Sulphur, a Chemical Element that Improves People's Lives

Sulphur removed from oil and gas provides a critical manufacturing input for hundreds of everyday products

BACKGROUND

Sulphur compounds removed from refined petroleum products improves air quality. Since the early 1970's, countries worldwide have been reducing sulphur dioxide emissions from gasoline to help control the effects of "acid rain". This increase in sulphur supply eliminated Frasch Mining, which is more environmentally destructive. Sulphur is an essential product that is used in numerous agricultural and industrial applications that support our everyday lives.

US Domestic Sulphur Trade

- Liquid sulphur is produced at refineries and gas plants then loaded into tank cars and tank trucks
- Sulphur moves safely across all Class I railroads in 24,000 tank car shipments annually[2]
- The largest sulphur producing states are Texas, Louisiana, California, Illinois, and Wyoming[1]
- The largest sulphur consuming states are Florida, North Carolina, Louisiana, Texas, and Idaho[1]

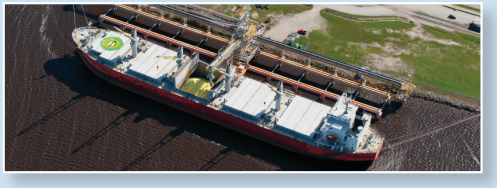
The Numbers [1]

Worldwide **85 million tonnes** of sulphur is produced annually

The largest sulphur producing countries are **China**, **USA**, **Saudi Arabia**, **UAE**, and **Russia**

The US produces **over 8 million tonnes** of sulphur annually.

The US imports **1.3 million tonnes** of sulphur and exports **1.8 million tonnes**



THE SULPHUR INSTITUTE

The Sulphur Institute champions the essential scientific & social benefits provided by sulphur - an element that improves people's lives.

www.sulphurinstitute.org

Sulphur - A Key to Economic Growth

Sulphur and sulphuric acid drive economic growth by boosting agricultural yields, powering industrial processes, and creating jobs, while also promoting environmental sustainability by reducing harmful emissions. Without sulphur, everyday life would be challenging as it is essential for producing the food we consume, manufacturing everyday products, and supporting critical industries.

Agriculture: Agriculture accounts for over 60% of all sulphur consumption.It is used in the manufacturing of phosphate fertilizers, nitrogen fertilizers and inorganic pesticides and fungicides to support plant growth. Sulphuric acid, which is produced from sulphur, is used to convert phosphate rock into a soluble form - phosphate fertilizers - for nutrient uptake. With less sulphur provided by atmospheric deposition - in the form of acid rain - research is indicating the need for more sulphur fertilizers, which is why sulphur is considered **The Fourth Major Crop Nutrient**. Balanced fertilizer programs, following 4R practices, with the inclusion of sulphur, **has more than doubled world crop yields since 1960**.[3] Sustaining fertilizer production to **feed a growing world population** will rely directly on sulphur production from refineries and gas plants.

Critical Minerals: Sulphur is an essential element used in the manufacturing of sulphuric acid. Sulphuric acid is essential for the extraction of metals such as **nickel, copper, lithium,** and **cobalt**. These metals are vital for the production of **batteries, computer chips** and other technologies critical to **national** and **energy security**.

Sulphur Chemistry: Sulphuric acid is widely known as **"The King of Chemicals"** and supports:

- the **production of pulp** and **paper** products
- manufacturing major **antibiotics** such as penicillin
- vulcanization of **rubber, cement, detergents,** and **pesticides**
- the production of **plastics,** and **synthetic fibers**
- Petroleum Alkylation produces **high octane clean burning gasoline** essential for modern engines.

A World Without Sulphur

If the US doesn't produce enough sulphur, it could lead to significant disruptions in various industries, including agriculture, energy, and manufacturing, ultimately jeopardizing food security, technological advancements, and economic stability.

Without Sulphur... you won't have:

- Phosphate Fertilizer
- Lithium Batteries
- Paint
- Concrete
- Makeup
- Synthetic Fibers
- Detergents
- Computer Chips
- Wine Production
- Paper Products
- Automotive Tires
- Water Treatment
- Pharmaceuticals
- Oil Refining
- Waste Treatment
- pH Balancing...***& more!***

> *"Through its major derivative, sulphuric acid, sulphur ranks as one of the more-important elements used as an industrial raw material. It is of prime importance to every sector of the world's industrial and fertilizer complexes. Sulphuric acid production is the major end use for sulphur, and consumption of sulphuric acid has been regarded as one of the best indexes of a nation's industrial development. More sulphuric acid is produced in the United States every year than any other chemical."*
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> United States Geological Survey (USGS)

Due to the significant role sulphur plays in people's lives, it should be considered an essential element that must continue to be produced. If petroleum production is reduced, sulphur will become scarce.

The world today can not thrive without sulphur.

The spelling for the chemical element is "sulfur" in American English, while "sulphur" is the preferred spelling in British English and used by The Sulphur Institute.

Data Sources: (1) United States Geological Survey (2) Association of American Railroads (3) United States Department of Agriculture