





Environmental problems combined with global population growth are creating shortages in food, energy and water – our most fundamental commodities. Climate change may threaten global food security as glaciers melt and the world's freshwater supply melts with it.

There are plenty of ways to invest in water as a theme through many public companies globally that operate in the fields of water management, treatment, infrastructure and supply. New techniques and technologies offer hope across the spectrum of water demand and supply, and exciting innovations include solar-powered desalination, filtration using nanotechnology, smart monitoring, and precision agriculture.

Also, there is a clear need for innovative solutions in agriculture technology as the demand for nutrition rises with per capita GDP in large emerging markets. The number of resources needed to meet the growing demand for food must be achieved through sustainable methods as the ultimate goal is to continuously produce agricultural goods while simultaneously reducing the environmental footprint.

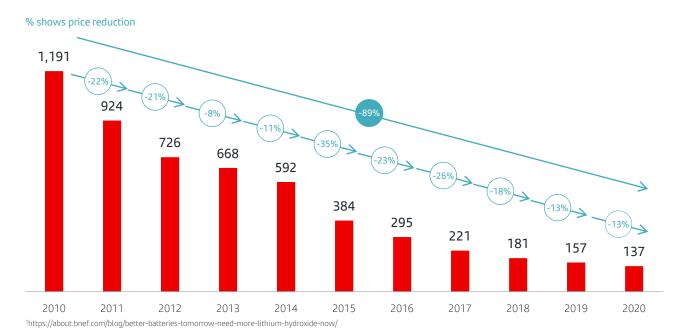
Lithium is another scarce resource and its demand is expected to increase exponentially with the shift to electric vehicles. The world is not running out of lithium yet because renewable energy and electric vehicles are nowhere near entirely replacing fossil fuels. Demand will increase in future, and with it the need for constant innovation in mining and battery design technology. BNEF expects the lithium market to be adequately supplied from 2023 onward, with the exception of a potential shortage of lithium hydroxide as soon as 2025-20271. Growing demand will require the lithium industry to significantly increase its capacity and doing this in a sustainable way that avoids boom and bust cycles will be a challenge. Specialty chemical companies are benefiting from a surge in global lithium-ion battery demand driven by electric vehicles, which is set to quadruple over the next five years according to Bloomberg BNEF.

We find a similar **problem of scarcity in rare earths** with the added risk of threats to supply due to Chinese global production dominance. Rare earths are critical to the manufacturing of goods such as smart phones, lasers and hybrid batteries.

## Price of a Li-ion battery pack, volume-weighted average

Real 2020 dollars per Kilowatt hour

Source: BloombergNEF 2020 Lithium-Ion Battery Price Survey December 16, 2020







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# Key trends in Scarce Resources



It's too soon to write any one material into the history of the 21st century, but one is bound to play a significant role: **lithium**. Much as steel enabled modern infrastructure, **lithium materials enable mobile power applications**. As the world electrifies ground-based transportation and seeks solutions to intermittent power production from renewable energy sources, demand for lithium materials is expected to soar. Wind-energy plants contain nine times more minerals than gas-fired ones, according to the International Energy Agency (IEA)<sup>2</sup>. Electric cars require six times more minerals than those powered by combustion engines. **To meet the world's climate goals, the IEA calculates that consumption of lithium, which is used in batteries, must increase 40-fold by 2040<sup>3</sup>. Lithium prices have risen 52% so far in 2021 (as of July 31st) according to Benchmark Mineral Intelligence<sup>4</sup>.** 

Rare earth metals and alloys that contain them are used in many devices that people use every day such as computer memory, DVDs, rechargeable batteries, cell phones, catalytic converters, magnets, fluorescent lighting and much more.



Globally, the volume of renewable water available to each person in a year fell by roughly 40% between 1992 and 2014, according to a RobecoSAM study (Water: the market of the future). At the same time, we're using more water – global annual water extraction totals 4,500 km3 today compared with 600 km3 in 1990. We need water for everything: for our personal use, to grow food, and to produce virtually all the goods required for our survival. Water is also vital to economic growth. Practically all of society's commercial activities, from agriculture and electricity generation to the production of consumer goods depend on the availability of water. Although water has become a precious commodity in many areas of the world, the price of water charged to consumers in most countries is still too low to accurately reflect its value. And while demand for water resources is growing rapidly, supply is limited.

Technology holds the key to resolving the world's growing water shortage problems. Smart water meters, robotic network inspectors, micro pollutants treatments, smart sprinklers are just examples of the large scope of innovation in the field of water usage efficiency. Existing infrastructure needs to be refurbished after decades of underinvestment and this need provides also a source of business opportunities. The Biden administration is proposing plans for a variety of programs for water infrastructure. Specifically, it supports programs to provide safe drinking water or treat wastewater, such as sewer overflows or stormwater as part of the proposed Bipartisan Infrastructure Plan.



The food industry is facing unprecedented challenges in production, demand and regulations stemming from consumer trends. Consumer demand and focus have changed in recent years. An increasing focus by consumers on sustainability, health and freshness has placed significant pressure on the food industry to innovate. Today's agriculture routinely uses sophisticated technologies such as robots, temperature and moisture sensors, aerial images, and GPS technology. These advanced devices and precision agriculture and robotic systems allow businesses to be more profitable, efficient, safe, and more environmentally friendly.

