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Dear readers,

Welcome to the July 2021 issue of *Global Gypsum Magazine* - the world's leading print and digital gypsum resource. This issue features all of the latest gypsum sector news (Page 8), as well as Jacob Winskell's account of some of Asia's biggest wallboard producing nations: China, Iran, Russia and Vietnam (Page 18).

This issue also contains the 2021 update of our top wallboard producers series of articles (Page 10). The past 12 months have seen another set of significant changes to the industry, notably the acquisition of USG Boral by Knauf in Asia, plus the sale of USG Boral's Australian assets to Etex. This has further concentrated the capacity held by the Top 10 wallboards producers, which are now more dominant than ever. Together they share more than 12,397Mm^2/yr of capacity, 86.7% of the global total. In our July 2020 issue the figures were 11,687Mm^2/yr and 83.2%, respectively. There is also comment on the largest wallboard markets globally, as well as how these break down when we consider their relative populations, plus summaries of the Top 10 wallboard producers by installed capacity.

Those with an interest in insulation can turn to Page 27 in this issue for the *Global Insulation Section*, with the latest sector news, as well as a look at how Europress-Umwelttechnik and Cross Wrap have helped a German landfill operator deal with difficult-to-handle mineral wool wastes (Page 30).

Enjoy the issue!

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The combined *Global Gypsum & Insulation Conferences* will take place in March 2022 near Lisbon, Portugal.

Norway: Saint Gobain's Fredrikstad gypsum wallboard plant to go carbon neutral

France-based Saint-Gobain plans to upgrade its 13Mm^2/yr Fredrikstad gypsum wallboard plant in partnership with state-owned sustainable energy agency Enova. The Euro25m upgrade will expand the plant's production capacity by 40% and make it, according to the producer, the world's first carbon-neutral plasterboard plant. The plan includes electrification of the currently gas-powered drying process.

US: Eagle Materials increases sales and earnings in 2021 financial year

Eagle Materials recorded consolidated net sales of US$1.62bn in its 2021 financial year, up by 16% year-on-year from US$1.40bn. Its net earnings quadrupled to US$339m from US$70.9m. Its gypsum wallboard sales volumes increased by 6% to 265Mm^2 from 265Mm^2. The building materials producer increased its wallboard prices during the second half of the year due to improved demand outlook for single-family construction activity in the US and increasing demand for its products.

President and chief executive officer Michael Haack said "Across all measures, fiscal 2021 was extraordinary for Eagle as we met and overcame challenges that were inconceivable just a year earlier. The resilience of our business model, our financial discipline and our team's operational and strategic execution allowed us to deliver record financial results, integrate the largest acquisition in the company's history and further streamline our business portfolio by divesting several non-core businesses, all while achieving industry leading safety performance. Our strong operating cash flow enabled us to reduce leverage to under 1.5 times net debt-to-earnings before interest taxation depreciation and amortisation (EBITDA), providing us with significant liquidity and increased financial flexibility." He continued "As we begin our new fiscal year, Eagle is well-positioned, both geographically and financially, with ample raw material reserves to capitalise on the underlying demand fundamentals that are expected to support steady and sustainable construction activity growth over the near and long-term. We remain confident in Eagle's prospects for continued growth and sustainable value creation for all shareholders."

Australia: Boral rejects Seven Group Holdings takeover bid

Boral has rejected a proposed US$5.0/share takeover bid by Seven Group Holdings. The building materials producer received the bid on 10 May 2021 and then rejected it the following day, according to the Financial Review newspaper. Seven Group Holdings started buying shares in Boral in March 2020 and reached a 23% stake in the company by April 2021. Boral has continued a share buy-back programme it commenced in April 2021 as part of its response to the takeover attempt. Sources quoted by the newspaper also expect Boral to work with investment bank Jarden Australia in retaliation to Seven Group Holdings' actions.

GLOBAL GYPSUM NEWS

Canada: Canadian Gypsum Company closes part of Hagarsville plant due to coronavirus outbreak

The Canadian Gypsum Company (CGC) temporarily closed part of its wallboard plant in Hagarsville in Ontario in June 2021 due to a coronavirus outbreak amongst its employees. Around half of the 250-strong workforce at the site was sent home, according to local press. The plant's mine has also been closed. The company said it had acted "out of an abundance of caution" and it was working with local health services.

Belgium: Bernard Delvaux to be Etex's next CEO

Etex has appointed Bernard Delvaux as its chief executive officer with effect from 1 January 2022. He will succeed Paul Van Oyen when he retires at the end of 2021. Delvaux has held senior executive roles for over 30 years in large groups such as Bpost, Proximus and Sonaca. Van Oyen joined Etex in 1990 as a laboratory and project manager active in the research and development department. He became the CEO of Etex in 2015.

Ireland: Etex acquires Evolusion Innovation

Belgium-based Etex has acquired multi-disciplinary engineering consultancy Evolusion Innovation. The group says that the new subsidiary will join its New Ways division. It said that the acquisition is 'another step' in the execution of its ambition to become a global leader in offsite construction.

Evolusion Innovation develops and certifies construction materials and components and high-rise building systems. It employs 40 people at its Cork headquarters in County Cork, Ireland.

US: GMS to acquire Westside Building Material

GMS has agreed to acquire gypsum wallboard retailer Westside Building Material for US$135m. The trader operates nine sites across California and Nevada. The producer says that the company's current management will continue to lead the business.

President and chief executive officer John Turner said "The acquisition of Westside reflects the continued execution of our growth strategy and brings together two leading organisations with shared cultures and entrepreneurial values. Westside's differentiated platform provides a unique opportunity for GMS to expand our reach and capture significant growth opportunities in strategically important West Coast markets." He added "We believe that through this combination we will create new opportunities to deliver world-class service to our customers and value to our stakeholders for years to come."

New Zealand: Government to launch building materials price probe

The New Zealand Ministry of Finance plans to launch a commission to investigate high building materials prices. The New Zealand Herald newspaper has reported that finance minister Grant Robertson said that New Zealanders pay 'too much' for building materials. Robertson indicated that any probe would look into gypsum wallboard, among other building materials. Average national building materials prices are 20 – 30% higher in New Zealand than in Australia.

Kazakhstan: Zhambylgips to resume gypsum wallboard production

France-based Saint-Gobain subsidiary Zhambylgips plans to resume the production of gypsum wallboard. Kapital News has reported that the move will create jobs and lead to the development of transport infrastructure in the area, according to the company.

Saudi Arabia: National Gypsum's first-quarter sales and profit decline in 2021

National Gypsum's three-month profit in the first quarter of 2021 declined by 23% year-on-year to US$7.20m from US$9.33m in the first quarter of 2020. During the quarter it recorded a net profit of US$3.78m, down by 20% from US$4.72m.

Spain: Saint-Gobain Placo exports natural gypsum to Canada

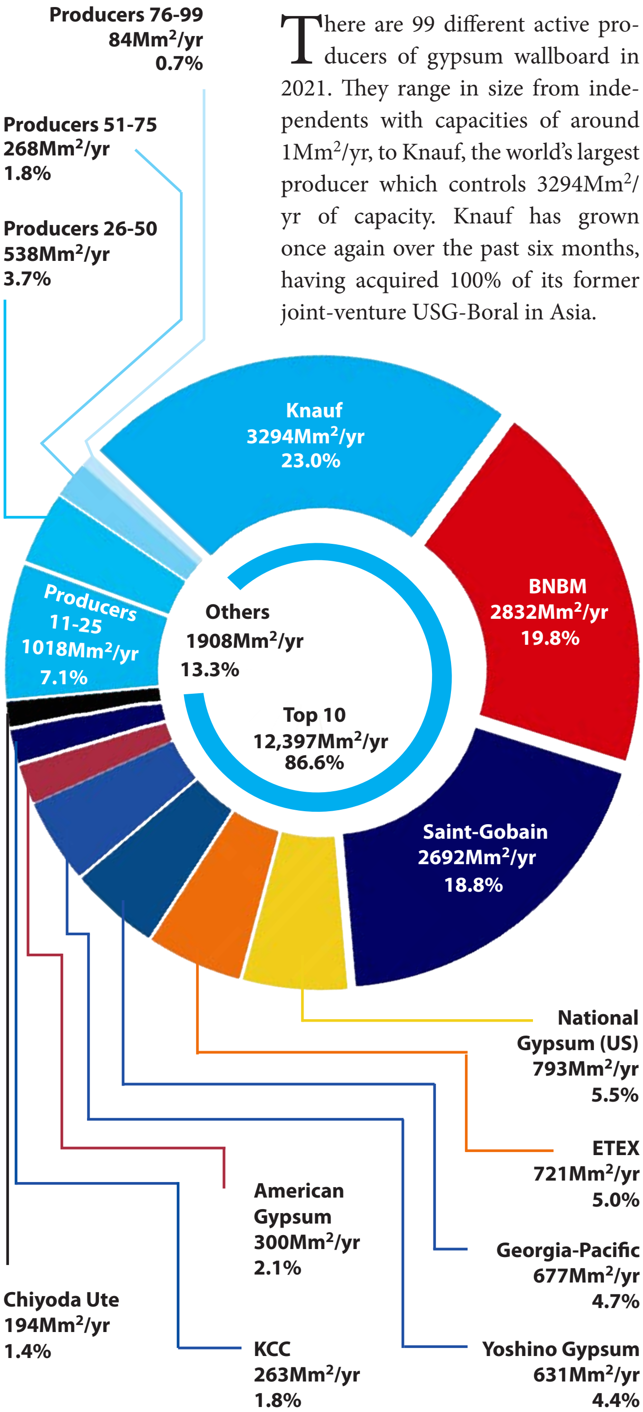
Saint-Gobain Placo has sent its first load of gypsum for 2021 to Montreal in Canada. The shipment consisted of 80,000t of natural gypsum from the company's Almería quarry. It said that it previously expanded port facilities at Almería to facilitate shipments of this kind. It added that the shipment 'consolidates the Almería-Montreal trade route,' supporting the positioning of the Port of Almería as a strategic axis in international maritime trade.

