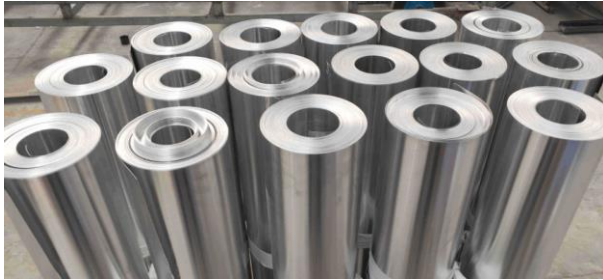


# Research on the Sustainable Development Layout of key Players(Foil, Roll, Plate)

# Research on the Sustainable Development Layout of key Players (Foil, Roll, Plate)



## OBJECTIVES

- The objective of the project is to assist clients in understanding the product layout and sustainable development strategy of China Foil, Roll and Plate Producer, and to provide professional expertise on the hot topics and industry evolution trend for client's strategy.

## PROCESS

- Methodology
  - ▶ Establish EXCEL format of the primary research per client's needs
  - ▶ Conduct primary research by SMM's network
  - ▶ Cross check the key information by various sources
  - ▶ Edit the report and provide the presentation for client of the whole project team
- Sample Size
  - ▶ FRP producers (11)
- Project Time
  - ▶ 5 weeks

## DELIVERABLES

- Excel data package regarding
  - ▶ Basic information: plant name, province, city, foundation, ownership, business scope
  - ▶ Capacity: casting, hot rolling, cold rolling, ABS, aero plate
  - ▶ Equipment: supplier, specification, speed, completion year
  - ▶ Product: product category, domestic/foreign, processing charge, extra service, payment period, Alloy specification for the price benchmark etc.,
- Strategy analysis of target players
  - ▶ Carbon emission
  - ▶ Internal team
  - ▶ CC agency
  - ▶ Carbon goal

# Excel Data Package



## China FRP Market Study

14-Jun

### 1 FRP producers' profile market study

- [1.1 FRP producer's profile - Northeast Light Alloy Co., Ltd.](#)
- [1.2 FRP producer's profile - Tianjin Zhongwang Aluminium Co., Ltd.](#)
- [1.3 FRP producer's profile - Southwest Aluminium \(Group\) Co., Ltd.](#)
- [1.4 FRP producer's profile - Henan Zhongfu High Precision Aluminium Products Co., Ltd.](#)
- [1.5 FRP producer's profile - Guangxi Investment Group](#)
- [1.6 FRP producer's profile - Arconic \(Qinhuangdao\) Aluminum Industries Co., Ltd.](#)
- [1.7 FRP producer's profile - Shandong Nanshan Aluminium Co., Ltd.](#)
- [1.8 FRP producer's profile - Shandong Weiqiao Pioneering Group., Ltd.](#)
- [1.9 FRP producer's profile - Chalco Ruimin Co., Ltd.](#)
- [1.10 FRP producer's profile - Henan Mingtai Industry Co., Ltd.](#)
- [1.11 FRP producer's profile - Baowu Aluminum Technology Co., Ltd.](#)

### 2 Aero forging machine market study

- [2.1 Aero forging machine application in targeted companies](#)

	ii	3xxx	N	formation is not needed					
	iii	5xxx	Y		0	/	formation is not needed	0	/
	iv	6xxx	N						
<b>10</b>		<b>Construction</b>							
	i	Standardized quality sheet	N						
	iii	1xxx	N	formation is not needed			formation is not needed		
	iv	3xxx	N						
	v	5xxx	N						
<b>11</b>		<b>Litho</b>							
	i	PS	N	formation is not needed			formation is not needed		
	ii	CTP	N						
<b>12</b>		<b>Foil/fin stock</b>			24	0		20	0
	i	Bare fin	N						
	ii	Welded fin (non-auto brazed)	N	formation is not needed			formation is not needed		
	iii	Foil stock	Y		0	/		0	/
<b>13</b>		<b>Other IP</b>							
			N						

2020(kt)	Export Countries	Production 2021 (kt)	Export 2021(kt)	Export Countries 2021
50	Poland, Mexico	238	205	Poland, Mexico
15	Poland, Cambodia, Mexico	120	60	Poland, Cambodia, Mexico
0	/	10	0	/
8	Poland, Mexico	25	13	Poland, Mexico
		formation is not needed		
0		24	0	

