

Neutral

Nantong Jianghai Capacitor Co. (002484.SZ)

Chinese aluminum electrolytic capacitor leader seeking new drivers; initiate at Neutral on valuation

002484.SZ | 12m Price Target: **Rmb27.50** | Price: **Rmb27.19** | Upside: **1.1%**

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Jianghai is the 5th largest aluminum electrolytic capacitor player globally (7% share in 2021) & the largest industrial aluminum electrolytic capacitor maker in China that has been leveraging its strength into film capacitor and super capacitor businesses. We like Jianghai given its: 1) Vertical integration of key aluminum electrolytic capacitor manufacturing processes with c.70% self-sufficiency rate for formed foil (vs. c.30% for Japanese peers) which provides c.18% GPM advantage and closer control of product performance; 2) Strong industrial client base in aluminum electrolytic capacitor, which has high entry barriers, with brand recognition the company can leverage into other segments; 3) Pipeline business of film capacitor and super capacitor products which is about to bear fruit in coming years driven by new energy demand. However, **we initiate coverage at Neutral** with a 12M TP of Rmb27.5, as we see: 1) Aluminum electrolytic capacitor business (80% of total revenue as of 2021) is still heavily exposed to the industrials & home appliances end market (60%+ of total revenue) where growth is significantly lower than products for new energy end markets in the long run; 2) Current valuation is fair with the stock trading at 39X/33X 2022E/23E P/E on the back of our 16%/23% revenue/EPS CAGR forecast in 2022-25E. We are -3%/-11%/-17% and -2%/-11%/-15% vs. Wind consensus for 2022E-24E revenue/net income.

Key up/downside risks: 1) Significant development/pullback of key downstream segments such as NEV/solar power/wind power; 2) Faster/slower-than-expected business development in NEV film capacitor and super capacitor products; 3) Lower/higher-than-expected price hike of electricity.

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Key Data

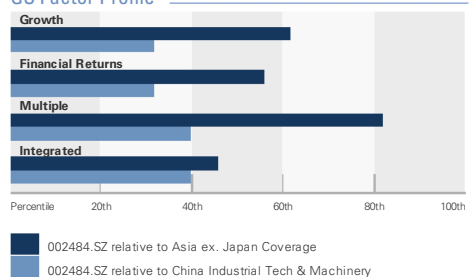
Market cap: Rmb22.6bn / \$3.4bn
Enterprise value: Rmb22.1bn / \$3.3bn
3m ADTV: Rmb196.4mn / \$29.2mn
China
China Industrial Tech & Machinery
M&A Rank: 3
Leases incl. in net debt & EV?: No

GS Forecast

	12/21	12/22E	12/23E	12/24E
Revenue (Rmb mn)	3,549.7	4,352.1	4,967.2	5,710.1
EBITDA (Rmb mn)	630.9	815.0	940.4	1,111.0
EPS (Rmb)	0.52	0.71	0.83	1.01
P/E (X)	32.9	38.5	32.7	26.8
P/B (X)	3.3	4.7	4.3	3.8
Dividend yield (%)	0.7	0.6	0.8	0.9
N debt/EBITDA (ex lease,X)	(0.7)	(0.6)	(0.7)	(0.8)
CROCI (%)	12.5	15.6	16.4	17.4
FCF yield (%)	(0.4)	0.8	1.3	1.8

	3/22	6/22E	9/22E	12/22E
EPS (Rmb)	0.14	0.18	0.18	0.20

GS Factor Profile



Source: Company data, Goldman Sachs Research estimates. See disclosures for details.