Peter Edwards, Global Gypsum Magazine

Top 10 gypsum wallboard producers in 2021

Global Gypsum looks at the gypsum wallboard sector along company and country lines using data from the *Global Gypsum Directory 2021*...

There are 99 different active producers of gypsum wallboard in 2021. They range in size from independents with capacities of around 1Mm^2/yr, to Knauf, the world's largest producer which controls 3294Mm^2/yr of capacity. Knauf has grown once again over the past six months, having acquired 100% of its former joint-venture USG-Boral in Asia.



	Producer	Capacity (Mm^2/yr)	% of global capacity	Number of plants
1	Knauf	3294	23.0	95
2	BNBM	2832	19.8	71
3	Saint-Gobain	2692	18.8	71
4	National Gypsum (US)	793	5.5	18
5	ETEX Group	721	5.0	25
6	Georgia-Pacific	677	4.7	16
7	Yoshino Gypsum	631	4.4	16
8	American Gypsum	300	2.1	4
9	KCC	263	1.8	2
10	Chiyoda Ute	194	1.4	5
11	PABCO Gypsum	147	1.0	2
12	Boral	128	0.9	5
13	Jason Plasterboard	120	0.8	3
14	Panel Rey	86	0.6	3
15	Volma Corporation	85	0.6	3
16	CSR Gyprock	80	0.6	4
17	LafargeHolcim	66	0.5	3
18	National Gypsum (S Arabia)	54	0.4	2
19	Irving Wallboard	46	0.3	1
20	Mada Gypsum	42	0.3	1
21	Gulf Gypsum Board	36	0.3	1
22	Gypsemna	34	0.2	1
23	Winstone Wallboard	34	0.2	2
24	Fassa SpA	30	0.2	1
25	Magma Mordovcement	30	0.2	1
Total: Top 25 Producers		13,415	93.8	356
Total: Producers 26-50		538	3.8	29
Total: Producers 51-75		268	1.9	25
Total: Producers 76-99		84	0.7	24
TOTAL		14,305	100.0	434

Above Left - Figure 1: Breakdown of capacity in global gypsum wallboard industry, 2021. **Source:** *Global Gypsum Directory 2021* and *Global Gypsum* research.

Above - Table 1: Top wallboard producers by installed capacity, 2021. **Source:** *Global Gypsum Directory 2021* and *Global Gypsum* research.

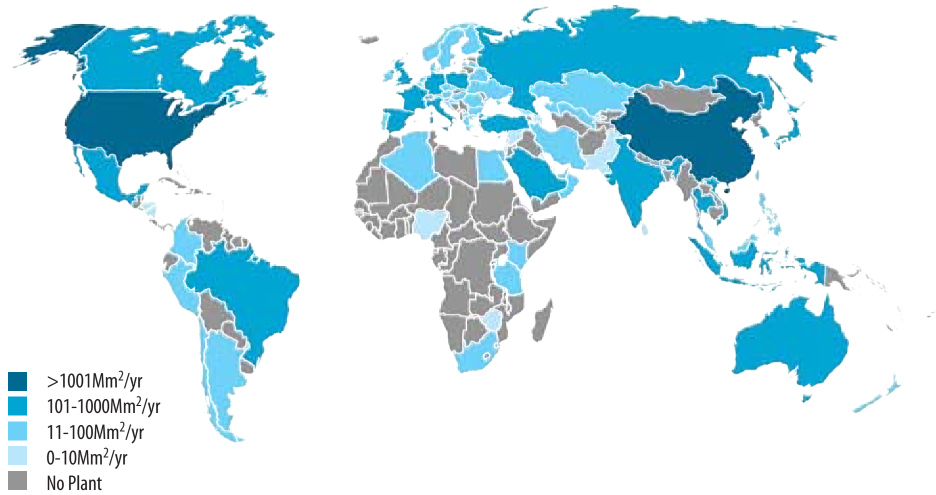
ETEX has also grown marginally year-on-year by picking up USG-Boral's assets in Australia. Due to this continued consolidation, and smaller moves elsewhere, the Top 10 wallboard producers now control 12,397Mm^2/yr of capacity, around 86.7% of the global total. The Top 25 control 13,415Mm^2/yr (93.8%).

Within the Top 25 producers, wallboard capacity is firmly in the hands of companies based in established markets (9949Mm^2/yr, 69.5% of Top 25). Those from markets where gypsum wallboard use is less prevalent control 3466Mm^2/yr (30.5%). Most of this is due to China's BNBM (2832Mm^2/yr, 21.1% of Top 25).

The largest gypsum wallboard producing country by installed capacity in 2021 is the US, which has 3632Mm^2/yr of global capacity, more than a quarter of the world's total. The only country that compares in terms of size is China, with 3205Mm^2/yr across 85 plants, the most of any nation. Combined, the US and China are home to 48% of global wallboard capacity.

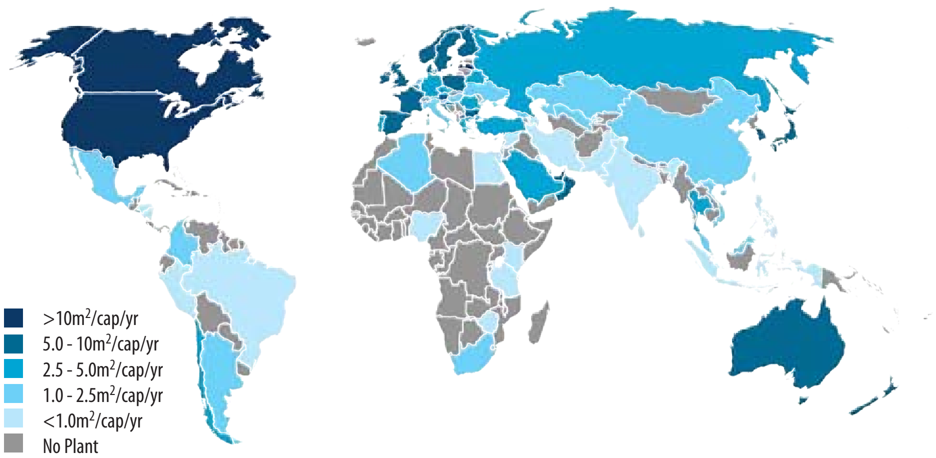
The third-largest wallboard market, Japan (775Mm^2/yr), is just a quarter of the size of China's. No other country has more than 500Mm^2/yr, although a further 18 each have more than 100Mm^2/yr. The countries in the top positions are predominantly developed markets where wallboard is a well-established building material. These include South Korea, Canada, Australia, the UK and large EU countries like France and Germany.

Also in the Top 25 wallboard producing countries are developing markets where the material has gained a foothold more recently. Many of these, including Brazil, Russia and Mexico, are notable for their large populations. When their relatively large capacities are divided by their large populations, the relative size of these industries is revealed (compare Figures 2 & 3). Developed markets in the top 25 wallboard-producing nations have a capacity/population ratio of 6.8m^2/capita/yr. The developing wallboard markets' ratio is 1.3m^2/capita/yr. Dividing the global capacity by the global population gives an average of ~1.8m^2/yr.



