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Potash Production in Europe

European Potash Producers Association (APEP)



APEP

- ◆ ASSOCIATION DES PRODUCTEURS
EUROPÉENS DE POTASSE
- ◆ EUROPEAN POTASH PRODUCERS ASSOCIATION

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About APEP

The "Association des Producteurs Européens de Potasse" (APEP), also known as the "European Potash Producers Association," was founded in 1982 under Belgian law to represent Europe's potash producers.

With members operating four major mines in Germany and Spain, as well as the United Kingdom, APEP plays a crucial role in ensuring the sustainable and responsible production of potash, a key nutrient for agriculture and important feedstock for various industries.

APEP advocates on behalf of its members at both European and international level, engaging with EU institutions and other stakeholders on regulatory issues relevant to the sector. The association is instrumental in shaping policies related to mining and environmental sustainability, ensuring compliance with EU directives while promoting the Union's competitiveness.

Through collaboration and knowledge sharing, APEP fosters innovation and best practices in potash mining, supporting both the EU's food security by ensuring a stable supply of essential fertilisers and contributing to various industrial sectors.



What is Potash?

Potash is a general term representing a variety of potassium salts, primarily potassium chloride, but also others like potassium sulfate.

Potassium (K) is the seventh most abundant element in the Earth's crust and can be found in the cells of every living organism.[1] In Europe, potash ores were formed millions of years ago from the evaporation of ancient seas, leaving behind nutrient-rich salts that are essential for crop growth, sustainable yields, and nutritious food production.



Potassium Chloride

Potassium chloride (KCl) is the most commonly used potassium source in fertilizer production due to its high potassium content as compared to other sources. Indeed, KCl contains 50% K (equivalent to 60% potassium oxide, K_2O). The color of KCl can range from deep red to white, depending on the presence of naturally occurring iron oxides within the sylvinite and sylvite ores. The naturally occurring potash-containing minerals are either extracted through conventional mining, solution mining, or recovered as KCl containing brines; these are generally white in color. There is no difference in the behavior of the red and white forms in the soil.[2]



[1] [HTTPS://WWW.ICLGROUP.NL/PRODUCT/POTASH/?LANG=EN](https://www.iclgroup.nl/product/potash/?lang=en)

[2] [HTTPS://ICL-GROWINGSOLUTIONS.COM/AGRICULTURE/BRANDS/POTASH/](https://icl-growingsolutions.com/agriculture/brands/potash/)

Agriculture

Along with nitrogen (N) and phosphorous (P), potassium is one of the three main plant nutrients that make up fertilizer (NPK), which crops need in large quantities.

Potash is a mined mineral from former saline seas over 200 million years old, rich in naturally occurring salts like Na, K, Mg, and Ca. Therefore, potash is a natural, non-synthesized product, making it a natural mineral fertilizer rather than a synthetic one.

Unlike other nutrients, potassium plays a key role in regulating many internal processes within plants. These essential processes depend on having enough potassium available. When crops lack sufficient potassium, it leads to lower quality and reduced yields.[3]

Beyond Plant Nutrition

Potash has various uses beyond agriculture. It is widely used as an additive or auxiliary material in several industries, including pharmaceuticals.[4] Potassium chloride is an essential component in hemodialysis, peritoneal dialysis, infusion solution, parenteral/enteral nutrition, ORS/electrolyte-containing beverages, and numerous medicines as active pharmaceutical ingredients (API) or excipients.[5] Other applications of potash include industrial chemicals, animal feed, soap making, food production, pH adjustment, and glassmaking.[6]



[3] IBIDEM

[4] [HTTPS://APEP.EU/POTASH/](https://apep.eu/potash/)

[5] [HTTPS://WWW.KPLUS.COM/EN-US/OUR-BUSINESS-PRODUCTS/PHARMA/APPLICATION-RANGE/INDEX.HTML](https://www.kpluss.com/en-us/our-business-products/pharma/application-range/index.html)

