

XYG Leads to an Imperial Age in flat glass

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Guide

We believe the future global flat glass industry will probably enter into an Imperial Age led by Chinese companies, where XYG will reproduce Fuyao to become a global leader

Summary

- , raise TP to 11.76HKD. We believe the future by Chinese companies. We raise 2017-19 net profit to 3.91bn, 4.74bn, 5.78bn, EPS0.97, 1.18, 1.44HKD, raise our target price to 11.76HKD.
- **China era in global flat glass market:** We think in a foreseeable future the flat glass will still be based on float process.

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1. Investment Story

When Caesar crossed the Rubicon, an era began.

We believe the future global flat glass industry will probably enter into an Imperial Age led by Chinese companies (Referring to our report “
”), where XYG will reproduce the growth track of Fuyao to become the global leader:

Firstly, PRC pollution permits policy will be strictly executed in 2018 and the new emission standard will also be applied from June 1, 2018. We believe this will lead to a supply shortage from 2018 to 2020 in domestic flat glass market (Referring to our earlier report “
20171118”).

Secondly, XYG well-timed globalization process is accelerating, opening the global growth path. Considering float glass as tradable goods, future glass industry research should have a global perspective. **From the global perspective, overseas factories will help XYG gain more international comparative advantages, which will change and even subvert the domestic and global glass industry competition status in quo.**

1.1. Undervaluation and Potential Resurrection

XYG has three main sectors: float glass, automobile glass and architectural glass, covering the whole glass sectors except the raw material part. XYG is the leader of each sector: it is China largest float glass producer with high quality positioning, also possessing the largest auto replacement market share and second largest architectural market share where it is just behind CSG domestically. XYG belongs to Shanghai-Hong Kong Stock Connect program, compared with other listed peers, we find XYG is deeply undervalued. Considering high dividend payout ratio and overseas growth

Figure 1 Undervaluation with comparison December 19, 2017

			XYG	Kibing	CSG	Fuyao
Revenue	2016	CNY billion	11.54	6.96	8.97	16.62
Gross margin	2016	%	36.26	29.34	26.88	43.07
Net income	2016	CNY billion	2.87	0.84	0.80	3.14
Net Margin	2016	%	24.92	11.99	8.96	18.91
PE	2017E		9.30	14.33	27.57	20.57
Market Value		CNY billion	31.00	15.10	15.90	69.40

Sources WIND, GTJA Securities

2. Global float glass industry enters into China

Age

Currently, the global flat glass industry is based on float process. Compared with traditional Colburn and Pittsburgh methods, float process has raised the level of automation and average capacity scale, achieving a significant cost reduction. Since 1950s to present as well as in the foreseeable future, we think the mainstream architectural glass and auto glass will still be based on float process.

Figure 2 Processes comparison Float process is the base of modern glass industry

Age	Events	Location	Process	Properties
1916	Colburn process invented	USA	An electric motor pulls a rod with melt glass on it, drawing glass horizontally over a set of rollers which roughly formed a flat sheet of glass. The glass sheet passes through an annealing oven and gets cut then.	Unstable quality High cost
1925	Pittsburgh process invented	USA	A pair of horizontal cooler is set up on a firebrick. The melt glass diverted by brick is pulled upward after cooling through the cooler.	Inhomogeneous thickness
1952	Pilkington invented float process	UK	The molten glass is fed into a "tin bath. The glass flows onto the tin surface form a floating ribbon with smooth surfaces. Then sheet can be lifted from the tin onto rollers. Once off the bath, the glass sheet gets cooled gradually.	Significant cost reduction, Longer furnace life, Higher products quality
1981	China Luoyang float process invented	China		

Sources GTJA Securities

Float process is stable and achieves large-scale industrialized production. Process" in the early 1980s, after 40 years of rapid development, we believe that in this heavy assets industry, the fully localization of equipment, technology and high production efficiency have given Chinese companies significant edges in global competition.