Above - Figure 2: Global gypsum wallboard capacity, 2021. **Source:** *Global Gypsum Directory 2021* and *Global Gypsum* research.

Below - Figure 3: Global gypsum wallboard capacity divided by population, 2021. **Source:** *Global Gypsum Directory 2021* and *Global Gypsum* research.

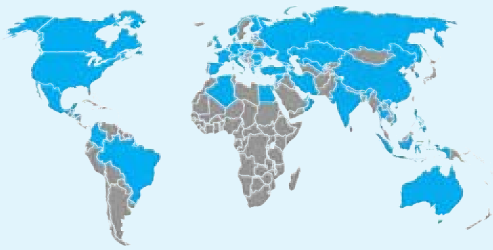


Below - Table 2: Top 10 countries by installed capacity. **Source:** *Global Gypsum Directory 2021* and *Global Gypsum* research.

	Country	Capacity (Mm^2/yr)	% of global capacity	Capacity / Population (m^2/capita/yr)	Number of Plants
1	United States	3632	25.4	11.1	63
2	China	3205	22.4	2.3	85
3	Japan	775	5.4	6.1	20
4	Russia	483	3.4	3.3	16
5	South Korea	413	2.9	8.0	6
6	United Kingdom	405	2.8	6.1	12
7	Canada	394	2.8	10.5	8
8	France	368	2.6	5.5	11
9	Germany	348	2.4	4.2	11
10	Australia	248	1.7	9.8	13
Total: Top 10 Countries		10,271	71.8	6.7	245
Total: Top 25 Countries		12,585	88.0	6.8	348
Countries 26-70		1720	12.0	1.3	86
TOTAL		**14,305**	**100.0**	**1.8**	**434**

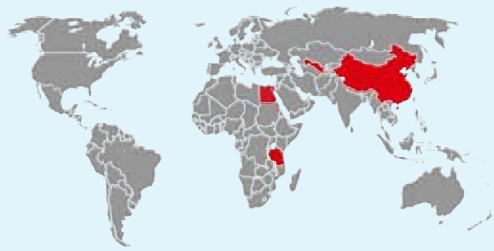
1. Knauf • 3294Mm^2/yr

Knauf, founded in 1936 in Bavaria, Germany, now operates 95 wallboard plants in 46 countries. It took over US-based USG Corporation in 2019, adding 1154Mm^2/yr of North American capacity to an already impressive list of facilities across Europe, Asia, South America and Africa. It then acquired 100% of its former joint venture USG Boral in Asia in 2021, adding an additional 359Mm^2/yr.



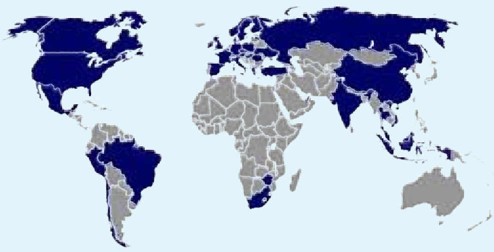
2. BNBM • 2832Mm^2/yr

Beijing New Building Materials (BNBM) is the largest wallboard manufacturer in China. It is currently branching out with a 40Mm^2/yr line coming online in Uzbekistan, a 35Mm^2/yr project in Egypt and a 3Mm^2/yr plant in Tanzania, as part of China's Belt and Road initiative.



3. Saint-Gobain • 2692Mm^2/yr

Founded in 1665, Saint-Gobain operates 71 wallboard plants in 34 countries. It increased its wallboard capacity via the acquisition of US-based Continental Building Products in 2020, adding a further 298Mm^2/yr to its US-based CertainTeed brand.

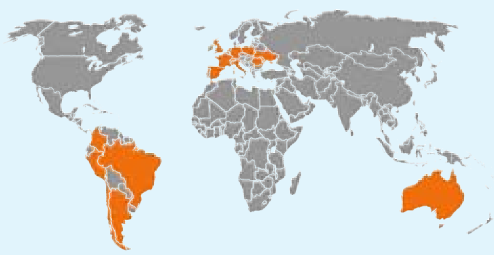


4. National Gypsum • 794Mm^2/yr

National Gypsum is a US wallboard producer based in Charlotte, North Carolina. It has been in private hands since 1995 and now operates 18 wallboard plants in 16 States across the country. It is around a third of the size of third-placed Saint-Gobain in terms of active wallboard capacity.

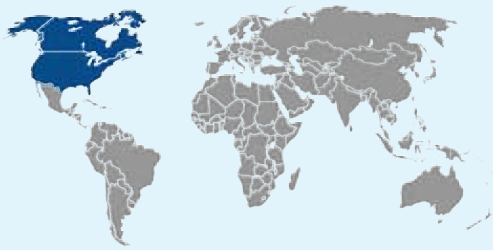
5. ETEX Group • 721Mm^2/yr

Belgium's ETEX entered the gypsum wallboard sector in 2011 via the acquisition of Lafarge's assets in Europe and South America. It has recently acquired former USG Boral assets in Australia, taking its capacity up by 87Mm^2/yr and increasing its presence in the wallboard sector to 26 plants in 15 countries.



6. Georgia-Pacific • 677Mm^2/yr

Wood products manufacturer Georgia-Pacific moved into gypsum wallboard via the acquisition of Bestwall Gypsum in 1965. It was acquired by the Koch Group in 2005 and has since expanded its portfolio to 677Mm^2/yr across 12 US States and two Canadian Provinces, most notably via the purchase of Temple-Inland in 2013.



7. Yoshino Gypsum • 631Mm^2/yr

Yoshino Gypsum was founded in 1937 and is now Japan's largest wallboard manufacturer. In 2021 it operates 581Mm^2/yr of wallboard capacity from 14 plants at home, with 50Mm^2/yr overseas capacity via two plants in Indonesia (20Mm^2/yr) and Vietnam (30Mm^2/yr).

8. American Gypsum • 300Mm^2/yr

American Gypsum is part of building materials group Eagle Materials. The company operates four wallboard plants in three US States under its light materials division, which, following delays due to the Covid-19 pandemic, is yet to be formally separated from its heavy materials division, which covers cement and concrete activities.

9. KCC • 263Mm^2/yr

KCC began life as Kumkang Korea Chemical Co. Ltd, a paint and PVC sealant manufacturer, in 1974. It has since grown to become South Korea's leading construction materials producer, with two wallboard plants and a capacity of 263Mm^2/yr.

10. Chiyoda Ute • 194Mm^2/yr

Chiyoda Ute traces its history back the establishment of roofing slate producer Chiyoda Kenzai in 1948. It established its first wallboard plant at Yokkaichi in April 1955 and added subsequent plants in the 1970-2000s. It also took over gypsum operations of Adlar Group in 1999. It has been in a formal strategic business alliance with Germany's Knauf since 2006.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Jacob Winskell, Global Gypsum Magazine

Gypsum giants of Asia

Global Gypsum widens its focus to take in the gypsum industries of four different countries from every quarter of Asia - from the verges of Europe and the Middle East to South East Asia and the Far East - namely Russia, Iran, Vietnam and China.

Millennia of migration, conquest and commerce bind Asia's 44.6Mkm^2 continental landmass. The area is home to most of the world's populace and many of its oldest civilisations. Trade has been the one constant throughout the region's history, with natural products like spice and silk, which gave their names to Asia's famous trade routes, driving development across the continent. In the 21st century, the import and export of industrial products such as gypsum wallboard does the same.

The four countries analysed here differ demographically, politically and economically (see Figure 1, below) but all participate in the global gypsum wallboard trade through their sizeable gypsum wallboard industries. We will look at gypsum supply and gypsum wallboard production in each country in turn before reviewing the common challenges for regional producers. We begin in the North, with Russia.

