Emerson Analytics Co. Ltd.
www.emersonanalytics.co
emersonanalyticscoltd@gmail.com

China Hongqiao – Electrifying Margins to Absurd Levels

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The Basics	
Ticker:	HK:1378
Recent Price:	HK$7.8
Market Cap:	HK$56.6bn

Emerson Analytics Forecast
Target Price:HK$3.1 (-60%)

China Hongqiao raised Rmb5.2bn in its 2011 IPO to set itself off on the path to becoming the world's largest aluminum producer. Our investigations show it began cooking its books at the IPO stage by under-reporting production costs and purchasing electricity and alumina from connected parties at exceedingly low prices.

China Hongqiao's net margins were similar to those of its peers from 2007 to 2009. In 2010, it claimed a sharp improvement to a staggering 27.7% when its peers continued to struggle with single-digit margins. In subsequent years, China Hongqiao persisted with its accounting irregularities and reported margins far higher than those of its peers.

The company's success is not built on the use of self-supplied electricity as its peers also have captive power plants. We have used three independent methods (working through China Hongqiao's numbers in great details, talking to its ex-staff, and relying on data from an industry consultancy) to show that the true cost of its electricity generation is 40% higher than its claim. In 1-3Q2010, when coal price went up 23%, China Hongqiao dared fabricate a 33% drop in the unit cost of its self-supplied electricity.

In addition to under-reporting Rmb11.7bn of self-supplied electricity generation costs during 2010-15, China Hongqiao also bought electricity from a purported independent third party at below generation costs, thus reaping Rmb1.9bn of subsidies.

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China Hongqiao buys alumina, the key raw material for producing aluminum, from related parties at such artificially low prices that its main supplier is now in serious financial woes. Such alumina subsidies have totaled Rmb6.1bn over the years, while the under-reported costs of its internally produced alumina amounted to about Rmb2.0bn.

Predictably, China Hongqiao's effective deposit rates have consistently been less than prevailing rates offered by banks, suggesting that its cash and bank balances are probably less than half of claim. At the end of 2015, this represents a black hole of Rmb4.9bn on the balance sheet.

Such fraudulent acts are no longer sustainable as China Hongqiao has run up a huge pile of debts (Rmb53.9bn) representing 149% of equity.

All in all, we believe China Hongqiao has hidden some Rmb21.6bn of costs through under-reporting and related party subsidies over the years. Using assumptions advantageous to the company, we estimate that its real profitability is less than half of its claim and that the stock is worth only 40% of its current price level.

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Disclaimer

We are a group of seasoned equities analysts with many years of experience in the research of economic and political trends as well as individual stocks around the world. With background in various international investment banks, we have followed the development of the Chinese equities market right from day one.

We are determined to expose as much of the fraud in the Chinese stock market as we can. The most widespread and serious fraud is probably that undertaken by listed companies, in fabricating non-existent businesses and stealing shareholders money, among other tricks.

In exposing these crimes we challenge the listed companies to prove the integrity of their announcements and financial statements. The listed companies, of course, want everybody to believe that their announcements and financial statements are true. Their auditors, employees, independent directors, lawyers, shareholders and even the general public all hope that these announcements and financial statements are true.

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China Hongqiao – Electrifying Margins to Absurd Levels

China Hongqiao Group Limited was listed in Hong Kong in March 2011. Following its massive investments in aluminum facilities and captive power plants, it has now become the world's largest aluminum producer.

However, our investigations and analysis have shown that, mainly through under-reported costs and "subsidies" provided by connected parties disguised as independent third parties, China Hongqiao has fabricated a profitability that vastly exceeds those of its peers. In a way this financial forgery is similar to that undertaken by Shenguan Holdings (0829.HK), which we exposed more than two years ago.

A clear sign of suspicious accounting is China Hongqiao's deteriorating quality of disclosure. This mainly involves the key cost items in its operations, as shown in the following table:

Exhibit 1 – Data ceased to be disclosed by China Hongqiao

Data ceased to be disclosed	Year
Electricity cost for aluminum output	2011
Cost of externally sourced alumina	2011
Alumina consumption per unit of aluminum output	2013
Electricity consumption per unit of aluminum output	2013
Cost of self-supplied electricity	2015

Source: Emerson Analytics

Shandong Weiqiao Aluminum and Power Co., Ltd. (Weiqiao A&P, 山東魏橋鋁電有限公司) is China Hongqiao's most important subsidiary. It has made many useful disclosures when it raises debts from the financial markets. The following table shows some key indicators for China Hongqiao and Weiqiao A&P.

Exhibit 2 – China Hongqiao vs. Weiqiao A&P, 2015

	China Hongqiao	Weiqiao A&P	Weiqiao A&P as % of China Hongqiao
Revenue (Rmb m)	44,110	42,048	95%
Production volume of alumina (k tons)	4,981	4,981	100%
Production volume of aluminum (k tons)	4,617	4,090	89%
Power generation (m kWh)	52,648	42,720	81%

Sources: China Hongqiao, Weiqiao A&P

Clearly, Weiqiao A&P accounts for the overwhelming majority of China Hongqiao's businesses. In the absence of usable data for China Hongqiao, we have taken Weiqiao A&P's data as substitutes. We believe this treatment provides a reasonably accurate analysis of China Hongqiao's group performance.

Part 1. Abnormal Financial Performance

China Hongqiao has consistently reported abnormal financial performance, such as massively negative free cash flow and steadily rising interest-bearing debts. Its absurdly high profit margins, naturally, attract our attention.

1.1. Deloitte Resigned as Auditors in June 2015

China Hongqiao was audited by Deloitte Touche Tohmatsu (Deloitte) from the time of its IPO through the conclusion of its 2014 annual report. On June 12, 2015, they resigned as China Hongqiao's auditors. The company claimed this was a result of "fee disputes"[1].

But we all know that auditors rarely resign as a result of fee disputes. There is sufficient competition among the Big Four and second tier audit firms to ensure they don't nickel and dime clients. "Fee disputes" are almost exclusively used as a means for auditors to resign without being forced to bring attention to uncovered financial irregularities.

In fact, a paper released in 2015 by the Hong Kong Institute of Certified Public Accountants states the following:

The Stock Exchange of Hong Kong Limited (SEHK) and the Securities and Futures Commission (SFC) have raised concerns with the Hong Kong Institute of Certified Public Accountants concerning announcements made by listed issuers of the SEHK of the reasons for changes in auditors. In many cases, fee disputes are stated to be the reason for the change. ***Concern has been expressed that certain auditors have been relying on purported fee disputes to disguise the real reasons for the change. As a result, potentially significant and fundamental matters about the listed issuer may not be disclosed to investors and creditors and the market is not therefore being kept fully informed.*** *It is important that the situation concerning the change of auditors should be disclosed in full to avoid the possibility of the market being misled.*[2]

Auditor resignation is an obvious red flag of China Hongqiao's financial irregularities. However, as we will show in the following pages, China Hongqiao began doctoring its books at least during the IPO process in 2010 and has perpetuated its crime to this day. Deloitte cannot be excused for not properly carrying out its duties diligently all through those years. Similarly, the current auditors, Ernst and Young, are equally culpable for negligence.

1.2. Absurdly High Margins

A key step in analyzing China Hongqiao is to identify peers that are suitably comparable. We have looked at all publicly listed aluminum companies with manufacturing capacity in mainland China, and have excluded quite a number of them for various reasons. For example:

[1] http://www.hkexnews.hk/listedco/listconews/SEHK/2015/0612/LTN20150612829.pdf
[2] http://app1.hkicpa.org.hk/ebook/HKSA_Members_Handbook_Master/volumeI/COErevised.pdf, p.157

- Chalco (2600.HK): a vertically integrated entity with trading accounting for 76% of its revenue in 2015;

- China Zhongwang (1333.HK): an exclusively downstream entity focusing on extrusion (China Hongqiao derived only 4.6% of its 2015 revenue from extrusion); and

- Yunnan Aluminum (000807.SZ): which uses hydropower, unlike China Hongqiao and most other Chinese aluminum producers which rely on coal-fired power plants.

As a result, there are four listed entities that are most comparable to China Hongqiao: Jiaozuo Wanfang (000612.SZ), Henan Shenhuo (000933.SZ), Zhongfu Industrial (600595.SH) and Nanshan Aluminum (600219.SH). Among them, Nanshan Aluminum has a more or less balanced business in aluminum and downstream products. This is fundamentally different from China Zhongwang, and the company is therefore kept on our list for peer comparison. The following table presents some of the key indicators for the companies in question:

Exhibit 3 – Comparable aluminum companies in 2015

Short name	Stock code	Main production base	Revenue (Rmb m)	Percentage of self-supplied electricity
Jiaozuo Wanfang	000612.SZ	Henan Province	4,658	74%
Henan Shenhuo	000933.SZ	Henan Province	17,558	100%
Zhongfu Industrial	600595.SH	Henan Province	9,712	100%
Nanshan Aluminum	600219.SH	Shandong Province	13,670	100%
China Hongqiao	**1378.HK**	**Shandong Province**	**44,110**	**85%**

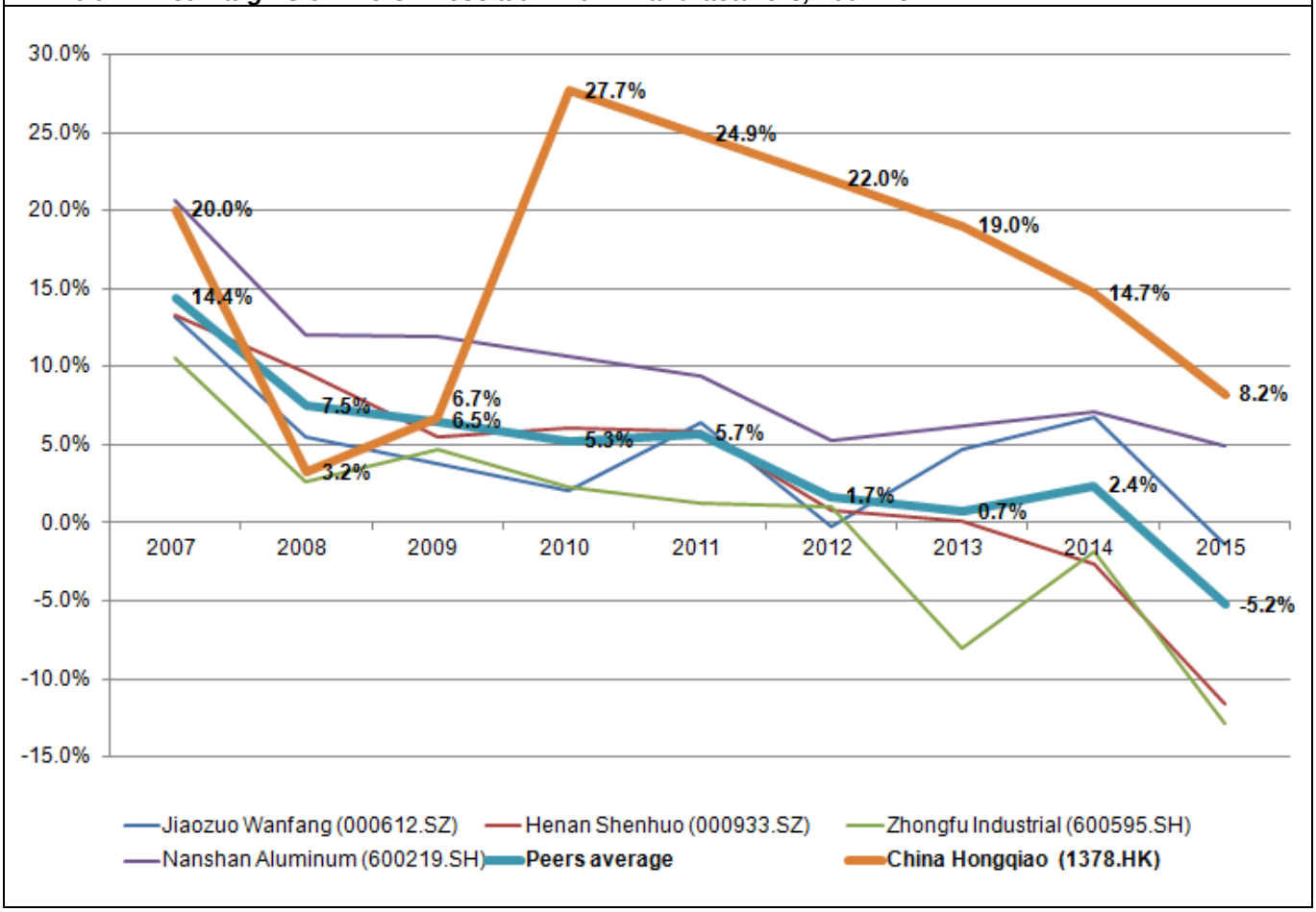
Source: Emerson Analytics

We first look at the net margins of these five companies, as shown below in Exhibit 4. For Henan Shenhuo and Zhongfu Industrial, we have excluded their trading revenue in calculating their margins. In 2015, they both derived about 10% of their revenue from trading, a business with razor-thin margins. We believe this adjustment can more accurately reflect their manufacturing net margins and make the comparison more sensible.

As can be seen, China Hongqiao achieved net margin of 27.7% in 2010. This was a whopping 5.3x the average for the other four companies, which was 5.3%, and was 2.6x that of the Nanshan Aluminum, which was the second best performer at 10.7%. Subsequent years have also demonstrated a similar pattern.

In essence, China Hongqiao's net margins are absurdly high relative to those of its peers.

