

STRATEGIC METALS USES IN THE GROWING GREEN ECONOMY

Twin Metals' mineral deposits are part of the Duluth Complex, home to one of the world's largest untapped copper, nickel and platinum group metals (PGM) resources in the world. These metals are necessary to maintain our current economy and quality of life, and are also critical to the emerging green economy. The wind, solar and other alternative energy industries rely on copper, nickel and PGMs for their products. Below are some of the uses for copper, nickel and PGM metals in the growing green economy:



Wind energy – Wind turbines convert kinetic energy from wind into electrical power. A single 3MW wind turbine contains 4.7 tons or 9,400 pounds of copper. Minnesota is a national leader in the wind energy industry, ranking fifth nationally for the most installed wind capacity (2011).

Solar energy – Some of copper's unique and beneficial traits are that it is resistant to corrosion and oxidation, and that it is malleable and ductile, making it an ideal material for wiring. Copper is used in the wiring of solar panels, one of the emerging clean energy producers. Nickel containing stainless steel is also vital to solar panels, which

is used in the tubing and frames, for its heat and corrosion resistant properties. The Minnesota Legislature mandated investor-owned utilities must produce 1.5 percent of their electricity from solar power by 2020.

Hybrid cars – A standard car requires 42 pounds of copper while a hybrid car necessitates 75 pounds of copper. Nickel is also used in the specialized batteries that power hybrid cars, providing recharging capacity. The U.S., with only one active nickel mine, relies primarily on imports to meet nickel demand. It is estimated that 99 percent of the nation's nickel resource is located in Minnesota.

Emissions reductions – Catalytic converters are vital to greatly reducing harmful emissions from vehicles. Platinum and palladium are necessary components that help control the harmful exhaust elements including carbon monoxide, nitrogen and hydrocarbons.

Sources:
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