

USEA 16th Annual State of the Energy Industry Forum

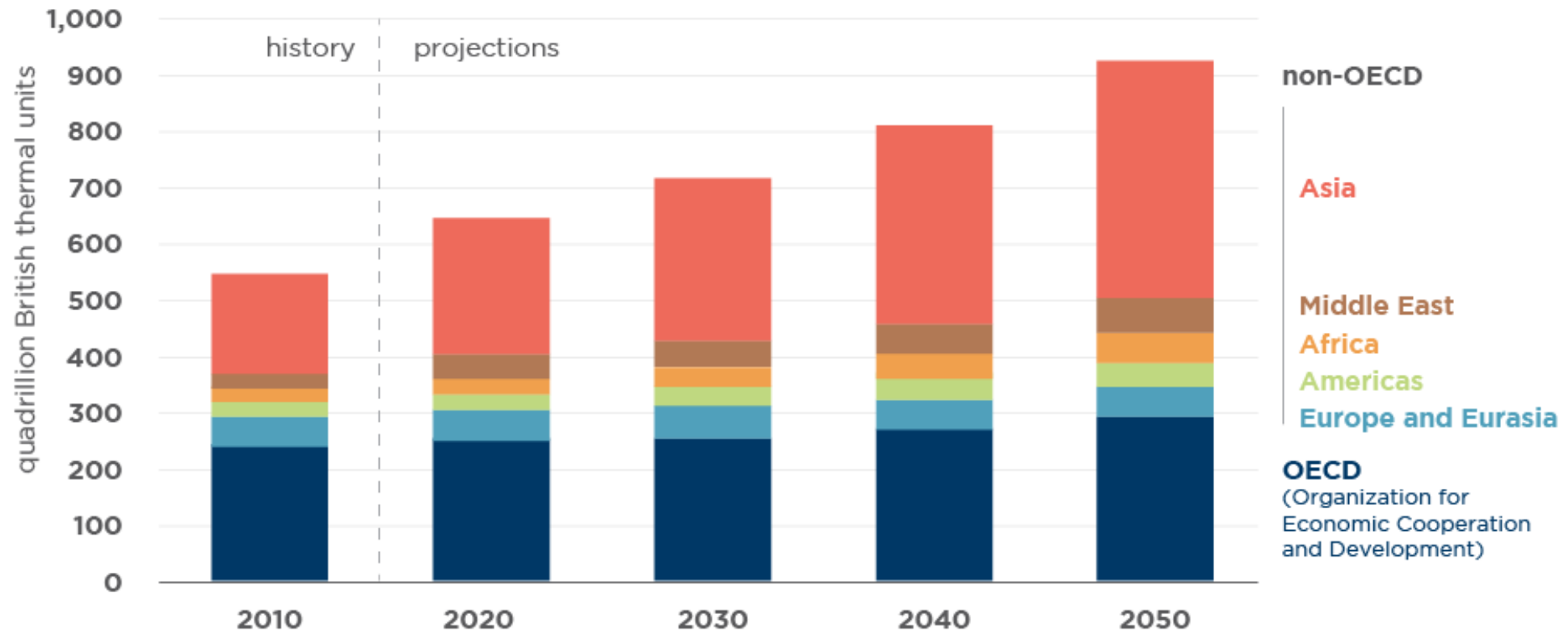
National Press Club
Washington, D.C.
January 23, 2020