Exhibit 4 – Net margins of five Chinese aluminum manufacturers, 2007-15



Source: Emerson Analytics

As already shown in Exhibit 3, China Hongqiao's peers all rely on their own power plants for the bulk of electricity used in their manufacturing process. Among them, Henan Shenhuo even has its own coalmines! Nanshan Aluminum, meanwhile, contracts its electrolytic reduction process to sister power company controlled by the majority shareholders and is regarded as having self-supplied electricity. While China Hongqiao may have a little cost advantage from its own grid, the use of self-supplied electricity cannot explain its abnormally high margins.

Secondly, just like China Hongqiao, Jiaozuo Wanfang also sells mainly molten aluminum rather than aluminum ingot. In 2013 and 2014, 70% of Jiaozuo Wanfang's sales volume was derived from molten aluminum, while in 2015 it derived 64% of its sales revenue from molten aluminum. During 2007 to 2015, China Hongqiao derived 56-91% of its sales revenue from molten aluminum. While molten aluminum tends to lend cost advantage to both suppliers and users, this cannot be a significant factor in explaining China Hongqiao's high margins, as Jiaozuo Wanfang's net margins were similar to those of the other peers.

1.3. How to Shave the Cost of Self-supplied Electricity by 33% when Coal Price Rises 23%?

Have you noticed from the above chart that China Hongqiao's net margins were not much different from its peers' prior to 2010? It achieved a net margin of 6.7% against the peers average of 6.5% in 2009. From 2010 onward, China Hongqiao has put in a vastly superior performance.

Let us focus on 2010. China Hongqiao's IPO prospectus dated March 14, 2011 discloses its financial performance up to the first nine months of 2010. So, what happened during those nine months?

Starting in 2010, China Hongqiao sold steam to Binzhou Gaoxin Aluminum & Power Co., Ltd. (Gaoxin A&P, 濱州高新鋁電股份有限公司), purportedly an independent third party. Prior to this, China Hongqiao supplied its steam for free to Weiqiao Pioneering Group Co., Ltd. (Weiqiao Pioneering, 山東魏橋創業集團有限公司), a connected party controlled by majority shareholder Zhang Shiping (張士平), for the manufacture of alumina.

In the first nine months of 2010, China Hongqiao achieved Rmb514m of revenue from selling steam to Gaoxin A&P, accounting for 5% of its total revenue during that period. Although China Hongqiao did not disclose the cost of steam sales, we can derive this through two methods, as shown in Exhibit 5.

Exhibit 5 – Cost of steam for first nine months of 2010 estimated at Rmb336m

Year end Dec 31 (Rmb m)	2007	2008	2009	1-3Q2010
Method 1				
Revenue from steam				514
x Cost ratio of Weiqiao A&P				66%
= Cost of steam				**339**
Method 2				
Unit cost of aluminum (Rmb/ton)	11,268	13,505	10,627	8,256
x Sales volume of aluminum (k tons) / 1,000	277	610	731	747
= Cost of aluminum	3,118	8,239	7,769	6,167
Cost of sales	3,118	8,239	7,769	6,504
- Cost of aluminum	3,118	8,239	7,769	6,167
= Cost of steam	**0**	**0**	**0**	**336**

Sources: Weiqiao A&P, China Hongqiao, Emerson Analytics

Method 1: During 2012-15, Weiqiao A&P achieved revenue of Rmb907m from the sale of steam on corresponding costs of Rmb599m or 66% of sales. Applying this same ratio to China Hongqiao, its cost of steam in the first nine months of 2010 was Rmb339m (514 * 66%).

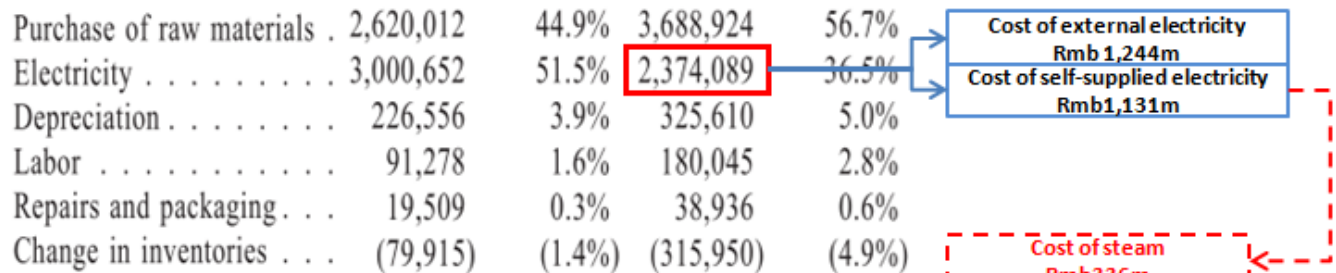
Method 2: In 2009, China Hongqiao's unit cost of aluminum was reported to be Rmb10,627/ton. For the first nine months of 2010, this declined 22% to Rmb8,256/ton while the spot market price of coal rose 23%. In the first nine months of 2010, China Hongqiao sold 747k tons of aluminum, which amounted to a total Rmb6,167m at its reported Rmb8,256/ton price. Taking this out of the Rmb6,504m total costs leaves Rmb336m, which must be the cost of steam.

The two methods yield more or less the same cost for steam production. In our subsequent analysis we will adopt the second method. On the reported 3,873k tons of steam sold in the first nine months of 2010, unit cost was Rmb87/ton.

Exhibit 6 below details China Hongqiao's cost of sales. For the first nine months of 2010, its cost of electricity was Rmb2,374m, comprising Rmb1,244m for external electricity and Rmb1,131m for self-supplied electricity.

Exhibit 6 – Breakdown of cost of sales (1-3Q2010)

	Nine months ended September 30,			
	2009		2010	
	RMB'000	Percentage of total cost of sales	RMB'000	Percentage of total cost of sales
Purchase of raw materials	2,620,012	44.9%	3,688,924	56.7%
Electricity	3,000,652	51.5%	2,374,089	36.5%
Depreciation	226,556	3.9%	325,610	5.0%
Labor	91,278	1.6%	180,045	2.8%
Repairs and packaging	19,509	0.3%	38,936	0.6%
Change in inventories	(79,915)	(1.4%)	(315,950)	(4.9%)
Others	(46,883)	(0.8%)	212,089	3.3%
Total	5,831,209	100.0%	6,503,743	100.0%



Sources: China Hongqiao, Emerson Analytics

The cost of steam is never separately disclosed by China Hongqiao. Is it included in the cost of self-supplied electricity? We analyze the two scenarios in Exhibit 7 below.

Exhibit 7 – Self-supplied electricity cost falls 33% while coal price up 23%

Year end Dec 31 (Rmb m)	2007	2008	2009	1-3Q2010
Scenario1: Excluding cost of steam				
Cost of electricity	283	1,085	917	1,131
/ Volume of electricity (m kWh)	977	2,962	3,135	5,760
= Unit cost of electricity (Rmb/kWh)	0.290	0.366	0.293	**0.196**
Change (%)		27%	-20%	**-33%**
Scenario2: Including cost of steam				
Cost of electricity				1,131
- Cost of steam				-336
= Cost of electricity after steam				795
/ Volume of electricity (m kWh)				5,760
= Unit cost of electricity (Rmb/kWh)				**0.138**
Price of coal				
Qinhuangdao price of 5,000 kcal coal (Rmb/ton)	359	538	444	544
Change (%)		50%	-18%	**23%**

Sources: China Hongqiao, Emerson Analytics

Scenario 1: Not included in cost of self-supplied electricity

- This implies that the unit cost of self-supplied electricity was Rmb0.196/kWh in the first nine months of 2010, down 33% from the 2009 level.

Scenario 2: Included in cost of self-supplied electricity

- This implies that the unit cost of self-supplied electricity was merely Rmb0.138/kWh in the first nine months of 2010, 30% below that implied in Scenario 1.

- **Such an exceedingly low cost of Rmb0.138/kWh was impossible when the Qinhuangdao spot price of 5,000 kcal coal (the benchmark for China Hongqiao) stood at Rmb544/ton.** (Please see Section 2.2 and Exhibit 16 below for an indication of this relationship).

Steam is a by-product of electricity generation. There is also no better category in Exhibit 6 to put cost of steam than in cost of self-supplied electricity. We therefore believe that Scenario 2 represents the unit cost of self-supplied electricity that China Hongqiao actually used in its accounts.

However, our subsequent analysis will be based on Scenario 1 because it is an assumption that affords China Hongqiao the maximum benefit of doubt. This means we will simply ignore the cost of steam.

For the first nine months of 2010, the Qinhuangdao spot price of 5,000 kcal coal was 23% higher than that for 2009. As our subsequent analysis of electricity cost will frequently refer to coal prices, we present detailed coal price data for the period from 2007 through mid-2016 in Appendix I. Such prices include value-added tax (VAT) and are sourced from official website for the Qinhuangdao market http://www.cqcoal.com.

How was it possible for China Hongqiao to reduce its cost of self-supplied electricity by 33% in the first nine months of 2010 from the 2009 level while the spot market price of coal rose 23%? Let's look at this from the concept of generation cost.

(1) Was there a significant improvement in China Hongqiao's generator efficiency?

Prior to the end of 2010, China Hongqiao used only 135MW generators. There could not have been any significant improvement in the efficiency of China Hongqiao's electricity generation units.

(2) Was China Hongqiao using, during the first nine months of 2010, lower-cost coal stockpiled from previous years?

Impossible, because China Hongqiao has always conducted monthly tenders for its coal use, which rules out significant stockpiles.

(3) Did increased generation hours prompt a significantly lower generation cost?

In 2009, China Hongqiao's generators achieved an average 4,009 utilization hours. For 2010, the performance in the first nine months implies 7,846 utilizations hours on annualized basis. But this cannot adequately explain the decline in generation cost because increased utilization hours can only help reduce the fixed portions of total generation cost with no impact on the fuel cost which makes up some 70-80% of the total. This can be shown simply below.

Assume that in 2009, fuel cost accounted for 70% of total electricity generation cost while other costs accounted for 30%. With standard coal consumption unchanged in the generation process, the total unit cost in the first nine months of 2010 would be 101.4% of that in 2009, based on the following formula:

70% * (1 + 23%) + 30% * 4,009 / 7,846

Thus, it is clear that China Hongqiao's unit generation cost could not have fallen 33% while coal price rose 23%. Clearly, the company's abnormally low electricity generation cost cannot be true, and its abnormally high net margin also cannot be true.

In Part 2 below, we will conduct a comprehensive analysis on the true cost of China Hongqiao's self-supplied electricity.

Part 2. True Electricity Generation Cost 40% Higher than Company's Claim

Having satisfied ourselves that the cost of self-supplied electricity reported by China Hongqiao could not be true, we then attempted three independent methods to ascertain the company's true cost of electricity generation. The three methods have led to more or less the same result, that the true cost of China Hongqiao's self-supplied electricity was about 40% higher than that reported by the company.

At the end of 2015, China Hongqiao had total installed electricity generation capacity of 9,330MW, of which 81.4% consisted of 330MW generators. As detailed below, China Hongqiao had no large generator (600MW or more, which are more efficient than the smaller ones) at all.

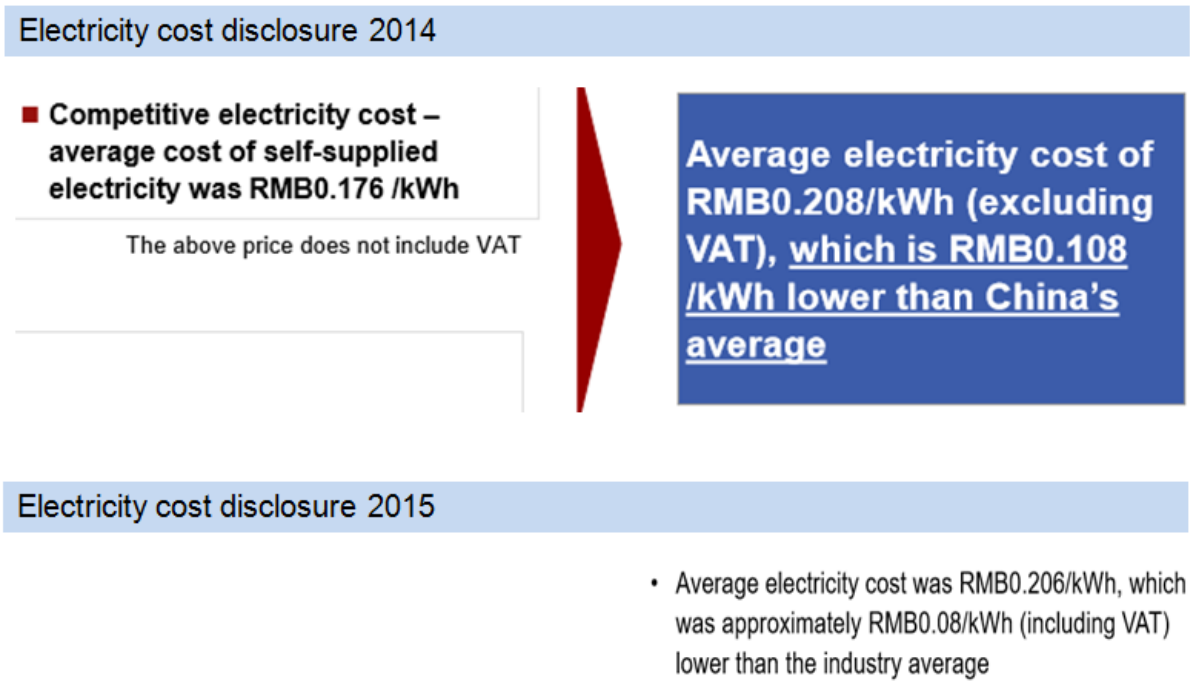
Exhibit 8 – China Hongqiao installed generation capacity as at end-2015 (MW)

Unit capacity	Number of units	Total capacity	Percent of total
60	2	120	1.3%
135	12	1,620	17.4%
330	23	7,590	81.4%
Total	**37**	**9,330**	**100.0%**

Source: China Hongqiao

We have shown in Exhibit 1 above the steady deterioration of China Hongqiao's disclosure since its listing in early 2011. While the company ceased to disclose its cost of self-supplied electricity from 2015, it has continued to disclose the average cost of electricity (i.e. inclusive of electricity purchased from "independent third party"). However, its definition of average cost of electricity was changed: instead of disclosing the cost excluding VAT, it disclosed the cost with VAT, as shown in Exhibit 9 below.