[6] [HTTPS://WWW.ICL-GROUP.COM/BLOG/WHAT-IS-POTASH-THE-WHOLE-STORY/](https://www.icl-group.com/blog/what-is-potash-the-whole-story/)

Role of Potassium in Plants

Adequate plant growth of cultivated crops requires large quantities of potassium.[7] In fact, throughout growth, most crops contain more potassium than any other nutrient, including nitrogen (N). While small amounts of potassium are needed for key enzyme processes, much larger quantities are essential for regulating the plant's **water balance and movement**. Potassium also facilitates adenosine triphosphate (ATP) production during photosynthesis. It affects the formation and movement of sugars and amino acids (assimilates), as well as their polymers, such as starch and proteins, within the plant.

Because of this vital role, potassium deficiency can cause chlorosis (yellowing of leaves), which may progress to necrosis (leaf death). Potassium deficiency can also lead to slender and weak stems, making plants more prone to bending (lodging).

Adequate quantities of potassium are thus essential for a crop to achieve its **full yield potential**. Potassium also significantly influences various aspects of quality, including grain size and appearance, tuber size, oil content, dry matter and starch content, sugar percentage, fruit ripening, and overall quality.

Many of potassium's functions in plants are related to physiological conditions and response to stress. These include:

- Efficient nitrogen and water use;
- Drought tolerance;
- Frost resistance.

Adequate potassium supply and nutrition help plants overcome periods of stress.



[7] [HTTPS://WWW.PDA.ORG.UK/PDA_LEAFLETS/8-INTRODUCTION-TO-POTASH-USE/](https://www.pda.org.uk/pda_leaflets/8-introduction-to-potash-use/)

Potash Mining in the EU

Potash mining in the European Union (EU) takes place in two Member States, Germany and Spain, with a total of four mines operated by APEP's members with operations dating back to 1893 and 1969, respectively. Both countries have well-established mining laws that govern various aspects of potash mining, including permitting, inspections, monitoring, and environmental legislation. These laws ensure that the mining activities are conducted responsibly and sustainably, adhering to both EU and national environmental regulations. It is important to note that each potash mine in the EU is unique in several ways.

The mineral composition of the crude salt extracted varies between locations, with annual extraction rates ranging from less than 5 million tonnes to about 20 million tonnes. This variability influences the mining and processing methods used, the types and numbers of installations at each site, the range of final potash products for different applications, and the management practices for extractive waste and wastewater.

Outside of the EU, a potash containing ore called Polyhalite is mined by ICL UK in Boulby, the deepest mine in the United Kingdom. The Boulby potash deposits are found at depths of around 1,200 meters.

Country	Mine site	Mined minerals	Mining methods	Treatment
Spain	ICL Iberpotash	Sylvinit	Continuous cutting	Flotation
Germany	K+S Zielitz	Sylvinit	Blasting	Flotation Thermal Dissolution
Germany	K+S Neuhof	Hard Salt, Carnallitit	Blasting	Flotation ESTA
Germany	K+S Werk Werra	Hard Salt, Sylvinit, Carnallitit	Blasting	Flotation Thermal Dissolution ESTA

Source: Henry Rauche (2015): Die Kaliindustrie im 21. Jahrhundert

Food Security

Potash contributes to food security in Europe because it is vital to the proper functioning of plant physiological processes and crop production.

With the global demand for food steadily increasing, the world population expected to reach nine billion by 2050, and the loss of arable land due to desertification, affordable fertilizers – especially those rich in potassium – are crucial for sustaining crop growth and productivity. Given recent supply chain disruptions, Europe's role in ensuring a stable supply of potash is more important than ever.