Rich Nolan
President & CEO
National Mining Association



Global Energy Use to Increase 50% by 2050

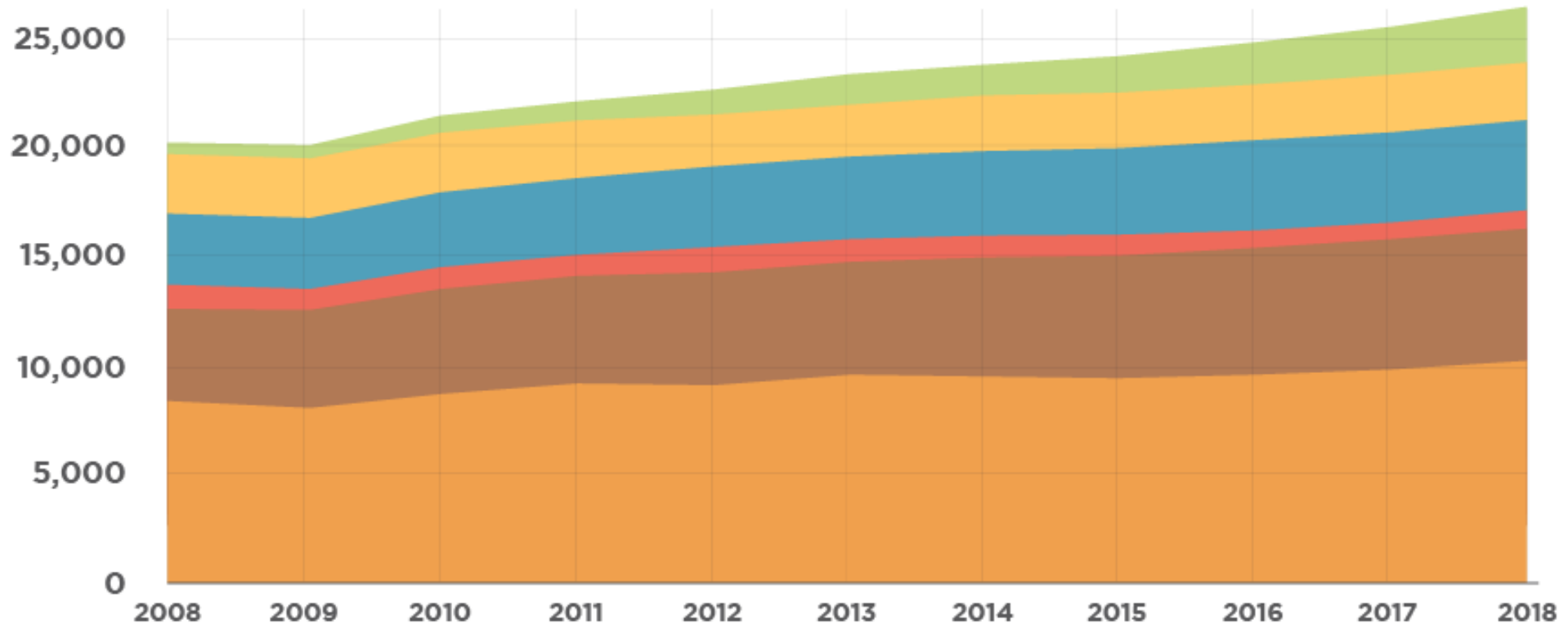
Global primary energy consumption by region (2010-2050)



Fossil Fuels Remain Dominant

Global electricity generation by fuel source (Terrawatt hours)