Agricultural technology innovators have created exciting new ways to harness the power of technology to enhance the world's food supply. Agtech innovations are protecting crops and maximizing outputs — enabling structural changes in the agriculture system that could achieve important sustainability goals of lowering greenhouse gases, reducing water use, ending deforestation and potentially even sequestering carbon back into soil. Examples of food tech include alternative protein/dairy products, food traceability and treatment along the supply chain in order to maintain freshness and reduce food waste, and meal kit distribution companies that, by delivering the exact amount needed for a recipe, also reduce food waste.

<sup>&</sup>lt;sup>2,3</sup> IEA: The Role of Critical Minerals in Clean Energy Transitions Part of World Energy Outlook Flagship report — May 2021

 $<sup>^4\,\</sup>underline{\text{www.benchmarkminerals.com}}$ 





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# Ejemplos de empresas líderes en Recursos Escasos



LG Chem Ltd. is a Korean chemical manufacturer and global leader in lithium batteries. The company's products also include petrochemicals, plastic resins, and engineering plastics.

LG Chem RESU lithium batteries are leaders in the photovoltaic energy sector for self-consumption. According to Statista, LG Chem was the leader in the global market of lithium-ion battery makers from January 2020 to August 2020 with a 26,5% market share.

The petrochemical producer will make a 6 trillion Korean Won (\$5.2 Billion) investment in expanding production lines of its battery materials, including cathode and separators according to a company statement.

### **▲** ALBEMARLE®

Albemarle Corporation is a global developer, manufacturer and marketer of highly-engineered specialty chemicals. The company operates through three segments: Lithium, Bromine Specialties and Catalysts.

The Lithium segment develops lithium-based materials for a wide range of industries and end markets. It develops and manufactures a broad range of basic lithium compounds, including lithium carbonate, lithium hydroxide, lithium chloride, and valueadded lithium specialties and reagents.

The Catalysts segment consists of three main product lines: Clean Fuels Technologies, fluidized catalytic cracking (FCC) catalysts and additives; and performance catalyst solutions (PCS).



Ganfeng Lithium covers a wide swath of the lithium battery supply chain, from lithium resource development, refining and processing to battery manufacturing to battery recycling. Its products are widely used in electric vehicles, energy storage, 3C products, chemicals and pharmaceuticals. The Group's lithium resources are located across the globe, and it is the only company in the lithium industry that has the commercial scale technologies to extract lithium from brine, ore and recycled materials. The Groups lithium compound capacity ranks third worldwide.

In 2000, Ganfeng was founded by Li Liangbin. Li and his team transformed the company from a lithium compounds processing plant in a niche market industry into a global leader.



Xylem, Inc. is a designer, manufacturer, equipment, and service provider for water and wastewater applications addressing the full-cycle of water from collection, distribution, and use to the return of water to the environment.

It operates through following business segments: Water Infrastructure, Applied Water, and Measurement and Control Solutions. The Water **Infrastructure segment** focuses on the transportation, treatment and testing of water. The Applied Water segment encompasses the uses of water and focuses on the commercial, residential, and industrial end markets. The Measurement and Control Solutions segment focuses on developing technology solutions that enable intelligent use and conservation of critical water and energy resources as well as analytical instrumentation used in the testing of water.



Beyond Meat Inc. develops plant-based protein food products.

Since first being founded in 2009, Beyond Meat is a company that has taken the culinary world by storm thanks to its wide range of plant-based meat substitutes that look and taste like real meat.

With vegan and vegetarian diets rapidly gaining popularity across the world as people begin attempting to live a healthier lifestyle and lower their ecological footprint, Beyond Meat has capitalized on this. The company reported that as of December 31, 2020, its products were available at approximately 122,000 retail and foodservice outlets, across grocery, merchandiser, club, convenience store, and natural retailer channels, and other food-away-from-home channels, including restaurants, foodservice outlets and schools.



Agilent Technologies, Inc. provides core bio-analytical and electronic measurement solutions to the communications, electronics, life sciences, and chemical analysis industries.

Agilent Technologies, Inc. is an American analytical instrumentation development and manufacturing company that offers its products and services to markets worldwide. Agilent was established in 1999 as a spin-off from Hewlett-Packard. The resulting IPO of Agilent stock was the largest in the history of Silicon Valley at the time

Agilent helps ensure that our global food supply is free of contaminants—whether chemical, viral, bacterial or microbiological. From pesticides to pharmaceutical residues to trace metals, Agilent provides methods for monitoring contaminants affecting quality of life.

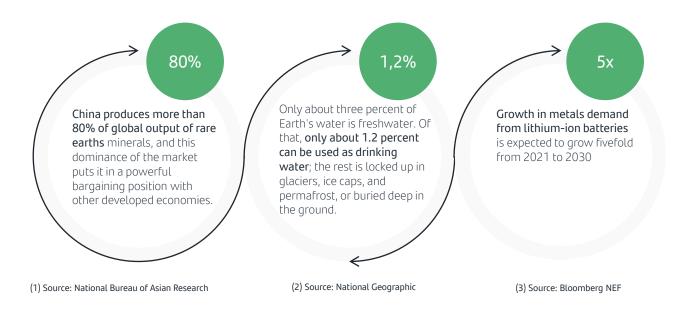




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## Did you Know that?





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