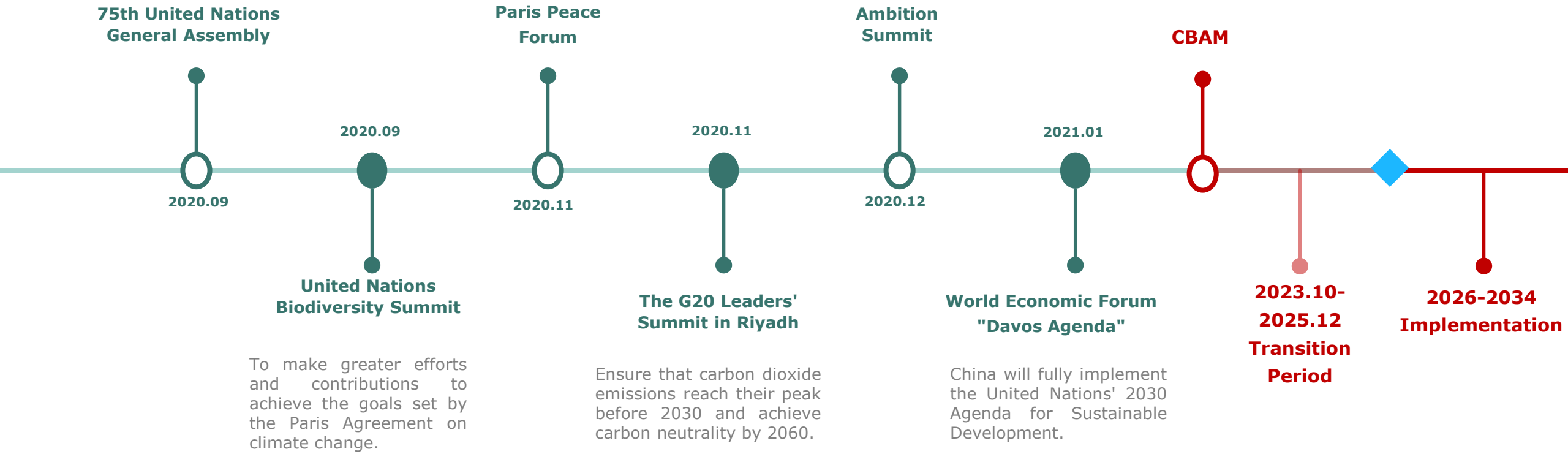
# CBAM Carbon Tariff

China will adopt more policies and measures, to peak CO<sub>2</sub> emissions before 2030 and achieve carbon neutrality before 2060.

Formally propose the 3060 carbon target. Peak carbon emissions before 2030 and achieve carbon neutrality by 2060.

By 2030, China's CO<sub>2</sub> emissions per unit of GDP will decrease by more than 65% compared to 2005. The proportion of non-fossil energy in primary energy consumption will reach about 25%, and the total installed capacity of wind and solar power generation will exceed 1.2 billion KW.

CBAM will initially cover six categories of products: steel, cement, aluminum, fertilizers, electricity and hydrogen. CBAM intends to level the playing field between EU-produced goods and imported goods by aligning their carbon prices.



# Hot Topics of Aluminum Industry

## Energy transition in aluminum smelting

Switching from a traditional energy supply dominated by thermal power to an energy structure dominated by green energy such as hydropower, solar power, and wind power.



## Relocating aluminum smelting plants to the west

The migration is from provinces with mainly thermal power resources such as Xinjiang, and Shandong to regions with relatively abundant hydropower resources such as Yunnan, Sichuan, and Qinghai.



## Increasing supply and demand of recycled aluminum

After the demand for primary aluminum supply gradually peaks, the growth rate of both supply and demand for recycled aluminum in China will exceed that of the primary market.



## Increasing low-carbon aluminum demand trend

Companies such as Tesla, Apple, and State Grid are continuously increasing their demand for low-carbon aluminum.



## Indirect cost increase caused by carbon trading

The design of carbon emission rights trading in the aluminum industry has been completed, and it is expected to enter the implementation phase in 2023-2024. This will lead to an increase in indirect costs.