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Neutral

Nantong Jianghai Capacitor Co. (002484.SZ)
Rating since Jul 31, 2022

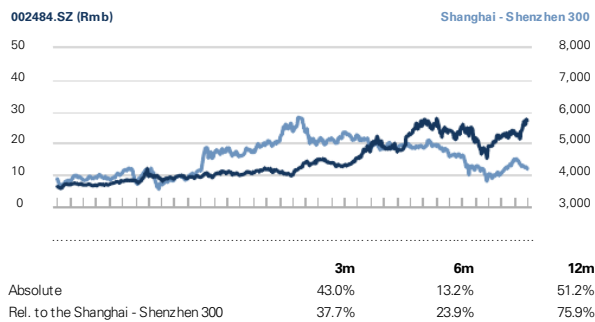
Ratios & Valuation

	12/21	12/22E	12/23E	12/24E
P/E (X)	32.9	38.5	32.7	26.8
P/B (X)	3.3	4.7	4.3	3.8
FCF yield (%)	(0.4)	0.8	1.3	1.8
EV/EBITDA (X)	22.1	27.2	23.4	19.6
EV/EBITDA (excl. leases) (X)	22.1	27.2	23.4	19.6
CROCI (%)	12.5	15.6	16.4	17.4
ROE (%)	10.6	13.0	13.8	15.1
Net debt/equity (%)	(9.8)	(10.7)	(12.3)	(14.9)
Net debt/equity (excl. leases) (%)	(9.8)	(10.7)	(12.3)	(14.9)
Interest cover (X)	62.3	79.7	93.2	112.0
Days inventory outst, sales	79.0	76.4	76.1	75.6
Receivable days	126.4	119.8	122.0	121.5
Days payable outstanding	108.5	101.0	103.4	103.0
DuPont ROE (%)	10.0	12.3	13.1	14.2
Turnover (X)	0.6	0.7	0.7	0.7
Leverage (X)	1.3	1.3	1.3	1.3
Gross cash invested (ex cash) (Rmb)	4,857.4	5,280.7	5,816.0	6,434.6
Average capital employed (Rmb)	3,687.1	4,089.0	4,458.6	4,851.2
BVPS (Rmb)	5.21	5.75	6.38	7.14

Growth & Margins (%)

	12/21	12/22E	12/23E	12/24E
Total revenue growth	34.7	22.6	14.1	15.0
EBITDA growth	30.5	29.2	15.4	18.1
EPS growth	16.9	35.1	17.8	21.7
DPS growth	1.6	46.5	17.8	21.7
EBIT margin	13.3	14.3	14.7	15.4
EBITDA margin	17.8	18.7	18.9	19.5
Net income margin	12.3	13.5	13.9	14.8

Price Performance



Income Statement (Rmb mn)

	12/21	12/22E	12/23E	12/24E
Total revenue	3,549.7	4,352.1	4,967.2	5,710.1
Cost of goods sold	(2,629.3)	(3,218.9)	(3,656.3)	(4,193.4)
SG&A	(226.2)	(239.4)	(273.2)	(285.5)
R&D	(197.0)	(239.4)	(273.2)	(314.1)
Other operating inc./exp.)	(25.5)	(30.5)	(34.8)	(40.0)
EBITDA	630.9	815.0	940.4	1,111.0
Depreciation & amortization	(159.1)	(190.9)	(210.7)	(233.9)
EBIT	471.8	624.1	729.8	877.1
Net interest inc./exp.)	(1.7)	(0.9)	0.2	2.1
Income/(loss) from associates	6.7	3.8	11.6	26.2
Pre-tax profit	500.9	672.0	791.3	962.5
Provision for taxes	(62.5)	(60.6)	(95.0)	(115.5)
Minority interest	(3.5)	(3.8)	(4.2)	(4.6)
Preferred dividends	-	-	-	-
Net inc. (pre-exceptionals)	434.9	587.6	692.2	842.4
Post-tax exceptionals	-	-	-	-
Net inc. (post-exceptionals)	434.9	587.6	692.2	842.4
EPS (basic, pre-exception) (Rmb)	0.52	0.71	0.83	1.01
EPS (diluted, pre-exception) (Rmb)	0.52	0.71	0.83	1.01
EPS (basic, post-exception) (Rmb)	0.52	0.71	0.83	1.01
EPS (diluted, post-exception) (Rmb)	0.52	0.71	0.83	1.01
DPS (Rmb)	0.12	0.18	0.21	0.25
Div. payout ratio (%)	23.1	25.0	25.0	25.0

Balance Sheet (Rmb mn)

