Green Value Chains for Soft Commodities: Quantifying the Chinese Market Opportunity

BRIEFING PAPER

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Images: Getty Images, Unsplash

Contents

Executive summary

The global economy is at a pivotal moment of transformation. Extreme weather is becoming more common, threatening nature, food, water, energy, health and social stability. Bold action is needed today to restore the planet and protect our future. Various actors along the industry chain must make concerted efforts to shape high-quality, resilient and responsible value chains, moving from pledges to concrete action.

The food and fast-moving consumer goods (FMCG) industries together produce more than one-third of global emissions,[1] which mainly come from their upstream supply chains. Nearly 70% of the food industry's emissions come from land use, more specifically from agriculture and deforestation. Decarbonizing value chains in these sectors can be a game-changer for achieving the net-zero goal.

In recognition of this fact, both consumer and producer economies have made various efforts. In June 2023, the European Union Deforestation Regulation (EUDR) entered into force.[2] It is a new law that aims to prevent companies from selling commodities linked with deforestation and forest degradation in European Union (EU) markets or exporting them from the EU. Over the first half of 2023, rainforest clearance in Brazil was 34% less than last year,[3] and the least since 2019.

China, as one of the major demand markets, has a crucial role to play by collaborating with producing countries and companies along the supply chains.

Soft commodities, specifically soybean, beef, palm oil, and paper and pulp, are recognized as major drivers of global deforestation. During the Annual Meeting of the New Champions in Tianjin, China, in June 2023, the Tropical Forest Alliance established the Taskforce on Green Value Chains in China to encourage the global supply chain actors who enter the Chinese market to reduce deforestation.[4]

This briefing paper is the first publication of the taskforce. It seeks to provide business leaders with a clear picture of the macro environment they are operating in, and to provide policy-makers with a basic analysis as the starting point to better design and evaluate policies and regulations. It starts with an overview of the soybean, beef and palm oil market conditions and trends in China over the past decade, informed by their linkages to deforestation and land use conversion. Next, this paper maps out the existing challenges and strategic priorities towards a forest-positive and resilient future. This paper also offers a handy framework and case studies for businesses to implement this transition.

1 Market deep-dive: Soybean, beef, palm oil

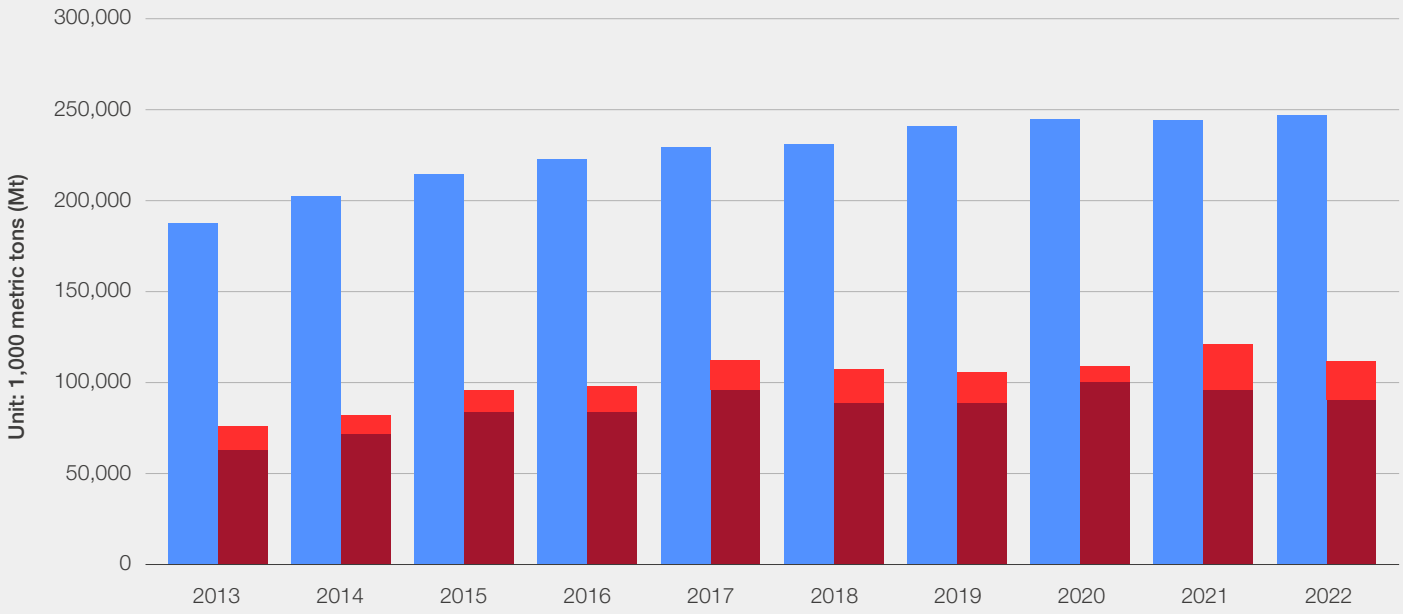
1.1 Soybean

As the largest emerging economy, China has an enormous appetite for soybean, taking up 40% of global total consumption. As Figure 1 shows, over 80% of China's soybean consumption has relied on imports over the past decade.[5] Although the output of soybean in China hit 20.28 million metric tons (MMt) in 2022 – an increase of 23.7% year-on-year – the shortfall in domestic supply remains a significant challenge in the near future.

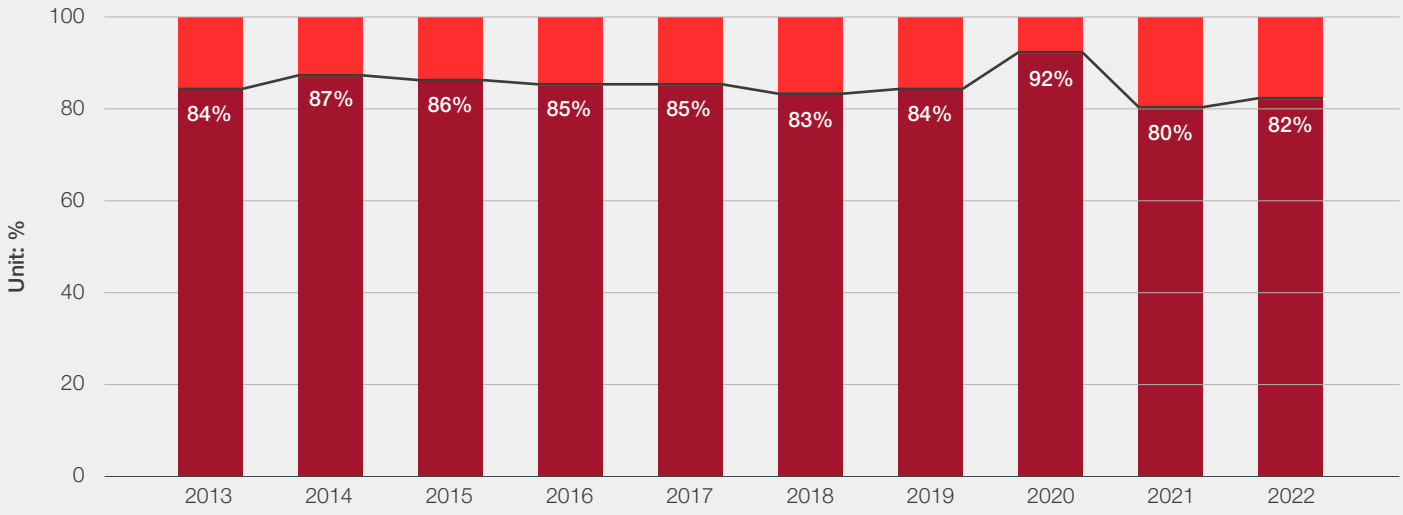
FIGURE 1 **Soybean consumption in China and the world, 2013-2022**