Exhibit 9 – Electricity cost disclosure 2014 vs. 2015



Sources: http://www.hongqiaochina.com/UpLoad/en/20150330063126_China%20Hongqiao%202014%20AR%20ppt_eng-FINAL%20FOR%20PRINT.PDF, *p.14*
http://www.hongqiaochina.com/UpLoad/en/20160314051909_China%20Hongqiao%20FY2015%20annual%20results%20presentation_English.pdf, *p.16*

Value-added tax is a tax added on to the selling price set by the vendor. To conform to the numbers in its financial statements, a listed company usually discloses unit prices excluding VAT. After years of following this standard practice, why did China Hongqiao changed to this peculiar way of disclosure? The only reason we can think of is that it didn't want people to notice the exceedingly cheap electricity cost that it fabricated.

But hiding the cost of self-supplied electricity could not prevent us from deducing this number logically. First, the average cost of electricity inclusive of VAT was Rmb0.206/kWh, or Rmb0.176/kWh without VAT (0.206 / 1.17).

We know that the proportion of China Hongqiao's self-supplied electricity was 84.7% of the total and that the cost of externally sourced electricity was Rmb0.280/kWh. Let the cost of self-supplied electricity be X, according to the formula 0.280 * 15.3% + X * 84.7% = 0.176, X = Rmb0.157/kWh.

2.1. Retail Price 1/3 Below National Grid's ≠ Generation Costs 1/3 Below Peers'

Prior to 2010, China Hongqiao had two "external" electricity suppliers, Weiqiao Pioneering and Gaoxin A&P. At the end of 2009, China Hongqiao terminated its power purchase agreement with Weiqiao Pioneering, making Gaoxin A&P its only external power supplier.

Exhibit 10 below summarizes China Hongqiao's electricity usage, including total consumption, the proportions of externally sourced and self-supplied electricity, and their costs. Production volume of aluminum includes aluminum products as well as aluminum-processed products. Figures in blue are those of Weiqiao A&P, which are used in the absence of relevant data for the whole China Hongqiao group.

Exhibit 10 – China Hongqiao's electricity consumption, 2007-15

Year end Dec 31	2007	2008	2009	2010	2011	2012	2013	2014	2015
Production volume of aluminum (k tons)	311	617	726	1,076	1,596	1,859	2,434	3,346	4,617
x Electricity consumption per aluminum (kWh/ton)	13,878	14,319	14,319	13,453	13,457	13,456	13,500	13,471	13,463
= Electricity consumption (m kWh)	**4,313**	**8,834**	**10,398**	**14,478**	**21,480**	**25,015**	**32,859**	**45,074**	**62,159**
- External	3,336	5,872	7,264	6,501	12,029	10,356	11,106	12,508	9,510
- Self-supplied	977	2,962	3,135	7,977	9,451	14,659	21,753	32,566	52,648
Percentage									
- External	77.3%	66.5%	69.9%	44.9%	56.0%	41.4%	33.8%	27.8%	15.3%
- Self-supplied	22.7%	33.5%	30.1%	55.1%	44.0%	58.6%	66.2%	72.3%	84.7%
Cost of electricity (Rmb/kWh)	**0.283**	**0.391**	**0.397**	**0.238**	**0.259**	**0.245**	**0.233**	**0.208**	**0.176**
- External	0.281	0.403	0.442	0.290	0.290	0.290	0.290	0.290	0.280
- Self-supplied	0.290	0.366	0.293	0.196	0.220	0.214	0.204	0.176	0.157

Sources: China Hongqiao, Weiqiao A&P, Emerson Analytics

The cost of externally sourced electricity for 2007 is calculated as Rmb0.281/kWh, which is somehow significantly different from the Rmb0.385/kWh disclosed in the company's IPO prospectus. For 2010, China Hongqiao has not disclosed the full year unit cost of self-supplied electricity and we have used the number for the first nine months of 2010 instead. Similarly, the 2011 full year cost of self-supplied electricity is actually the 1H2011 number as disclosed by the company.

Normally, the cost of self-supplied electricity should include a few items such as the following on top of the generation cost:

- According to the Price Control Administration of Shandong Province, captive power plants connected to the national grid must pay a system standby fee based on their respective electricity generation volume, subject to a maximum Rmb0.035/kWh[3]. China Hongqiao does not connect to the national grid because it has its own grid connecting its dozens of generators. It, therefore, does not pay the system standby fee.

[3] http://wenku.baidu.com/link?url=Y5U34VahX4-Q8GCSkw3JCxmQeM4JTebsWbLIeQrRYacOzruqav5RljiZNuH2G3nP1AE_RZs2gdnS-uToULNyNF6D_WIIlU1wJCPquxxRGnS

- The retail price sold by the national grid to consumers includes various levies such as Rural Network Debt Repayment Fund, Urban Public Utilities Levy, National Major Hydro Projects Construction Fund. In Shandong province, the various levies for electricity sold to industrial and commercial enterprises total Rmb0.061/kWh (See Exhibit 11 below). According to the government's rules and regulations, captive power plants are also required to pay such levies on their electricity output. Our investigation revealed that the company had not paid such levies.

- Amortization of the cost of captive power grid means the total cost of self-supplied electricity is higher than generation cost. Our analysis has ignored the construction cost of China Hongqiao's captive power grid. This is an assumption advantageous to the company.

Exhibit 11 – Levies for industrial-commercial electricity total Rmb0.061/kWh

National Major Hydro Projects Construction Fund	0.007
Rural Network Debt Repayment Fund	0.020
Continuing Support Fund for Large-to-medium Reservoir Emigrants	0.008
Continuing Support Fund for Local Reservoir Emigrants	0.001
Urban Public Utilities Levy	0.010
Renewable Energy Levy	0.015
Total	**0.061**

Source: http://www.sdwj.gov.cn/images/ggfw/jggl/zls/2015/04/20/94D47E3B6CBE54AA5BA60768DFCEA0AC.pdf, p.4

Based on the above three factors, we estimate that China Hongqiao's cost of self-supplied electricity is the same as its generation cost.

We compare China Hongqiao's generation costs with those of publicly listed power generation companies such as Huaneng Power (0902.HK), China Res Power (0836.HK) and China Power (2380.HK) as well as the provincial Xinneng Taishan (000720.SZ). From Exhibit 12 below, we can see that all power generation companies have similar generation costs, while China Hongqiao has reported costs about 1/3 below those of the professional power generation companies. **Bear in mind that we are comparing generation costs**.

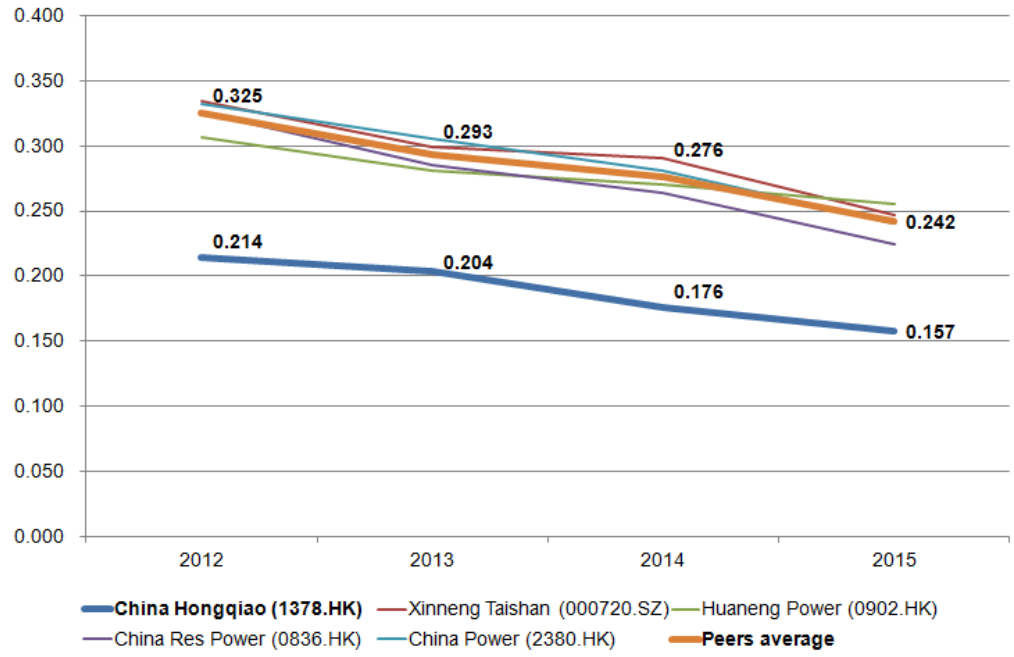
Some readers may say there's nothing new in this. As early as mid-2012, this has been widely reported in an article entitled "山东魏桥集团自办电厂 电价比国家电网低1/3 (Shandong Weiqiao Group Operates own Power Plants, Price at 1/3 Below that of National Grid)".

Weiqiao Pioneering and China Hongqiao are both controlled by Zhang Shiping. Weiqiao Pioneering generated 22,634m kWh of electricity in 2015[4], accounting for 30% of the total electricity generated by China Hongqiao and Weiqiao Pioneering combined. Mainland China media, members of the investment community and even company insiders often do not distinguish among the various legal entities such as

[4] http://www.chinamoney.com.cn/fe/CMS5_G20306002Resource?info=31243292;res=14689849832781268054941;download=, p.14

"Weiqiao Pioneering", "China Hongqiao" or "Weiqiao A&P", and simply refer to "Weiqiao" or "Weiqiao group" indiscriminately.

Exhibit 12 – Reported generation costs 1/3 below those of professional power companies, 2012-15



Source: Emerson Analytics

Exhibit 12 refers to China Hongqiao's generation costs being 1/3 below those of the big professional players, while the news article above refers to Weiqiao's retail price of electricity being 1/3 below that of the national grid. They are totally different!

The retail price of a captive power plant may be 1/3 below that of the national grid for reasons other than generation cost. For example, it may not include all the levies shown in Exhibit 11. Or the proximity of the captive power plant to its end-users helps reduce transmission cost. Further, a private enterprise is more cost efficient than the national grid.

How can China Hongqiao's generation costs be 1/3 below those of the professional big players? Given that the traditional coal-fired power generation industry is a matured industry, technological progress has been slow and technical differentiation is limited. For example, in 2015, the three big national players (Huaneng Power, China Res Power and China Power) reported a maximum gap of 1.6g/kWh in their respective power supply standard coal (7,000kcal/kg calorific value) consumption. That's a difference of just 0.5%.

Below, we present three independent ways to find the actual generation cost of China Hongqiao and dispel the myth that it is 1/3 cheaper than the professional big players.

2.2. Method 1: 2015 Coal Price and Consumption Suggest Generation Cost 36% Higher than Reported

The cost of power generation mainly includes the cost of coal, depreciation, maintenance and labor, with coal cost accounting for the bulk. First, we calculate coal cost from standard coal consumption and unit coal price. Then we refer to the big professional players for other costs. Adding the two steps together yields the final generation cost for China Hongqiao.

(1) Power supply standard coal consumption at about 350g/kWh

China Hongqiao discloses very little about its own electricity generation business. However, there is considerable publicly available information on Weiqiao A&P's power supply standard coal consumption which is a reasonably accurate proxy.

Weiqiao A&P's power supply standard coal consumption has held relatively steady at 350-355g/kWh during 2013-15, as shown in Exhibit 13 below. This is commensurate with the 330MW generators that China Hongqiao mainly uses, as shown in Exhibit 8.

Exhibit 13 – Weiqiao A&P's power supply standard coal consumption about 350g/kWh

图表 10. 公司近年来发电主要指标情况

	2012 年	2013 年	2014 年	2015 年第一季度
装机容量（万千瓦）	240	306	525	624
发电量（亿度）	146.16	180.11	226.87	88.59
电力自给率（%）	63.35	62.14	62.27	71.39
power supply standard coal consumption (g/kWh)			525	—
供电标准煤耗（克/千瓦时）	322	352	355	367
资料来源：魏桥铝电				

Source: Weiqiao A&P

	2013 年	2014 年	2015 年
装机容量（万千瓦）	306	525	801
发电量（亿度）	180.11	226.87	427.20
电力自给率（%）	62.14	62.27	79.33
power supply standard coal consumption (g/kWh)		...12	6,537
供电标准煤耗(克/千瓦时)	352	355	351
资料来源：魏桥铝电			

Source: Weiqiao A&P

Sources: http://www.chinamoney.com.cn/fe/CMS5_G20306002Resource?info=16317254;res=14536855023901232028180;download=, p.16
http://www.chinamoney.com.cn/fe/CMS5_G20306002Resource?info=32551694;res=14731266802921861483238;download=, p.17

Our investigator dialed the contact telephone number listed in certain of Weiqiao A&P debt issue documents and confirmed the accuracy of the above numbers with Staff A (**Audio Evidence 1**).

At one of China Hongqiao's power plants installed with 330MW generators, the power supply standard coal consumption data provided by Ex-staff B at the fuel department conformed to the above numbers (**Audio Evidence 2**).

To protect the personal safety of these interviewees, we will not make public our audio recordings of these telephone conversations. We are, however, sharing such audio recordings as well as the interviewees' names, positions, contact telephone numbers and dates of contact with the Securities and Futures Commission (SFC) of Hong Kong.