In China, supply-side reform limits new glass capacity and strict environment policies has lifted production cost. We think that the domestic industry will roughly stay stable in the next few years. Considering the raising environment, energy and labor cost, globalization becomes the inevitable choice. In the future, the competition of Chinese Float glass companies will not only be determined by domestic condition, but also international comparative advantages. Large-scale automated manufacture process and overseas low-cost production factors will bring opportunities to

those Chinese companies who choose "go global" strategy. We conclude that in the future, excellent Chinese manufacturing leaders such as XYG Glass will achieve global market growth in the same time bring significant changes to domestic market.

2.1. Emission permits of pollutants and new emission standards may cause supply shortage, while domestic demand is stable

On the demand side, about 70% of the float glass is used in the property installation market, while 15%~20% is consumed by automobile-related demand and exports account for the remainder. The demand for float glass is affected by the fluctuations of the completed floor space. Currently, the nationwide demand side is stable compared with much tightened supply side due to the strict enforcement of environmental policies. Now severe restriction has been imposed on new capacity. Should the pollutant emission permit system and the newly released environmental protection regulations be implemented throughout the country after June 1st 2018 (The emission standards will be harder to meet, and the many float lines in northern China are unable to be qualified), we conclude that there will be a supply shortage imminent.

Figure 3:

Related policies of the glass industry on the capacity-reduction and environmental protection (2015~2017)

Date	Government Departments	Related Policies	Measures
May 31st 2017	The Ministry of Water Resources	Strengthening Water Resources Management to Promote Supply-Side	New projects in industries with serious overcapacity such as steel, cement, electrolytic aluminum, flat glass and shipping, as well as the new, modified and expanded projects of adopting technology and -Water-Consuming Technology and Equipment Phase- for new water permits and the setting of sewage outfalls and other related procedures.
Dec 5th 2016	The State Council	The 13th Five-Year Plan for the Protection of the Ecological Environment (GF [2016] No.65)	The flat glass industry should promote "coal to gas" and "coal to electricity", and ban the burning of low-quality raw materials such as high-sulfur petroleum coke. And all the float glass production lines not using clean energy should implement flue gas desulphurization. All the float glass production lines should implement high-efficiency dust removal and denitrification of flue gas.
May 18th 2016	The General Office of State Council	Guidance on Promoting the Steady Growth, Adjusting Structure, and Increasing Benefit of the Building Materials Industry (GF [2016] No.34)	Before 2020, the production concentration of the top 10 flat glass production should reach about 60%; Before the end of 2020, it is strictly prohibited to record and build new flat glass construction projects to expand production capacity; Before the end of 2017, the capacity replacement under the same actual controller should be suspended. New industrial glass project, furnace capacity exceeding 150 tons / day, should be technically transformed following the existing flat glass production line. The government encourages the flat glass industry to reduce excess capacity by means of joint

restructuring and advocates reasonable production restrictions.

	The	Action Programme for	
	Ministry of	the Production and	
Aug 31st 2015	Industry	Application of	High-
	and	Environmentally	
	Information	Friendly Building	
	Technology	Materials	

We notice that the government also stepped up efforts to investigate and deal with the construction of nonconforming production lines (max production capacity differs from what has been designed and applied according to): flat-glass enterprises are required to complete the application for a sewage disposal permit before December 31, 2017. In addition, the government focuses on solving the remaining problems such as the expansion of capacity without approval and coal-fired wastes, etc. New emission standards will be introduced in the next year, and the indicators will be further tightened (sulfur dioxide emissions targets may cut 50%). We think the approaching deadline has exacerbated environmental pressure on undocumented enterprises and the control over the construction of non-compliant production lines has further reduced supply-side capacity.

Figure 6 The proportion of domestic glass industry using clean energy to produce high-end float-glass capacity is still insufficient.