Russia

GDP: US$1.70tn
Population: 144m
Wallboard capacity: 483Mm^2/yr
(Per capita): 3.35m^2/yr

Iran

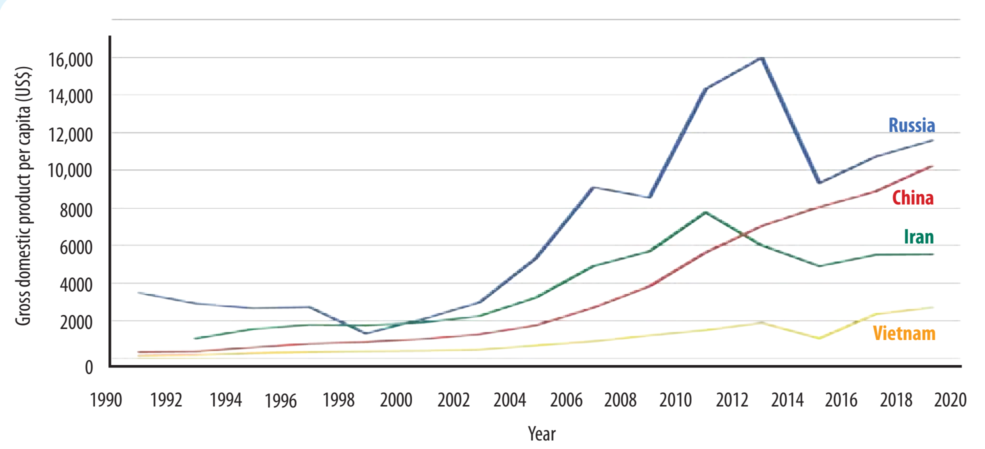
GDP: US$454bn
Population: 82.9m
Wallboard capacity: 18.0Mm^2/yr
(Per capita): 0.22m^2/yr

Vietnam

GDP: US$245bn
Population: 96.5m
Wallboard capacity: 70.0Mm^2/yr
(Per capita): 0.73m^2/yr

China

GDP: US$14.3tn
Population: 1.40bn
Wallboard capacity: 3.0Bnm^2/yr
(Per capita): 2.16m^2/yr



Right - Figure 1: GDP per capita in Russia, Iran, Vietnam and China, 1990 - 2020.

Source: *World Bank.*

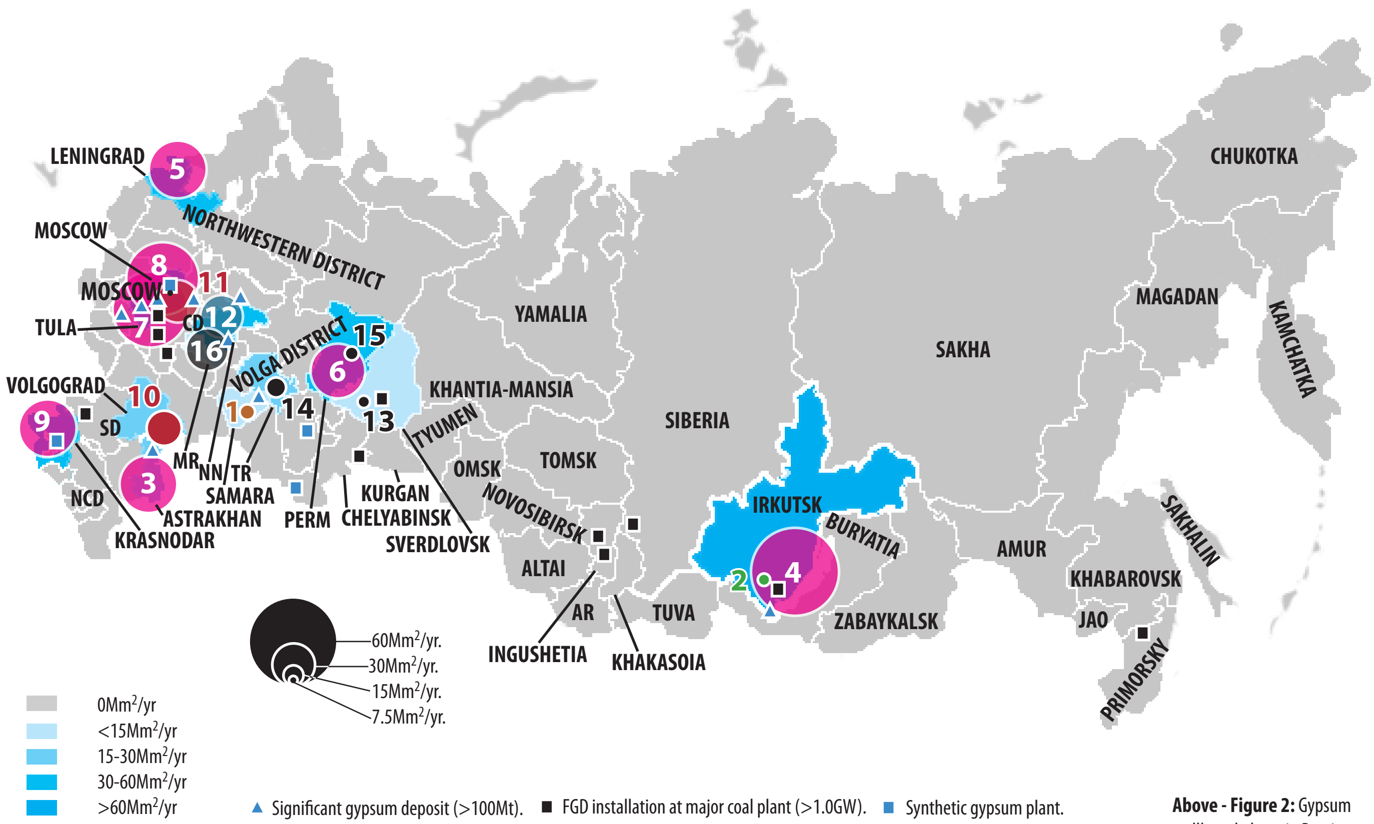
Russia

Russia modernised rapidly during the 20th century and obtained its present borders following the dissolution of the Soviet Union in 1991. Since that time, gross domestic product (GDP) has more than doubled, but the population has shrunk by 2.7%.[1] Many former agricultural and industrial areas have undergone drastic depopulation and some Soviet-era industries no longer exist. Industry still employs more than a quarter of the population. The country is 'blessed with almost every known mineral and natural resource known to man:'[2] natural gas and oil account for over a third of state revenues and the majority of exports. Among its estimated US$75.0tn natural resources fortune Russia also counts the world's largest gypsum reserves.[3]

Gypsum sources

In 2019, Russian reserves of natural gypsum totalled an estimated 3.28Bnt - more than half the global total of 7.50Bnt.[4] 28% of the reserves lie within 24 deposits currently under exploitation. The largest is the 850Mt Novomoskovsk gypsum deposit in Tula oblast. This and eight other deposits of over 100Mt account for over three quarters of Russian natural gypsum production. Figure 2 (below) maps the locations of these alongside gypsum wallboard plants.

Russian gyspum mining is open-pit and returns rock with a gypsum content of close to 90%. Extraction is very economical due to the thickness and minimal overburden of deposits. Nevertheless, exploitation of this bounty has been sporadic. In 2020, Russia's natural gypsum yield fell by 31% year-on-year to 3.8Mt from 5.5Mt.[5] The figure puts it 11th globally, behind Mexico with 5.4Mt and ahead of Saudi Arabia with 3.3Mt. From the Soviet heyday of



Golden Group:
1. Samara, Samara, 12Mm²/yr.

Angarsky Group:
2. Angarsky, Irkutsk, 5.0Mm²/yr.

Knauf:
3. Baskunchak, Astrakhan, 40Mm²/yr.
4. Irkutsk, Irkutsk, 60Mm²/yr.
5. St. Petersburg, Leningrad, 40Mm²/yr.
6. Kungur, Perm, 38Mm²/yr.
7. Novomoskovsk, Tula, 52Mm²/yr.
8. Krasnogorsk, Moscow, 50Mm²/yr.
9. Psebai, Krasnodar, 40Mm²/yr.

Volma Corporation:
10. Volgograd, Volgagrad, 25Mm²/yr.
11. Voskresenks, Moscow, 30Mm²/yr.

Saint-Gobain:
12. Gomzovo, Nizhny Novgorod, 30Mm²/yr.

GIFAS: 13. Ekaterinburg, Sverdlovsk, 5.0Mm²/yr.

Aksolit: 14. Kalinina, Tatarstan, 15Mm²/yr.

Gypsopolimer: 15. Vasilyeva, Perm, 11Mm²/yr.

MordovCement: 16. Komsomolsk, Mordovia, 30Mm²/yr.

Above - Figure 2: Gypsum wallboard plants in Russia. Circle size indicates production capacity. Regions are colour-coded by total capacity. AR - Altai Republic; CD - Central District; JAO - Jewish Autonomous Oblast; MR - Mordavian Republic; NN - Nizhny Novgorod; SD - Southern District; TR - Tatarstan Republic.