(2) Price of Standard Coal

Exhibit 14 shows China Hongqiao's coal procurement prices, with those in blue being data for Weiqiao A&P.

Exhibit 14 – China Hongqiao's standard coal procurement prices, 2007-15

Year end Dec 31 (Rmb/ton)	2007	2008	2009	2010	2011	2012	2013	2014	2015
Cost of coal (Rmb m)	224	899	869			3,150	3,803	3,368	4,566
* 1,000 / Volume of coal (k tons)	540	1,360	1,738			5,690	8,170	9,040	16,493
= Procurement price	415	661	500	603	660	554	465	373	277
Qinhuangdao price of 5,000 kcal coal	359	538	444	553	616	515	438	389	312
Price gap (procurement price - Qinhuangdao price of 5,000 kcal coal)	56	123	56	51	45	39	28	-16	-35
Procurement price	415	661	500	603	660	554	465	373	277
x 7,000 / 5,000	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
= Price of standard coal	581	925	700	845	925	775	652	522	388

Sources: China Hongqiao, Weiqiao A&P

The 2010 and 2011 procurement prices are deduced from relevant data in previous and subsequent years. In 2009, the gap between China Hongqiao's procurement price and the Qinhuangdao spot price of 5,000kcal/kg was Rmb56/ton. From 2012, this has steadily narrowed, reflecting China Hongqiao's strengthened bargaining power as its capacity grew and demand for coal increased. Assuming a steady decline trend, we set the price gap for 2010 at Rmb51/ton and that for 2011 at Rmb45/ton. Adding back the benchmark Qinhuangdao 5,000kcal/kg coal price, we arrive at a procurement price of Rmb603/ton for 2010 and Rmb660/ton for 2011.

According to China Hongqiao's IPO prospectus, "*Qinhuangdao price of coal with an average calorific value of 5,000 kilocalories is most relevant to our average coal consumption cost*". This implies that China Hongqiao's power plants use coal of 5,000kcal/kg average thermal heat. At another China Hongqiao power plant with 330MW generators, a mid-level management Ex-staff C also confirmed to our investigators that his plant used coal with average calorific value of 5,000kcal/kg (**Audio Evidence 3**).

To arrive at the price of standard coal, simply multiple the procurement price by 7,000/5,000.

(3) Costs other than fuel

For a traditional industry such as electricity generation, reference to peer group data is the best way to estimate operating costs other than fuel. In Exhibit 15, we present the cost structure of the four power generation companies listed earlier.

Exhibit 15 – Other generation costs (Rmb/kWh) of China Hongqiao peer group, 2012-15

Xinneng Taishan (000720.SZ)

	2012	2013	2014	2015
Fuel cost	0.262	0.218	0.204	0.154
Other costs	0.073	0.081	0.086	0.093
Total	**0.335**	**0.299**	**0.290**	**0.247**

Huaneng Power (0902.HK)

	2012	2013	2014	2015
Fuel cost	0.250	0.219	0.201	0.174
Other costs	0.057	0.062	0.069	0.082
Total	**0.306**	**0.281**	**0.270**	**0.255**

China Res Power (0836.HK)

	2012	2013	2014	2015
Fuel cost	0.254	0.213	0.186	0.146
Other costs	0.071	0.073	0.078	0.079
Total	**0.325**	**0.285**	**0.264**	**0.225**

China Power (2380.HK)

	2012	2013	2014	2015
Fuel cost	0.255	0.226	0.190	0.145
Other costs	0.078	0.080	0.092	0.095
Total	**0.333**	**0.306**	**0.281**	**0.240**

Source: Emerson Analytics

To be conservative, we choose the lowest other costs in each year as the cost for the company. Thus, for 2014 we take China Hongqiao's other costs as Rmb0.069/kWh (achieved by Huaneng Power), and for 2015 we choose Rmb0.079/kWh (China Res Power).

Combining the above three parts yields the true generation cost of China Hongqiao. For example, in 2015, the company's procurement price of standard coal was Rmb388/ton and its power supply standard coal consumption was 351g/kWh. Multiplying the two gives rise to fuel cost of Rmb0.136/kWh. Adding this to the lowest other costs of Rmb0.079/kWh reported by its peers in that year arrives at a generation cost of Rmb0.215/kWh for the company.

From 2007 through 2011, data for power supply standard coal consumption and other costs are missing. We attempt an estimate by using the lowest numbers during 2012-15, and the results are shown in Exhibit 16.

Exhibit 16 – China Hongqiao's generation cost based on fuel and other costs, 2007-15

Year end Dec 31 (Rmb/kWh)	2007	2008	2009	2010	2011	2012	2013	2014	2015
Price of standard coal (Rmb/ton)	581	925	700	845	925	775	652	522	388
x Power supply standard coal consumption (g/kWh) / 1000,000	322	322	322	322	322	322	352	355	351
= Fuel cost	0.187	0.298	0.225	0.272	0.298	0.250	0.229	0.185	0.136
+ Other costs	0.057	0.057	0.057	0.057	0.057	0.057	0.062	0.069	0.079
= Estimated generation cost	**0.244**	**0.355**	**0.282**	**0.329**	**0.354**	**0.306**	**0.292**	**0.254**	**0.215**
Cost of self-supplied electricity - China Hongqiao claim	0.290	0.366	0.293	0.196	0.220	0.214	0.204	0.176	0.157
Estimated fuel cost relative to China Hongqiao claim	-35%	-19%	-23%	39%	35%	17%	12%	5%	-14%
Estimated generation cost relative to China Hongqiao claim	-16%	-3%	-4%	67%	61%	43%	43%	44%	36%

Source: Emerson Analytics

For the 2007-09 period, generation costs estimated under Method 1 were broadly in line with those reported by China Hongqiao. From 2010 onward, the generation costs estimated under Method 1 far exceeded those reported by the company: for 2010-11 they were more than 60% higher, from 2012 onward they were about 40% higher. Even more outrageous, in several years just the fuel costs estimated under Method 1 were already higher than the costs of self-supplied electricity reported by China Hongqiao. For 2010 and 2011, our estimated fuel costs were more than 35% higher than the reported costs of self-supplied electricity.

How is this possible?

2.3. Method 2: Ex-staff Says 2015 Generation Cost at Rmb0.231-0.239/kWh

In May 2012, a mainland China financial newspaper *Innovative Finance Observation* carried an article entitled "山东首富电厂电价比国电低:每度电成本仅0.35元 (Electricity from Shandong's Richest Man Cheaper than that of National Grid: Only costs Rmb0.35/kWh)", as shown in Exhibit 17. It quoted an insider as saying that "Weiqiao's power plants in Zouping county can control its cost at about Rmb0.35 per kWh".

China Hongqiao – Electrifying Margins to Absurd Levels

As mentioned earlier, even China Hongqiao's employees do not bother to distinguish among Weiqiao Pioneering, China Hongqiao or Weiqiao A&P and simply refer to Weiqiao indiscriminately. From the context of the entire article, it appears that this insider is an employee of China Hongqiao.

Exhibit 17 – China Hongqiao 2012 generation cost said to be Rmb0.35/kWh

发电账本

发电成本是一笔难算的账，只能取平均值。而在煤价高企、财务成本提高的前提下，电厂亏

Weiqiao's power plants in Zouping county can control its cost at about Rmb0.35 per kWh.

“魏桥在邹平的电厂，每度电成本可以控制在0.35元左右。”卫常说。但这个数字在相邻不远泰安市某央企电厂，是0.4-0.45元。

上述泰安电厂的燃料部主任对新金融记者说，现在山东省上网电价是0.42元，有时比我们上网成本还要低，全年基本上都属于亏损发电阶段。

发电成本主要在电煤和人力两部分，其中电煤采购成本占到70%-80%。魏桥热电厂的电煤主要从内蒙古汽运而来。“电厂的经营团队比较给力，通常是在煤价低位时大量买进。”卫常说。但亏损中的国营电厂，因为资金紧张，往往不能在价低时大手笔采购。

在人力成本上，在卫常看来，就更容易控制，稍微压低工资就可以做到。魏桥电厂普通职工月工资在3000元左右，没有奖金。而卫常认识在国有电厂的朋友，基本工资就是3000元，额外还有其他福利，“用他们的话说，每月都有莫名其妙的奖金。”

另外在设备检修方面，比如锅炉养护等，魏桥电厂并没有外包给专业的施工单位去做，卫常曾经做过技术检修，他说这方面成本是可以压缩的，所以魏桥投入的非常少，而国有电厂的检修成本是魏桥的两倍以上。

Source: http://finance.sina.com.cn/china/20120520/101712104269.shtml

The Rmb0.35/kWh should be inclusive of VAT, implying a price of Rmb0.299/kWh excluding VAT. This is 40% higher than the claim of Rmb0.214/kWh self-supplied electricity cost made by China Hongqiao!

In the second half of 2016, Emerson Analytics conducted an extensive on-site investigation of China Hongqiao's electricity generation cost. The above-mentioned middle management Ex-staff C at one of China Hongqiao's power plants told us that his plant achieved generation cost of Rmb0.27-0.28/kWh (including VAT) in 2015. The English translation of the transcript of our recorded conversation follows:

Audio Evidence 4 – Ex-staff C says 2015 generation cost (with VAT) Rmb0.27-0.28/kWh	
Emerson investigator:	What was your plant's generation cost in 2015?
China Hongqiao Ex-staff C:	Last year's generation cost including desulphurization and denitrification was about Rmb0.27-0.28/kWh.
Emerson investigator:	Was that the average for the four generators in your plant?
China Hongqiao Ex-staff C:	Yes, the average generation cost.
…	
China Hongqiao Ex-staff C:	Currently, our plant's average generation cost is about Rmb0.26/kWh.
Emerson investigator:	Is this Rmb0.26/kWh the 2015 average?
China Hongqiao Ex-staff C:	No, that's for the first half of 2016.

Source: Emerson Analytics

The Rmb0.27-0.28/kWh cost inclusive of VAT translates to Rmb0.231-0.239/kWh net of VAT. Assuming the lowest Rmb0.231/kWh that affords the most advantage to China Hongqiao, this cost is 47% higher than the Rmb0.157/kWh cost of self-supplied electricity claimed by the company.

Some readers may accuse us of unfairly selecting data that suit our purposes. They may point to this article entitled "魏桥自备发电成本仅每度一毛七 电价比网电低三成以上 (Weiqiao Self-supplied Electricity only Costs Rmb0.17/kWh, 30% Cheaper than that of National Grid)", which says that Weiqiao's generation cost was only Rmb0.18/kWh in 2015 and Rmb0.17/kWh in 1Q2016, and ask why don't we use these numbers?

We must admit that when there are major discrepancies among data from different sources, we need to be selective. Our principle, however, is to be as close to the truth as possible.

In the first article referred to in this section, there are not only generation cost data but also details on China Hongqiao's coal procurement, labor cost and maintenance expenses. We deem this article to be highly accurate. As for the second article, it contains many vaguely worded sentences, with little useful information other than repeating a debt valuation report on Weiqiao Pioneering.

It is quite clear to us which of two articles is superior.

2.4. Method 3: Data from Industry Consultancy Confirm the Previous Two Methods

We have procured from an industry consultancy firm with well-known expertise in aluminum a large number of data that corroborate the first two methods that we have used. This expert consultancy specializes in the research of the entire aluminum industry value chain. It publishes regular industry reports and often holds seminars about the industry. The following table shows Weiqiao A&P's 2015 quarterly electricity generation cost data the consultancy supplies to us. For the whole of 2015, Weiqiao A&P's generation cost amounted to Rmb0.26/kWh (including VAT).

Exhibit 18 – Weiqiao A&P 2015 generation cost according to industry consultancy

Price of captive power (purchased coal)

	省	企业	冶炼厂	建成产能	运行产能	网电实际价格	占比	直购电	占比	自备电价格外购煤	占比	自备电价格自采煤	占比	加权电价	自备电成本	网电成本	综合电力成本
2015年1季度				430	430	0.56	4%				96%		0%		5,551	7,582	5,632
2015年2季度				430	430	0.36	33%				67%		0%		4,368	4,842	4,524
2015年3季度				430	430	0.36	33%				67%		0%		4,366	4,841	4,523
2015年4季度				430	430	0.36	33%				67%		0%		3,932	4,841	4,232
2015年1季度				500	380	0.61	2%				98%		0%		5,335	8,344	5,395
2015年2季度				500	450	0.61	2%				98%		0%		5,398	8,443	5,459
2015年3季度				500	450	0.61	2%				98%		0%		4,874	8,305	4,943
2015年4季度				500	450		0%				100%		0%		3,404		3,404
2015年1季度	山东	宏桥	山东魏桥铝电有限公司	4400	4300					0.29	100%		0%	0.29	3,916		3,916
2015年2季度	山东	宏桥	山东魏桥铝电有限公司	4700	4600					0.25	100%		0%	0.25	3,376		3,376
2015年3季度	山东	宏桥	山东魏桥铝电有限公司	4700	4700					0.25	100%		0%	0.25	3,376		3,376
2015年4季度	山东	宏桥	山东魏桥铝电有限公司	5000	4800					0.25	100%		0%	0.25	3,376		3,376

1-4Q2015

Weiqiao A&P

Source: Emerson Analytics

In order to protect the interest of this industry consultancy so that it will not be harassed by China Hongqiao for providing us with the relevant data, we are not revealing its name here. We have also blurred certain electricity data regarding other aluminum companies. We are, however, providing the Hong Kong SFC a complete set of the information supplied to us by this industry consultancy.

Exhibit 19 summarizes Weiqiao A&P's electricity generation costs for 2010-15 as supplied by the industry consultancy. It can be seen that the 2015 cost is 41% higher than that claimed by China Hongqiao, while the 2010 cost is a staggering 83% higher than the claim.