Fuel	Production line aggregated	Annual production capacity	Proportion
Coke oven gas	10	3810	4.14%
Coal tar.	21	8280	9.00%
Coal gas	70	25770	28.02%
Petroleum coke.	54	21168	23.02%
Natural gas.	65	27499	29.90%
Heavy oil.	16	5436	5.91%
Total	236	91963	100.00%

Source: China Glass Futures Website, GTJA Securities

Strict regulations combined with high recovery cost make it difficult to restart for those already shutdown production lines. On one hand, the Government pay great importance to supervision, and after the closure of the production line, it is difficult to get the approval to resume production; On the other hand, the cost of reproducing is heavily increased. It is estimated that the cost of a common glass line is about 50 million yuan to 100 million yuan. The cost of changing the combustion unit is increasing (and it may not meet the fuel supply). In addition, the daily operation cost of environmental devices such as desulphurization and denitration is about 20,000 yuan. Banks are tightening financing loans for overcapacity sectors such as glass, therefore we judge it is difficult to put the shutdown capacity back into production again.

Figure 7:
Flat glass prices hit a five-year high, with new capacity falling significantly since 2015

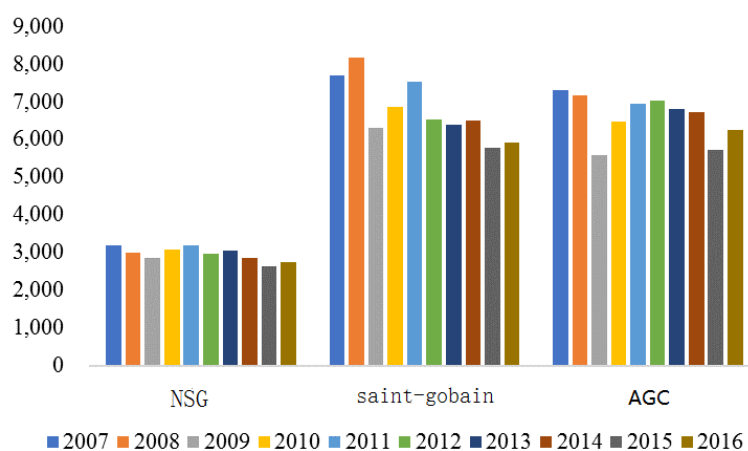
million US dollars

Area	2013	2018	2023	CAGR(10years)
World demand	72000	102300	139900	

number			
Area	country	2005	2015
NA	US	35	21
	Canada	2	0
EU	UK	4	3
	Finland	1	0
	Belgium	6	2
	Italy	7	5
	Spain	6	5

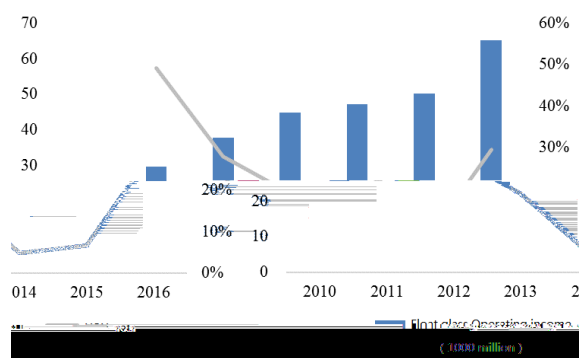
Source GTJA Securities

Figure 13: Global giants grow slowly in past ten years in Million USD



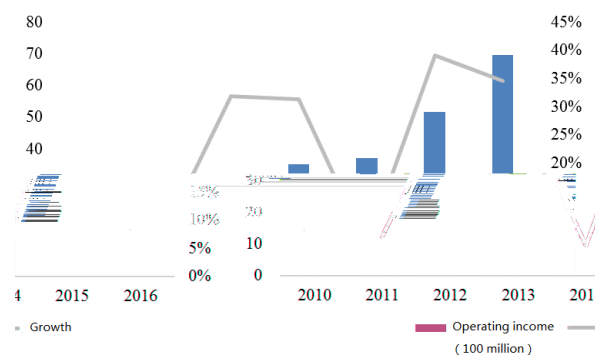
Source Bloomberg, GTJA Securities

Figure 14 XYG float glass revenue grows rapidly



Source wind, GTJA Securities

Figure 15 Qibing glass revenue grows fast



Source wind, GTJA Securities

Malaysia b

southeast

Asia economic association has a booming market. According to Freedonia Group, the demand for flat glass in this area will grow at 6.84% CAGR in 2013-2023, the rate just slightly lower than Chinese market. Yet, global giants only have few capacity in southeast Asia, furthermore, local companies are lacking of skills and technology to product such product themselves so this give Chinese companies great opportunities to stand out. In Malaysia, there are 5 lines at present (NSG for 2, Qibing for 2, and XYG for 2), and we estimate total capacity is 3800t/d in Malaysia, among which