Soybean

Consumption



China's import share

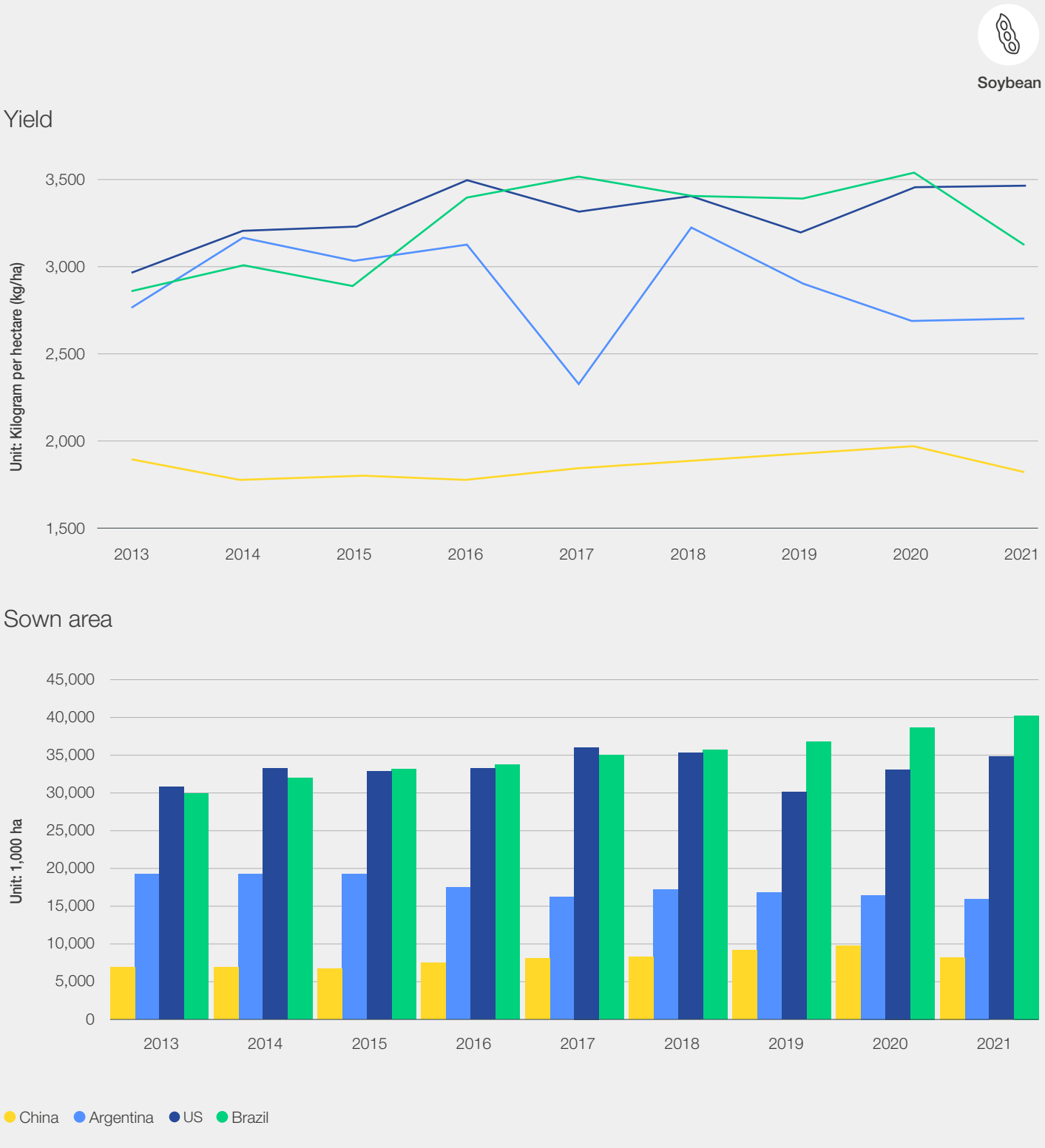


Global consumption China's local production China's imports

Sources: General Administration of Customs of China, China's Ministry of Agricultural and Rural Affairs and OECD-FAO Agri Outlook.

The reason for this heavy reliance is that soybean productivity and sown area in China are much lesser than in the United States (US) and Brazil (Figure 2).[6] China's domestic production of soybean is mainly used for human consumption due to its high protein content and the demand for non-genetically modified soybean, while imported soybean is mainly used for oilseed and animal feed for its high oil content. Thus, domestic and imported soybeans are distinguished as separate target markets.

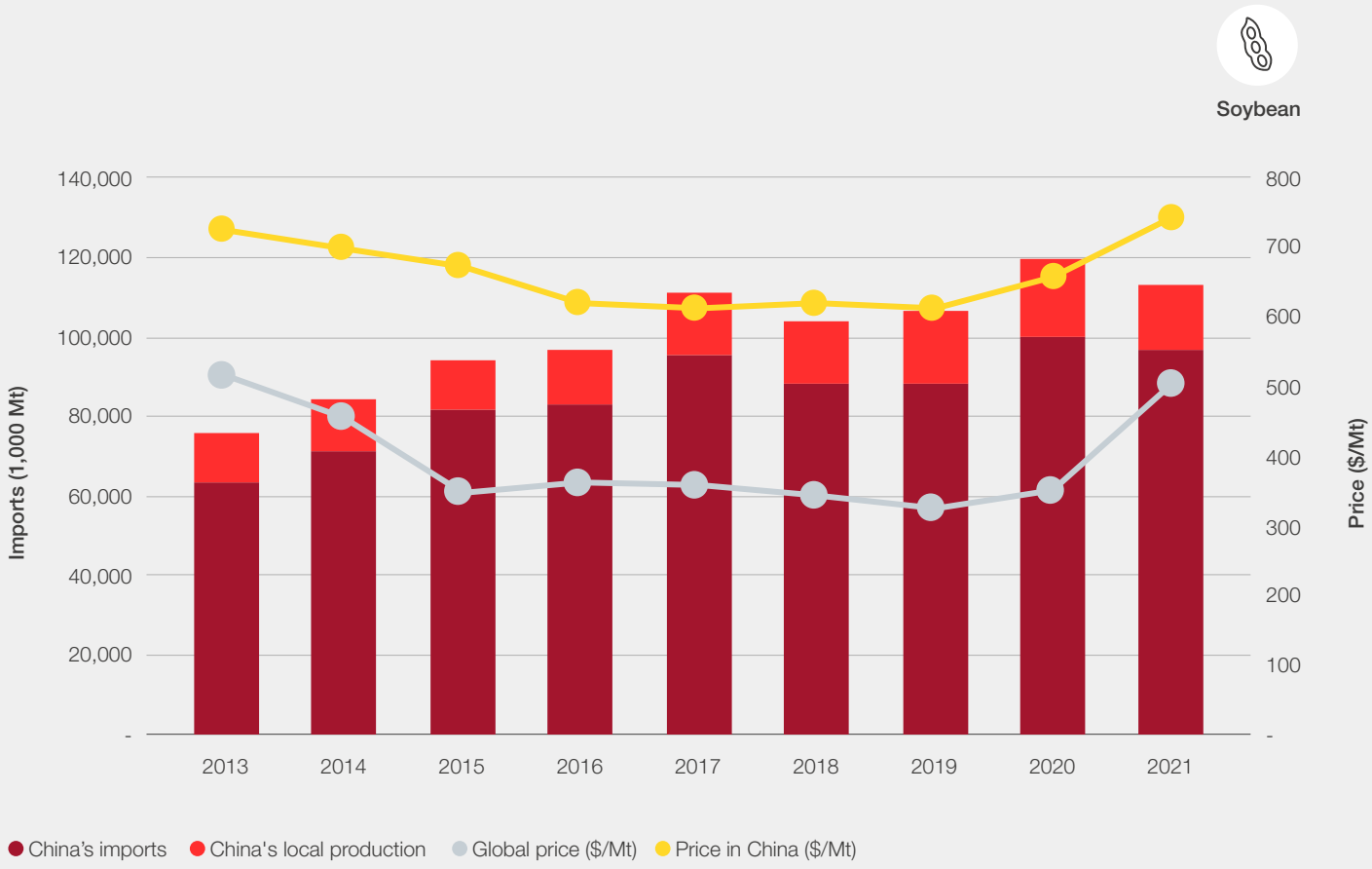
FIGURE 2 **Soybean yield and sown area, 2013-2021**