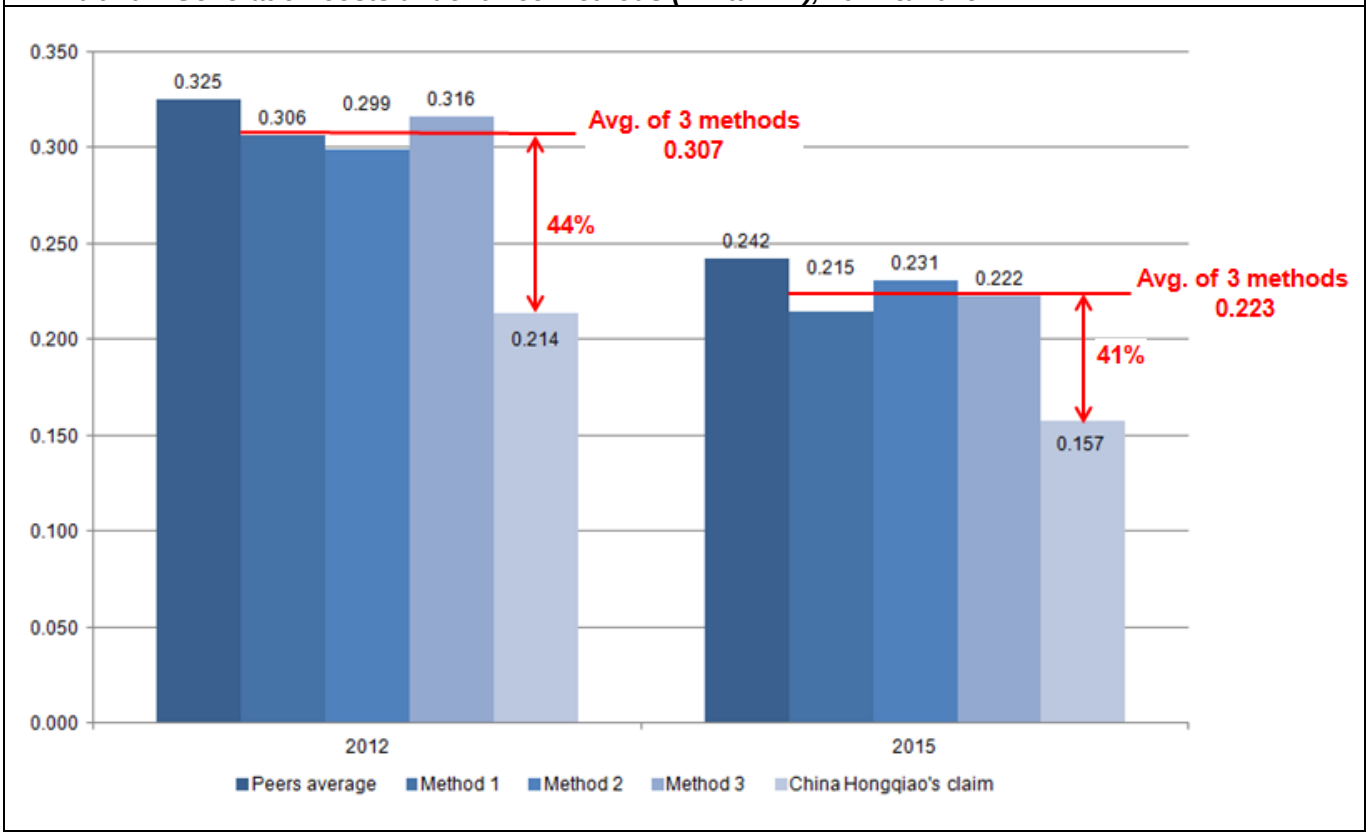
Exhibit 19 – Generation costs claimed vs. industry consultancy data (Rmb/kWh), 2010-15

	2010	2011	2012	2013	2014	2015
Generation cost with VAT	0.420	0.450	0.370	0.310	0.300	0.260
Generation cost without VAT	0.359	0.385	0.316	0.265	0.256	0.222
Claimed cost of self-supplied electricity	0.196	0.220	0.214	0.204	0.176	0.157
Ex-VAT generation cost exceeds claim by	83%	75%	48%	30%	46%	41%

Source: Emerson Analytics

Now that we have presented our investigations into China Hongqiao's self-supplied electricity costs for 2007-15, we can see that only the 2012 and 2015 performance can be ascertained by all three methods. This is summarized in Exhibit 20 below.

Exhibit 20 – Generation costs under three methods (Rmb/kWh), 2012 & 2015



Source: Emerson Analytics

For 2012, the generation costs arrived under our three methods are Rmb0.306/kWh, Rmb0.299/kWh and Rmb0.316/kWh, respectively, with the largest number only 5.7% higher than the smallest. The average is Rmb0.307/kWh, 44% higher than the Rmb0.214/kWh claimed by China Hongqiao. For 2015, the situation is similar.

In our subsequent discussions on the under-reporting or subsidy of China Hongqiao's electricity cost, we will use data under Method 3.

We also assume that Gaoxin A&P and China Hongqiao itself have similar generation cost. This is because both have their power plants in the same region installed with similar generators and operated as a single business.

- The tendency to refer to Weiqiao Pioneering, China Hongqiao and Weiqiao A&P simply as Weiqiao or Weiqiao Group also extends to Gaoxin A&P. Local people have told our investigators that the plant facilities in their neighborhood (which legally belong to Gaoxin A&P) belong to "Weiqiao".

- Gaoxin A&P participates in joint tenders organized by Weiqiao. As shown in Exhibit 21 below, Zouping No.4 Power Plant belongs to Gaoxin A&P but takes part in this particular tender for the procurement of coal organized by Weiqiao. The said power plant also participates in Weiqiao A&P's tender for coal dust treatment[5].

Exhibit 21 – Gaoxin A&P power plant participates in a Weiqiao Group tender

Source: http://www.sci99.com/

2.5. Illicit Gains of Rmb13.6bn from Under-reporting and "Third-party" Subsidies

With regard to self-supplied electricity, deducting the unit cost as claimed by China Hongqiao from the true generation cost gives rise to the extent of under-reporting perpetuated by the company. Multiplying this number with the self-supplied electricity consumption is the total under-reported electricity cost in a given year.

With regard to electricity "externally" sourced from Gaoxin A&P, theoretically, China Hongqiao's procurement price should be higher than Gaoxin A&P's generation cost. This is because Gaoxin A&P should, under normal circumstances, charge its customer not only the relevant administrative overhead and finance cost but also a return on its investment. In the absence of any useful information relating to

[5] http://www.weiqiaocy.com/cn/newsShow.aspx?id=2589

these three items, we are simply deducting China Hongqiao's procurement price from Gaoxin A&P's generation cost. This gives rise to the unit subsidy provided by Gaoxin A&P to China Hongqiao, which is an assumption advantageous to the latter.

The results are presented in Exhibit 22 below.

Exhibit 22 – Rmb13.6bn of illicit gains from under-reported costs and subsidies, 2010-15

Year end Dec 31 (Rmb m)	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Procurement price of external electricity (Rmb/kWh)	0.281	0.403	0.442	0.290	0.290	0.290	0.290	0.290	0.280	
- Estimated generation cost (Rmb/kWh)	0.244	0.355	0.282	0.359	0.385	0.316	0.265	0.256	0.222	
= Cost gap (Rmb/kWh)				-0.069	-0.095	-0.026				
x Volume of external electricity (m kWh)	3,336	5,872	7,264	6,501	12,029	10,356	11,106	12,508	9,510	
= Subsidies of external electricity from Gaoxin A&P				-448	-1,138	-272				**-1,858**
Cost of self-supplied electricity (Rmb/kWh)	0.290	0.366	0.293	0.196	0.220	0.214	0.204	0.176	0.157	
- Our estimated generation cost (Rmb/kWh)	0.244	0.355	0.282	0.359	0.385	0.316	0.265	0.256	0.222	
= Cost gap (Rmb/kWh)				-0.163	-0.165	-0.102	-0.061	-0.080	-0.065	
x Volume of self-supplied electricity (m kWh)	977	2,962	3,135	7,977	9,451	14,659	21,753	32,566	52,648	
= Under-reporting of self-supplied electricity				-1,297	-1,556	-1,499	-1,326	-2,619	-3,418	**-11,715**
Total illicit gains from electricity use				**-1,746**	**-2,694**	**-1,770**	**-1,326**	**-2,619**	**-3,418**	**-13,573**

Source: Emerson Analytics

During 2010-12, Gaoxin A&P provided about Rmb1.9bn of subsidies to China Hongqiao by selling its electricity below its own generation costs. During 2010-15, China Hongqiao under-reported about Rmb11.7bn of its own electricity generation costs. Together, they allowed China Hongqiao to shave at least Rmb13.6bn of expenses from its financial statements during those six years.

Eagle-eyed readers may see that during 2013-15, China Hongqiao bought electricity from Gaoxin A&P at prices higher than the latter's generation costs, which constituted "negative subsidies" that we have ignored! This idea of "negative subsidies" is only seemingly correct. Don't forget that in addition to

generation cost, Gaoxin A&P also incurred administrative overhead and finance charges (not to mention a return on investment). There is really no evidence that Gaoxin A&P was able to fully recover its full costs during that time.

Part 3. Misrepresentation of Rmb8.1bn Alumina Costs

Alumina is the most crucial raw material in the production of aluminum. The hidden costs that we have seen in China Hongqiao's electricity consumption are, not surprisingly, being repeated here.

Exhibit 23 below shows China Hongqiao's alumina consumption from 2007 to 2015. Again, numbers in blue signify Weiqiao A&P data in the absence of relevant data from China Hongqiao.

Exhibit 23 – China Hongqiao's alumina consumption, 2007-15

Year end Dec 31	2007	2008	2009	2010	2011	2012	2013	2014	2015
Production volume of aluminum (k tons)	311	617	726	1,076	1,596	1,859	2,434	3,346	4,617
x Alumina consumption per aluminum	1.860	1.946	1.916	1.861	1.870	1.878	1.890	1.890	1.917
= Alumina Consumption (k tons)	**578**	**1,201**	**1,392**	**2,003**	**2,985**	**3,491**	**4,600**	**6,324**	**8,851**
- External	578	1,201	1,392	2,003	2,985	2,004	1,703	2,708	3,870
- Self-supplied						1,487	2,897	3,616	4,981
Percentage									
- External	100%	100%	100%	100%	100%	57%	37%	43%	44%
- Self-supplied						43%	63%	57%	56%
Cost of alumina (Rmb/ton)	**2,379**	**2,495**	**1,712**	**1,612**	**1,870**	**1,776**	**1,832**	**1,801**	**1,841**
- External	2,379	2,495	1,712	1,621	1,870	1,849	1,891	1,940	1,894
- Self-supplied						1,677	1,797	1,697	1,800
As % of external volume									
- Weiqiao Pioneering	100%	100%	100%						
- Gaoxin A&P				100%	97%	92%	100%	98%	72%

Sources: China Hongqiao, Weiqiao A&P

Prior to 2010, China Hongqiao only sourced its alumina from Weiqiao Pioneering. In December 2009, Weiqiao Pioneering sold its alumina production facilities to Gaoxin A&P. Since then, Gaoxin A&P has been China Hongqiao's most important alumina supplier.

3.1. Cost of Self-supplied Alumina Under-reported by Rmb2.0bn

China Hongqiao commissioned its own alumina production facilities in 2012 with total output of 1,487k tons that year, accounting for 43% of its needs. In subsequent years, internally produced alumina has generally accounted for 60% of use.

China Hongqiao – Electrifying Margins to Absurd Levels

The production of alumina comprises mainly of raw materials (bauxite and caustic soda), energy and labor. Just like the production of electricity we have discussed earlier, alumina production is a matured industry.

Similar to the electricity generation assets, the alumina production facilities of China Hongqiao and Gaoxin A&P are managed as a single business. Therefore, we believe it is reasonable to consider that China Hongqiao's alumina production costs are similar to those of Gaoxin A&P.

The industry consultancy that supplied us with electricity generation cost data also provided us with detailed alumina production costs of Gaoxin A&P during the 2011-15 period, as well as those for a major privately-held manufacturer of alumina and aluminum located in Shandong province. The consultancy also took the view that Weiqiao A&P had similar cost structure as Gaoxin A&P, as they both used "imported bauxite, with similar production process and scale of production".

The consultancy's alumina data are shown in Exhibit 24 below. We are not revealing the identity of this privately-held Shandong enterprise, but again we are supplying a complete set of the information that we have received to the Hong Kong SFC.

In Exhibit 24, full costs include selling and administrative expenses and finance charges. For our present purpose we are ignoring these items and focusing only on production cost. The numbers in the table represent costs inclusive of VAT. Dividing these numbers by 1.17 gives rise to costs excluding VAT.