70% exports to Indonesia, Korea, Vietnam, etc.

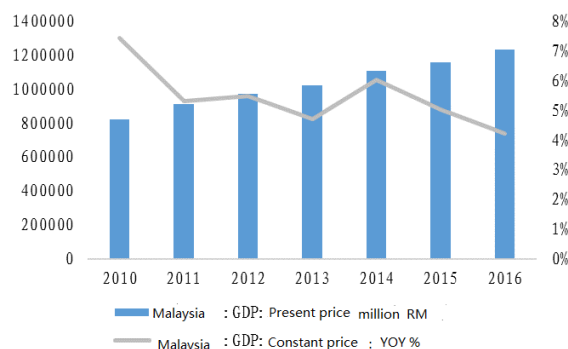
at exportation, even in the future we can see some shipping to China mainland market. In midterm of 2018, XYG will be releasing its two lines (2000t/d) in Malaysia, before 2020, there will be more coming. We conclude ssing plant overseas.

Figure 16 Global giants only have few capacity in southeast Asia

Company	Southeast Asia
NSG	Malaysia (2 、 Vietnam (2)
ASG	Thai 3 、 Philippines 1 、 Indonesia 2
Saint Gobain	0
Guardian	Thai 2 、 India 1

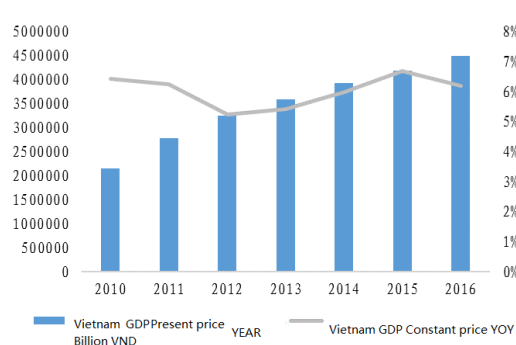
Source GTJA Securities

Figure 17 Malaysia GDP grows quickly



Source wind, GTJA Securities

Figure 18 Vietnam grow fast



Source wind, GTJA Securities

3. i market

XYG began its business with automotive replacement glass in 1988, and keeps focusing on the exporting market. In the late 90s, the company entered the segment of architectural glass. It has got involved in the float glass sheets production through deep processing since 2006, which at that time was aimed to be self-sufficient. The float glass is positioned as high-grade product.

Figure 19 Step by Step, XYG grows rapidly and becomes an industry leader

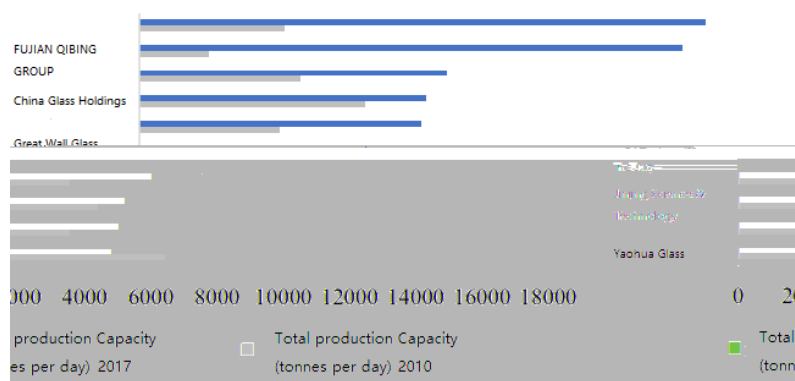
Various colored glass (green, blue, brown, etc.) are available and those