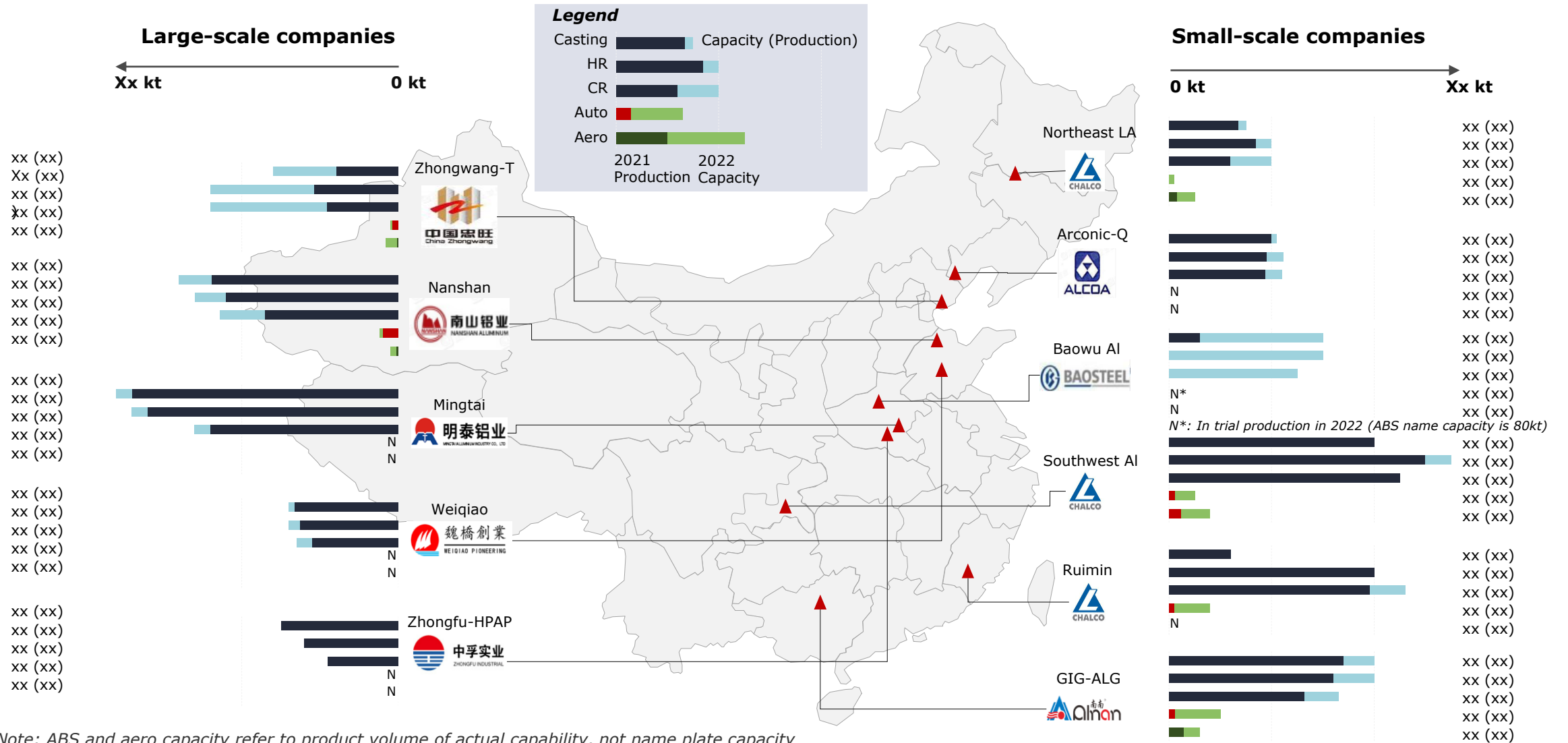
## Investment of aluminum smelting plants overseas

China's supply-side reform is approaching the ceiling of its electrolytic aluminum capacity, and overseas investment in aluminum plants will accelerate under the constraints of the dual-carbon policy.

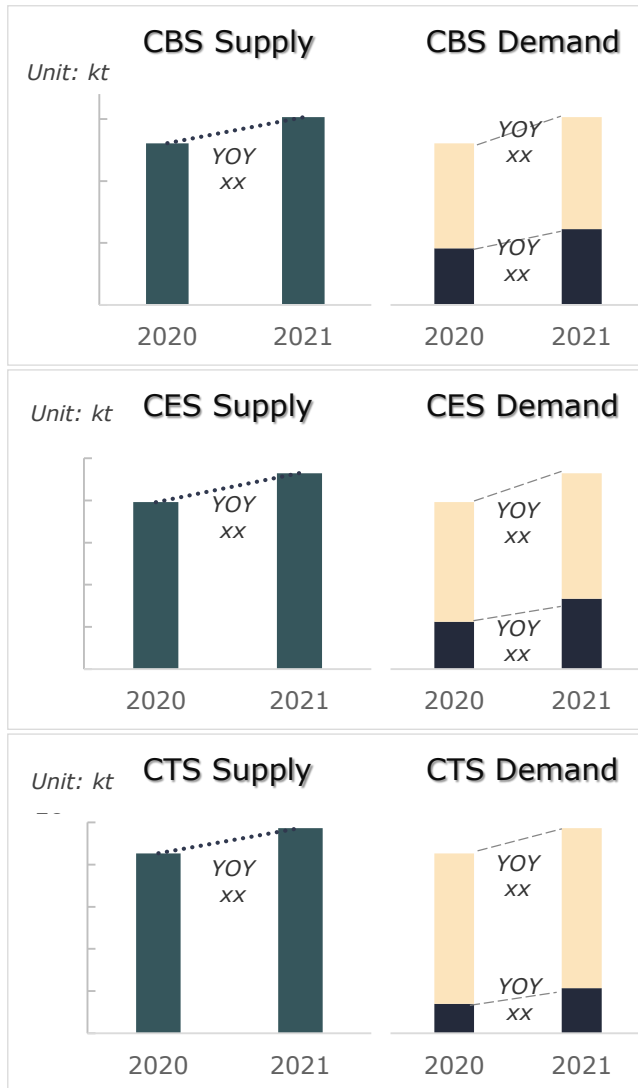
# Key Players Industry Chain Global Layout