Source: *Global Gypsum Directory 2021.*

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the gypsum quarries, production collapsed to below 1.0Mt at the turn of the millennium. It grew steadily to 5.3Mt in 2014 before falling again, remaining at 4.0Mt between 2016 and 2018.

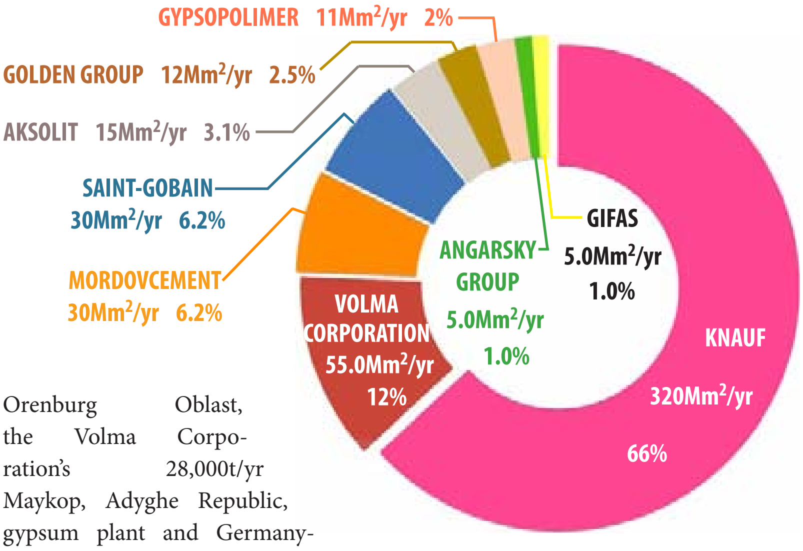
Gypsum wallboard producers in Russia have supplemented their gypsum supply with synthetic gypsum from other sources. Russia's growing coal power sector produced an estimated 100Mt of flue gas desulphurisation (FGD) gypsum across its 78 plants in 2020, mostly for use in cement production.[6] As Russia diversifies its energy supply away from oil and natural gas, FGD gypsum from the combustion of low-quality coal and lignite will become increasingly abundant and affordable. All major coal-fired power plants are shown in Figure 2.

Four gypsum plants produce synthetic gypsum by other methods. These are the 143,000t Novotroitsk Soda Plant gypsum plant in Orenburg Oblast, the Volma Corporation's 28,000t/yr Maykop, Adyghe Republic, gypsum plant and Germany-based Knauf's Karmaskaly, Bashkortostan Republic, and Krasnogorsk, Moscow Oblast, gypsum plants (See Figure 2).

Right - Table 1: Russian federal subjects by gypsum wallboard production capacity.

Source: *Global Gypsum Directory 2021.*

	Federal subject	Plants	Capacity (Mm^2/yr)
1	Moscow	2	80
2	Irkutsk	2	65
3	Tula	1	52
4	Perm	2	49
5	Astrakhan	1	40
=	Krasnodar	1	40
=	Leningrad	1	40
8	Mordovia	1	30
=	Nizhny Novgorod	1	30
10	Volgagrad	1	25
11	Tatarstan	1	15
12	Samara	1	12
13	Sverdlovsk	1	5.0
	TOTAL	16	483



Right - Figure 3: Russian gypsum wallboard producers by production capacity share.

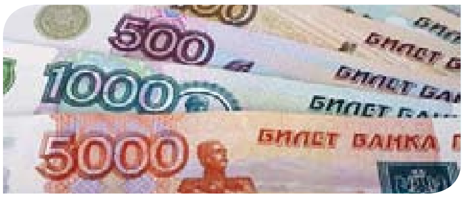
Source: *Global Gypsum Directory 2021.*

Wallboard production

Gypsum wallboard production takes place in 13 of Russia's constituent krais, oblasts and republics. Table 1 lists these federal subjects by their shares of the total 483Mm^2/yr production capacity. Figure 2 (previous page) shows each plant's location. Regionally, capacity is divided between Volga district with 136Mm^2/

Right: Kizhi Island, Karelia Republic.

Source: *Shutterstock.*



yr (28%), Central district with 132Mm^2/yr (27%), Southern district with 105Mm^2/yr (22%), Siberian district with 65.0Mm^2/yr (13%), Northwestern district with 40.0Mm^2/yr (9%) and Ural district with 5.0Mm^2/yr (1%). Thus, 13 plants with a total production capacity of 413Mm^2/yr (86%) are in Europe and three plants with a total production capacity of 70Mm^2/yr (14%) are in Asia.

Nine producers participate in Russia's gypsum wallboard industry. Figure 3 (below right) shows the production shares of each producer.

Russian gypsum wallboard production is 66% German-owned due the predominance of one company: Bavaria-based **Knauf**. The group has operated in the country since 2004, where its subsidiary Knauf Gips produces plaster, cement board, insulation and various specifications of gypsum wallboard.

The company operates seven gypsum wallboard plants with a total capacity of 320Mm^2/yr. The largest of these is the 60.0Mm^2/yr-capacity Irkutsk plant in the Siberian district of Irkutsk. Two large Knauf Gips plants serve the Central district, namely the 52.0Mm^2/yr Novomoskovsk and the 52.0Mm^2/yr Krasnogorsk gypsum wallboard plants in Tula and Moscow oblasts. The 40.0Mm^2/yr Baskunchak, Astrakhan Oblast, Kubanskij and Krasnodar Krai plants serve the Southern district while the 40.0Mm^2/yr St. Petersburg, Leningrad Oblast, plant serves the Northwestern district and the 38.0Mm^2/yr Kungur, Perm Krai serves the Volga district. In 2017, Knauf Gips upgraded its Kommunar, Leningrad, gypsum wallboard liner plant at a cost of Euro54.0m.

All other producers are Russian-owned with the exception of France-based **Saint-Gobain**. The Parisian congolmerate's subsidiary Gyproc operates the 30.0Mm^2/yr Gomzovo, Nizhny Novgorod, plant in Central district. The two other remaining largest plants are also in Central district: **Volma Corporation**'s 30Mm^2/yr Voskresensk, Moscow, plant and **Mordov Cement**'s 30Mm^2/yr Magma gypsum plant in Komsomolsk, Mordovia. Volma Corporation also owns the 25Mm^2/yr Volgograd, Volgograd, plant. Five producers operate single plants of 15Mm^2/yr-capacity or under. These are **Angarsky Group**, **Aksolit**, **GIFAS**, **Golden Group** and **Gypsopolimer**.

Right - Figure 4: Gypsum wallboard plants in Iran. Circle size indicates production capacity. Regions are colour-coded by total capacity. EA - East Azerbaijan; KG - Kuh Giluya; NK - North Khurasan; WA - West Azerbaijan.

Source: *Global Gypsum Directory 2021.*

Knauf
1. Tehran, Tehran, 11.0Mm²/yr.

Asia Malybden:
2. Yazd, Yazd, 3.0Mm²/yr.

Sadaf Gypsum Co.
3. Bastak, Hormozgan, 2.0Mm²/yr.

Matanat-A.
X. Semnan (upcoming).

Capacity:
120Mm²/yr.
60Mm²/yr.
30Mm²/yr.
15Mm²/yr.

Single gypsum mine.
Multiple gypsum mines.

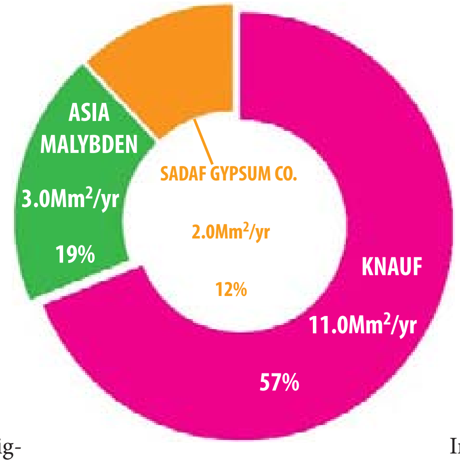
0Mm²/yr
<3.0Mm²/yr
3.0-6.0Mm²/yr
6.0-9.0Mm²/yr
>9.0Mm²/yr

Iran

Iranians have inhabited the 1.68m square kilometre triangle of land between the Gulf, Mesopotamia and the mountains of Central Asia for nine milennia. Through that time a succession of dynasties has established regional empires centred on the heartland of Iran.

