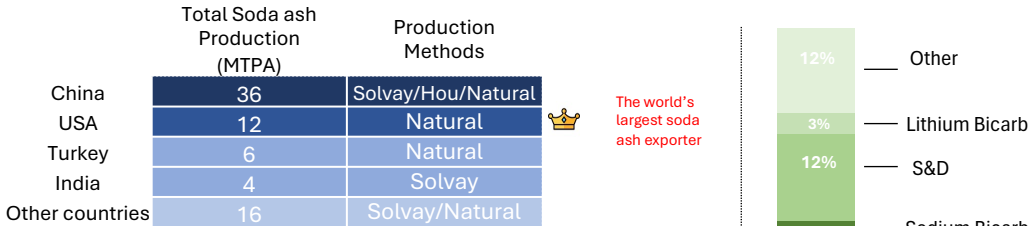


- The primary uses of soda ash are in the manufacturing of glass, soap & detergent, other kinds of chemicals, metallurgical processes, soap & detergent, pulp & paper, oil & gas and so on. The United States, Turkey and China accounted for **81%** of global soda ash production on 2024. The global soda ash market demand was estimated at approximately at around **74 million** metric ton per year.
- China, the United States** and **Turkey** accounted for **81%** of world's soda ash production in 2024.

China as the World's Top soda ash producer, but USA as the largest exporter of soda ash



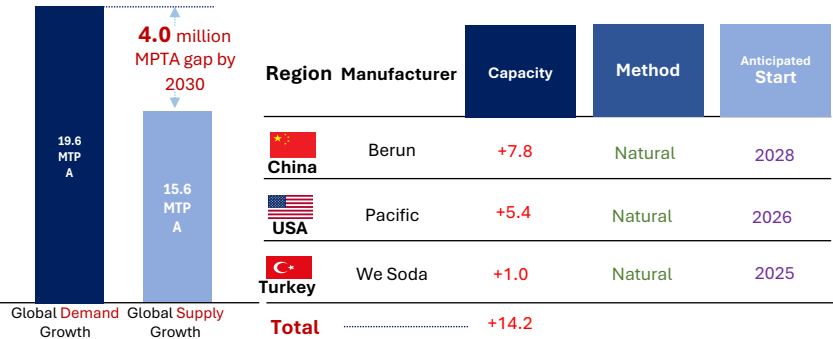
Note: other countries are UK, Kenya, European countries and so on.
Turkey is the world's second largest soda ash exporter after USA.

Future Soda Ash Supply & demand

- The global soda ash demand will have 2 million growth (approximately 3%) every year.
- According to IHS, the global soda ash demand will increase to **76 million** metric ton in 2028.
- Soda ash industry will experience **4.0 million MPTA gap** by 2030.

Supply & Demand Gap

Major Global Soda Ash Expansion 1 mil & above



Unit of Measurement: metric ton per year (MTPA) Source: Chemical Market Analytics by OPIS

Primary Methods of Soda Ash Production

- Natural method of extracting sodium carbonate from **trona ore**
- Synthetic method using the Solvay & Hou processes

Natural Soda Ash vs. Synthetic Soda ash

	Natural	Solvay	Hou
Raw Materials	Trona Ore	Salt, Limestone & Ammonia	Salt, Limestone & Carbon Dioxide
By-products	None	Calcium Chloride (Waste)	Ammonia Chloride (co-product)
Energy Usage	3-6 MMBtu/ton	9-13 MMBtu/ton	9-13 MMBtu/ton
Water Usage	1.5-2.0 ton	10-15 ton	10-15 ton
CO2 Emm.	~ 0,4	~ 1,1	~ 1,1

Byproduct as the main difference between the Solvay and Hou processes

Feature	Hou Process	Solvay Process
Main Byproduct	Ammonium chloride (NH ₄ Cl)	Calcium Chloride (CaCl ₂)
Ammonia Recovery	Ammonia is recovered and used to create ammonium chloride	Ammonia is recovered and recycled to the beginning of the process.
Final Products	Sodium carbonate is the main product, with ammonium chloride as a valuable product.	Sodium carbonate is the main product, with calcium chloride as a waste product.
Efficiency	More efficient due to the production of a saleable by product.	Less efficient due to the disposal of a waste product

Note: the **Hou process** is a modification of the Solvay process aiming to be more efficient by recovering the ammonia for reuse in ammonium chloride which can be sold as chemical fertilizer in agriculture.

The sale of **ammonium chloride** as fertilizer may be the reason for its widespread use in China. The **Hou process** may be favored in Chinese provinces with a strong demand of

ammonium chloride.

World's Natural Trona Resources

USA, Turkey, Kenya and Botswana are the primary sources of Trona ore across the world. Among them, **USA** ranks first globally in proven trona ore reserve.