Exhibit 24 – Gaoxin A&P alumina production cost according to industry consultancy, 2011-15

Cost of bauxite / Cost of energy / Cost of caustic soda

		铝土矿单耗（吨）	铝土矿价格（元/吨）	铝土矿成本（元/吨）	能源单耗（公斤）	标煤价格（元/吨）	能源成本（元/吨）	烧碱单耗（公斤）	烧碱价格（元/吨）	烧碱成本（元/吨）	石灰成本（元/吨）	新水单耗（吨）	新水价格（元/吨）
	2011年	2.56	495	1267	517	877	453	122	2253	275	41	2.5	6
	2012年	2.62	484	1268	489	773	378	134	2488	333	69	2.5	6
	2013年	2.70	509	1374	449	610	274	138.5	1950	270	75	2.5	6
	2014年	2.70	516	1393	448	562	252	138.5	1870	259	108	2.5	6
	2015年	2.70	477	1288	436	532	232	138	1855	256	97	2.5	6
	2011年	2.55	491	1252	515	867	447	122	2203	268	38	2.5	6
	2012年	2.61	486	1268	476	790	376	132	2613	344	67	2.5	6
高新铝电有限	2013年	2.69	515	1385	444	601	267	139	1950	270	78	2.5	6
Gaoxin A&P	4年	2.69	514	1383	450	556	250	136	1880	256	106	2.5	6
	2015年	2.68	492	1319	441	528	233	135	1866	252	78	2.5	6

Fin cost / Selling cost / Admin cost / Full costs

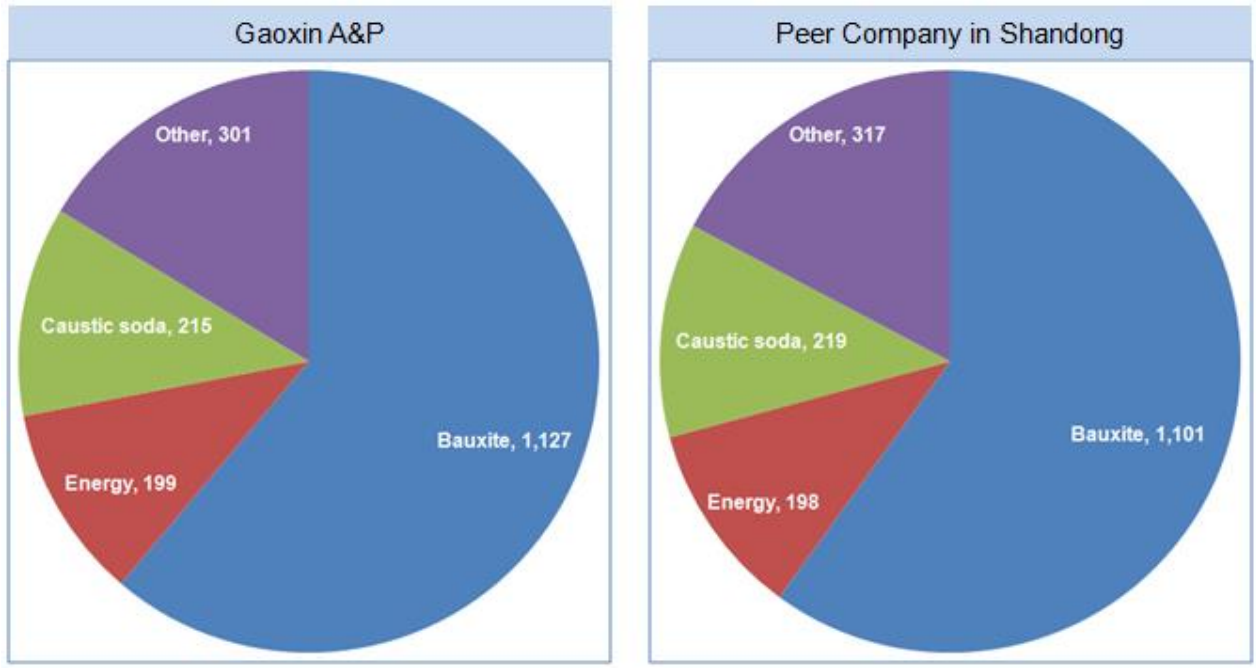
		新水成本（元/吨）	人工成本（元/吨）	制造费用（元/吨）	折旧费用（元/吨）	财务费用（元/吨）	销售费用（元/吨）	管理费用（元/吨）	其它	完全成本（元/吨）
	2011年	15	72	59	125	141	22	34	48	2552
	2012年	15	72	59	125	145	22	34	47	2567
	2013年	15	73	60	125	150	22	34	50	2522
	2014年	15	74	60	125	150	22	34	51	2543
	2015年	15	75	59	125	152	22	34	50	2405
	2011年	15	70	55	133	145	22	35	60	2540
	2012年	15	72	55	133	146	22	35	65	2598
高新铝电有限	2013年	15	72	57	133	148	22	35	63	2545
Gaoxin A&P	4年	15	73	58	133	149	22	35	61	2541
	2015年	15	74	52	133	150	22	35	60	2422

Source: Emerson Analytics

Thus, for 2015, Gaoxin A&P's bauxite cost excluding VAT was Rmb1,127/ton (1,319 / 1.17). Its energy cost was Rmb199/ton (233 / 1.17), its caustic soda cost was Rmb215/ton (252 / 1.17), while its other production costs totaled Rmb301/ton ((78 + 15 + 74 + 52 + 133) / 1.17). The aggregate production cost was therefore Rmb1,842/ton. This calculation underestimates the total because labor cost cannot offset VAT, but the difference is really marginal.

The peer company achieved total production cost of Rmb1,835/ton in 2015, nearly the same as that of Gaoxin A&P. Its cost structure was also very similar, as can be seen in Exhibit 25 below. The two entities also had very similar total production cost and cost breakdown during 2011-14.

Exhibit 25 – Alumina production cost breakdown (Rmb/ton), 2015



Source: Emerson Analytics

To calculate the extent of China Hongqiao's under-reporting of its alumina production cost, one can first deduct the cost claimed by the company from true production cost, which yields the under-reported unit cost. Multiplying this with the volume of China Hongqiao's own alumina production will yield the total amount of cost under-reported by the company.

As shown in Exhibit 26 below, China Hongqiao's real alumina production cost in 2012 was Rmb1,992/ton or 19% higher than the company's claim. During the 2012-15 period, it hid a total of some Rmb2.0bn alumina production cost from its accounts.

Exhibit 26 – Estimates of under-reported self-supplied alumina cost, 2007-15

Year end Dec 31 (Rmb m)	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Cost of alumina claimed (Rmb/ton)						1,677	1,797	1,697	1,800	
- Production cost (Rmb/ton)						1,992	1,946	1,943	1,842	
= Cost gap (Rmb/ton)						-315	-149	-246	-42	
x Volume of alumina (k tons) / 1,000						1,487	2,897	3,616	4,981	
= Under-reporting of alumina cost						-468	-432	-890	-209	**-1,999**

Source: Emerson Analytics

3.2. External Alumina Subsidies Total Rmb6.1bn

We will now look at the subsidies that China Hongqiao has received from Weiqiao Pioneering and Gaoxin A&P through purchasing alumina below market price.

Exhibit 27 shows certain relevant market prices and cost data for alumina during 2011-15. Market price data are provided by an industry consultancy Antaike. Appendix II contains daily spot prices of alumina in China and Shandong province for 2012-15, inclusive of VAT. We have excluded VAT when we use these prices in our report.

Exhibit 27 – Alumina market prices and production cost data (Rmb/ton), 2011-15

	2011	2012	2013	2014	2015	Average
Spot price in Shandong province		2,242	2,217	2,251	2,047	
Spot price in China	2,308	2,232	2,135	2,171	2,003	**2,170**
Procurement price - China Hongqiao	1,870	1,849	1,891	1,940	1,894	
Production cost - Gaoxin A&P	1,947	1,992	1,946	1,943	1,842	
Full costs - Gaoxin A&P	2,171	2,221	2,175	2,171	2,070	**2,162**
Spot price in Shandong province - Spot price in China		10	82	81	44	**54**
Procurement price - production cost	-77	-143	-55	-3	52	**-45**
Procurement price - full costs	-301	-372	-284	-232	-176	**-273**

Sources: China Hongqiao, Antaike, Emerson Analytics

As can be seen from the table:

- Spot price in Shandong province tends to be higher than the national average. From 2012-15, the Shandong prices were higher than the national average by Rmb10/ton, Rmb82/ton, Rmb81/ton and Rmb44/ton, respectively, for an average of Rmb54/ton over the four-year period.

- During 2011-14, China Hongqiao's procurement prices were consistently below Gaoxin A&P's production costs. For the five years from 2011 to 2015, China Hongqiao's procurement prices were on average Rmb45/ton below Gaoxin A&P's production costs.

- From 2011 to 2015, China Hongqiao's procurement prices were on average Rmb273/ton below Gaoxin A&P's full costs. That is to say, Gaoxin A&P incurred a loss of Rmb273/ton on average by selling alumina to China Hongqiao.

- Coincidentally, China's alumina spot prices averaged Rmb2,170/ton during 2011-15, very close to Gaoxin A&P's full costs of Rmb2,162/ton in the same period.

In estimating the subsidies that China Hongqiao reaped from Gaoxin A&P, it is natural to use the Shandong spot price as benchmark. However, we are willing to give China Hongqiao another advantage and use the national average spot price as benchmark. Given that Gaoxin A&P's full costs were very similar to the national average spot price, we believe that, from a long term perspective, it should have been able to sell its alumina at levels higher than its full costs.

As seen from Exhibit 28, the gap between China Hongqiao's alumina procurement price and the China spot price has been rather erratic during 2007-15, with procurement price being lower than spot price by Rmb769/ton (for a discount of 24%) in 2007 and Rmb729/ton (31% discount) in 2010. For other years, the gap averaged Rmb297/ton (13% discount).

Multiplying the difference between China Hongqiao's procurement price and the China spot price with the quantity of alumina purchased from Weiqiao Pioneering and Gaoxin A&P yields the total subsidy for China Hongqiao. As an example, China Hongqiao reported that in 2010 it bought 2,003k tons of alumina from Gaoxin A&P at an average Rmb1,621/ton, implying a discount of Rmb729/ton. As a result, it reaped a subsidy totaling Rmb1.46bn from Gaoxin A&P that year.

Exhibit 28 – Estimated subsidies from external alumina suppliers, 2007-15

Year end Dec 31 (Rmb m)	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Procurement price (Rmb/ton)	2,379	2,495	1,712	1,621	1,870	1,849	1,891	1,940	1,894	
- Spot price in China (Rmb/ton)	3,148	2,885	2,000	2,350	2,308	2,232	2,135	2,171	2,003	
= Price gap (Rmb/ton)	-769	-390	-288	-729	-438	-383	-243	-231	-109	
x Volume of alumina (k tons) / 1,000										
- Weiqiao Pioneering	578	1,201	1,392							
- Gaoxin A&P				2,003	2,880	1,853	1,703	2,662	2,768	
= Subsidies of alumina	**-445**	**-468**	**-401**	**-1,460**	**-1,262**	**-710**	**-414**	**-615**	**-300**	**-6,075**
- Weiqiao Pioneering	-445	-468	-401							-1,313
- Gaoxin A&P				-1,460	-1,262	-710	-414	-615	-300	-4,762

Source: China Hongqiao

During 2007-15, total alumina subsidies for China Hongqiao amounted to Rmb6.1bn, of which Weiqiao Pioneering contributed Rmb1.3bn while Gaoxin A&P contributed Rmb4.8bn.

According to China Hongqiao's IPO prospectus, the company was able to buy alumina from Weiqiao Pioneering at low prices prior to 2010 because its "alumina purchase orders were for long term and of large quantity". From 2010, it was able to buy alumina from Gaoxin A&P at low prices because of two additional reasons: "the company pays for transportation and maintains deposits of Rmb400m".

Such reasons are ludicrous. A simple rebuttal is this: will Gaoxin A&P sell its alumina below market price over a sustained period of time for such silly reasons that it now ends up in serious negative equity?

3.3. Why is Gaoxin A&P Happy to Lose Rmb6.62bn?

Let us now review the benefits China Hongqiao has reaped from Gaoxin A&P over the years. In Exhibit 22 above, we have shown that China Hongqiao received subsidies totaling Rmb1,858m from Gaoxin A&P through the purchase of electricity at below generation cost. In Exhibit 28, we have shown that China Hongqiao received subsidies totaling Rmb4,762m from Gaoxin A&P through the purchase of alumina at below market price. Combined, total subsidies amounted to Rmb6,620m.

On November 23, 2016, a negative report about China Hongqiao was published on the Internet in a special-purpose website. According to that negative report, Gaoxin A&P suffered Rmb2.0bn of losses in each of 2014 and 2015 such that at the end of 2015 its net asset value was negative.[6] This is a strong support to our argument that Gaoxin A&P has been subsidizing China Hongqiao.

Naturally, China Hongqiao claimed that it was not privy to Gaoxin A&P's financial performance but did admit that, based on industry information, it was "**not uncommon for alumina enterprises in the PRC to record loss under the market conditions of 2014 and 2015**"[7].

Did Gaoxin A&P only suffered losses in 2014 and 2015 because of low alumina price? Not so! As we have shown in Exhibit 22, during 2010-12, Gaoxin A&P sold electricity to China Hongqiao at prices below its generation costs, by as much as Rmb0.095/kWh in 2011. During 2010-15, it sold alumina to China Hongqiao at below market prices, by as much as Rmb729/ton in 2010, as shown in Exhibit 28 above.

According to the negative report referred to above, Gaoxin A&P is actually an undisclosed related party to China Hongqiao. We will not repeat here the evidence presented by that negative report, and will not refute the so-called "clarification" made by China Hongqiao. We only have this question for the China Hongqiao management:

[6] http://hongqiaoexposed.com, p.7
[7] http://www.hkexnews.hk/listedco/listconews/SEHK/2016/1220/LTN20161220706.pdf, p.6

Why would anyone be so altruistic as to sell its products at a loss for six or more years to an unrelated third party so that it ended up with a huge pile of debts that far exceeded the value of its assets?

There is one more point that we want to remind our readers: Gaoxin A&P's current legal representative Liu Chunmeng (劉春猛) is a supervisory board member of Binzhou Beihai Xinhe New Aluminum Profiles Co., Ltd. (濱州市北海信和新材料有限公司), which China Hongqiao acquired in June 2016.

Our investigations into China Hongqiao have unearthed a large amount of evidence regarding its undisclosed related parties and connected transactions. Some of the evidence found duplicates that in the negative report in question and will not be repeated here. In Part 4 below, we will examine China Hongqiao's acquisition of Binzhou Municipal Binbei New Material Co., Ltd. (Binzhou Binbei, 濱州市濱北新材料有限公司) and expose the tricks it used to hide its connections to the target company.