Target Group	Bauxite	Alumina	Electrolytic AI	Casting	Hot Rolling	Cold Rolling	FRP Company Name	Target FRP
Company A	✗	✗	✗ ⚡	✓	✓	✓	XXX	Y
Company B	✗	✗	✓ ⚡	✓	✓	✓	XXX	Y
Company C	✗	✗	✗	✓	✓	✓	XXX	Y
Company D	✓	✗	✓	✓	✓	✓	XXX	Y
Company E	✗	✓	✓ ⚡	✓	✓	✓	XXX	Y
				✓	✓	✓	XXX	Y
Company F	✗	✗	✗	✓	✓	✓	XXX	Y
				✓	✓	✓	XXX	N
Company G	✓	✓	✓ ⚡	✓	✓	✓	XXX	Y
				✓	✓	✓	XXX	Y
				✓	✓	✓	XXX	Y
Company H	✓	✓	✓ ⚡	✓	✓	✓	XXX	Y
				✓	✓	✓	XXX	Y
				✓	✓	✓	XXX	N
Company J	✓	✓	✓ ⚡	✓	✓	✓	XXX	Y
				✗	✗	✓	XXX	Y
				✗	✗	✓	XXX	N
				✗	✗	✓	XXX	N

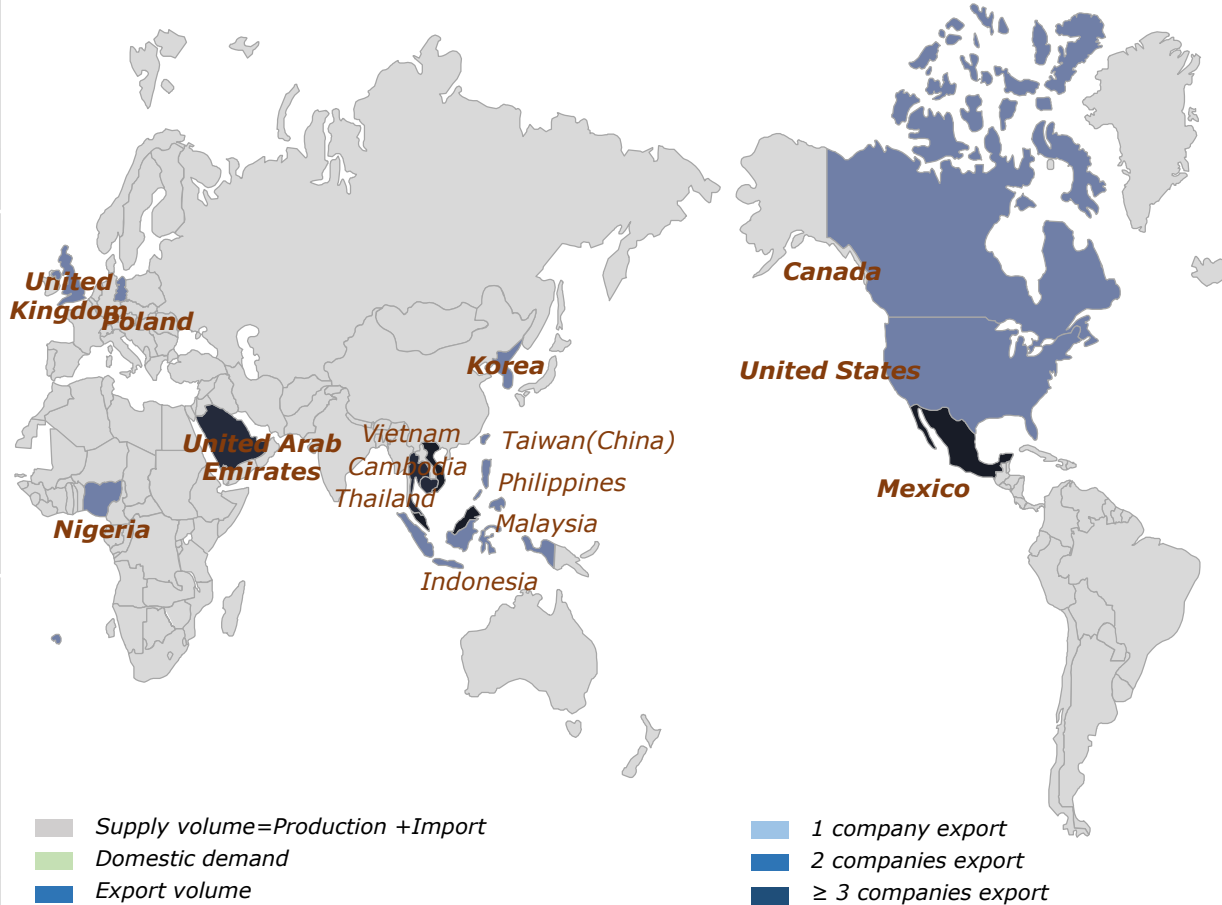
# Target FRP Company Scale and Distribution