Sources: National Bureau of Statistics of China and OECD-FAO Agri Outlook.

This reflects in the price. The prices of China's domestic soybean produce have been consistently higher than international prices. (Figure 3).[7] Yet, China's immense import dependency poses a critical challenge for China: despite being the largest buyer of soybean globally, the country holds insufficient leverage in influencing its price or terms in international trade.

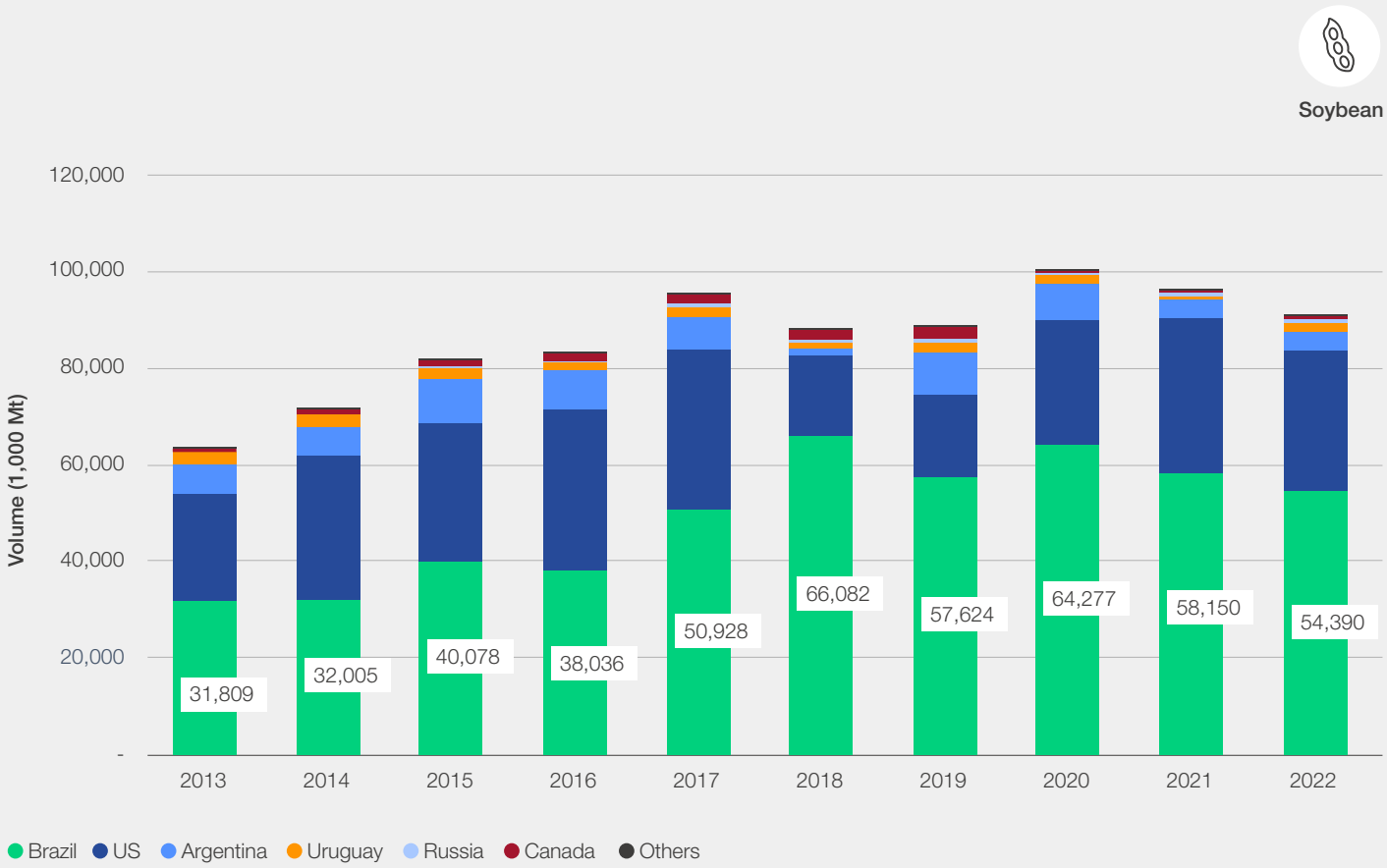
FIGURE 3 **Soybean prices and China's imports, 2013-2021**



Sources: General Administration of Customs of China, China's Ministry of Agricultural and Rural Affairs, International Monetary Fund and OECD-FAO Agri Outlook.

Since 2013, most of the soybean imported into China has come from Brazil, and the top three exporters – Brazil, US and Argentina – have made for 90% of the soybean supply to China since 2018 (Figure 4).[8] Due to the growing tensions between China and the US since 2018, China's soybean imports from the US have shrunk, further constricting China's sources of soybean import. This has exposed China's soybean supply to risks such as geopolitical uncertainties and climate-induced crop failures in these primary source countries.

FIGURE 4 **China's main soybean suppliers, 2013-2020**



Sources: General Administration of Customs of China.

For Brazil, becoming the major exporter of soybean also takes a toll.

