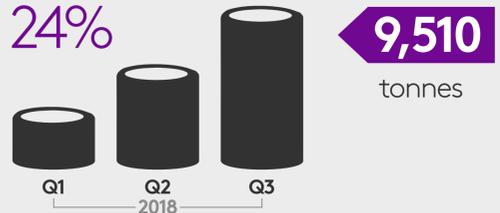
## Niobium Steps Up

Niobium, also known as Columbium, imparts strength, corrosion and abrasion resistance, along with improved energy absorption, fatigue properties and fracture toughness to structural steels.

World niobium production is



U.S. imports of FeNb grew



The market for niobium is expected to witness a compound annual growth rate of



## Building for Tomorrow

Structural beams, reinforcing bar and plate applications account for over

**500 million tonnes** of world steel production.

The most common applications of steel use in buildings and infrastructure are made up of

**44%** reinforcing bar.

China is the leading market for rebar followed by North America.



The global rebar market is expected to grow at a compound annual growth rate of

**6.9%**

and reach a valuation of

**\$223,78b**

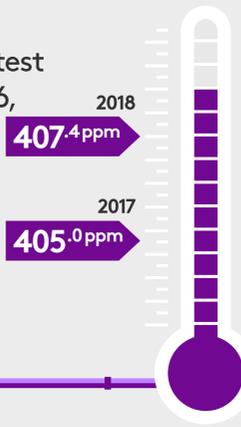


## Climate Change Keeps Accelerating

Levels of greenhouse gases rose to a new high in 2018.

2018 was the fourth hottest year globally behind 2016, 2015, and 2017.

Average global CO<sub>2</sub> concentration in parts per million.



Sea levels in 2018 were the highest ever measured. The global sea level is rising to an average rate of

**↑1.2 inches** per decade.

## While America's "D+" Infrastructure Continues to Unravel

The World Economic Forum ranked America's overall infrastructure 9th in the world and the quality of its roads 11th.

Real infrastructure spending nationally by U.S. federal, state and local governments declined

**↓\$9.9 billion** from 2007 to 2017.

Investment in infrastructure is only one-third of that in 1960 and without action, the U.S. will lose

**\$5.8 million jobs** by 2040.



The National Association of Manufacturers projects the total cost of to the U.S. to meet its' ten-year infrastructure needs at

**\$1.09 trillion**



## Alloy Optimization Is the Answer

Almost every greenhouse gas technology including the generation of thermal and renewable energy, electrification, mass transport and the hydrogen economy relies on steel as a basic building block.

Whether countering climate change or rebuilding crumbling infrastructure, the world not only needs but demands steels tough enough to withstand the seismic forces, fires, coastal flooding, 150-mph winds and rising levels of water acidity that accompany global warming.

Niobium-microalloyed rebar are the antidote.