	12/21	12/22E	12/23E	12/24E
Cash & cash equivalents	649.2	734.9	877.8	1,109.5
Accounts receivable	1,306.2	1,550.1	1,769.1	2,033.7
Inventory	852.6	970.1	1,101.9	1,263.8
Other current assets	457.9	457.9	457.9	457.9
Total current assets	3,265.9	3,713.0	4,206.7	4,865.0
Net PP&E	1,383.3	1,460.4	1,587.1	1,725.2
Net intangibles	243.4	236.8	230.2	223.5
Total investments	154.7	160.0	171.6	197.8
Other long-term assets	525.5	664.0	733.3	767.9
Total assets	5,572.8	6,234.2	6,928.9	7,779.5
Accounts payable	811.9	970.1	1,101.9	1,263.8
Short-term debt	201.6	201.6	201.6	201.6
Short-term lease liabilities	-	-	-	-
Other current liabilities	80.3	127.0	153.1	190.7
Total current liabilities	1,093.8	1,298.6	1,456.6	1,656.0
Long-term debt	22.2	22.2	22.2	22.2
Long-term lease liabilities	-	-	-	-
Other long-term liabilities	121.7	133.9	147.3	162.0
Total long-term liabilities	143.9	156.0	169.4	184.2
Total liabilities	1,237.7	1,454.7	1,626.0	1,840.2
Preferred shares	-	-	-	-
Total common equity	4,300.7	4,741.3	5,260.5	5,892.3
Minority interest	34.4	38.2	42.4	47.0
Total liabilities & equity	5,572.8	6,234.2	6,928.9	7,779.5
Net debt, adjusted	(425.5)	(511.2)	(654.0)	(885.8)

Cash Flow (Rmb mn)

	12/21	12/22E	12/23E	12/24E
Net income	434.9	587.6	692.2	842.4
D&A add-back	159.1	190.9	210.7	233.9
Minority interest add-back	3.5	3.8	4.2	4.6
Net (inc)/dec working capital	(271.0)	(203.2)	(219.1)	(264.6)
Other operating cash flow	(15.6)	6.9	1.8	(11.5)
Cash flow from operations	310.8	586.0	689.7	804.8
Capital expenditures	(373.9)	(400.0)	(400.0)	(400.0)
Acquisitions	-	-	-	-
Divestitures	-	-	-	-
Others	157.9	-	-	-
Cash flow from investing	(216.0)	(400.0)	(400.0)	(400.0)
Repayment of lease liabilities	-	-	-	-
Dividends paid (common & pref)	(112.4)	(100.3)	(146.9)	(173.0)
Inc/(dec) in debt	15.2	-	-	-
Other financing cash flows	(37.6)	0.0	0.0	0.0
Cash flow from financing	(134.8)	(100.3)	(146.9)	(173.0)
Total cash flow	(40.0)	85.7	142.8	231.8
Free cash flow	(63.1)	186.0	289.7	404.8

Source: Company data, Goldman Sachs Research estimates.

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In this report, we provide detailed analysis on how vertical integration of core aluminum electrolytic capacitors will impact the cost structure and control of product performance, on top of the global aluminum electrolytic capacitor competition landscape.