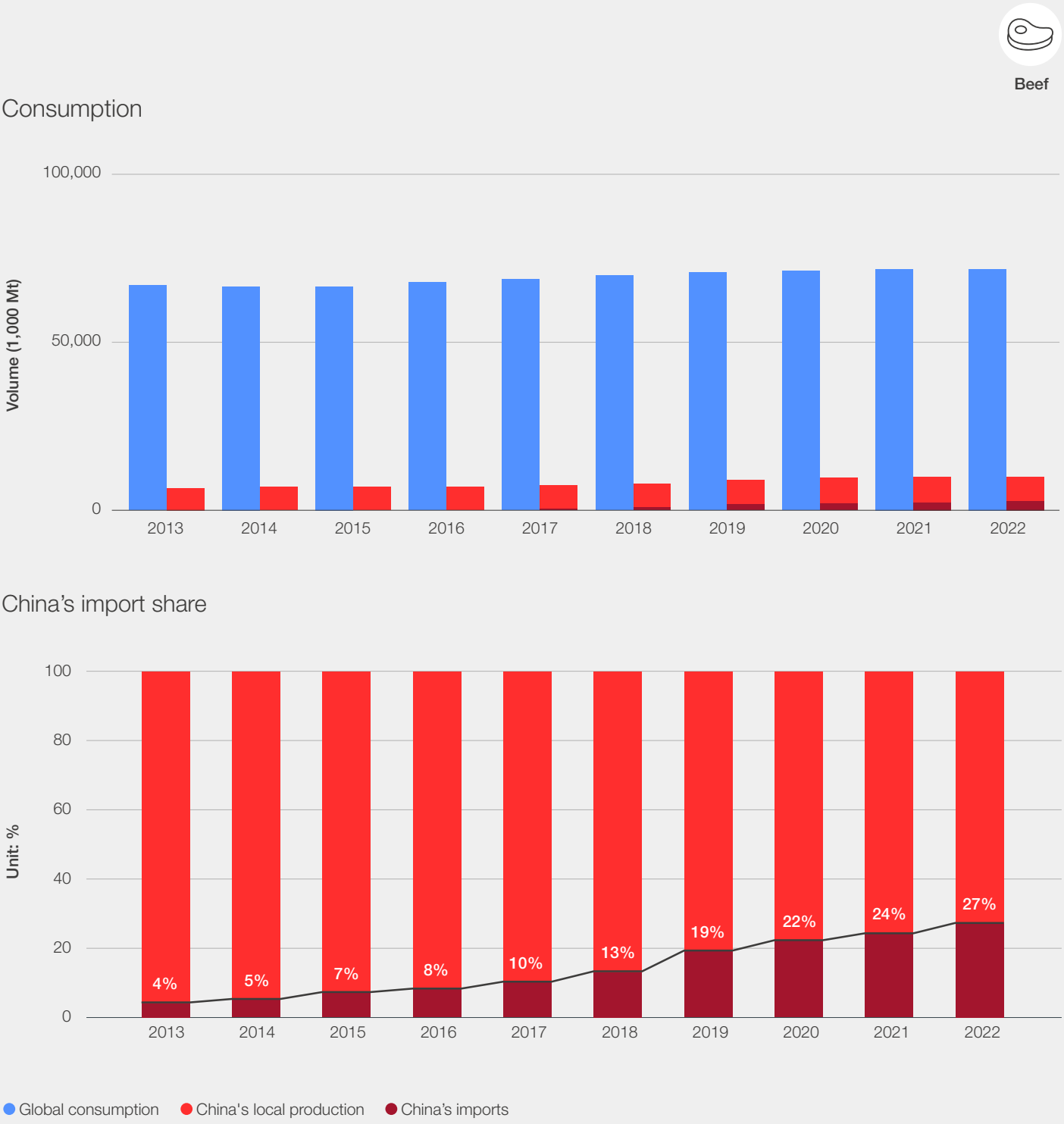
Based on the soybean yield in Brazil, to produce each ton of soybean in high deforestation risk areas, 0.32 hectares of tropical rainforest could be cut and/or converted to agricultural use. Taking the cut-off date as 31 December 2020,[9] in 2021 and 2022, 2.99 million hectares (Mha) and 3.31 Mha of tree cover was lost in Brazil, of which an average of 18% was driven by oilseeds.[10] This amounts to a total of 1.134 Mha of tree cover loss driven by oilseed production, amounting to 3.54 MMt of soybean being deforestation related.

1.2 Beef

As Figure 5 shows,[11] global beef consumption has shown a stable increase over the past decade, with China accounting for 13.6% in 2022. Home to 18% of the world's population,[12] China will see an increase in beef consumption in the near future. At the same time, the share of imported beef in China's total consumption has been on a steady rise since 2013, going from 4% in 2013 to 27% in 2022.

Compared to other meat products' self-sufficiency rate (beef at 73%, pork at 98%, poultry at 99% and lamb at 92%), China depends more on the international market for beef.

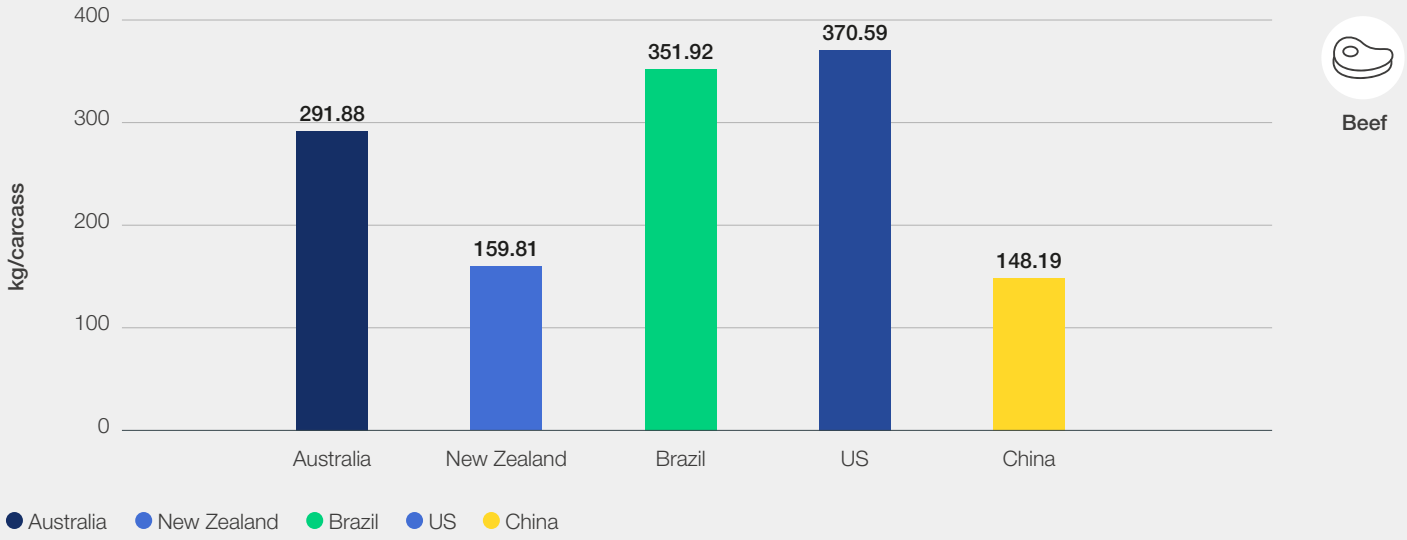
FIGURE 5 | **Beef consumption in China and the world, 2013-2022**



Sources: General Administration of Customs of China, United States Department of Agriculture and OECD-FAO Agri Outlook.