Gypsum sources

Modern Iran is a true giant of natural gypsum. Its estimated 900Mt of reserves lie in 485 scattered deposits across 24 of the country's 31 provinces.[7] Fars province has the most deposits - 90, followed by Kohgiluyeh with 77. The *Global Gypsum Directory 2021* lists nine significant locations at which extraction occurs. Figure 4 (above right) shows these. In 2020, Iranian natural gypsum production was 16.0Mt, consistent with 2019 levels.[5] Figure 6 (below) plots Iran's ten-year gypsum yield alongside those of Russia and China. In 2019, it exported 4.3Mt, more than a quarter of the natural gypsum it produced. This collapsed to close to zero in 2020 following the US's imposition of sanctions on the trade of Iran's mineral and industrial commodities in May 2019. Iran has no coal-fired power plants.



Above right - Figure 5: Iranian gypsum wallboard producers by production capacity share.

Source: *Global Gypsum Directory 2021.*

Gypsum wallboard production

Three gypsum wallboard plants with a total capacity of 16.0Mm²/yr operate in Iran, according to the *Global Gypsum Directory 2021*. These are spread across three provinces: Tehran, Yazd and Hormozgan. Figure 4 shows each of the plants' locations.

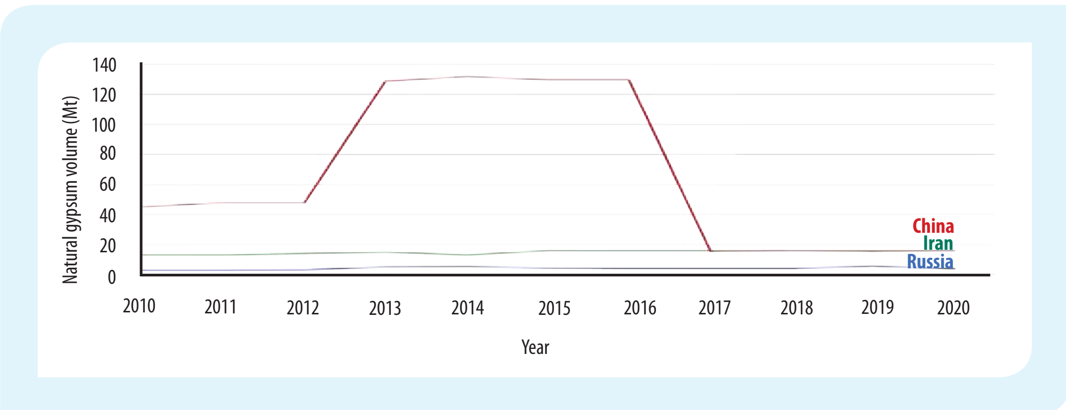
Germany-based **Knauf** subsidiary Knauf Iran's 11.0Mm²/yr Tehran gypsum wallboard plant gives the group 69% of the national capacity. The plant entered production in the 1960s and had several different owners prior to Knauf Iran, which acquired it in 1995.

Asia Malybden controls 19% of national capacity via the 3.0Mm²/yr Yazd gypsum wallboard plant in Yazd province. **Sadaf Gypsum Co.**'s 2.0Mm²/yr Sadaf, Bastak county, gypsum wallboard plant in the natural-gypsum-rich province of Hormozgan constitutes the remaining 12%. It is the country's oldest gypsum wallboard plant (established in 1962) and produces gypsum wallboard for the domestic market as well as for export to Oman and the UAE.

Azerbaijan-based **Matanat-A** was planning to establish a new gypsum wallboard plant in Semnan province, where it currently operates a gypsum quarry, in 2016. France-based **Saint-Gobain**'s Middle East trade development director Ammar Bashare previously expressed his company's interest in investing in the province in 2016.

Right - Figure 6: Natural gypsum production in China, Iran and Russia, 2010 - 2020.

Source: *USGS.*



Vietnam

Vietnam emerged from the former French colony of Indochina in 1945. In 2020, the United Nations reclassified the country's economy to transitional from developing.

Gypsum sources

Vietnam's sole significant natural gypsum reserve, in Kien Giang, Mekong River Delta region, only supplies cement producers. For its natural gypsum, the gypsum wallboard sector must rely on imports, which totalled 5.10Mt in 2020, down by 9% year-on-year from 5.58Mt in 2019. Oman supplied 2.49Mt (49%) of imports. Other sources were Thailand, China and Laos.

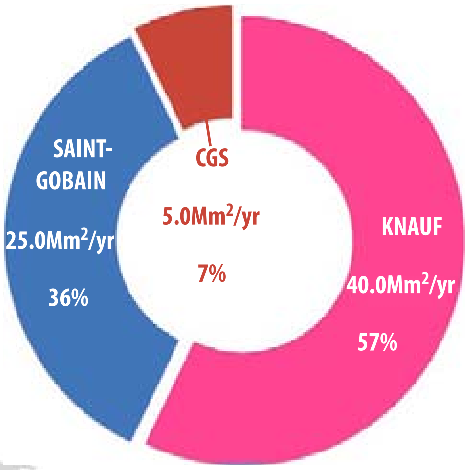
Phosphogypsum is sometimes used in cement production but has yet to enter gypsum wallboard production. Rather, the sector relies primarily on FGD gypsum, of which there is a reliable long-term supply from Vietnam's growing coal sector. It installed its first FGD system at a coal-fired power plant in 2003 and produced 74.0Mt in 2020, up by 18% year-on-year from 62.5Mt in 2019.

Wallboard production

Five gypsum wallboard plants give Vietnam a total gypsum wallboard production capacity of 70.0Mm^2/yr. Figure 7 (above right) maps plants' locations. Figure 8 (top right) divides production capacity by producer.

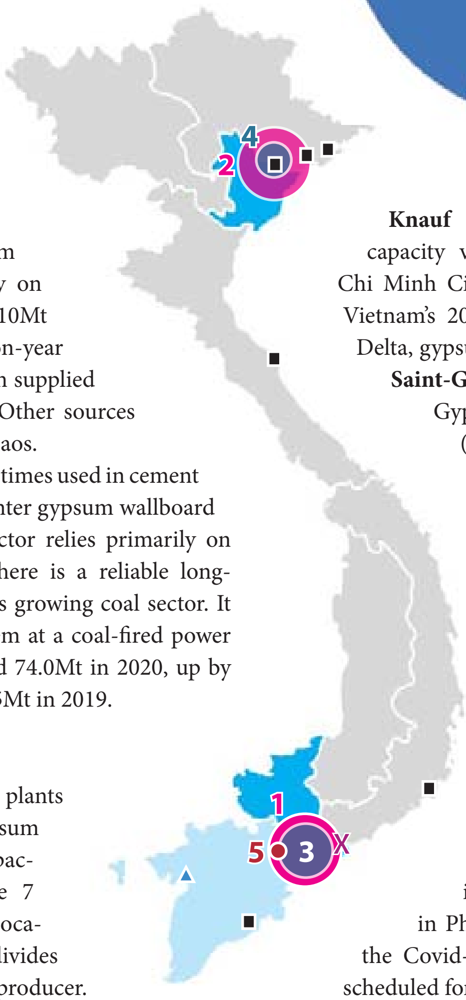
Knauf controls 40.0Mm^2/yr (57%) of capacity via USG Boral's 20.0Mm^2/yr Ho Chi Minh City, South East region, and Knauf Vietnam's 20.0Mm^2/yr Hai Phong, Red River Delta, gypsum wallboard plants. France-based **Saint-Gobain**'s subsidiary Saint-Gobain Gyproc's two plants total 25Mm^2/yr (36%) in capacity and are also located in the South East and Red River Delta regions. These are its 15.0Mm^2/yr Ho Chi Minh City plant and 10.0Mm^2/yr Hai Phong plant. In 2020, Saint-Gobain reported year-on-year sales growth from 2019 levels in Vietnam. Lastly, **CGS** operates the 5.0Mm^2/yr (7%) Huu Tanh gypsum wallboard plant in Mekong River Delta.

Japan-based **Yoshino Gypsum** is building a US$50m gypsum plant in Phu My, South East region. Prior to the Covid-19 outbreak, the plant had been scheduled for 2020 commissioning.



Left - Figure 8: Gypsum wallboard producers by share of Vietnamese capacity.

Source: *Global Gypsum Directory 2021.*



Left - Figure 7: Gypsum wallboard plants in Vietnam. Circle size indicates production capacity. Regions are colour coded by capacity.
Source: *Global Gypsum Directory 2021.*

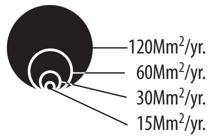
Knauf
1. Ho Chi Minh City, South East region, 20.0Mm^2/yr.
2. Hai Phong, Red River Delta, 20.0Mt/yr.