PM summary

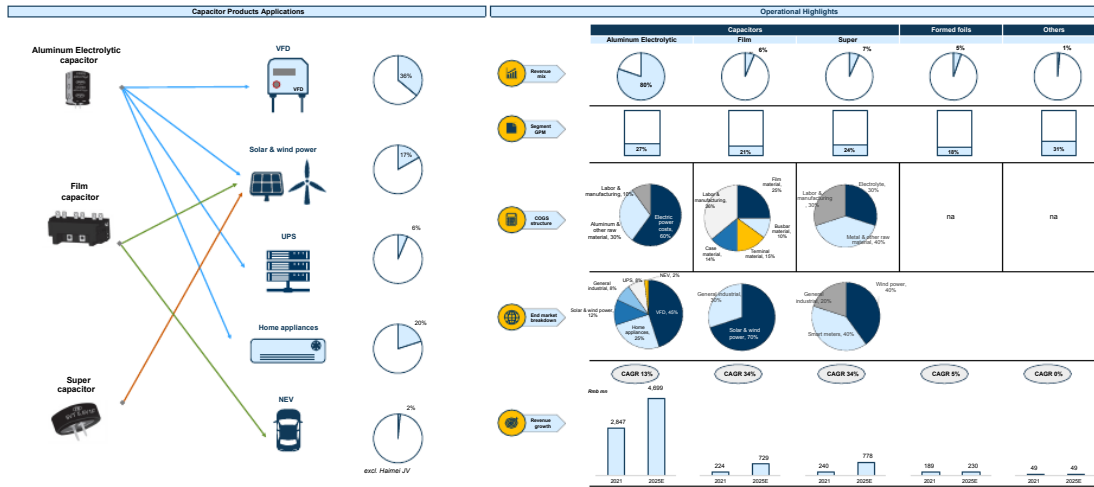
Established in 1958, Jianghai is a leading aluminum electrolytic capacitor manufacturer which currently ranks as the 5th largest film capacitor player globally (7% share) and the largest industrial aluminum electrolytic capacitor maker in China. The company listed on the Shenzhen Stock Exchange in 2010. Jianghai mainly focuses on industrial end markets such as VFD (variable-frequency drive), UPS (uninterruptible power supply), solar & wind power, NEV (new energy vehicles), and various kinds of industrial equipment. Jianghai vertically integrates key aluminum electrolytic capacitor manufacturing processes with c.70% self-sufficiency rate for formed foil, deploying its formed foil factories in Ulanqab/Baoji/Yuncheng to enjoy low electricity costs which account for c.50% of COGS for aluminum electrolytic capacitor products. Over the years, Jianghai has established a strong client base in the industrial aluminum electrolytic capacitor segment which has high entry barriers, especially among top industrial clients globally, including players such as Siemens, Rockwell, Yaskawa, ABB, Huawei, and Inovance. Building on its strength in the industrial aluminum electrolytic capacitor segment, Jianghai also began to establish film capacitor and super capacitor businesses in 2011 and 2013 respectively. As of 2020, the company was ranked 37th in China's top 100 electronic components manufacturers (per China Electronic Components Association).

Our investment view

- We like Jianghai given its: 1) **Vertical integration of key aluminum electrolytic capacitor manufacturing processes** with c.70% self-sufficiency rate for formed foil (vs. c.30% for Japanese peers) which provides the company with better margin advantage and closer control of product performance; 2) **Strong client base in the industrial aluminum electrolytic capacitor segment which has high entry barriers**, with brand recognition the company can leverage into other segments; 3) **Pipeline business of film capacitor and super capacitor products** which is about to bear fruit in the coming years driven by new energy demands.
- However, we also note that the company's aluminum electrolytic capacitor business (80% of its total revenue as of 2021) is still heavily exposed to the industrial end market (48% of total revenue) and home appliances end market (20% of total revenue) where growth is significantly lower than products for new energy end markets in the long run.
- We expect Jianghai to deliver a 16%/23% revenue/EPS CAGR in 2022-25E with consistent market share gains in the aluminum electrolytic capacitor segment thanks to domestic substitution and accelerated revenue booking from film capacitor and super capacitor products driven by new energy demands. Our 12-m Rmb27.5TP is derived by applying a 2025E P/E of 28X and discounting back to 2023E with a CoE of 10.5%, and implies upside of 1% vs our coverage median of +18%.
- **Key up/downside risks:** 1) Surge/pullback of key downstream segments such as NEV/solar power/wind power; 2) Faster/slower-than-expected business development in NEV film capacitor and super capacitor products; 3) Lower/higher-than-expected

price hike of electricity.

Exhibit 1: We project 13%/34%/34% 2022-25E revenue CAGR for aluminum electrolytic/film/super capacitor products
Company business overview