Self-supply has a close connection with domestic production. As Figure 6 shows, in 2021, the US and Brazil reported beef carcass weight more than twice that of China's.[13] This indicates that China has great potential to increase beef production efficiency through technological innovation and industrial upgrades.

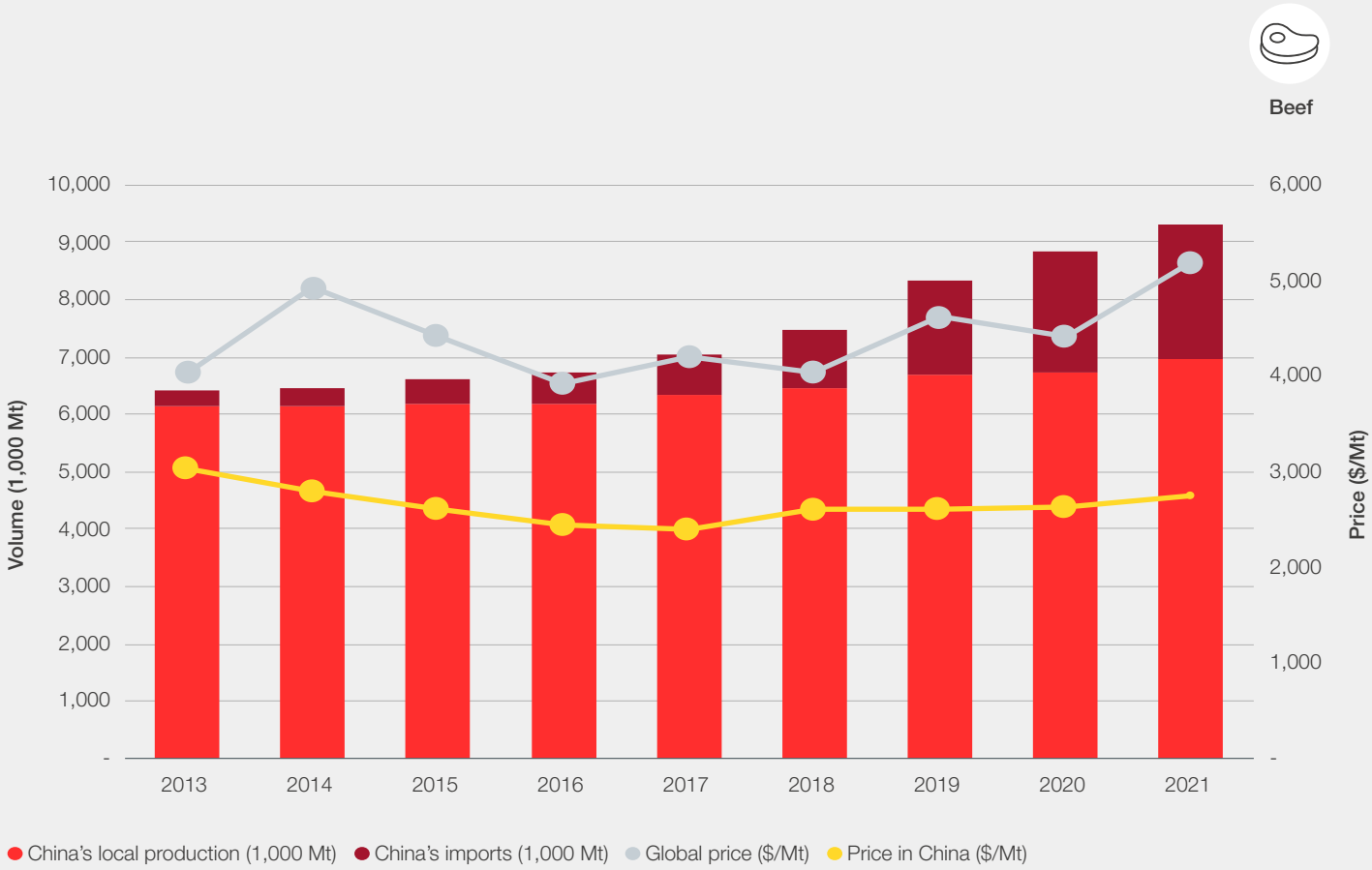
FIGURE 6 | **Beef yields, 2021**



Sources: China Agricultural Industry Outlook Report.

As for market prices, the international price has long been higher than that of Chinese domestic produce. International beef prices have witnessed a rapid increase since 2020, while the Chinese market has remained calm during this period. Despite rising prices, China's beef import volume is still growing (Figure 7).[14]

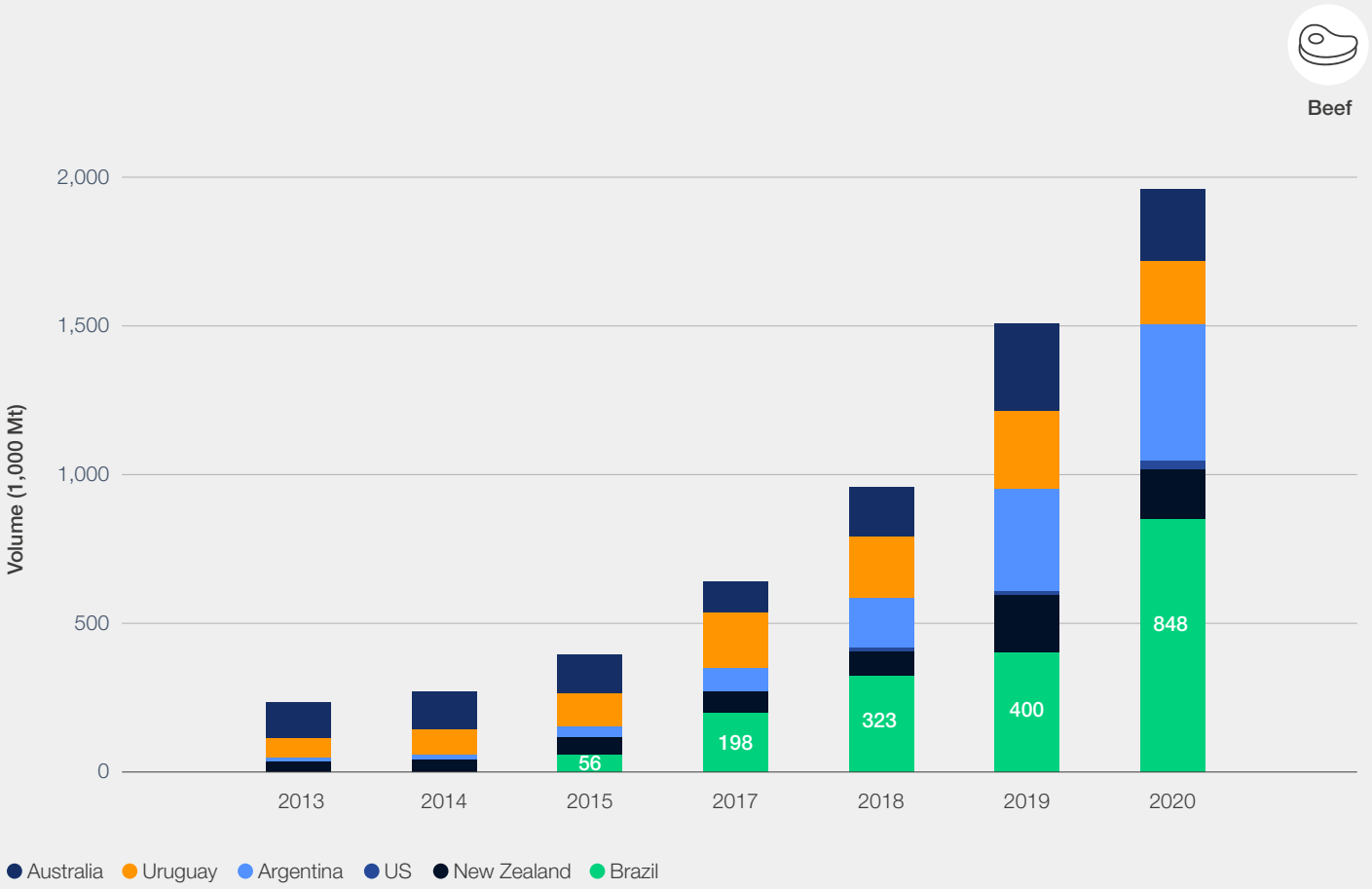
FIGURE 7 | **Beef prices and China's consumption, 2013-2021**