Coal Gas Oil Hydro Nuclear Renewables



U.S. Carbon Dioxide Emissions by Fuel

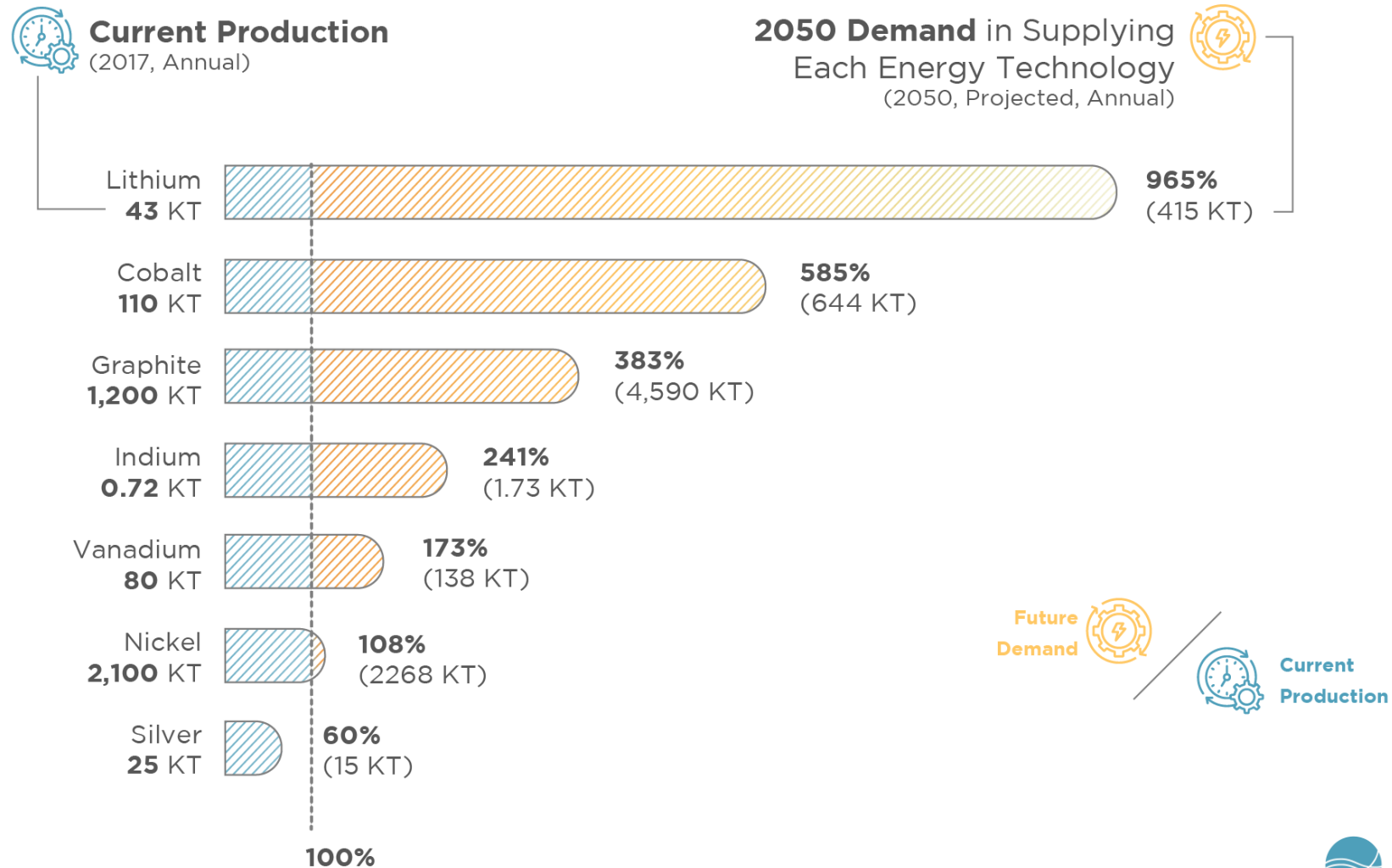
Million metric tons

	2017	2018	2019F	2020F
Petroleum and other liquid fuels	2,329	2,374	2,364	2,355
Natural gas	1,474	1,625	1,682	1,710
Coal	1,316	1,259	1,127	998
Total energy	5,130	5,269	5,180	5,074

