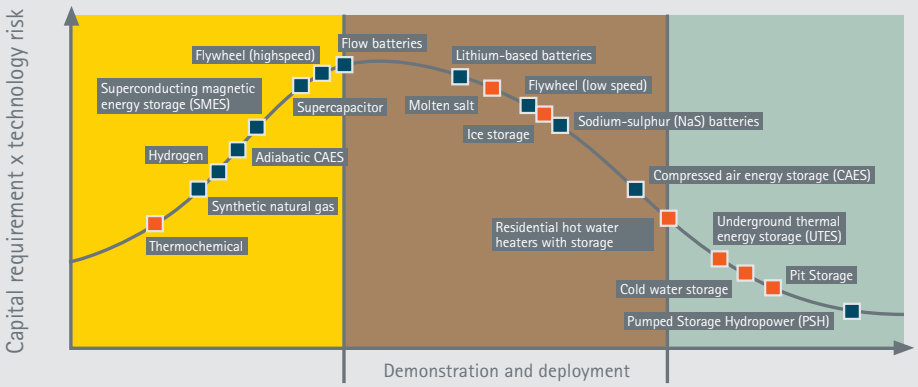
Copper's Role in Grid Energy Storage Applications

Copper Development Association Inc.
Copper Alliance

The market for energy storage in the U.S. is robust and rapidly changing, with strong governmental and venture capital investments, successful demonstration projects and recent technological advancements all contributing to future growth.

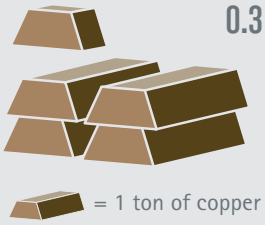
Maturity of Energy Storage Technologies



Source: Decourt, B. and R. Debarre (2013), "Electricity storage", Factbook, Schlumberger Business Consulting Energy Institute, Paris, France and Paksoy, H. (2013), "Thermal Energy Storage Today" presented at the IEA Energy Storage Technology Roadmap Stakeholder Engagement Workshop, Paris, France, 14 February.

Copper. Essential to Sustainable Energy.

Copper's durability, efficiency, reliability, superior conductivity and safety play key roles in the batteries, wiring, and motors used by these devices. Lithium-ion, flow and sodium batteries as well as flywheels, CAES, and pumped hydropower are strong users of copper at the unit level, and certain pieces of electrical equipment and supporting infrastructure—such as transformers, generators, inverters, cooling systems, other motors and wiring—also rely on the metal.

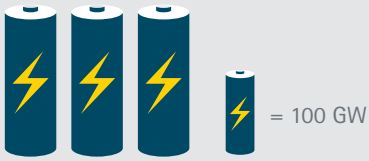


= 1 ton of copper

0.3 to 4 tons per MW

The range of copper content found in storage installations.

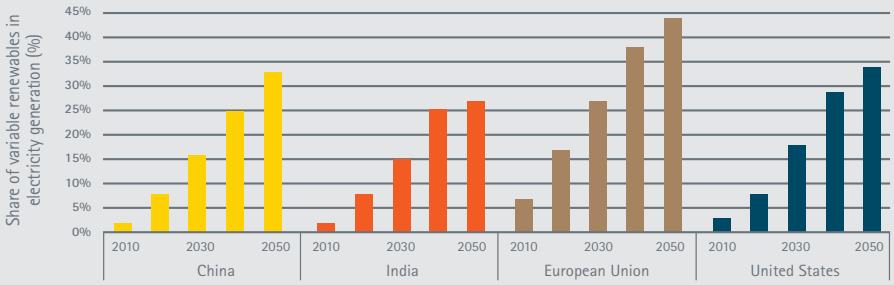
300 gigawatts (GW)



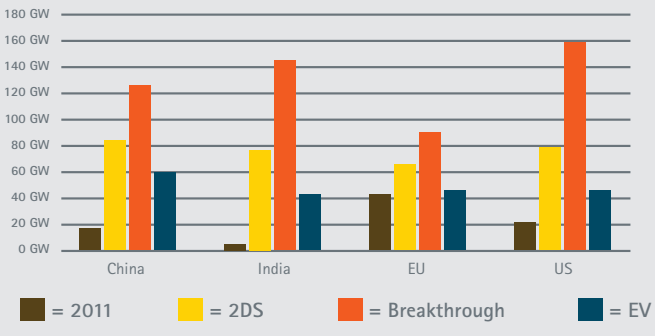
= 100 GW

The estimated global opportunity for energy storage over the next 10 to 20 years, valued between **$200 and $600 billion**.

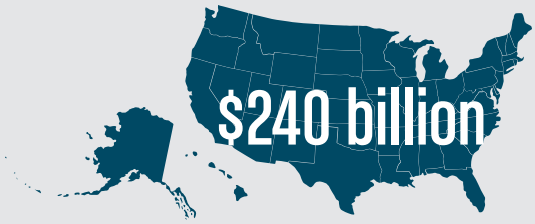
Share of variable renewables in electricity generation (%)



Electricity storage capacity for daily electricity storage by region in 2011 and 2050 for ETP 2014 scenarios



United States, Western Europe and China represent the largest markets for energy storage.



The amount forecasted by industry analysts that will be invested in grid storage applications in the U.S. through 2020.

Sources: Market Evaluation for Energy Storage in the United States, KEMA, Inc., January 2012.
Based on IEA data from the Technology Roadmap: Energy Storage © OECD/IEA 2014, IEA Publishing; modified by Copper Development Association, Inc.. License: www.iea.org/t&c/termsandconditions/#d.en.26167.