Sources: General Administration of Customs of China, United States Department of Agriculture, China's Ministry of Agricultural and Rural Affairs, International Monetary Fund and OECD-FAO Agri Outlook.

In 2020, imports from Brazil and Argentina together took up more than 62% of China's imports, indicating the need for diversification to strengthen supply resilience (Figure 8).[15]

FIGURE 8 **China's main beef suppliers, 2013-2020**



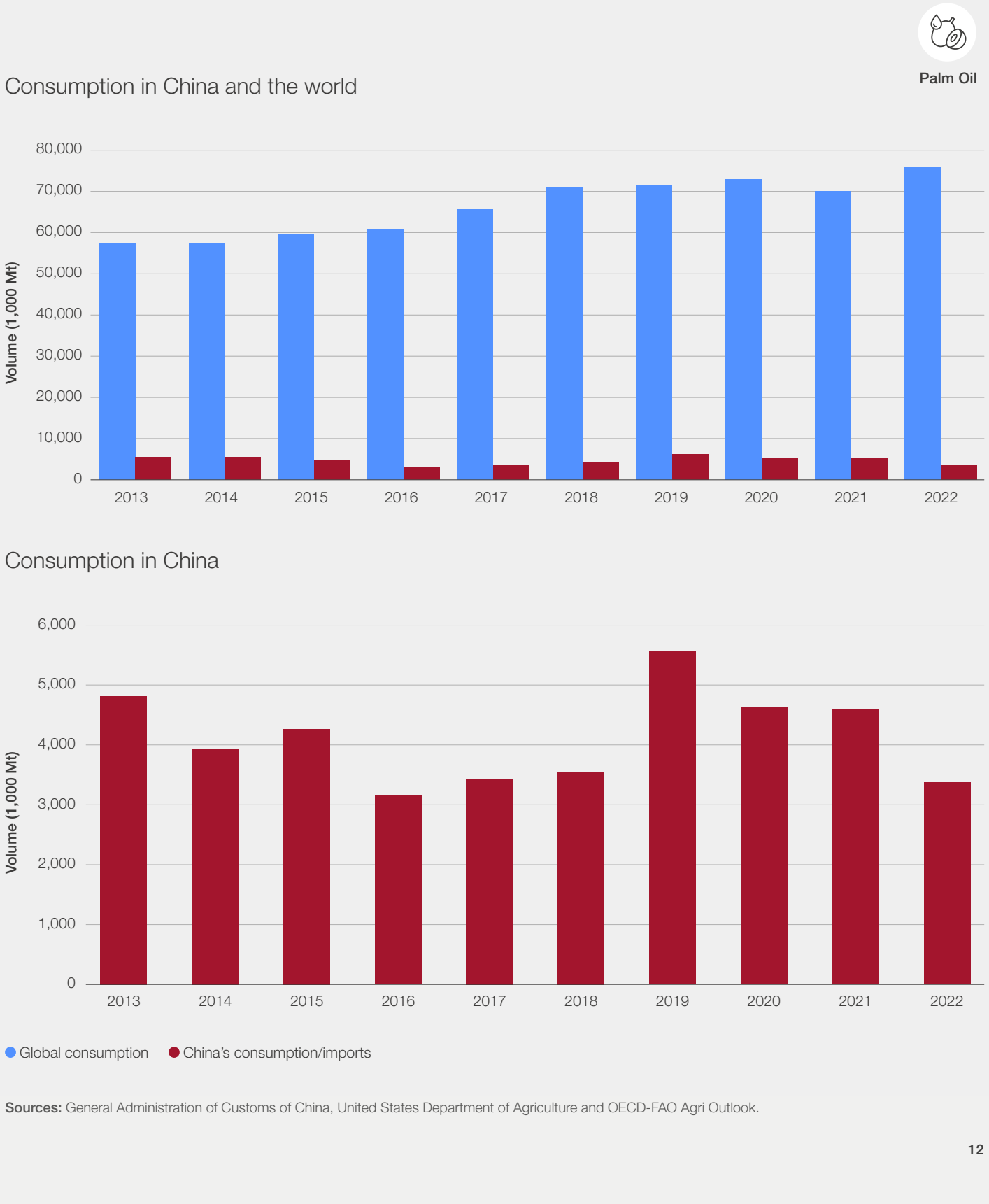
Sources: General Administration of Customs of China.

The expansion of pastureland to raise cattle was responsible for 41% of tropical deforestation – an average of 2.1 Mha every year,[16] with most of this converted land in Brazil. Based on the average beef yield of 351.92 kilogram per hectare, 0.95 MMt of beef produced per year was with high deforestation risk.

1.3 Palm oil

Global palm oil consumption has grown from 2013 to 2022, notwithstanding occasional demand fluctuations. China accounts for less than 7% of global palm oil production.[17] Yet it is worth noting that China covers almost all of its palm oil demand with imports. Indonesia and Malaysia have been China's primary suppliers of palm oil, supplying over 85% of China's total palm oil imports in 2022. Thailand, Ghana and Colombia are also active suppliers.