# FRP Product Supply and Demand of Can



## Export Countries of Target Can Product



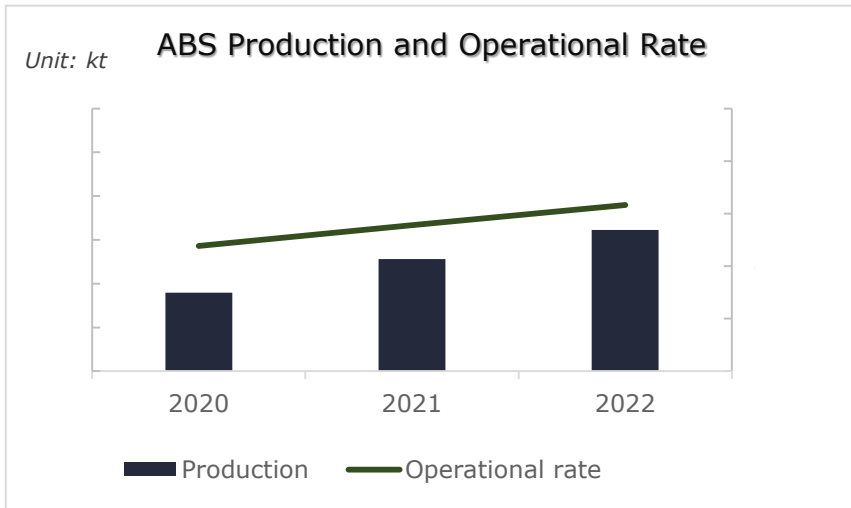
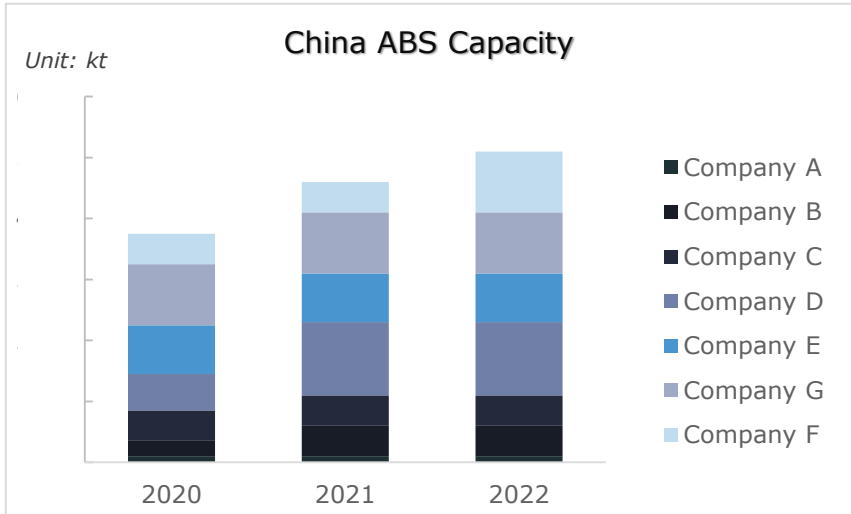
- From 2020 to 2021, the demand of can product in domestic remain at stable, and export volume increased significantly, which drives its production.
- Can export structure is same at its supply structure, CBS is the main export product, accounting for more than xx% of the overall exports.
- There are many exporting countries for canned products, including Asia, Europe, North America and Africa. Vietnam, Malaysia and Mexico are the top three target exporters and more than 3 key players export to those three countries.
- Total can import volume is small and ignorable, only about xx kt/a.