Figure 21 Quality leader and full product range compared with XYG

	XYG Product	Normal glass
Yield	95%	85%(

scale of XYG

Figure23 XYG has the highest float glass production capacity in China (By Dec.18th 2017)



Source China glass info website, GTJA Securities

Figure 24 XYG than overseas competitors

Company	Year capacity (thousand tonnes)	Number of production lines	Individual line daily melting capacity (tonnes)
XYG Glass	5930	20	812
Nippon Sheet Glass	5900	27	599
Asahi Glass	6250	46	372
Saint-Gobain	5260	31	465
Guardian Industries	4740	27	481

Source China glass info website, GTJA Securities

* Data of Nippon Sheet Glass, Asahi Glass Co., Saint-Gobain, Guardian

XYG is the first mover to upgrade itself from labor intensive industry to smart manufacturing. The number of skilled workers, daily production capacity per worker and revenue generated per person shows the level of automation, and we found XYG has a lead over rivals. High automation could effectively reduce the labor costs as well as loss and increase the yield rate.

Figure 25 Compared with overseas leaders, XYG has a higher level of automation

Company	Number of employees in float glass production 2016	Daily production capacity per person tonnes	Year revenue generated per person thousand USD 2016
XYG Glass	3013	5.7	280

Asahi Glass	15412	1.1	180
Saint-Gobain	33000	0.4	180
Nippon Sheet Glass	32689	0.5	190

Source Bloomberg, GTJA Securities

* Number of XYG employees is an estimated one. Daily capacities of Nippon Sheet Glass, Asahi Glass Co., Saint-Gobain are 2015 figures.

Figure 26 Decrease in number of employees and increasing production efficiency year by year

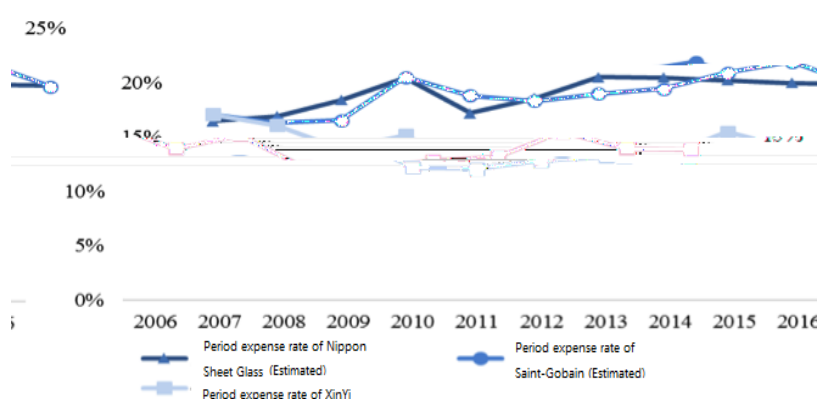
Year	XYG Glass	XYG Float Glass
2014	13833	3321
2015	13783	3268
2016	12745	3013
2017H1	11765	2909

Source GTJA Securities

3.3. Cost control shows the operation capability of international standards

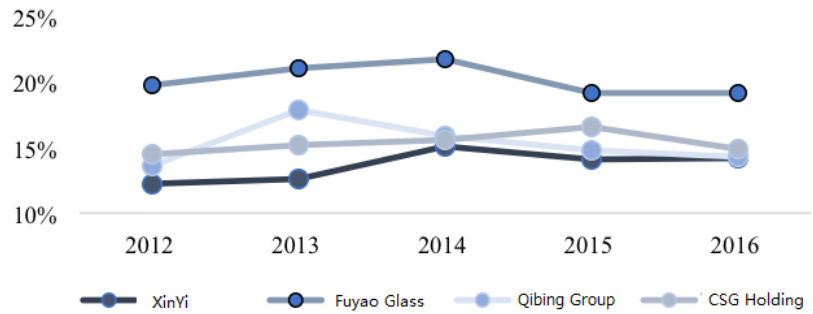
Compared with both domestic and overseas leaders, the period expenses of XYG is significantly lower than industry average. We believe that the high automation level in production, the flat management structure and low financing costs from Hong Kong contributes to the well control of period expenses.

