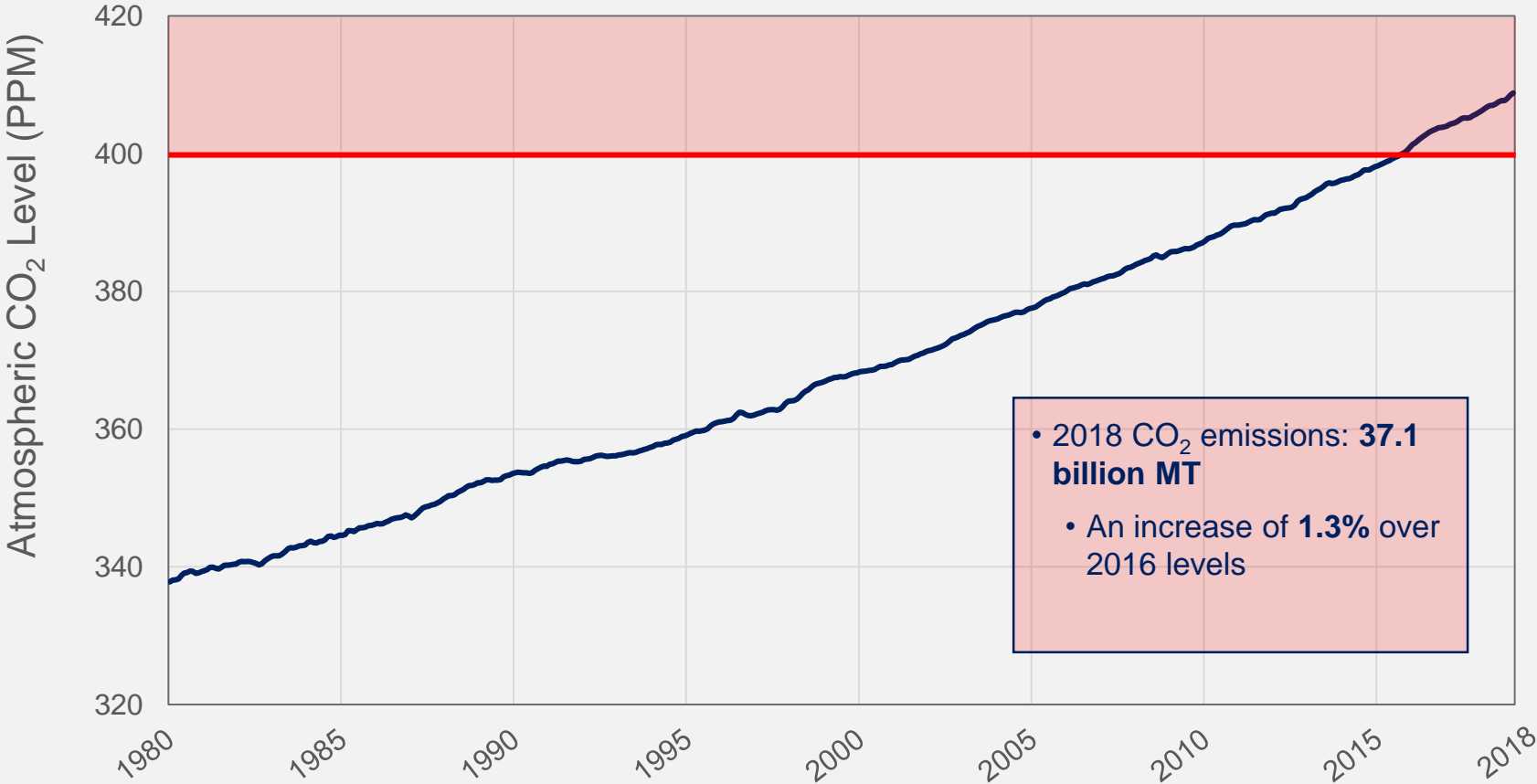
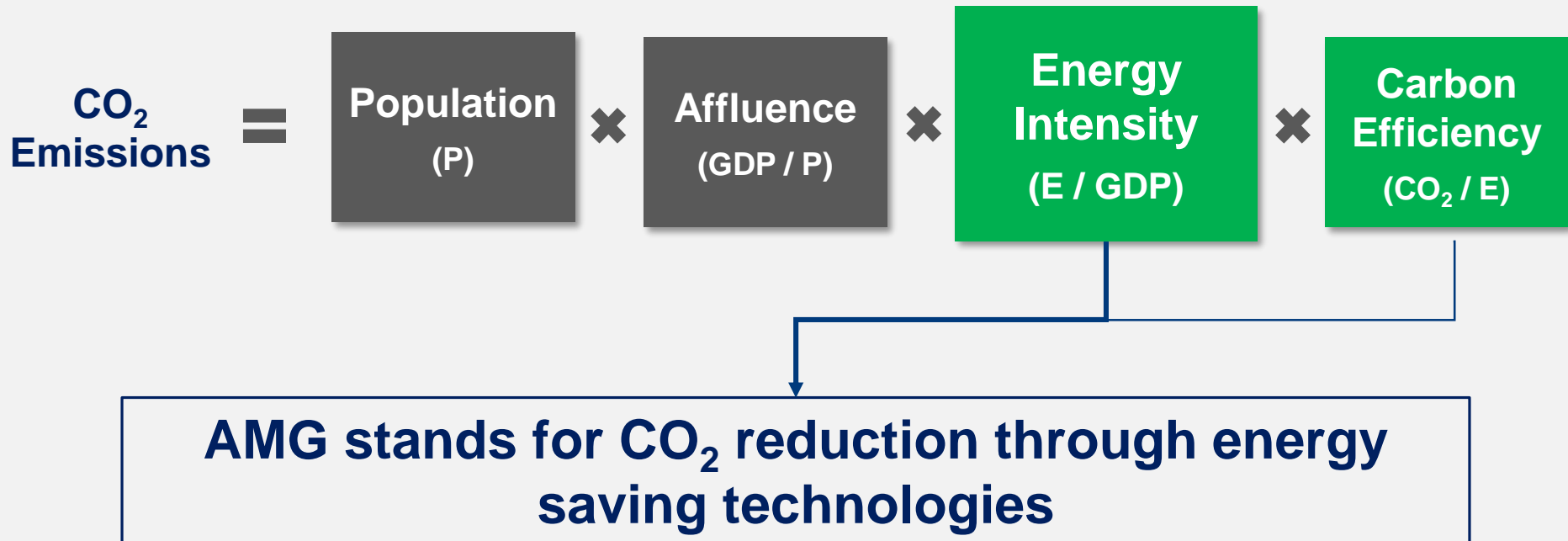


