

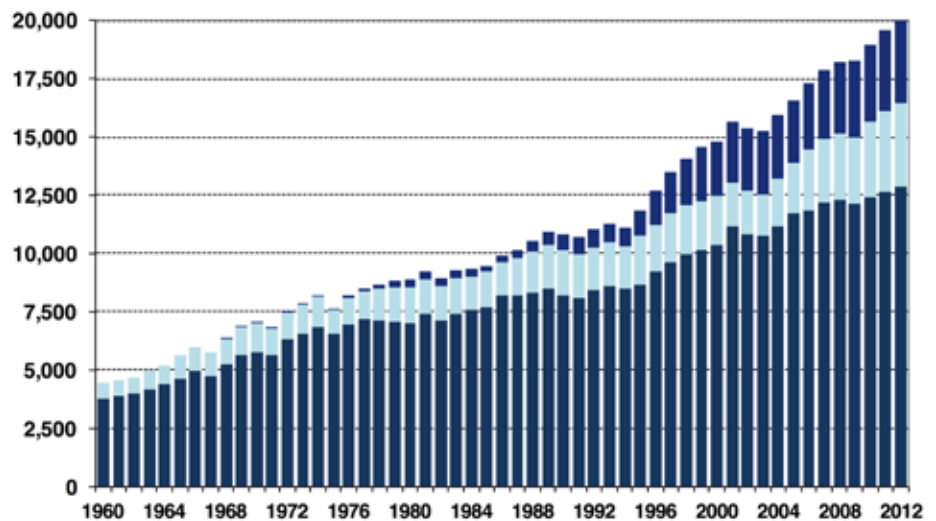
# Copper and Modern Economies

**Copper is necessary for the expansion of renewable energy resources such as wind, wave, geothermal, and tidal power.**

Today, copper, iron and gold are amongst the most widely used metals in modern society.<sup>11</sup> Copper, in particular, is used for a wide range of purposes and is a key element of progress in modern economies. It is currently essential to nearly all equipment powered by electricity. Modern plumbing, which delivers potable water, is heavily dependent upon copper pipes and fittings. Copper is antimicrobial, and therefore highly useful in medical applications.<sup>12</sup> Copper components are found in many items that define the built capital of economic advancement, including refrigerators, cell phones, generators, computers, medical apparatus, plumbing pipes, communications transmission and power tools.

In the production of electrical power, copper is by far the best element for the windings on generators. It is used exclusively in

**Figure 3.** ▶ World Refined Copper Production, 1960-2012. Units in thousand metric tonnes. With the emergence of solvent extraction-electrowinning (SX-EW) technology, refined copper produced from leaching ores has been on the rise, increasing from less than 1% of world refined copper production in the late 1960's to 18% of world output in 2012. Source: ICSG.



**21 BILLION KILOWATT HOURS**

**OF ELECTRICITY ARE PRODUCED WORLDWIDE EACH YEAR, WHICH ALL DEPEND ON COPPER**



power station generators whether the energy source is coal, gas, oil, hydro, nuclear, wind, wave, geothermal, or solar (steam) power. Over 21 billion-kilowatt hours of electrical power were produced globally in 2012,<sup>13</sup> and these hours were fully dependent upon copper windings. Copper is necessary for the expansion of renewable energy resources such as wind, wave, geothermal, and tidal power. For many uses, there is no known substitute for copper. Copper is ubiquitous in specialized electronics. Instruments utilizing copper are necessary in agriculture, steel production, software development, retail sales, teaching, surveying, and virtually every activity using electricity or technology. Copper is essential to all modern economies and the production of virtually all goods and services.