Note: All data is from 11 target companies. Production+ Import=Domestic consumption +Export. Since import volume of can product is insignificant, import is ignored

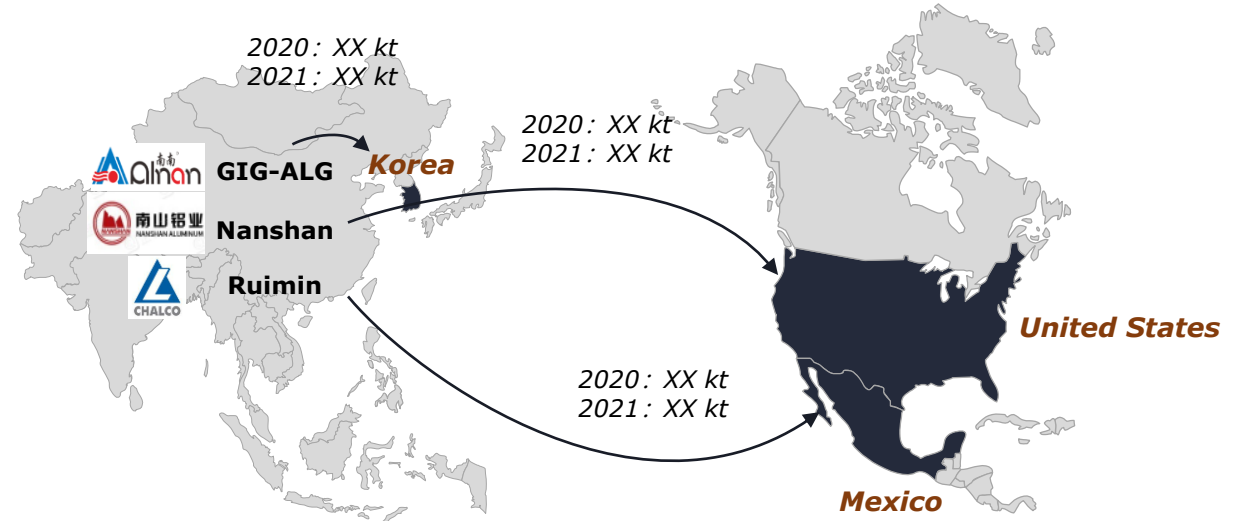
Source: SMM



# FRP Product Supply and Export of Auto



## Export Countries of Target Auto Product



- FRP players actively layout ABS industry since the development of lightweight in auto drives its demand. XX, XX and XX completed their ABS production expansion plan, doubling the capacity during 2020 to 2022. At the same time, the new player XX Aluminum Co., Ltd. entered the market, which incentive overall market competitiveness.
- Downstream demand of ABS increased between 2020 and 2022, while the ABS market is overcapacity, average operating rate is less than XX%.
- For the target automotive products, only 3 companies are currently deployed in overseas markets. XX is the earliest export enterprise and its target volume has reach to XX kt in 2021.

# FRP Product Price Analysis

## Target FRP Product Price Change and Driving Factors (2020-2022)

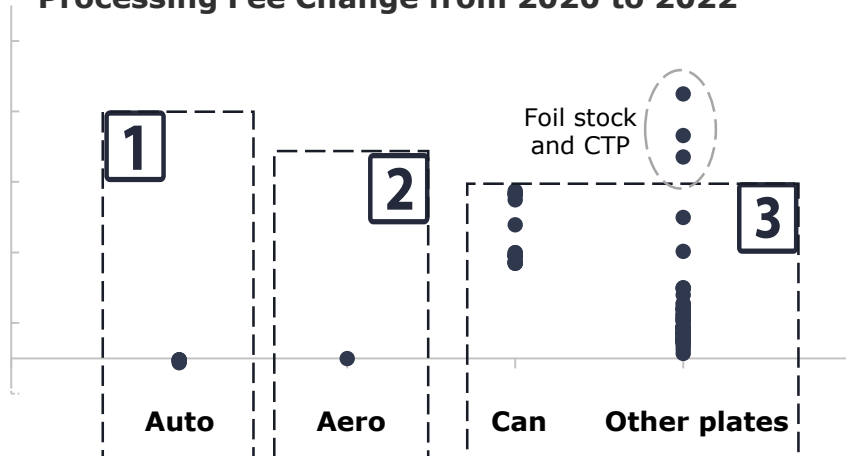
Driving Factors		Product Category			
		Can	Auto	Aerospace	Others
<b>S&amp;D</b>		↑	↓	Stable	↑
<b>Cost</b>	Raw Material				
	Labor	↑	↑	↑	↑
	Energy				
<b>Bargain Power</b>		Strong	Weak	Weak	Strong

**1** Processing fee of automobile products show a slight downward trend between 2020 and 2022. The main reasons are 1) The production expansion of auto products on the supply side is obvious, while the process of replacing Al with steel by the downstream demand side auto companies is relatively slow, and the overall market supply exceeds demand. 2) FRP companies have weak bargain power in the automotive industry and cannot smoothly transfer cost pressure downstream. 3) The competition in the field of automotive products is fierce, and some FRP companies would rather cut prices to compete for automotive customers.

