



# Copper & Candles: Expanding Digital Revolution to Jumpstart Growth

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## Key Takeaways

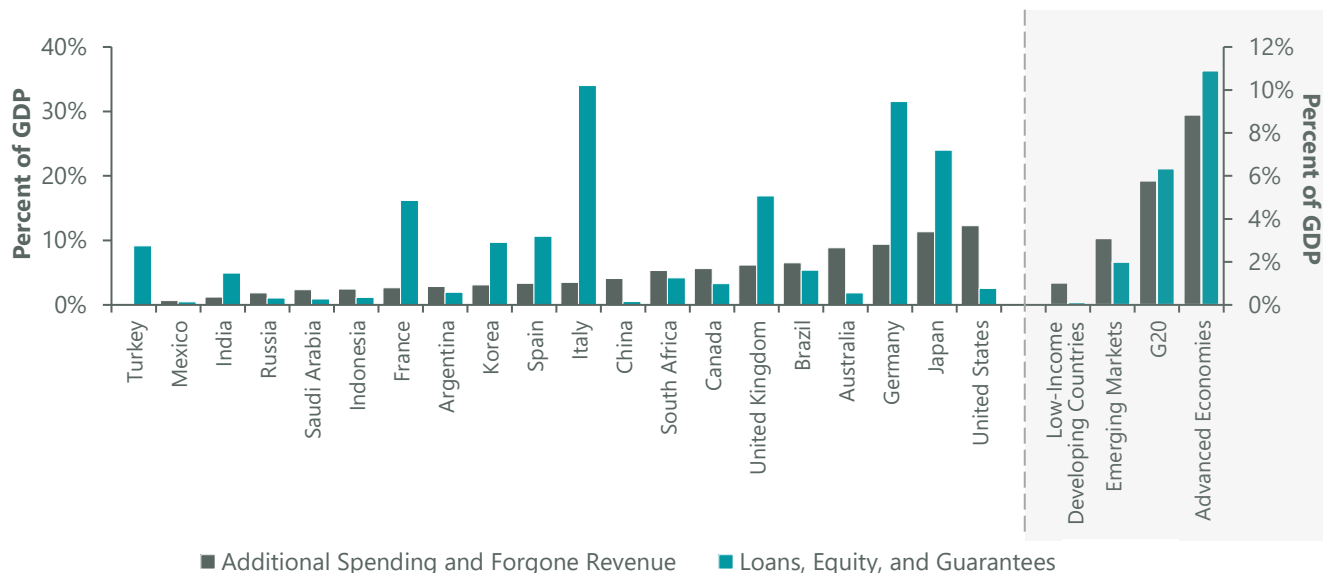
- ▶ A rebuilding of the global economy around powerful new technologies such as artificial intelligence, renewable energy and electric vehicles promises to fuel a period of rising spending, growth and productivity.
- ▶ Monetary and fiscal policies are aligning to address stagnation and inequality in the most forceful mix of support since the end of World War II.
- ▶ Progress tends to follow a pattern first of concentration and then capital-intensive broad distribution which can last for decades.

## Coming Analog Phase of Growth Could be Powerful

California is home to the globe's most valuable technology firms which in aggregate are worth more than all the companies in the rest of the developed world. Residents of that state are also unable to keep the lights on when running their air conditioners. This stark contradiction highlights that while billions have been invested to ensure the same day delivery of dog food, the basic infrastructure demands of a rapidly growing digital economy have been largely ignored. The global economy is on the cusp of a transformation, rebuilding around powerful new technologies. Artificial intelligence (AI), the Internet of Things (IoT), edge computing, renewable energy and the shift to electric-powered transportation promise to fuel a period of rising spending, growth and productivity. The last decade's focus upon shopping and entertainment will be viewed as just the initial phase of the mass adoption of technology that will now begin to deliver benefits to the overall quality of life in the world.

The more capital-intensive phase of what some call "the Fourth Revolution" will be enabled and accelerated by the need to create strong economic growth to offset both the COVID-19 pandemic and service the massive unfunded liabilities accumulated over the past 20 years. Monetary and fiscal policies are aligning to address stagnation and inequality in the most forceful mix of support since the end of World War II (Exhibit 1). Just this year, Germany and France announced spending plans equal to nearly 4% of GDP in addition to direct financial support for consumers and small businesses. Europe is focused on the theme of a "Green Economy," China on a program of spending on technology, education, health care and the environment, emerging markets on building strong domestic demand, the Middle East on diversifying away from fossil fuels while the U.S. is providing trillions to address inequality, injustice and unmet social needs. These efforts should combine to raise capital expenditures across the private sector.