Based on FY21 financials

Source: Company data, Gao Hua Securities Research

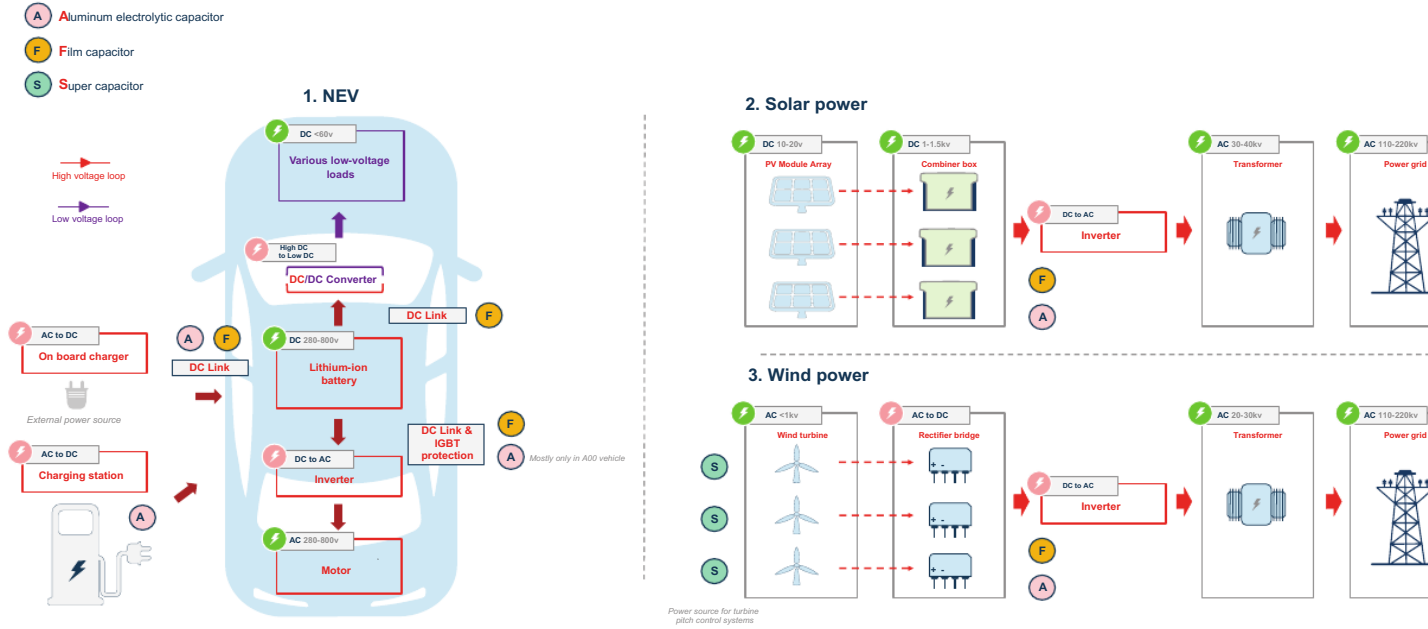
Exhibit 2: With its leading position in aluminum electrolytic capacitors, Jianghai has gradually leveraged its strength into film and super capacitor areas
Product universe of major capacitor types

Performance metrics	Why this metric matters?	Tantalum Electrolytic	Ceramic (incl. MLCC)	Aluminum Electrolytic	Film	Super
A. Capacitance per unit volume	Higher capacitance per unit volume ensures higher capability in storing electric charge.	High	Low	High	Medium	Not applicable
B. Peak voltage strength	Capacitors with high peak voltage strength could work in high voltage scenarios such as EV powertrain and solar power inverter.	Low	Medium	Medium	High	Not applicable
C. ESR (Equivalent series resistance)	Capacitors with low ESR could entail lower ripple effect and ensure system working stability & system life.	Low	Low	High to Moderate	Moderate	Not applicable
D. Polarity on termination	Non-polarized capacitors could be connected to AC circuits because of their indifference in positive and negative polarities.	Yes	No	Yes	No	Not applicable
E. Maximum operating temperature	Ensure functionality in high temperature scenarios such as industrials.	125°C	200°C	125°C	200°C	Not applicable
F. Temperature stability	Ensure operational stability scenarios with high temperature variance such as EV powertrain and solar power inverter. Ensure system operational stability.	Good	Moderate to Good	Low to Moderate	Good	Not applicable
G. MTBF (Mean time between failures)		~60,000 Hours - 200,000 Hours	>1,000,000 Hours	~40,000 Hours	>50,000 Hours	Not applicable
H. Cost	Lower cost level	High	Low	Low	Medium	Not applicable
I. Typical failure mode	Open circuit is generally considered more safe than short circuit in terms of protecting system.	Short Circuit	Short Circuit	Open Circuit	Open Circuit	Not applicable
J. Size	Small size could ensure more efficient space usage.	Small	Small	Large	Large	Not applicable
K. Service life	Long service life could reduce frequency of component replacement.	Medium	Long (10+ yrs)	Medium	Long (10+ yrs)	Not applicable
L. Self-heating	Capacitor with self-heating capability could restore itself in the event of a fault and improve safety and working stability.	No	No	No	Yes	Not applicable
Main application areas		Telecommunications, auto, aerospace	Wide range of applications including aerospace, 3C, medical medical electronics, industrial equipment, auto	Industrial equipment, auto, power, lighting, 3C	Power, auto, 3C, lighting	Industrial equipment, auto, power
Global market split		7%	62%	33%	8%	Not applicable
Key players		Overseas: Kemet (Yageo) Domestic: Torch Electron/Hongda	Overseas: Murata/TDK Domestic: Fenghua/Torch Electron	Overseas: Nichicon Domestic: Jianghai/Ahuas	Overseas: Panasonic/Nichicon/TDK/Kemet (Yageo) Domestic: Fantronix/Jianghai/Tongfeng	Overseas: Maxwell/Panasonic/Cellegy Domestic: Jianghai