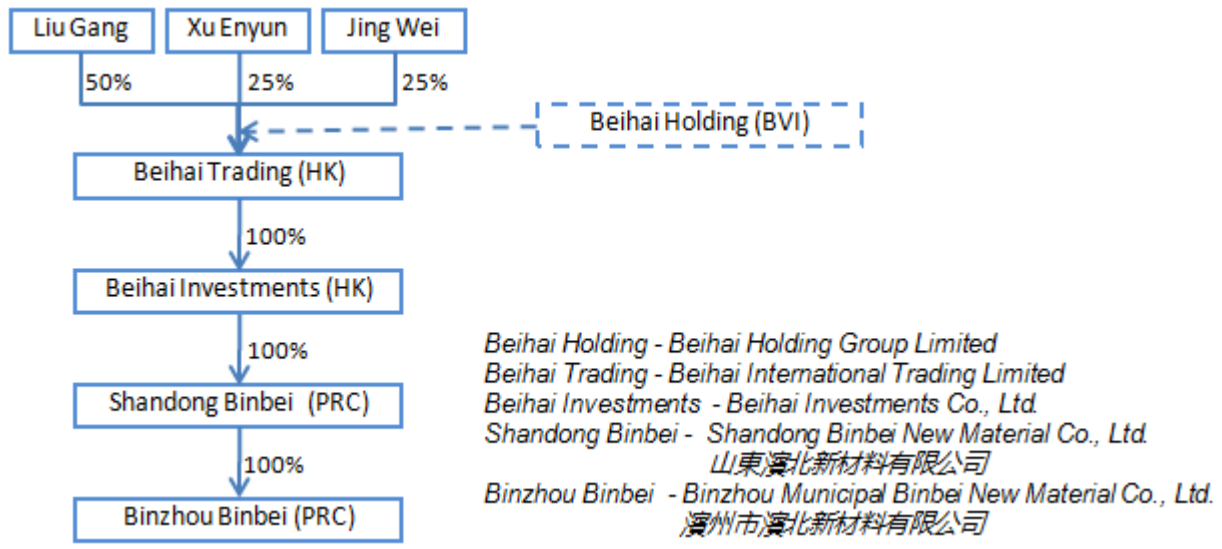
Part 4. Hiding a Connected Party Acquisition

This part examines the acquisition of Binzhou Binbei to show how China Hongqiao hides its connected parties from public view, thus deceiving regulators and the investment community. Are there other hidden connected parties? Only the connected parties know.

In December 2014, China Hongqiao purchased 100% interest in Binzhou Binbei from "independent parties" (through Shandong Binbei) for Rmb1.9bn in cash. Binzhou Binbei, in turn, owes another Rmb6.2bn to its former shareholders.

The complete shareholding structure of Binzhou Binbei as of July 1, 2012, represented by the solid lines, is shown below in Exhibit 29. At this point in time, the three ultimate natural person shareholders were Liu Gang (劉剛), Xu Enyun (徐恩雲) and Jing Wei (景偉), holding 50%, 25% and 25%, respectively, of Binzhou Binbei.

Exhibit 29 – Shareholders of Binzhou Binbei (July 1, 2012)



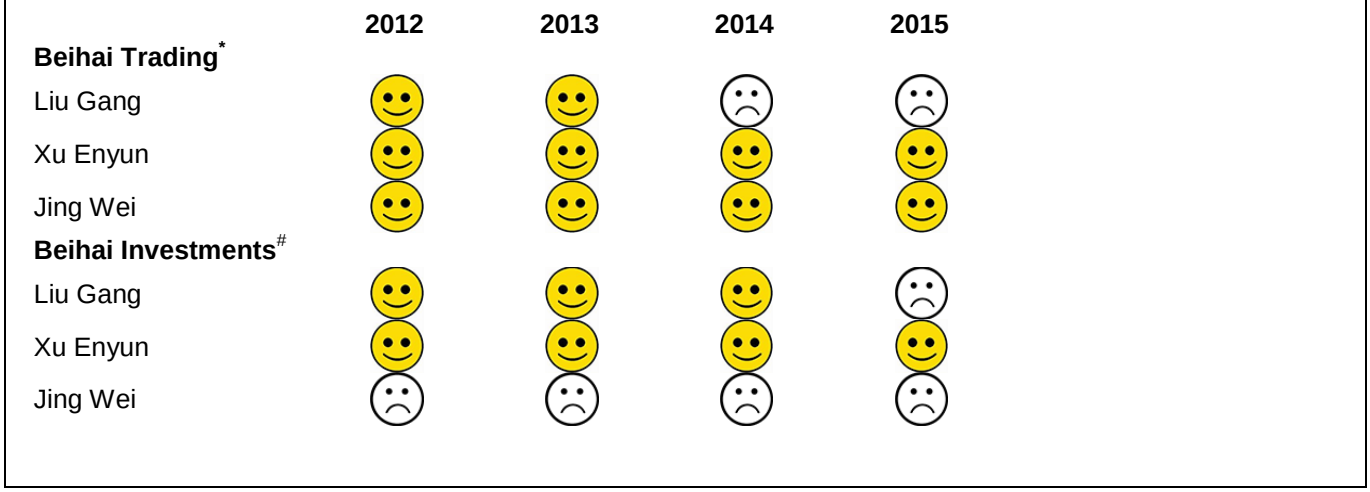
Sources: Hong Kong Companies Registry, ECIS (Shandong)

In October 2012, Liu Gang, Xu Enyun and Jing Wei transferred their ownership in Beihai Trading to Beihai Holding, a British Virgin Island-registered entity, as shown in the dotted line in Exhibit 29. According to China Hongqiao, "**from June 2011 to June 2014, Shandong Binbei was ultimately controlled by Mr. Liu Gang only as to 50% and the remaining 50% was owned by two individuals who were independent to the Group**"[8]. That is to say, Beihai Holding was controlled by the same three natural persons in the same proportions following the October 2012 transfer.

[8] http://www.hkexnews.hk/listedco/listconews/SEHK/2016/1220/LTN20161220706.pdf, p.9

This fact is further corroborated by the unchanged directorships of Beihai Trading and Beihai Investments, the intermediary holding companies of Binzhou Binbei, during 2012-13. In Exhibit 30 below, a smiling face indicates that the person in question is a director of a company at the end of a given year, while a sad face indicates that the person is not a director that year.

Exhibit 30 – Directors of Beihai Trading and Beihai Investments, 2012-15



Source: Hong Kong Companies Registry
** Year end Dec 23*
 # Year end May 23

According to China Hongqiao's clarification, "**In June 2014, Mr. Liu Gang disposed of his equity interests in Shandong Binbei to one individual … in December 2014, Shandong Binbei was ultimately controlled by the same two independent individuals as mentioned above as to 75% and 25%, respectively**"[9]. Although it is not clear whether it was Xu Enyun or Jing Wei who took over the 50% stake from Liu Gang, there is no doubt that Xu Enyun and Jing Wei were the only two ultimate shareholders of Shandong Binbei, the vendor in the transaction.

Strangely, after China Hongqiao's acquisition in December 2014, Xu Enyun remained a director of both Beihai Trading and Beihai Investments while Jing Wei unwaveringly held court at Beihai Trading throughout all those four years.

So, are Xu Enyun and Jing Wei really independent individuals as China Hongqiao claimed? Of course not!

Xu Enyun is an employee of China Hongqiao responsible for the company's project in the Beihai New Zone of Binzhou city. The three events listed below, which took place in 2012, 2014 and 2016,

[9] http://www.hkexnews.hk/listedco/listconews/SEHK/2016/1220/LTN20161220706.pdf, p.9-10

respectively, clearly demonstrate that Xu Enyun has always been China Hongqiao's managerial staff before and after the Binzhou Binbei acquisition:

August 30, 2012: http://www.bzcm.net/news/2012-08/30/content_889574.htm

June 23, 2014: http://www.binzhou.gov.cn/xxgkml/html/index.php?tablename=GFWJ_Page_GFWJ&guid={de52bee7-91bc-4a21-8cc5-7a3e9474054e}

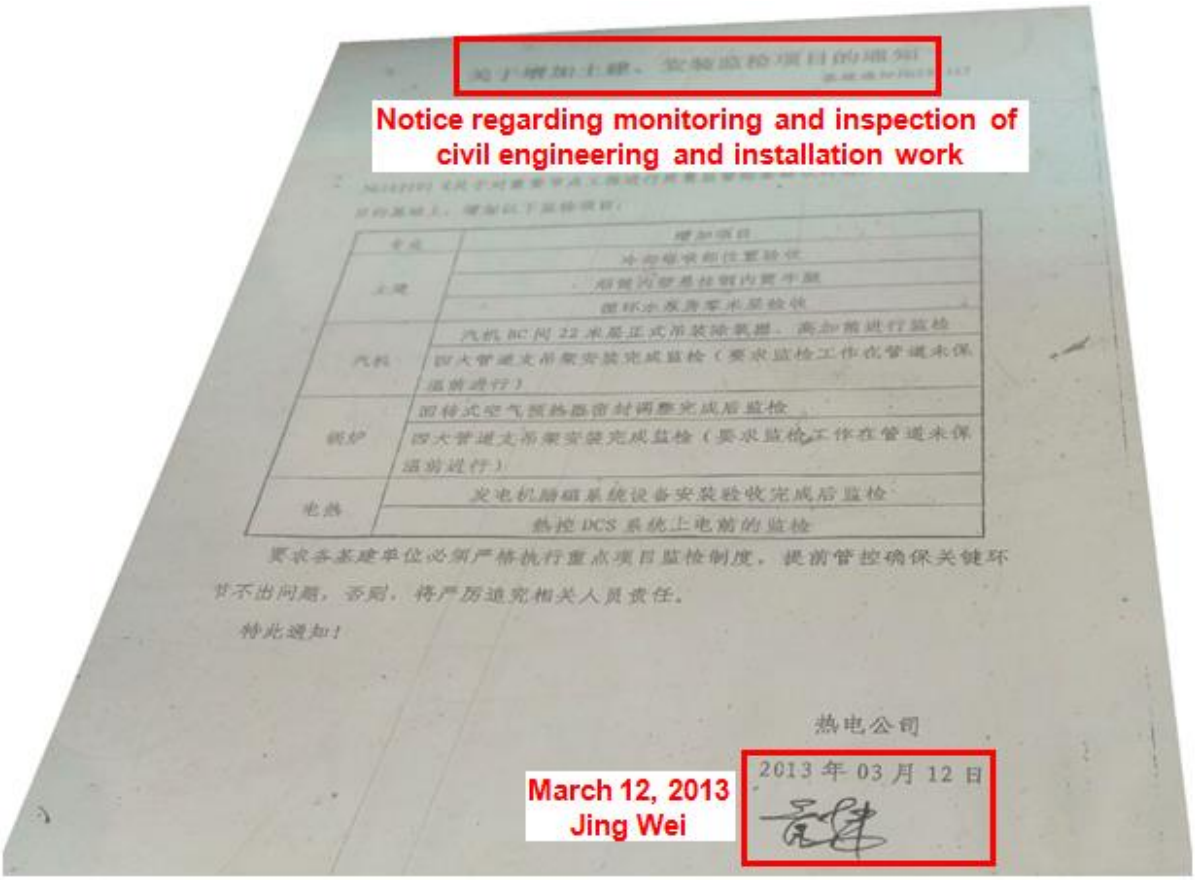
June 1, 2016: http://www.alu.cn/aluNews/NewsDisplay_990281.html

Exhibit 31 – Xu Enyun, China Hongqiao's project leader in Beihai New Zone

Source: http://www.bzcm.net/news/2012-08/30/content_889574.htm

Similarly, Jing Wei is also a China Hongqiao employee, currently responsible for the electricity business. Exhibit 32 below shows a China Hongqiao notice regarding monitoring and inspection, signed by Jing Wei in March 2013.

Exhibit 32 – Jing Wei signs China Hongqiao's monitoring and inspection notice



Source: Emerson Analytics

In the last few years, we have exposed a number of fraudulent companies such as China Lumena New Materials Corp. (0067.HK), Shenguan Holdings (Group) Limited (0829.HK), Sound Global Ltd. (0967.HK), China Fiber Optic Network System Group Ltd. (3777.HK) and Hua Han Health Industry Holdings Limited (0587.HK).

Over time, we have been increasingly surprised by the absurdly powerful "clarification" capability of the various managements. We will not be surprised if China Hongqiao defends the hidden connections in the Binzhou Binbei acquisition in this manner: *Xu Enyun and Jing Wei resigned from China Hongqiao just prior to the Binzhou Binbei acquisition, and returned to China Hongqiao shortly after the completion of the acquisition. Therefore, at the time of the acquisition, they were independent third parties not connected to China Hongqiao.*

Will China Hongqiao issue a "clarification" along similar lines? Will the Stock Exchange of Hong Kong accept this kind of absurdity, as it has done time and again?

Part 5. Financials and Valuation

Now we come to the real financial health of China Hongqiao. Simply put, it fails the acid test of interest income in relation to its cash and equivalent. In addition to the non-existent cash of some Rmb4.9bn, there must be other asset black holes, which often relate to the hidden connected transactions. Based on the various assumptions that we have detailed above, we believe China Hongqiao's real profitability is less than half of what it pretends to be. The prevailing under-reporting and subsidies can no longer be sustained, and we believe the stock is worth merely 40% of its current price.

5.1. Non-existent Cash of Rmb4.9bn

A usually reliable indicator of accounting fraud is the relationship between interest income and the amount of cash and bank balances. Not surprisingly, China Hongqiao fails this acid test.

