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Copper:By 2050, annual copper demand from wind/solar technologies could exceed 3 mn tonnes or ~15% of 2020 copper production~Citigroup, global copper market is expected to be in a 521,000 tonne deficit in 2021.

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COPPER'S ROLE IN RENEWABLE ENERGY

Copper is critical for renewable energy technologies with applications in cabling, wiring, heat-exchange, and more.

GOVERNMENTS around the world are taking action to accelerate the energy transition.

As of 2020, there were:



- **617**
Cities with **100% renewable energy targets**
Source: REN21
- **1,852**
Cities with **climate emergency declarations**
- **>10,500**
Cities with **emission reduction targets**

The Copper Intensity of Renewable Energy

As the adoption of solar and wind technologies grows, so will the need for copper.

Copper content per megawatt (MW):



5 tonnes



Solar PV



4.3 tonnes



Onshore Wind Farms



9.6 tonnes



Offshore Wind Farms

Cabling accounts for the bulk of copper usage in offshore wind farms.

Annual Installed Capacity (megawatts)

400K MW

300K MW

200K MW

100K MW

0 MW

2020

2030

2050

Copper demand from annual solar PV installations could more than double by 2030.

Copper content (tonnes)

Solar PV

1,860,000t

1,350,000t

Onshore Wind

868,600t

632,100t

268,800t

432,000t

Offshore Wind

57,725t

2030

2050

*2030 and 2050 projected annual installations are based on IRENA's REmap scenario
Sources: IRENA, Navigant Research, Copper Alliance

By 2050, renewable energy technologies could require **>3M tonnes** of copper annually—15% of global mine production in 2020.

This demand represents just three technologies, and the overall copper market is expected to be in a >500,000-tonne deficit in 2021.

New copper mines and additional mining capacity will play a key role in meeting copper's rising demand.