Global market split for 2021

Source: Kyocera, ECIA, TDK

Exhibit 3: How 3 types of capacitors (aluminum electrolytic/film/super) are adopted in major new energy applications (NEV/solar power/wind power)



Source: Company data, prepared by Gao Hua Securities Research

Exhibit 4: We forecast 16%/23% revenue/earnings CAGR over 2022-2025E
Company financial summary

Revenue profile	Unit	2021	2022E	2023E	2024E	2025E	22-25E CAGR
Capacitors							
Aluminum Electrolytic Capacitors							
VFD	Rmb mn	1,281	1,474	1,609	1,754	1,910	10%
yoy	%		15%	9%	9%	9%	
Global TAM	Rmb mn	4,818	5,083	5,363	5,658	5,969	5%
Global mkt share	%	27%	29%	30%	31%	32%	
Solar & wind power	Rmb mn	342	465	559	673	786	23%
yoy	%		36%	20%	20%	17%	
Global TAM	Rmb mn	958	1,135	1,301	1,530	1,708	16%
Global mkt share	%	36%	41%	43%	44%	46%	
NEV	Rmb mn	53	95	135	203	262	49%
yoy	%		79%	41%	51%	29%	
Global TAM	Rmb mn	751	1,189	1,495	1,845	2,183	31%
Global mkt share	%	7%	8%	9%	11%	12%	
UPS	Rmb mn	228	261	296	345	395	15%
yoy	%		15%	14%	16%	14%	
Global TAM	Rmb mn	4,214	4,348	4,235	4,315	4,387	1%
Global mkt share	%	5%	6%	7%	8%	9%	
Home appliances	Rmb mn	712	838	861	884	907	6%
yoy	%		18%	3%	3%	3%	
Global TAM	Rmb mn	7,738	8,375	8,608	8,839	9,067	4%
Global mkt share	%	9%	10%	10%	10%	10%	
General industrials	Rmb mn	231	289	333	383	440	17%
yoy	%		25%	15%	15%	15%	
Total segment revenue	Rmb mn	2,847	3,422	3,793	4,242	4,699	13%
yoy	%		20%	11%	12%	11%	
Industrials	Rmb mn	1,740	2,024	2,238	2,482	2,745	12%
New energy	Rmb mn	395	560	694	876	1,048	28%
Home appliances	Rmb mn	712	838	861	884	907	6%
Film Capacitors							
Solar & wind power	Rmb mn	157	214	290	387	525	35%
yoy	%		36%	36%	33%	36%	
Global TAM	Rmb mn	1,328	1,548	1,837	2,172	2,499	17%
Global mkt share	%	12%	14%	16%	18%	21%	
General industrials	Rmb mn	67	101	131	170	205	32%
yoy	%		50%	30%	30%	20%	
Total segment revenue	Rmb mn	224	315	422	557	729	34%
yoy	%		40%	34%	32%	31%	
Haimeimei (50% JV w/ Kemet)							
NEV	Rmb mn	48	101	181	298	437	74%
yoy	%		110%	79%	65%	47%	
Global TAM	Rmb mn	3,023	4,799	6,018	7,441	8,735	30%
Global mkt share	%	2%	2%	3%	4%	5%	
Super Capacitors							
Wind power	Rmb mn	96	165	215	265	276	30%
yoy	%		72%	30%	23%	4%	
Global TAM	Rmb mn	551	515	614	717	691	6%
Global mkt share	%	17%	32%	35%	37%	40%	
Smart meters	Rmb mn	96	123	153	187	236	25%
yoy	%		28%	25%	22%	26%	
Global TAM	Rmb mn	651	694	740	790	842	7%
Global mkt share	%	15%	18%	21%	24%	28%	
General industrials	Rmb mn	48	79	127	190	266	53%
yoy	%		65%	60%	50%	40%	
Total segment revenue	Rmb mn	240	367	495	643	778	34%
yoy	%		53%	35%	30%	21%	
Others							
Foils	Rmb mn	189	199	209	219	230	5%
yoy	%		5%	5%	5%	5%	
Financial summary							
Total revenue	Rmb mn	3,550	4,352	4,967	5,710	6,486	16%
yoy	%		35%	23%	14%	15%	
Gross margin	%	26%	26%	26%	27%	27%	
Operating margin	%	13%	14%	15%	15%	16%	
Net margin	%	12%	14%	14%	15%	15%	
EPS	Rmb	0.52	0.71	0.83	1.01	1.20	23%
yoy	%		17%	35%	18%	22%	
ROE	%	11%	13%	14%	15%	16%	
CROCI	%	12%	16%	16%	17%	18%	

