

# SUSTAINABLE COPPER

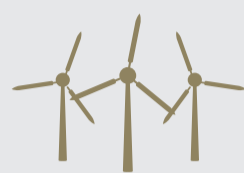
## Copper's Role in a Low-Carbon Economy

Copper is expected to play a critical role in a low carbon economy for its extensive use in **renewable energy** and **electric vehicle** applications.

### RENEWABLE ENERGY

Copper has the greatest thermal and electrical conductivity of any non-precious metal, making it the backbone of the energy industry. Copper is used in a variety of electrical components from cables and wiring, to motors, transformers, and many other power-enabling products. Here's how it stacks up in the primary renewable energy technologies expected to create a low-carbon future.

#### WIND



**5,000-14,900** POUNDS PER MEGAWATT (LBS/MW)

The amount of copper required in onshore wind farms is 5,000 - 14,900 pounds per megawatt, with offshore likely to require more.

##### USED IN

- Grounding system
- Coil Windings
- Cable Conductors
- Transformer Coils
- and more...

#### ENERGY STORAGE



**0.3-4**

TONS PER MEGAWATT (T/MW)

The amount of copper found in storage applications is 0.3 - 4 tons per megawatt.

##### USED IN

- Batteries
- Wiring
- Flywheels
- Pumped Hydropower
- Transformers
- Generators
- and more...

#### SOLAR



**11-40**



The amount of copper required in photovoltaic (solar) applications is 11-40 times greater than power from fossil fuel.

##### USED IN

- Cabling
- Earthing
- Inverters
- Transformers
- PV Cell Ribbons
- and more...



Regardless of type or size, renewable energy technologies require more copper per megawatt of new capacity compared to fossil fuel or nuclear derived energy by a factor of **2-6 times**.

### ELECTRIC VEHICLES

Electric vehicles, anticipated to be a major contribution to a low-carbon economy, require significantly more copper than fossil fuel-powered vehicles.

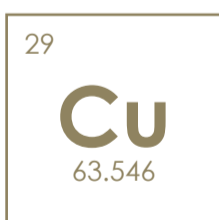
An internal combustion engine uses **23 kg OF COPPER**



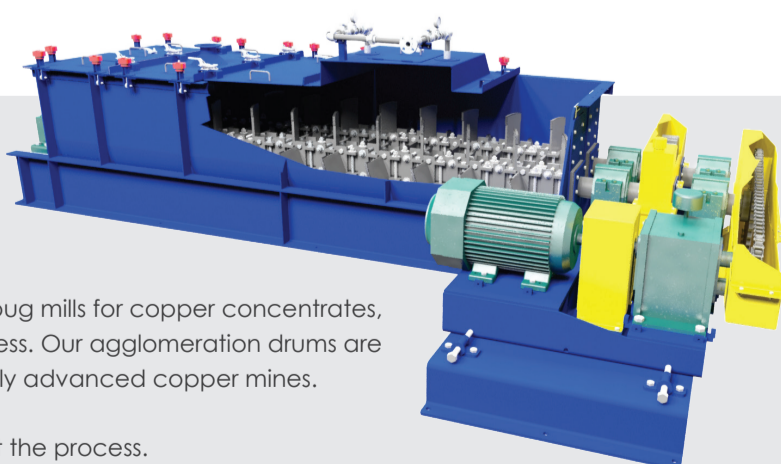
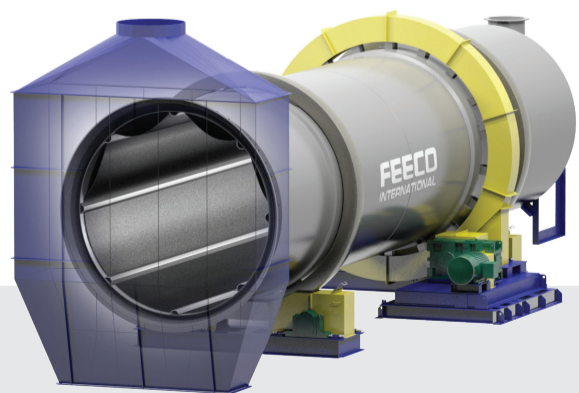
#### Electric Vehicle Copper Use by Type (in kg)

Hybrid Electric Vehicle (HEV)	40
Plug-in Hybrid Electric Vehicle (PHEV)	60
Battery Electric Vehicle (BEV)	83
Hybrid Electric Bus (Ebus HEV)	89
Battery-powered Electric Bus (Ebus BEV)	224-369

In 2027, 27 million EVs are expected to be on the road, pushing copper demand up from 185,000 tonnes (2017) to **1.74 million tonnes**.



The addition of just 1 kg of copper used to improve energy efficiency has an environmental return of **100 - 1,000 times** over the life of the equipment.



#### COPPER PROCESSING SOLUTIONS

FEECO is a leader in copper processing. We provide custom pug mills for copper concentrates, and agglomeration drums for the heap leaching/SX-EW process. Our agglomeration drums are utilized in some of the world's largest and most environmentally advanced copper mines.

We can also provide all of the handling equipment to support the process.

For more information, contact us today at [FEECO.com/contact](http://FEECO.com/contact)

#### SOURCES

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