**2** The added value of aerospace is high, and the impact of cost fluctuations is small. In addition, the supply pattern of aviation products has remained basically stable, and processing fees have not changed significantly from 2020 to 2022.

**3** Processing fees for cans and other common FRP products increased in 2020-2022. The main driving factors are 1) Overseas construction was affected by the epidemic, and the supply was insufficient, which led to a surge in China's export orders and an increase in demand. 2) Production costs rise. The prices of small metals such as Mg, Mn, and Cu have risen by 30xx%-40xx%. In addition, the costs of labor, electricity, and natural gas have also risen significantly. 3) FRP companies have strong bargain power in such products, and the pressure of rising costs can be transferred to the downstream by increasing the processing fee. At the same time, the pattern of supply exceeding demand further enhances the increase in processing fees. The processing fee of Foil stock and CTP products increased the most, with an increase of more than 5xx%.

### Processing Fee Change from 2020 to 2022



Note:

1. % = (processing fee of 2022 - processing fee of 2020) / processing fee of 2020

2. Other plates: except CBS, CTS, CES, Aero Plate, ABS Plate, Auto BiW, Auto Brazing

# Carbon Calculation Progress and Future Plan of 11 Target FRP Companies



	Company A	Company B	Company C	Company D	Company E	Company F	Company G	Company H	Company L	Company M	Company N
<b>Now</b>											
<b>Status</b>	✓	✓	✓	✓	✓	○	✗	✗	✓	✓	✗
<b>*FRP Carbon Emission</b>	XX t CO2/ t FRP in 2020	XX t CO2/ t FRP in 2021	NA	XX t CO2/ t FRP in 2021	XX t CO2/ t FRP in 2021	/	/	/	XX t CO2/ t FRP in 2020	NA	/
<b>Internal Team</b>	No specialized team	No specialized team	Has specialized team	Has specialized team	Has specialized team	/	/	/	Has specialized team	Has specialized team	/
<b>CC Agency</b>	SGS	Beijing Yaoyang	NA	NA	NA	/	/	/	BUREAU VERITAS	Carbon Trust	/
<b>Future (After July of 2022)</b>											
<b>Carbon Goal</b>				Carbon Peak by 2025	Carbon Peak by 2025	Carbon Peak by 2025	Carbon Peak by 2028		Carbon Peak by 2025	2025 Carbon Peak, 2055 Zero Emission	2023 Carbon Peak, 2050 Zero Emission
<b>Group</b>	✓	✓	✓					✓			
<b>FRP Company</b>	2022 goal CO2 reduce 3%	✓	✓	✓	✓	✓	✗	✗	2022 goal XX t CO2/t FRP	✗	✗
<b>CR or Buy CQ</b>	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR

○ Doing

✓ Have done

✗ Not Start

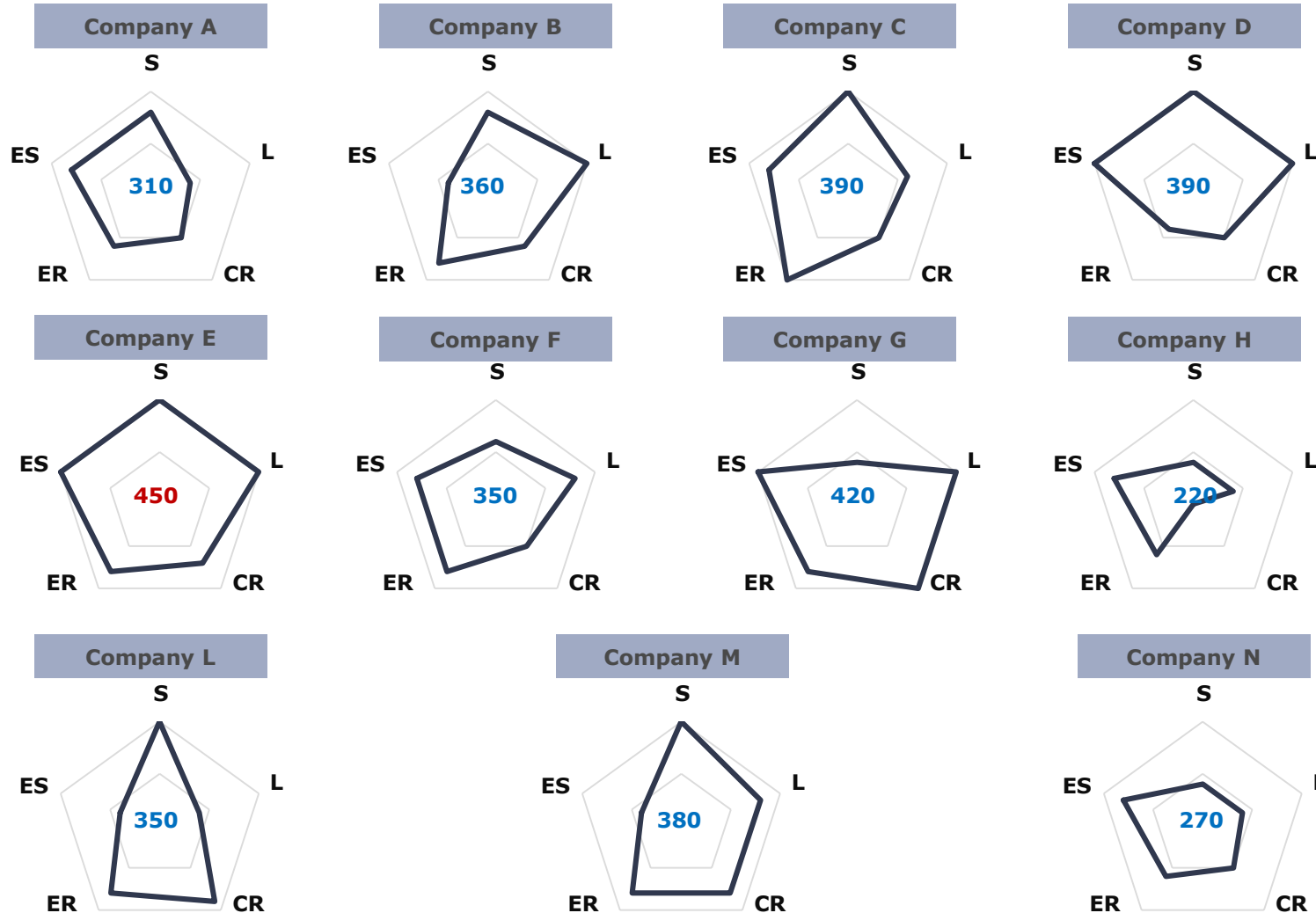
# Carbon Reduction Roadmap of 11 Target FRP Companies



	Company A	Company B	Company C	Company D	Company E	Company F	Company G	Company H	Company L	Company M	Company N	
<b>*LCA</b>	<i>Now</i>	✗	✗	✓	✓	✓	✗	✓	✗	✗	✗	✗
	<i>*Future</i>	✗	✓	✓	✓	✓	✓	✓	✗	✓	✓	
<b>*ES</b>	<i>Now</i>											
	<i>*Future</i>						Same		Same		Same	Same
<b>*RA</b>	<i>Unit: kt</i>											
	<i>Now</i>											
<i>*Future</i>	↑ CPS	↑ CPS	↑ CPS EOL	↑ CPS	↑ CPS	↑ CPS	↑ CPS	↑ CPS	↑ CPS	↑ CPS	↑ CPS	
<b>Elaborate Technologies</b>	✓	NA	NA	✓	NA	NA	✓	✗	NA	NA	✓	



# Sustainability Analysis of Target Companies



## Scoring Criteria for 5 Sustainable Capability

- **(S) Sustainable awareness** (reflected by carbon calculation progress): Higher score for meeting more standards. Standards: 1) Start/preparing carbon calculation. 2) Already have calculation results. 3) Set up internal specialized team
- **(L) Low carbon AI availability:** Score ranking: Group has potential/ low carbon AI layout and FRP close to the place > group has potential/ low carbon AI layout but FRP far away from the place > no potential/ low carbon AI layout but close to potential/ low carbon provinces > no potential/ low carbon AI layout and far away from potential/ low carbon provinces
- **(CR) CPS recycling:** Higher score for meeting more standards. Standards: 1) Already have recycling furnace. 2) High proportion of same grade use of recycled AI
- **(ER) EOL recycling:** Higher score for meeting more standards. Standards: 1) Already have recycling furnace. 2) Rich experience to recycle EOL scrap to FRP products. 3) Have specialized subsidiary to integrate resources
- **(ES) Energy structure:** Higher score for meeting more standards. Standards: 1) No owned thermal power, more flexible to change energy source 2) Located in provinces that are abundant in green power (hydro, solar, wind)