Exhibit 1: COVID Related Spending Just the Beginning



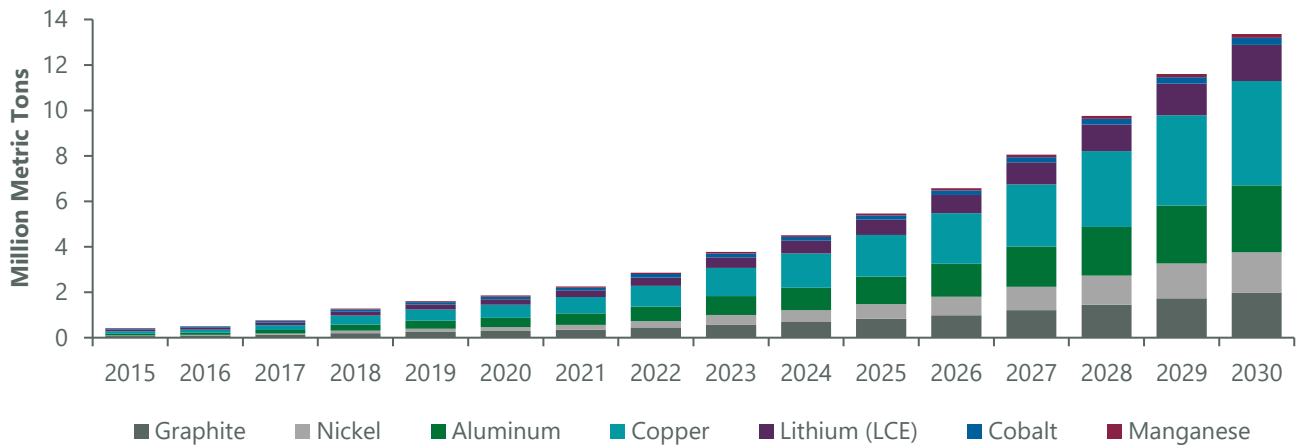
Data as of June 12, 2020. Source: National authorities; and IMF staff estimates.

Strong macroeconomic drivers are being complemented by the actions of companies to become more environmentally friendly due to investor preferences and shareholder pressure to ensure a sustainable and equitable planet. This is leading to a wave of capital spending in the industrial, energy and manufacturing sectors. Bayer of Germany plans to reduce CO2 emissions 42% and switch to 100% renewable energy by 2030. This is projected to cost an initial €500 million. In a speech at the United Nations, President Xi set a goal for China to reduce carbon emissions to near zero by 2060 while the European Green Deal pledges to invest €1 trillion over the next 10 years. Decarbonization will require a significant rebuilding of capacity in energy intensive process industries, creating strong demand for engineering services, construction and related materials from public companies in Europe, Asia and North America. Green buildings/smart cities are powerful swing factors toward this goal. For nations to meet the goals of the Paris Agreement, all buildings must be carbon neutral by 2050. Today less than 1% of all global buildings meet this criterion.

### Materials and Industrials Companies to Enable Change

Two related transformations in the energy and transportation sectors will also act to bolster growth. Hundreds of new electric truck and car models will be introduced over the next three years, moving the market from niche to mainstream. This will also require the construction of a network of charging stations. As the use of digitally connected devices shifts from the consumer to the industrial/commercial sectors, the volume of data will drastically increase power demands, which are estimated to rise from 2.6% to 15% of electric generating capacity. Meeting the power demands of a connected, digital economy and the coming mass adoption of electric vehicles will require a large investment in the generation, transmission and storage of electricity. The supply of copper, nickel, zinc, lithium, cobalt and graphite will need to expand tenfold over the next 10-20 years (Exhibit 2). There are just a handful of companies in the world, based primarily in Europe, Canada and Australia, with the expertise, capital and assets to grow the production of these basic materials and they are currently focused upon limiting spending and generating healthy cash flows. This disconnect is likely to lead to steadily rising prices for this basket of battery- and electricity-related metals.

Exhibit 2: Demand for Industrial Metals Projected to Soar



Data as of June 4, 2020. Source: Bloomberg New Energy Finance.

Alibaba founder Jack Ma once stated that his goal was not to become another Amazon but to make every company Amazon. The development of AI-powered tools for supply chain management and product distribution are becoming broadly available and affordable. Even small brands, retailers and manufacturers will be able to match the fulfillment capabilities of the largest e-commerce platforms in the coming years. This will be aided by the advent of new warehouse automation equipment that can address the final picking and packing phase, which remains largely manual. Online shopping has been mostly search based, manipulative and brand agnostic but will shift more to discovery and brand seeking. As a result, investment in the infrastructure to serve a broader base of consumer goods firms will increase strongly, with global logistics and transport companies playing a key role.

## Conclusion

The current deep-seated economic pessimism after a long period of below-trend growth in much of the world and the relatively narrow number of beneficiaries of the digital revolution is obscuring a powerful transformation, both socially and economically. Such transformation will be enabled by a step up in spending on new infrastructure to support the next phase of digitalization. The Economic Policy Institute estimates that every \$100 billion spent on infrastructure creates one million jobs. And according to the Business Roundtable, every dollar spent returns \$3.70 in additional growth over the following 20 years. China COVID-driven infrastructure spending has already boosted industrial output growth by 5.6% this past August, year-over-year.

Progress tends to follow a pattern first of concentration and then capital-intensive broad distribution which can last for decades. Thomas Edison invented the light bulb in 1879 but mass electrification took over 60 years and had to endure both the Great Depression and WWII. This dynamic creates a number of attractive global investment opportunities outside of the initial technology cycle leadership that we believe are overlooked, undervalued and are positioned for significant long-term earnings growth.

## About the Author



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