Figure 13 Period expenses of XYG are significantly lower than those ones of overseas leaders, Saint-Gobain and Nippon Sheet Glass



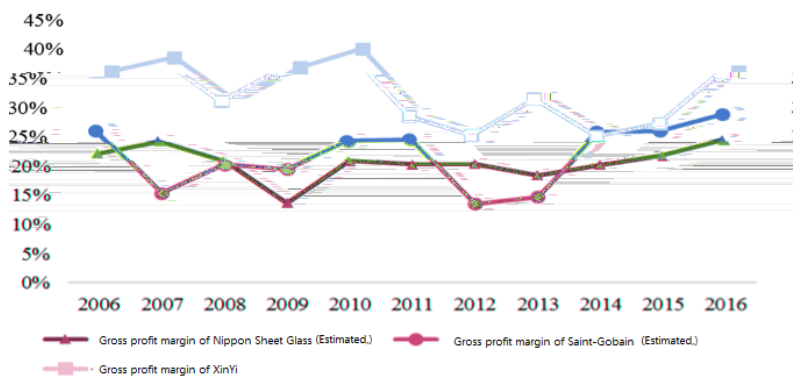
Source Bloomberg, GTJA Securities

Figure 14 XYG rivals



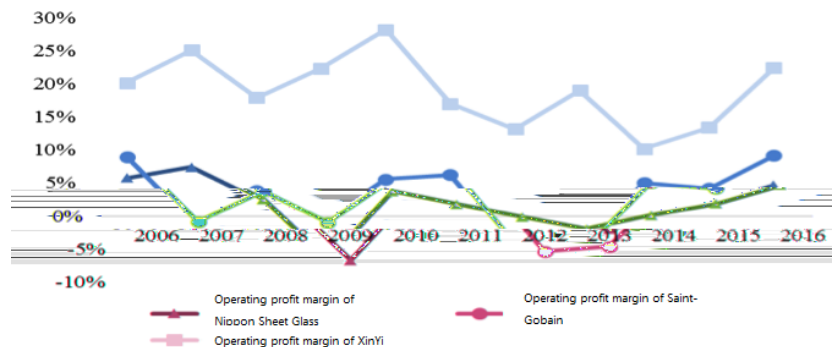
Source China glass info website, GTJA Securities

Figure15 XYG gross profit margin of glass is ahead of the ones of Saint-Gobain, Nippon Sheet Glass



Source Bloomberg, GTJA Securities

Figure 16 Operating profit margin of XYG is significantly higher than the ones of Saint-Gobain and Nippon Sheet Glass



Source Bloomberg, GTJA Securities

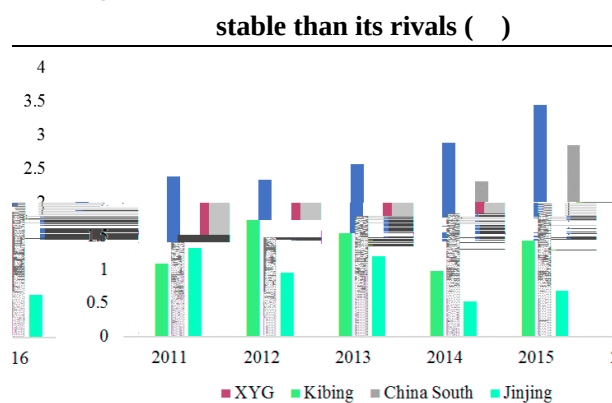
3.4. R&D Investment Continues to Lead the Industry

R&D expenditure of XYG Glass remained stable, leading the industry. The ratio of R&D expense/revenue kept at around 3%, with the amount far more than other companies. We believe that the steady R&D investment is the key to high quality of XYG's product.