Saint-Gobain:
3. Ho Chi Minh City, South East region, 15.0Mm^2/yr.
4. Hai Phong, Red River Delta, 10.0Mt/yr.

CGS
5. Huu Tanh, Mekong River Delta, 5.0Mm^2/yr.

Yoshino Gypsum
X. Phu My, South East region.

Capacity:



▲ Gypsum mine.
■ Flue gas desulphurisation installation at major coal-fired power plant (>1.0GW).

Left: Hai Phong, Red River Delta.

Source: *Shutterstock.*

China

Chinese recorded history goes back over 3000 years to the Shang dynasty, which arose in the Yellow River valley. The nation's 1.40bn-strong population - up by less than 1% year-on-year from 1.39bn - is larger than that of any continent outside of Asia. China's governing Chinese Communist Party (CCP) describes the country as a socialist consultative democracy. Its partly privately owned economy includes the world's largest manufacturing sector. In July 2021, its gypsum wallboard production capacity is 3Bnm^2/yr.

Gypsum sources

China's own mining and energy sectors supply its gypsum wallboard industry's raw material needs.

National natural gypsum production was 16.0Mt in 2020, up by 3% year-on-year from 15.5Mt in 2019.[5] The immense fluctuation year-to-year is made possible by the central organisation of management of China's mineral resources.

China, however, has half the gypsum reserves of Iran and less than a sixth those of Russia. The 16.0Mt of natural gypsum that it extracted in 2020 corresponds to 4% of its 450Mt reserves.[5] At this rate, these reserves' productive life will end in 2048.

Despite a CCP pledge to achieve national net carbon neutrality by 2060, China's total coal power capacity grew by 3% year-on-year to 1040GW in 2020.[8]

Gypsum wallboard production

84 gypsum wallboard plants are spread across 27 of China's 33 provinces. Shandong has the most with 19 plants, followed by Anhui with seven and Jiangsu with six. Hebei, Hubei and Liaoning each has five.

The leading gypsum wallboard producer in China is **China National Building Material** via its subsidiary BNBM Group. Other major companies are **Saint-Gobain**, which plans to open 10 new plants by 2026. Regional chief executive officer Javier Gimeno said "China has recovered from the Covid-19 pandemic in an exceptional manner." He added "Our business growth in China is linked with the development of the Chinese society and the growth of China's middle-income earners." **Knauf** expanded its gypsum wallboard footprint through its acquisition of 100% of USG Boral in April 2021. **Millennium Boat Group** and **Shandong Linyi Jinyuan Building Materials** both include gypsum wallboard in their broad product range.

Conclusion

In Asia, the on-going Covid-19 outbreak reduced gypsum wallboard demand and delayed new plant plans. Whether the continent's gypsum giants can return to growth will depend on the future trajectory of the pandemic. As soon as demand picks up, the gypsum industries examined here will all be ready to meet it.

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Right: Xinjian province, China.

Source: *Shutterstock.*

Denmark: Rockwool boosts sales, earnings and profit in first quarter of 2021

Rockwool recorded consolidated net sales of Euro671m in the first quarter of 2021, up by 3% year-on-year from Euro649m in the same period of 2020. Its earnings before interest, taxation, depreciation and amortisation (EBITDA) rose by 11% to Euro139m from Euro125m, while net profit rose by 11% to Euro68.0m from Euro61.0m. Its insulation segment's net sales were Euro498m, up by 3% from Euro483m.

The producer said that increased construction activity and strong stone wool insulation demand drove its overall sales development. It forecast strong market conditions for the full year in 2021, resulting in sales growth of 10 – 12%. It added that productivity improvements and a moderate price increase would likely offset an expected rise in input costs.

Austria: Austrotherm launches XPS insulation cut-off collection service

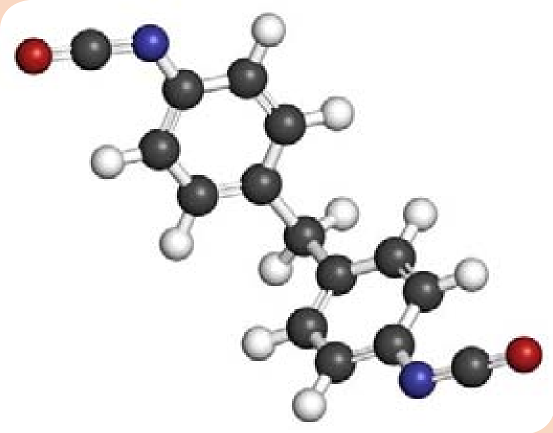
Austrotherm has launched a nationwide extruded polystyrene (XPS) insulation cut-off collection service. The service will pick up waste XPS insulation from building sites for recycling in production at Austrotherm's Purbach XPS insulation plant.

Technical director Heimo Pascher said "Our XPS sheets are ideal for recycling and can be fed back into the production process - this enables us to reduce CO_2 emissions and the consumption of resources in production. We are taking an important step in the direction of the circular economy." He added "We have carefully analysed the savings effect. By recycling we reduce the CO_2 emissions in the disposal of construction site waste by at least 50%. With every tonne of XPS which we recycle, 1.80t of CO_2 can be saved. Or, to put it more impressively, every tonne of XPS that we recycle from construction sites saves as much CO_2 as the amount that 148 European beech trees sequester in a year."

France: New plant at Soissons

Denmark-based Rockwool plans to begin building a new stone wool insulation plant at Soissons, Aisne Department in 2022. The new plant will use an 80%-reduced-CO_2 electric melting production method previously employed at Rockwool's Moss insulation plant in Norway in 2020. The company says that, when commissioned in 2024, the new plant will generate 130 jobs.

France and Southern Europe regional managing director Rafael Rodriguez said "We are pleased that our investment in Soissons will enable us to better support the government's ambitious efforts as well as the social and economic development of the local communities. With our more than 40-year history in France, this new facility is a natural next step for us in a market that continues growing in importance."



US: Dow plans new methylene diphenyl diisocyanate plant at Freeport chemicals plant

Dow plans to establish a methylene diphenyl diisocyanate (MDI) plant at its Freeport chemicals plant in Texas. The Houston Business Journal newspaper has reported that the new plant will have 30% more production capacity than Dow's current North American MDI plant, the La Porte MDI plant, also in Texas. When it commissions the new plant in 2023, the company plans to shut the La Porte plant, along with all its polyurethane (PUR) assets.

Industrial intermediates and infrastructure operating segment president Jane Palmieri said "This MDI investment optimises our existing asset infrastructure and enhances our global PUR leadership position, further enabling us to support downstream systems customers' growth." She continued "The back integration at the Freeport site creates a cost-competitive supply of key upstream polyurethane raw materials, ensures a reliable supply position to support our growth in downstream high-value polyurethane markets and delivers a more sustainable production process."

Malaysia: Knauf Insulation ships first batch from Johor Bahru mineral wool insulation plant

Knauf Insulation's Johor Bahru mineral wool insulation plant has successfully exported its first batch of 80% recycled glass Earthwool mineral wool insulation to Perth, Australia. The product uses Knauf Insulation's ECOSE Technology biological binder and is equipped with new improved clean facing. The company says that it uses compression packaging to optimise shipping volumes.

Chief operating officer David Ducarme said "Johor Bahru is an extraordinary achievement of commitment from Knauf Insulation colleagues from around the world who came together to work with local teams in unprecedented pandemic circumstances - setting a gold standard in safety - to ensure the highest quality solutions are now available to customers."

The Johor Bahru glass mineral wool insulation plant has a production capacity of 75,000t/yr and was originally scheduled for completion in 2020. It had an investment of Euro120m. It was built to export insulation products to markets in Japan, Australia, Korea, New Zealand and Singapore.

Romania: Saint-Gobain acquires Duraziv in Romania

France-based Saint-Gobain has acquired Duraziv, a producer of adhesives and other construction chemicals. The group said that the purchase would allow it to expand its range of interior and exterior finishing solutions. It also hopes the move will drive an improvement in the energy efficiency of buildings in Romania thanks to external thermal insulation solutions (ETICS) based on locally-produced stone wool and mortars. This latest addition follows the recent acquisition of Russia-based Adhesive Scientific and Production Company, a producer of polyurethane (PUR) and epoxy products.

Belgium: Etex plans Euro1.2m Sint-Niklaas high performance insulation plant upgrade

Etex is investing Euro1.2m on an upgrade to its Sint-Niklaas high performance insulation plant. The project is intended to increase the plant's capacity by 30% in order to benefit cold supply chain markets currently supporting vaccine transport. The company estimates that it will generate over Euro6m in sales from its 'high-performance, ultra-thin' insulation products used in both building applications and passively cooled containers for vaccine transport.