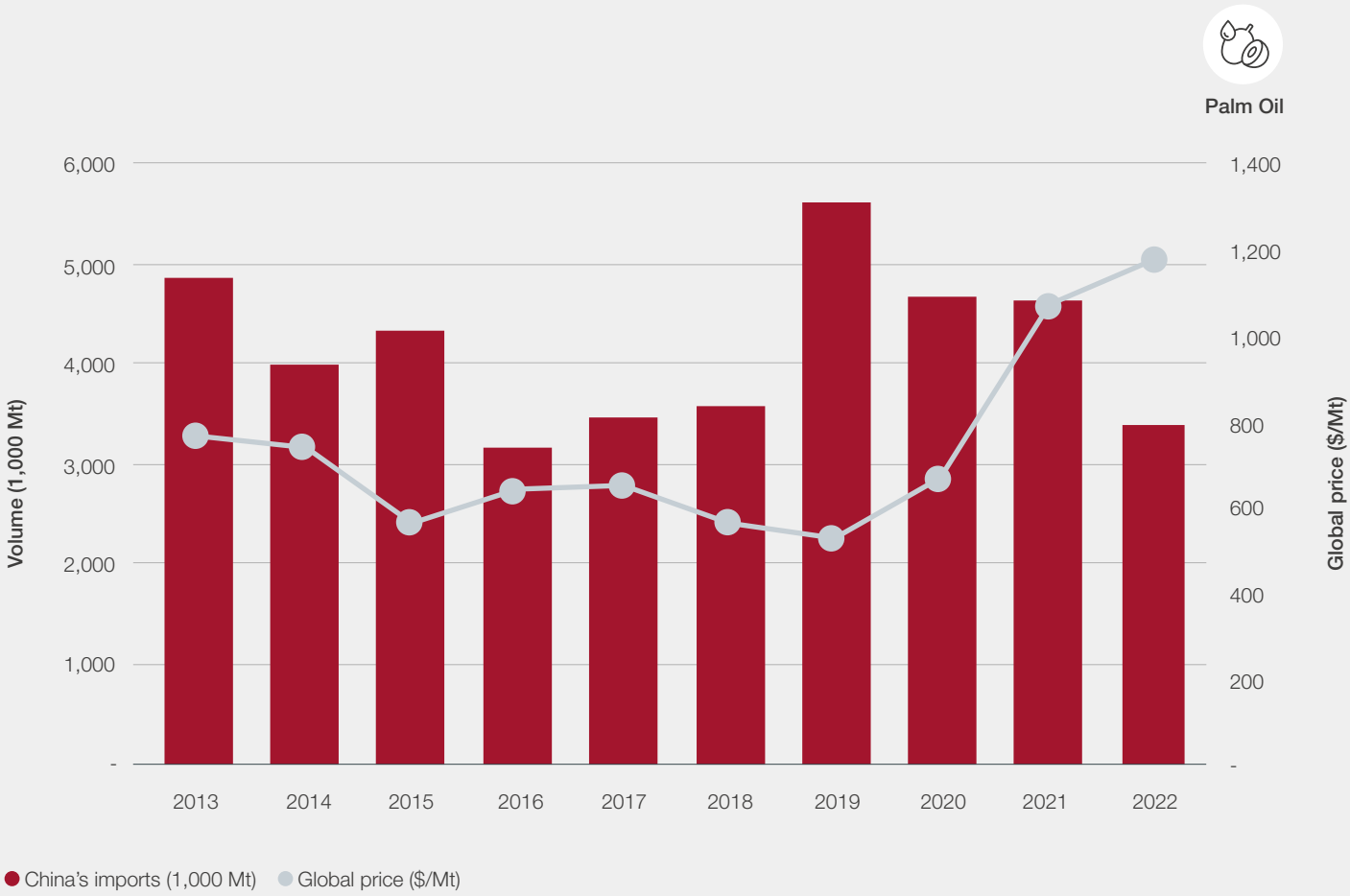
FIGURE 9 **Palm oil consumption in China and the world, 2013-2022**



Sources: General Administration of Customs of China, United States Department of Agriculture and OECD-FAO Agri Outlook.

The global market for palm oil has experienced substantial price increases since 2019, with prices escalating from $523.9/Mt to $1,177/Mt in 2022.[18] During this time, China has reduced its imports, reflecting the price-responsiveness of its imports (Figure 11).

FIGURE 10 **Palm oil prices and China's imports, 2013-2022**



Sources: General Administration of Customs of China and International Monetary Fund.

The palm oil supply chain is implicated in deforestation. Calculating from current data, to produce each ton of palm oil in high deforestation risk areas, 0.297 hectares of tropical rainforest in Indonesia could be deforested and converted to oil palm plantations.

2 The way forward: Priorities for unlocking systemic change in China

China, the largest importer of soybean and beef and the second largest importer of palm oil, is obviously a key player in the global soft commodities market. With deforestation attracting increasing attention on the global stage, it becomes imperative for China to strengthen its management of these supply chains. A multistakeholder approach for collective action is essential, as commodity-driven deforestation is a multifaceted issue that relates not only to environmental sustainability but also economic development, food security and international relations.

With expert insights from both public and private sectors, the taskforce has identified the challenges and proposes some solutions below.

2.1 Responsibility across the supply chain

Soft commodity value chains are complex, with multiple players who are difficult to trace. Traders are at a central position to engage with both upstream smallholder farmers and downstream consumer-facing companies. For soybean imports, Bunge, Cargill, COFCO International, Louis Dreyfus and Wilmar together account for over 80% of the soybean supplies that enter the Chinese market. The top 10 soybean crushing companies (including COFCO, Wilmar, Jiusan, SinoGrain, Bohai, Huifu, Cargill, Bunge, Herun and Louis Dreyfus) together account for over 80% of China's soybean crushing capacity.[19] For palm oil imports, COFCO International and Wilmar together make up over 60% of the market share.

Consumer-facing companies are not equipped with operationally and economically feasible tools for tracing up the entire supply chain. Within these companies, there is no mutually recognized mechanism for their sustainability, procurement and marketing departments to achieve the targets.

What is positive is that various organizations are developing relevant frameworks to ease the burden on businesses. For instance, the Science Based Targets Network is guiding companies in setting science-based targets for all earth systems.[20] The Accountability Framework provides a guidebook for companies to produce and source commodities while protecting forests and other natural ecosystems.[21]

Global market leaders have already made commitments and progress on reducing the deforestation risks along their supply chains, with detailed information presented below mapped using publicly available information. Chinese market leader Mengniu has also been catching up to take action.

Table 1 shows to what extent taskforce member companies had achieved deforestation and conversion free (DCF) supply chains for soy, beef, palm oil, and paper and pulp by 2022.

TABLE 1 | **Snapshot of taskforce members' progress and commitments**

Company	Deforestation and conversion free (DCF) progress (by sector)				Commitment
	Soy	Beef	Palm oil	Paper and pulp	
Bunge[22]	97.61% from Brazil verified DCF (99.86% of direct sourcing and 94.42% of indirect sourcing)	N/A	94% from suppliers with NDPE* commitments (53% verified DCF)	N/A	In 2015, Bunge promised to achieve zero deforestation and native vegetation conversion in its value chains by **2025**
Cargill[23]	96% of direct sourcing from Brazil estimated to be DCF	N/A	100% of fresh fruit originated in NDPE-compliant sources	N/A	In 2019, Cargill committed to making its agricultural supply chains free of deforestation by **2030**
Louis Dreyfus Company[24]	84% of traceable soybean from direct sourcing is non-deforestation related	N/A	98% traceability to mill level and 77% to plantation for global volumes. 0.429 MMt are ISCC and RSPO certified.	N/A	In 2022, LDC committed to eliminate deforestation and conversion of native vegetation of high conservation value for agricultural purposes from all supply chains by the end of **2025**.
L'Oréal[25]	100% of soya oil from sustainable sources and did not contribute to deforestation	N/A	Since 2012, 100% of purchases of palm oil, and palm oil and palm kernel derivatives certified as sustainable according to RSPO** criteria	100% of paper used for product leaflets and 99.9% of cardboard used for folding boxes for finished goods certified as coming from sustainably managed forests (FSC*** or PEFC**** certification)	In 2020, L'Oréal committed that 100% of the bio-based ingredients in its formulas and bio-based materials for packaging would not be linked to deforestation by **2030**
Mengniu[26]	100% of purchases by subsidiary Shengmu sourced from DCF-free planting areas	N/A	100% from Bellamy RSPO certified	82% of virgin paper for inner packaging had FSC certification	In 2023, Mengniu committed to eliminating the risk of deforestation in its supply chains by **2030**
Nestlé[27]	99.3% of soybean assessed as deforestation-free	99.9% of meat assessed as deforestation-free	95.6% of palm oil assessed as deforestation-free	99.9% of pulp and paper assessed as deforestation-free	In 2010, Nestlé committed to achieving zero deforestation in its supply chains by **2025**

Note: *NDPE: One of the most important commitments to have been made by the agricultural industry has been the "No deforestation, no peat and no exploitation" commitment; ** Roundtable on Sustainable Palm Oil; ***Forest Stewardship Council; **** Programme for the Endorsement of Forest Certification Schemes.