To meet the growing food demand and control rising food prices, it is essential to **maintain or increase yields** on the existing arable land. Achieving this requires efficient resource use, modern farming techniques, and access to affordable inputs like fertilizers.[8]

Currently, the EU's domestic production of potash fertilizers meets its demand, meaning the EU does not need to rely on imports to ensure a sufficient supply for its food system.[9]



[8] [HTTPS://VKS-KALISALZ.DE/MEDIEN/DUENGEN-ERNTEN-UND-ERNAEHREN/](https://vks-kalisalz.de/medien/duengen-ernten-und-ernaehren/)

[9] [HTTPS://WWW.KPLUSS.COM/.DOWNLOADS/IR/2024/KPLUSS-COMPANY-PRESENTATION-MARCH-2024.PDF](https://www.kpluss.com/.downloads/ir/2024/kpluss-company-presentation-march-2024.pdf)



Environment

In potash mining, up to 30% of the crude salt extracted underground is usable; the rest consists of residues that need to be disposed of, either in liquid or solid form. These residues consist of saline waste water and solid extractive waste (mostly sodium chloride). Despite the environmental impacts associated with potash mining, such as saline water, neither the ore, the potash products, nor the waste are considered hazardous.

The treatment methods are not based on chemical reactions. The sector is subject to ambitious and stringent environmental and mining regulations, both at European (e.g., Extractive Waste Directive, Water Framework Directive) and national levels, to ensure sustainable and competitive potash mining activities.

Residue disposal methods include placing them on tailing piles, using them as backfill, discharging liquid residues or using them as flooding medium in order to secure old mine working. Most solid residues are managed through tailing piles, with backfilling and discharging also being common practices.[10]



[10] [HTTPS://WWW.KPLUSS.COM/EN-US/NEWSROOM/KS-TOPICS/POTASH-MINING-WATER-PROTECTION/](https://www.kpluss.com/en-us/newsroom/ks-topics/potash-mining-water-protection/)

Socio-economic Impact

Potash production plays a key role in supporting local economies and communities. The case studies below demonstrate how potash mining creates jobs, stimulates local businesses, and generates crucial tax revenues, driving regional growth and infrastructure development.

Hesse and Thuringia, Germany

The K+S Werra plant in Hesse and Thuringia is a cornerstone of the local economy, providing significant employment and fostering regional development.

With 4,400 employees at the plant, K+S is the region's largest employer and supports an additional 3,000 jobs through its suppliers. The company's operations benefit around 3,300 suppliers, contributing €195 million in orders to local medium-sized businesses in 2012 alone.

K+S's economic impact extends to municipal revenues, with tax benefits of approximately €80 million, which directly support local communities.

Potash mining also stabilizes the population by offering skilled jobs and training positions, with K+S providing around 300 training places annually.

The Werra plant's role as an economic hub is further underscored by its impact on infrastructure, including logistics and research facilities that attract additional businesses.



[11] [HTTPS://WWW.KPLUSS.COM/EN-US/ABOUT-KS/SITES/EUROPE/WERRA/SOCIO-ECONOMIC-STUDY/](https://www.kpluss.com/en-us/about-ks/sites/europe/werra/socio-economic-study/)

Socio-economic Impact

Bages County, Spain

ICL Iberia (Iberpotash) is a major potash producer in Catalonia, Spain, and a key economic driver in the region. The company directly employs about 1,100 people, and its operations support over 4,000 full-time positions across Spain, including through suppliers and contractors.

ICL's economic impact on Spain's GDP is substantial, contributing €111 million directly, or 0.011% of the national GDP, and an additional €146 million through its expenditures and investments. Locally, ICL is vital, accounting for 28% of employment in Suria, Balsareny, and Sallent, and 69% in the local mining and chemical industries.

The company also boosts municipal revenues, with taxes and royalties increasing by 18% between 2011 and 2013. ICL's exports represent 0.32% of Catalan exports, highlighting its broader economic contribution. Through its operations, ICL Iberia supports sustainable industrialization and job creation in the region.



[12] [HTTPS://ICL-GROUP-SUSTAINABILITY.COM/REPORTS/SPAIN/](https://icl-group-sustainability.com/reports/spain/)

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