Head of Industry Steven Heytens said "Our products contribute to global energy efficiency and create sustainable value for our customers. Driven by the European Union Green Deal, we expect the demand for thin insulation solutions for building and cool logistics applications to increase strongly in the coming years. This investment fits with our growth strategy and confirms our commitment to strengthening our European position in high performance microporous insulation."

UAE: Kimmco-Isover wins Sharjah Waterfront City mineral wool insulation supply contract

France-based Saint-Gobain subsidiary Kimmco-Isover has secured a contract to supply mineral wool insulation for the Sharjah Waterfront City development. Trade Arabia News has reported that contractor High Star Contracting selected Kimmco-Isover's glass wool and stone wool insulation for their superlative acoustic performance, as well as their EPD certification.

Cross Wrap OY

A mobile solution for waste mineral wool fibre baling and wrapping

Europress-Umwelttechnik GmbH has recently supplied a CW Direct Bale Wrapper from Finland-based Cross Wrap Oy to bale and wrap waste mineral fibre to a client's landfill site in Germany.

Germany based Europress-Umwelttechnik has provided one of its clients with a unique mobile baling and wrapping unit that uses a Cross Wrap Direct Bale Wrapper to bale and wrap waste mineral fibre. The autonomous tracked mobile baling and wrapping machine is specially made to process used insulation material. Weighing in at 120t, the machine has a negative pressure / active suction system to provide low emissions and safe operations when compacting and wrapping harmful materials. It can be used to compact a variety of materials. This ingenious system replaces the old way of handling artificial mineral fibre at the customer's landfill site. Previously, the material was unloaded in the designated landfill area, covered with suitable material and then compacted by driving over it. The new mobile baling and wrapping solution has helped the compaction of the materials vastly, as the compaction is now four times more efficient than previously. The tightly-wrapped bales that are produced are 1.1m x 1.1m x 1.4m in size and weigh 1.2-1.6t.

Process description

The mobile baling and wrapping system has an automated process that starts when the bags filled with the mineral fibre are loaded into the machine's feed hopper. From there, the material goes through an airlock system into the pressing chamber of the Europress twin ram baler, which compacts the material with 210t pressing force into a cubical bale. The pressed bale is then pushed directly to the Cross Wrap Direct Bale Wrapping machine, which wraps the bale from all six sides tightly without the need for baling wire. The wrapped bale then leaves the machine through another efficient airlock onto a Cross Wrap-engineered conveyor, from where it can be safely taken to its secure end location.

The wrapped and baled material is very efficient to store on-site and it secures any harmful material inside a protective film layer. This operation benefits both the environment and operational efficiency.

Right: Mobile mineral wool baling and wrapping unit supplied by Europress-Umwelttechnik GmbH.

Above: Waste mineral wool is fed from above.

Special mobile baling and wrapping features

This mobile baling and wrapping unit has special features that are the first of their kind. These include the negative pressure / active suction system that covers the entire baling and wrapping cycle of the material. This air cleaning system has a multi-stage H14 filtration system that has a filtration separation efficiency of more than 99.995%. This system ensures that no harmful fibres are emitted into the surrounding air.

Another special feature is the machine's movable structure, which is made possible by installing it on a caterpillar-tracked chassis. This enables it to be driven across the working site to wherever the required location might be. The whole machine takes up space of 12.5m x 11.4m x 6.7m and weighs approximately 120t.

Both features make this a one-of-a-kind baling and wrapping unit and the first of its kind in Germany. The machine offers a low-emission and efficient way of handling harmful materials, and it helps to ensure efficient material transportation and safe disposal of waste.

Looking ahead

"We are happy to hear that there is a rising interest in mobile baling and wrapping solutions, that enable waste handling companies and landfills to operate more efficiently and to maximise their site and operations capacities," says Eetu Laatikainen, Sales Manager of Cross Wrap. "Although this machine is used on a specific landfill site, we see many possibilities on how to use similar machines in facilities that might need an even broader area of operation. The mobile construction of the machine supports the ease of the unit's transportation and fast operation startups. For these reasons, I see this as a good business model for many waste handling companies who want to move their operations closer to their customers, and with improved efficiency."

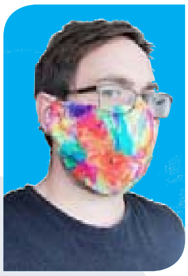
Versatile wrapping

As this mobile baling and wrapping machine has its features engineered for dusty and harmful material compaction it can also be used to compact many kinds of less harmful waste materials. The versatility comes from the use of the Cross Wrap Direct Wrapper, which can be equipped with optional wire tying to form bales out of materials that do not necessarily need the protective film layer. With this option the baling and wrapping unit can be used for different purposes.

Below: View of the wrapping step.

Are you in need of an 'emergency question?'

Peter Edwards Editor, *Global Gypsum Magazine (peter.edwards@propubs.com)*



As the world winds its way back to 'normality' following the Covid-19 pandemic, there is the prospect of increased social interaction. However, I now find myself somewhat bamboozled by the prospect of actually having full-on conversations with other people...in real life. This is especially tricky when the topics *du jour* have been covered. There's only so many times you can discuss the latest case-numbers, Covid rules and how you see the future of office working, before needing to move on to other topics.

Thankfully, I have recently rediscovered *Emergency Questions*, a book that claims to contain '1001 conversation savers for every occasion.' Leafing through, you can see what the contributors were trying to do: Stimulate random discussions with (very) unusual prompts. Many of the questions are tongue-in-cheek, some questions are plain weird and others cannot be printed here. However, many do have the potential to be quite revealing, even in a discussion with someone you know well, or require the recollection of dim and distant memories. So, in the interests of 'getting back out there,' here are some Emergency Questions... complete with my honest responses.

***Emergency Questions (EQ):* Do you have a nickname that has since been dispensed with?**

Peter Edwards (PE): Yes. On the first day of a university industrial placement, I was provided with a security pass that read 'Peter Ewards'. The fact that the missing 'd' went unnoticed for several weeks only added to the 'hilarity' when the error was finally spotted. I became 'Eee-wards' for the rest of the placement. We never found out if the real Peter Ewards ever stole my pass.

***EQ:* How long would you cope if the internet died?**

PE: If I'd just gone to bed, I would manage the night. If it was the weekend, I could get away with it for about half a day before wanting to Google something to win a minor dispute with Mrs Edwards. If it was a work day, there would be big problems. I am not a roofer.

***EQ:* What is the best thing that has ever happened on your birthday?**

PE: The *Global CemProcess Conference* - I'm not telling you which year!

***EQ:* What is the furthest you have driven in a single day? Did anything remarkable happen?**

PE: I once travelled back from a friend's wedding in the Highlands of Scotland to London, a distance of around 800km (500 miles), as one of two drivers. It would have been fine if we hadn't been driving in sideways rain for most of the journey. There was an element of racing the clock too, as I had to be up at 05:00 the following morning to catch a train to France.

***EQ:* In films snowmen always come to life. If that happened, would you be happy or freaked out?**

PE: Totally freaked out, unless it was Olaf from Frozen. He seems 'armless.

***EQ:* What is something nice and uncommercialised in your country and how would you ruin it?**

PE: Indian restaurants are renowned in the UK for being independently run and generally pretty good. It's about time someone took over loads and loads of these family-run enterprises and cynically made them really bland and indistiguishable... like Nandos.

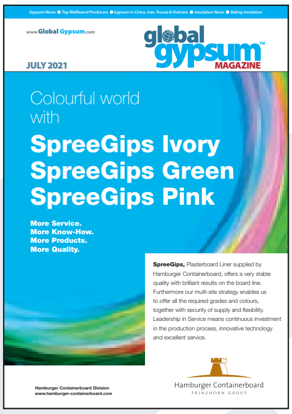
***EQ:* What is the worst movie you have ever been forced to sit through?**

PE: At university my house-mate suggested we see one of the Fast and Furious movies. It was dire and we should have left after a few minutes, but we had invested a lot of pennies in the film and, as impoverished students, we stayed until the end. Incidentally I had one of my best ever cinema experiences in the same screen shortly afterwards: The director's cut of Alien, starting at midnight.

***EQ:* What is the most embarrassing photo on display in your house?**

PR: Take your pick from an assortment of 16 small ones above my desk that were given to me by my sister as a birthday present. There's one of me in a cardboard box aged 15 months, for example.

Luckily we haven't had many visitors of late, but hopefully I will have to hide the photos soon!



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