2.2 Consumer awareness and behaviour

According to a recent study,[28] only 20%-40% of Chinese consumers recognize that soybean, beef, palm oil and some other soft commodities are related to deforestation. Moreover, the highest green premium that most consumers could accept is less than 10%. To bring about consumer behaviour shift, it is imperative that governments develop financial incentives and subsidies, and support with consumer communication to drive a larger market for green consumption. Additionally, further research must help craft sustainable marketing strategies.

2.3 Policy, regulation and certification

A huge gap exists between China's legal infrastructure pertaining to deforestation and that of developed countries. For instance, the definition of legal and illegal deforestation is not clear. Besides, no credible certification mechanisms exist, especially for the soybean sector.

Fortunately, positive signals are emerging. Two emerging economies, China and Brazil, have committed to supporting elimination of illegal logging and deforestation worldwide. China has also laid great emphasis on green trade, which is incorporated in the country's 14th Five-Year Plan.

Recognizing the complexities and challenges ahead in halting deforestation, the public and private sectors must work collaboratively to raise the ambition and move from pledges to action. The taskforce members encourage all stakeholders in the wider ecosystem to make collective efforts to boost China's green transition and the high-quality development of global value chains.

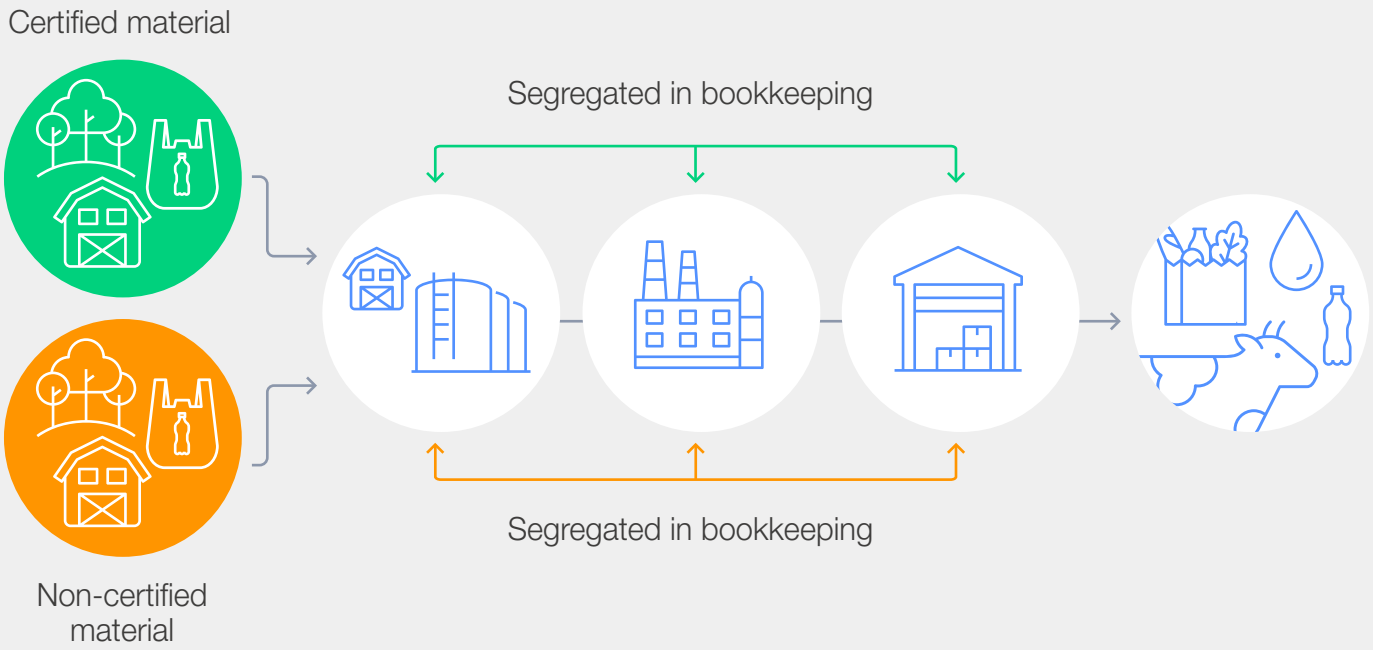
Annex

CASE STUDY 1

A mass balance chain-of-custody

- Mass balance is a chain-of-custody approach that allows tracking of the net amount of sustainable materials as they move through a system or supply chain.[29] Auditable bookkeeping ensures the appropriate allocation of these materials to finished goods.
- By recording the mass of inputs and outputs in the system, this approach ensures that a process does not produce more sustainable products than are possible with the amount of sustainable material used.
- This approach allows for sustainable and non-sustainable materials to be mixed throughout the transportation and industrial processes, yet ensures accurate measurement of the sustainable material feedstock.
- Major traders such as Bunge, Cargill and Louis Dreyfus have applied this approach to make certified sustainable commodities available to their customers.

Mass balance



CASE STUDY 2

Nestlé's supply chain monitoring system[30]

Nestlé is the top FMCG company on the Forest 500 list of companies, which ranks companies driving deforestation.[31] In 2022, over 99% of its primary supply chains for all in-scope materials including meat, pulp and paper, soy and sugar were assessed deforestation-free. It has disclosed a list of suppliers along with a variety of data to increase transparency in the agri-food sector. [32]

Since setting this target, Nestlé has started to benchmark its non-deforestation progress in each sector in three categories: traceable to low-risk origin, assessed on the ground, and assessed from the sky.[33]

- Traceable to low-risk origin: Products are traced back to regions classified as being at low risk of deforestation, using tools such as Maplecroft. Nestlé does this in collaboration with its partners (e.g. Earthworm Foundation and Proforest) or using technology platforms (such as SupplyShift).
- Assessed on the ground: On-the-ground assessments, including by High Carbon Stock Approach and High Conservation Value assessments, are carried out by partners such as Earthworm Foundation, Proforest and SGS and/or through certifications such as from the Roundtable on Responsible Soy (RTRS) and Proterra for soya, Forest Stewardship Council (FSC) and Programme for the Endorsement of Forest Certification Schemes (PEFC) for paper and Roundtable on Sustainable Palm Oil (RSPO) for palm oil. Only segregated products are accepted as deforestation-free (certified products are kept separate from others across all supply chains).
- Assessed from the sky: Production sites (farms, mills or supply areas) are monitored through satellite, after being identified through a traceability exercise along the supply chain.

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Endnotes

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