# ATMOSPHERIC CO<sub>2</sub> ACCUMULATION



# MATERIAL SCIENCE BASED SOLUTIONS



# THE AMG PORTFOLIO

AMG Critical Materials	CO <sub>2</sub> Relevance	
	Energy Savings	Energy Storage
Aluminum	Transportation	-
Graphite	Buildings	Anodes
Silicon	-	Anodes
Vanadium	Steel	Stationary Batteries
Antimony	-	Batteries
Mineração	-	Lithium
Superalloys	-	Fuel Cells
<b>AMG Technologies</b>		
Titanium Alloys	Aero Engines	V <sub>2</sub> O <sub>5</sub>
Engineering	Aero Engines	-

# AMG'S ROLE IN CO<sub>2</sub> REDUCTION

## Enabled CO<sub>2</sub> Reduction - 2018

Business Unit	Net CO <sub>2</sub> Reduction (tons) *	Technology / Product
Engineering	<b>43.5 million</b>	Thermal Barrier Coatings & Turbocharger Wheel Castings
Titanium Alloys & Coatings	<b>5.0 million</b>	Titanium Aluminides
Vanadium	<b>1.2 million</b>	Steel Alloying / Light weighting
Graphite	<b>1.0 million</b>	Graphite Insulation

**Total net CO<sub>2</sub> reduction (2018): 50.7 million tons**

\* Net of operating emissions

## THE CO<sub>2</sub> REDUCTION RATIO

Business Unit	Net CO <sub>2</sub> Reduction (tons)	Total Assets (\$M)	CO <sub>2</sub> Reduction Return *
Engineering	43.5 million	\$158	275.3 x
Titanium Alloys & Coatings	5.0 million	\$120	41.6 x
Vanadium	1.2 million	\$177	67.8 x
Graphite	1.0 million	\$94	10.6 x

\* Measured as ton of CO<sub>2</sub> reduction per \$1,000 invested