At least 95 billion MT natural sodium bicarbonate deposits have been identified in the world according to the UGIG>



USA

- Natural Soda ash** is primarily from trona ores and sodium carbonate-rich brines. The Green River Basin of Wyoming is the largest deposit of trona in the world.
- 94 billion MT of soda ash is forecasted for soda ash production in USA according to the USGS.
- In addition to the Green River Basin of Wyoming, Searles lake and Owens lakes in California can contribute approx. 810 million metric tons of soda ash reserves in the country.
- There are **four** soda ash companies operating **five** plants in Wyoming and one company operating **one** plant in California.

American top four soda ash producers

We Soda	Tata Chemicals
4.3 million	2.5 million
Solvay	Searles Valley
2.6 million	1.45 million

Unit of Measurement: metric ton per year



- The four companies have a total production capacity of **13.9 mil** metric ton per year.
- After We Soda acquired Gensis Alkali in USA, it becomes the world largest soda ash producer in the world.
- Pacific Soda**: Greenfield project in Wyoming US that **Sisecam** owns 100%; 5.0m ton capacity.
- West Soda**: Greenfield project in Wyoming US that **Sisecam** owns 60% and **We Soda** owns 40%; 2.7m ton capacity by 2030.



China

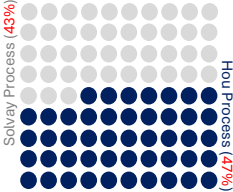
- China is the only country using three different types of soda ash processes in the world: Hou, Solvay and Natural.
- The use of Hou process is more than the use of Solvay process in China.
- In 2024, China produced approx. **36 million** MT of soda ash. Most of the Chinese soda ash are belonged to **synthetic type**.
- Inner Mongolia Berun** began to expand its production of **natural soda ash** in inner Mongolia at **5.0 million** metric ton per year in 2023. The new expansion of natural soda ash contributes to a 9% increase of all types of soda ash produced in China in 2024 compared with in 2023.
- The company expands its total capacity to **7.7 mil** mt and expects the new capacity to come on stream in 2026/2027.
- Most of the domestic soda ash plants are built close to the provinces with huge soda ash consumers except of Qinghai and Inner Mongolia.
- The advantages of Qinghai and Inner Mongolia attribute their **low costs to local coal** and **cheap local lake salt**, respectively.
- Leading soda ash exporters based in coastal regions are from Shandong, Jiangsu and Hebei.

China's top five soda ash producers

Inner Mongolia Berun	Henan Jindadi
6.7 million	5.6 million
China Salt (CNSG)	Tangshan Sanyou
4.6 million	3.5 million
	Shandong Haihua
	3.0 million

Unit of Measurement: metric ton per year (MTPA)

"Berun" is the only one natural soda ash producer in China.



The Ratio of Hou process to Solvay process in China

- The future role of China in soda ash demand will be going to primarily focus on the demand of **solar glass**. The current capacity of solar glass in China is 46 million MT per year.



Turkey

- The total capacity of soda ash production in Turkey is around 6.0 million MT per year while the annual demand of soda ash is 4.0 million MT per year. Turkey is a net exporter of soda ash.
- We Soda** has two soda ash facilities in Turkey: **ETI Soda** (2 mil MTPA) & **Kazan Soda** (3 mil MTPA).
- We Soda is the world's largest producer of natural soda ash having its plants in Turkey and USA. **Sisecam** has one soda ash facility (1.32 MTPA) in Turkey.
- Like USA, most of the Turkish manufacturers use trona minerals to produce natural soda ash and sodium bicarbonate.

Turkey's top soda ash producers

We Soda (Turkey)	Sisecam
5.0 million	1.32 million

Unit of Measurement: metric ton per year (MTPA)



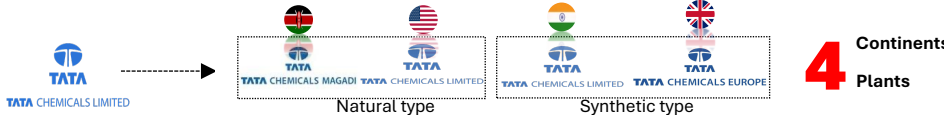
India

- The total capacity of soda ash production in India is around **5.0 mil** MPTA while the annual demand of soda ash is **4.0 mil** MPTA.
- The soap & detergent segment dominates the India's Soda ash market according to the alkali Manufacturers association of India
- GHCL is the largest soda ash producer in India, but Tata Chemicals is the world's third-largest producer of soda ash with an annual soda ash production capacity of **3.98 MTPA** with having plants in **4 different continents**.

India's top four soda ash producers

GHCL	Tata Chemicals
1.2 million	0.98 million
Nirma	RSPL
0.65 million	0.50 million

Unit of Measurement: metric ton per year (MTPA)



- Like in China, Soda ah production in India predominantly relies on synthetic methods because of the lack of the natural raw material. According to Care Edge, the production of 1MT of Soda ash requires 5MT of raw materials, leading to higher energy and raw material costs in India.



California's Trona ore



Turkish Trona ore