The whole set of production line was developed by XYG itself, which lowered the construction cost. Unlike the industry's common EPC mode, XYG -built, reducing construction cost

and optimizing efficiency. Taking the project of Deyang Sichuan for example, the total investment of the production line including the 1000T/D+800T/D high-quality float glass and deep processing line was 617,000,000, which was significantly lower than that of other companies.

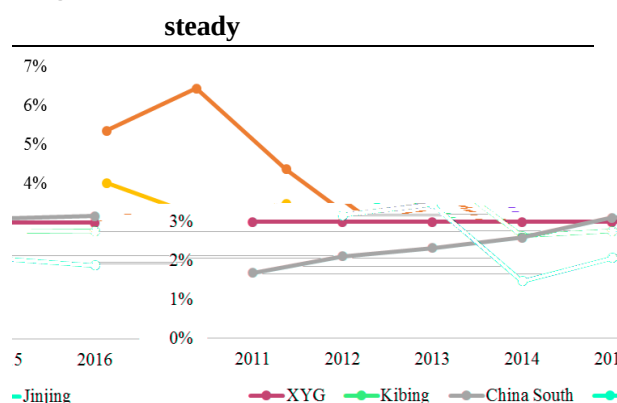
Figure 17: XYG



Sources wind GTJA Research

Note: XYG &D expenditure is estimated based on that the R&D expense ratio is 3%

Figure 18: XYG



Sources wind GTJA Research

Table 16 XYG

Project	Amount (RMB mn)	Production date	Lines	Single line melting/day	Annual production capacity	/ton
China South project in Wujiang	846	2011	2	800*2	52.56	1610
Kibing (not including the land)	320	2016	1	600	19.71	1624
glass project in Chongqing	680	2011、2012	2	600*2	39.42	1725
XYG Sichuan	617	2014、2015	2	1000、800	59.00	1046

Suppose

1、The price of raw materials during the construction remains stable and the yield is 90%

2、

and it includes some back-end processing;

XYG

-E, deep-processing line of automotive glass, etc., which are not excluded here (we

estimate that the investment is about 100-150million yuan)

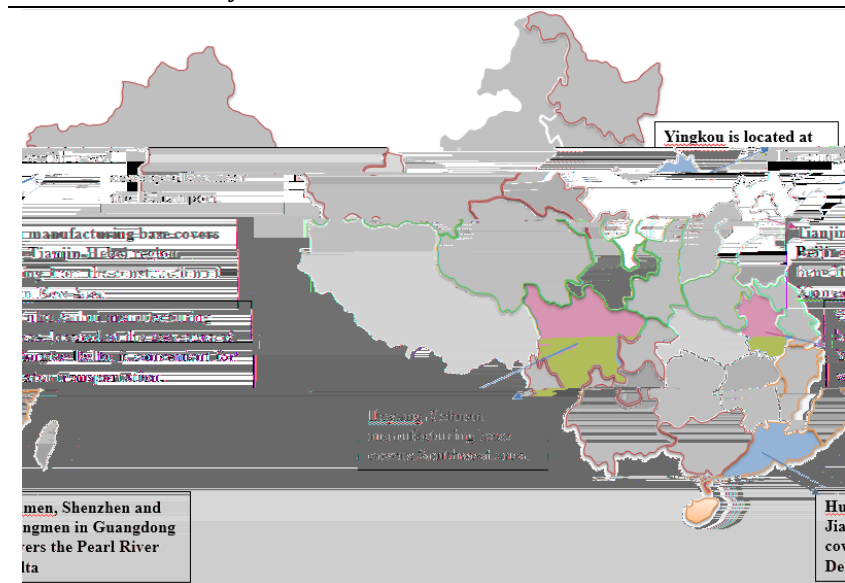
Sources: Company Announcement GTJA Research

3.5. The Manufacturing Bases Cover the Core Economic Belt, Reducing Transportation Cost

XYG currently has six manufacturing bases in Jiangmen, Humen of Guangdong, Deyang Sichuan, Wuhu Anhui, Tianjin and Yingkou Liaoning, radiating the major economic zones in our country. Furthermore, there are self-built wharfs in Wuhu, Jiangmen and Humen, which could transport the raw materials and finished products directly, therefore lowering transport cost (waterage is about 1/3 of the land freight).