As can be seen below, China Hongqiao has maintained high levels of cash and bank balances since its listing. From 1H11 through the end of 2015, the period-end cash and bank balances have averaged Rmb9.0bn. Most of the balances were denominated in the Chinese currency (97.5% at the end of 2015[10]). However, China Hongqiao's effective deposit rates have consistently held below normal bank interest rates. This is a clear sign that a large part of its cash and bank balances simply didn't exist.

Exhibit 33 – China Hongqiao's average deposit interest rates, 2011-15

Year end Dec 31 (Rmb m)	2010	1H11	2011	1H12	2012	1H13	2013	1H14	2014	1H15	2015
Interest income			11.2		28.6		72.2		66.5		34.7
Cash	2,752	7,575	7,499	7,222	10,047	12,832	8,033	11,907	8,506	7,184	9,090
Average Cash			5,942		8,256		10,304		9,482		8,260
Effective deposit interest rate			0.19%		0.35%		0.70%		0.70%		0.42%
Normal bank deposit rate*			1.67%		1.63%		1.48%		1.46%		1.03%
Gap			-1.48%		-1.28%		-0.78%		-0.76%		-0.61%

Sources: China Hongqiao, Emerson Analytics
**Assuming that China Hongqiao placed half of its money in savings accounts and half in three-month deposits*

If China Hongqiao's Rmb34.7m interest income in 2015 was derived on an average deposit rate of 1.03% throughout the year, the company should have had an average Rmb3,367m of cash and bank balances

[10] http://www.hkexnews.hk/listedco/listconews/SEHK/2016/0406/LTN20160406039.pdf, p.15

outstanding during the year. That's not even half of the average Rmb8,260m cash and bank balances that the company supposedly had during the year!

Exhibit 34 – China Hongqiao cash shortfall, 2015

Year end Dec 31 (Rmb m)	2015
Interest income	34.7
Normal bank deposit rate	1.03%
Estimated average cash	3,367
Reported average cash	8,260
Cash gap	4,893

Source: Emerson Analytics

5.2. Real Profitability Probably Less than Half of Claim

We have presented earlier comprehensive evidence that China Hongqiao has relied on under-reporting its own costs and purchasing electricity and alumina from purported independent third parties at below costs to subsidize its operations and exaggerate its profits. Our calculations have been shown in Exhibits 22, 26 and 28 above.

A summary of all China Hongqiao's under-reporting and subsidies during 2007-15 is presented in Exhibit 35 below. Based on the series of assumptions that we have made to the advantage of the company, we calculate that China Hongqiao has shaved Rmb21.6bn off its cost structure during the period in question. Our assumptions are advantageous to China Hongqiao because we have (i) ignored the production cost of steam; (ii) ignored the construction cost of its captive power grid; (iii) assumed that Gaoxin A&P sold its electricity to China Hongqiao only at generation cost without recovering other costs; and (iv) assumed that Gaoxin A&P sold its alumina to China Hongqiao at the average spot price for China as a whole, rather than at the higher Shandong spot price.

Exhibit 35 – China Hongqiao real profitability estimates, 2007-15

Year end Dec 31 (Rmb m)	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Net income - China Hongqiao's claim*	**904**	**284**	**577**	**4,189**	**5,875**	**5,453**	**5,586**	**5,301**	**3,620**	**31,789**
External electricity (Gaoxin A&P)				-448	-1,138	-272				
Self-supplied electricity				-1,297	-1,556	-1,499	-1,326	-2,619	-3,418	
External alumina (Weiqiao Pioneering)	-445	-468	-401							
External alumina (Gaoxin A&P)				-1,460	-1,262	-710	-414	-615	-300	
Self-supplied alumina						-468	-432	-890	-209	
- Total subsidies and under-reporting	**-445**	**-468**	**-401**	**-3,206**	**-3,956**	**-2,948**	**-2,172**	**-4,124**	**-3,928**	**-21,647**
x 75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
= Net income - Our estimate	**570**	**-67**	**277**	**1,784**	**2,909**	**3,241**	**3,957**	**2,209**	**674**	**15,554**
Our estimates relative to China Hongqiao's claim	-37%	-124%	-52%	-57%	-50%	-41%	-29%	-58%	-81%	**-51%**

Source: Emerson Analytics
** Excluding discontinued operations*

In 2010, China Hongqiao shaved Rmb3,206m off its cost by under-reporting its self-supplied electricity cost to the tune of Rmb1,297m, purchasing electricity from "external" party at Rmb448m below cost, and buying alumina from "external" party at Rmb1,460m below market price. If we put these costs back into China Hongqiao's profit and loss, the company's net profit in 2010 should have been Rmb1,784m (reported net profit Rmb4,189m minus additional costs of Rmb3,206m at 25% income tax rate), or 57% below the company's claim.

In other words, China Hongqiao exaggerated its 2010 profit by 135%!

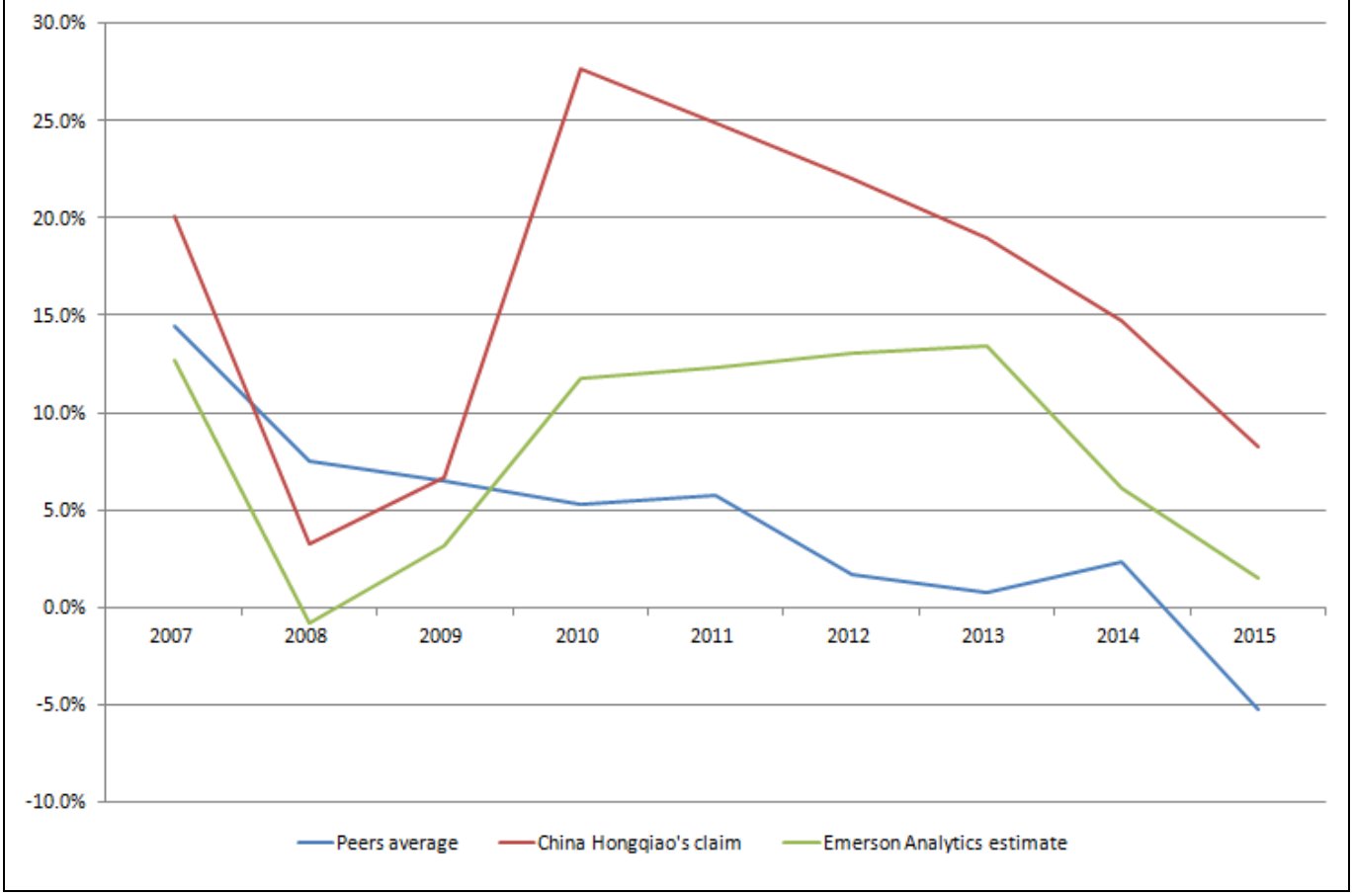
However, if we account for the cost of steam (i.e., we opt for Scenario 2 in Exhibit 7 and take the cost of its self-supplied electricity at Rmb0.138/kWh rather than the Rmb0.196/kWh in Scenario 1), then the under-reporting of self-supplied electricity cost balloons to Rmb1,763m ((Rmb0.138/kWh – Rmb0.359/kWh) * 7,977m kWh) from the Rmb1,297m estimate in Exhibit 35. Accordingly, the underlying profit in 2010 becomes Rmb1,435m (4,189 – (448 + 1,763 + 1,460) x 75%). This is 66% below China Hongqiao's claim. In other words, the profit exaggeration becomes 192%.

As can be seen in Exhibit 35, China Hongqiao could not have made more than Rmb15.6bn in aggregate after accounting for most of the under-reporting and subsidies during 2007-15 period. This is 51% lower than China Hongqiao's claim of Rmb31.8bn over the period in question.

Exhibit 36 below charts the net profit margins claimed by China Hongqiao, our estimated net margins for China Hongqiao, and the average net margins for its peer group. As can be seen, China Hongqiao's net

margin in 2010 was probably just 11.8% based on our estimates. This is significantly lower than the 27.7% claimed by China Hongqiao but still considerably higher than the 5.3% average achieved by its peer group. Subsequent years also exhibit a similar trend.

Exhibit 36 – Net margins comparison, 2007-15



Source: Emerson Analytics

Our net margin estimates for China Hongqiao are higher than peers average because we are too lenient and afford the company the most advantageous assumptions. If we account for the cost of steam, for example, China Hongqiao's 2010 net margin was only 9.5% (1,435 / 15,132).

China Hongqiao's fraudulent accounting practices are in some ways similar to those adopted by Shenguan, which we exposed in a report dated September 2, 2014. At that time, we estimated that Shenguan's true profitability was about Rmb290m or 62% below the company's claim. Since then, Shenguan's net profit has fallen steadily, from Rmb771m in 2013 to Rmb286m in 2015. A recent profit warning foreshadows that 2016 net profit would likely fall 50% year-on-year. That means its real profitability is only about half of our prediction!

When we analyze fraudulent companies that doctor their books, we usually act generously and make assumptions that afford them the most advantages. We have treated China Hongqiao similarly. Is it going to repeat Shenguan's performance and eventually reveal a true profitability worse than our forecast?

5.3. Current Subsidies/Under-reporting Unsustainable

We are convinced that China Hongqiao is facing three thorny issues that make its under-reporting and subsidies unsustainable.

(1) Under-reporting is becoming too expensive as leverage increases

During 2010-15, China Hongqiao has grown its total assets by 7x to Rmb106.4bn from Rmb13.3bn. This asset expansion has been supported by rapidly mounting debts, which has grown 12x to Rmb53.9bn from Rmb4.0bn during the period in question. The total debt to equity ratio jumped from 55% in 2010 to a whopping 149% in 2015, with US dollar debts accounting for 35% of the total.

To continue with its under-reporting, China Hongqiao needs to further expand its balance sheet by making bogus capital expenditures and acquisitions to fill the void created by the non-existent profits. But the company's gearings are dangerously high to continue with this trick.

(2) Gaoxin A&P's negative shareholder equity leaves it in danger of collapse

Gaoxin A&P is China Hongqiao's most important "external" supplier. During 2007-15, it provided China Hongqiao with subsidies amounting to Rmb6.62bn through selling electricity below its own generation cost and selling alumina at below prevailing market price. Together, such subsidies accounted for 31% of China Hongqiao's total illicit gains.

Gaoxin A&P reported Rmb2.0bn of losses in each of 2014 and 2015, leaving it at a massive negative shareholders equity at the end of 2015. It is unlikely to be able to continue its subsidy to China Hongqiao on such scale.

(3) Savings from unpaid electricity levies unlikely to continue

As we have shown earlier, electricity tariffs for industrial and commercial enterprises in Shandong province include various levies totaling Rmb0.061/kWh. Our investigation shows that China Hongqiao has never paid such levies to the government on its self-supplied electricity.

According to the government's rules and regulations[11], captive power plants are also required to pay such levies on their electricity output. The temporary exemption for China Hongqiao from paying such levies can be regarded as a form of government subsidy.

In 2015, China Hongqiao produced 52,648m kWh of self-supplied electricity. Even if it were to pay half of the required levies, that would add Rmb1,606m (0.061 / 2 x 52,648) to its cost. Our investigation shows that China Hongqiao is under increasing government pressure to pay these levies gradually over the next few years.

5.4. Valuation

Based on our estimates presented earlier, China Hongqiao's real profitability during 2007-15 was at least 51% below its claim. This, combined with questionable management integrity, suggests that the stock is worth about HK$3.1 a share. That's a downside of about 60%.

Finally, we call on the regulators to safeguard the integrity of the Hong Kong financial markets by taking forceful actions on China Hongqiao, which has been falsifying its accounts right from day one!

[11] http://www.sdwj.gov.cn/zcfg/05/4759.shtml
http://wenku.baidu.com/link?url=Y5U34VahX4-Q8GCSkw3JCxmQeM4JTebsWbLIeQrRYacOzruqav5RljiZNuH2G3nP1AE_RZs2gdnS-uToULNyNF6D_WIIlU1wJCPquxxRGnS
http://www.sdeic.gov.cn/articles/ch01057/201603/7e142198-0c05-4587-936d-285373aea8ae.shtml