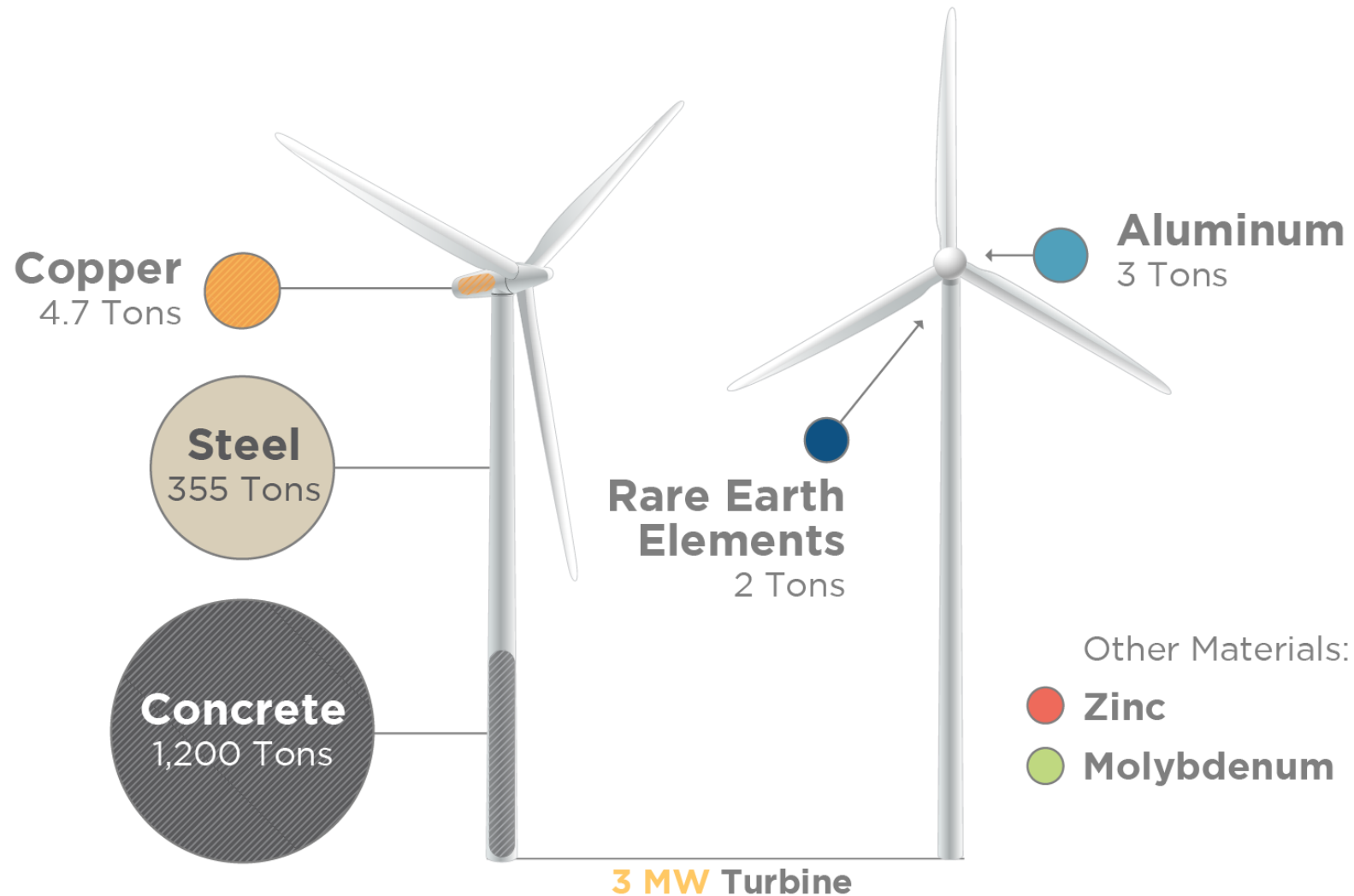
Source: Short-Term Energy Outlook Renewables and Carbon Dioxide Emissions