Besides, XYG has been building a manufacturing base in the Malacca region of Malaysia. Under the advantage of sea transport, the sales area radiates to ASEAN, South Korea and India, as well as China. Soon the company is about to set up a float manufacturing base in the Great Lakes region of Canada. In addition to satisfying the domestic demand in China, the products can also be shipped to the United States relying on the developed waterways.

Figure 19: XYG's manufacturing bases cover core area around the country



Sources: Company Announcement GTJA Research

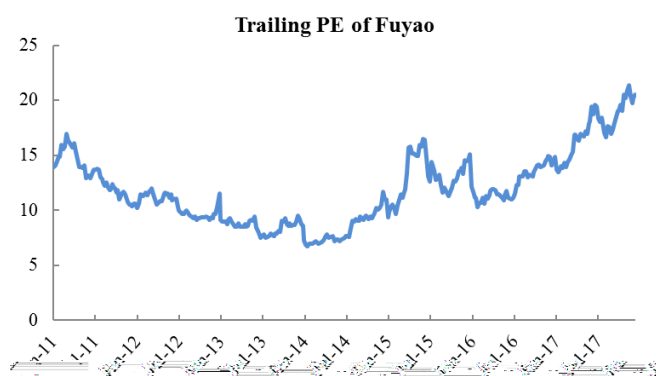
4. XYG Has Started Its Globalization, Referring To Fuyao Glass Group

We think that the internationalization means not only quantitative growth, but also the global markets, manufacturing, supply and production advancement, which could bring indigenous talents and global logistics system. In addition, China's advanced manufacturing industry going abroad weakens the domestic homogenization competition, which brings double rising of valuation and performance. That happened during the process of

XYG has started its globalization by building plant in Malay and entering into the North American market by establishing factory in Canada. It owns the similar advantages to Fuyao during the global process, that is, first-class products (by self-built production line and core technology), first-class cost (lowest in the industry), and precise layout (close to core markets). XYG has already been ready for global success. The current valuation of XYG is similar to that of Fuyao in 2014. With the future overseas expansion, both the

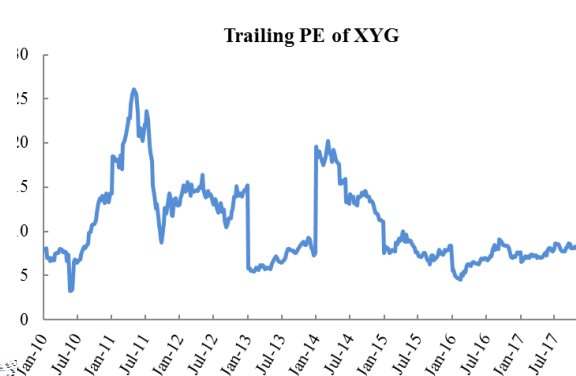
valuation and performance of XYG are expected to rise.

Figure 20: Fuyao went abroad in 2014, with valuation rising



Sources wind GTJA Research

Figure 21: Similar to Fuyao in 2014, XYG valuation is at the bottom.



Sources wind GTJA Research

Table 17 The position in the industry and business situation of XYG and Fuyao are similar

	XYG Glass	Fuyao Glass
GPM 2016	36.26%	43.07%
Industry average	23.57%	23.57%
Above the industry average	12.5%	19.5%
NPM 2016	24.92%	18.91%
ROE 2016	24.81%	17.44%
Market position	Float glass (domestic market share10% 、 ARG automotive glass (global market share 23%) & leader of architectural glass(domestic market share 20%	Leader of OEM automotive glass (domestic market share 65%)

Sources wind GTJA Research

5. Risks

The process of building plants overseas fails to meet expectations. Our main logic is based on XYG performance will be affected.

Demand for domestic real estate slumps. XYG's main business is inland. If that happens, the float glass market is bound to be impacted.

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