Note: F = Forecast

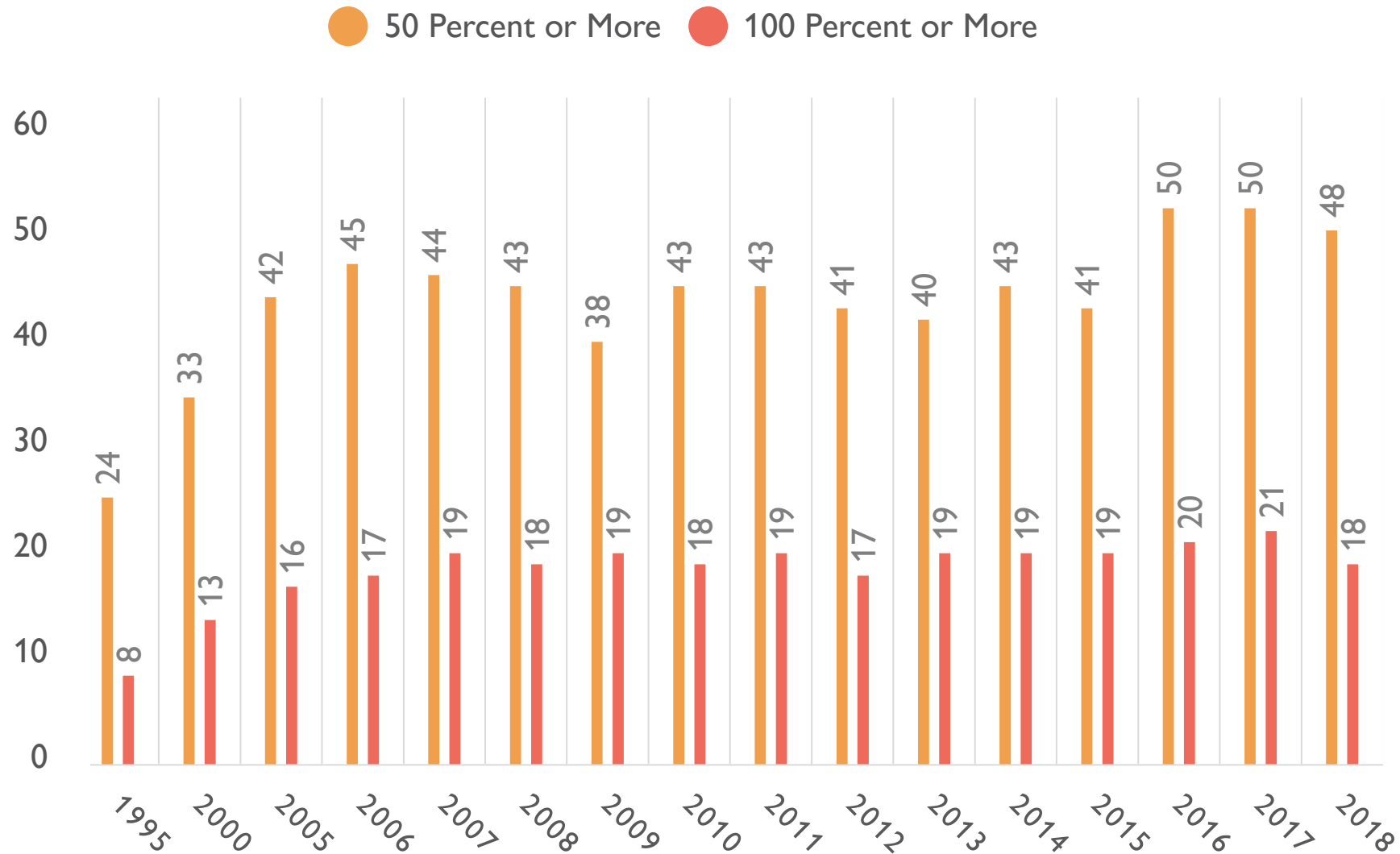
Mineral Demand from Green Technology by 2050



Our Energy Future is More Minerals Intensive than the Past



The U.S. is Import Dependent for 48 of 64 Key Minerals



Source: USGS Mineral Commodity Summaries 1991-2019 editions