Source: Company data, Gao Hua Securities Research

Why we like Jianghai?

Vertically integrated aluminum electrolytic capacitor mastering all stages of manufacturing knowhow

Jianghai vertically integrates the key manufacturing process of aluminum electrolytic capacitor with **c.70% self-sufficiency rate in formed foil (vs. c.30% for Japanese peers)** which would enable the company to have: **1) Margin advantage to deal with potential competition; 2) Closer control of product quality and higher capability of offering customization for clients.**

Close look at aluminum electrolytic capacitor manufacturing process: how it impacts product performance and COGS structure

The manufacturing process of aluminum electrolytic capacitor can be categorized into 2 stages: 1) formed foil manufacturing (which accounts for c.80% of COGS); 2) capacitor structure assembly (which accounts for c.20% of COGS). **The quality of formed foil, which is widely regarded as the most important core component of aluminum electrolytic capacitor, directly impacts the general electrochemical performance of the product. While capacitor structure assembly process is critical in realizing performance potential of formed foil and offering a customized final product which satisfies the idiosyncratic electronic demand from various end market clients.**

In the formed foil manufacturing process, naked aluminium foil needs to go through:

- **Corrosion:** During the corrosion process, naked aluminium foil will be emerged into proprietary acid solution where the smooth surface of naked aluminium foil will be corroded with countless micro holes. Therefore, by increasing the surface area, the foil would have higher capability of storing electric charge. **The quality of corrosion process is directly linked to key performance metrics of capacitance per unit volume and size;**
- **Formation:** During the formation process, corroded aluminium foil will be stimulated by anodizing voltages which generates an oxide film layer on the surface. **The quality of formation process will impact a capacitor's peak voltage strength, ESR (Equivalent series resistance), and service life.** During the formed foil manufacturing process, electricity is the major cost in the manufacturing process, especially formation process, that needs consistent electrical stimulation. The higher the voltage strength, the more electrical energy will be needed in stimulating process in formation. **Electric power costs account for c.50% of COGS for company's aluminum electrolytic capacitor products.**

Key steps in the capacitor structure assembly process, which is more skewed towards mechanical construction and testing, are as follows:

- **Slitting:** Cut a whole piece of aluminum foil roll into several small pieces to make it suitable for the demands of capacitor specification;
- **Terminal welding & winding:** Attach the terminals to foil slice and wind the foil slice to small foil roll which could be fit into capacitor shell;

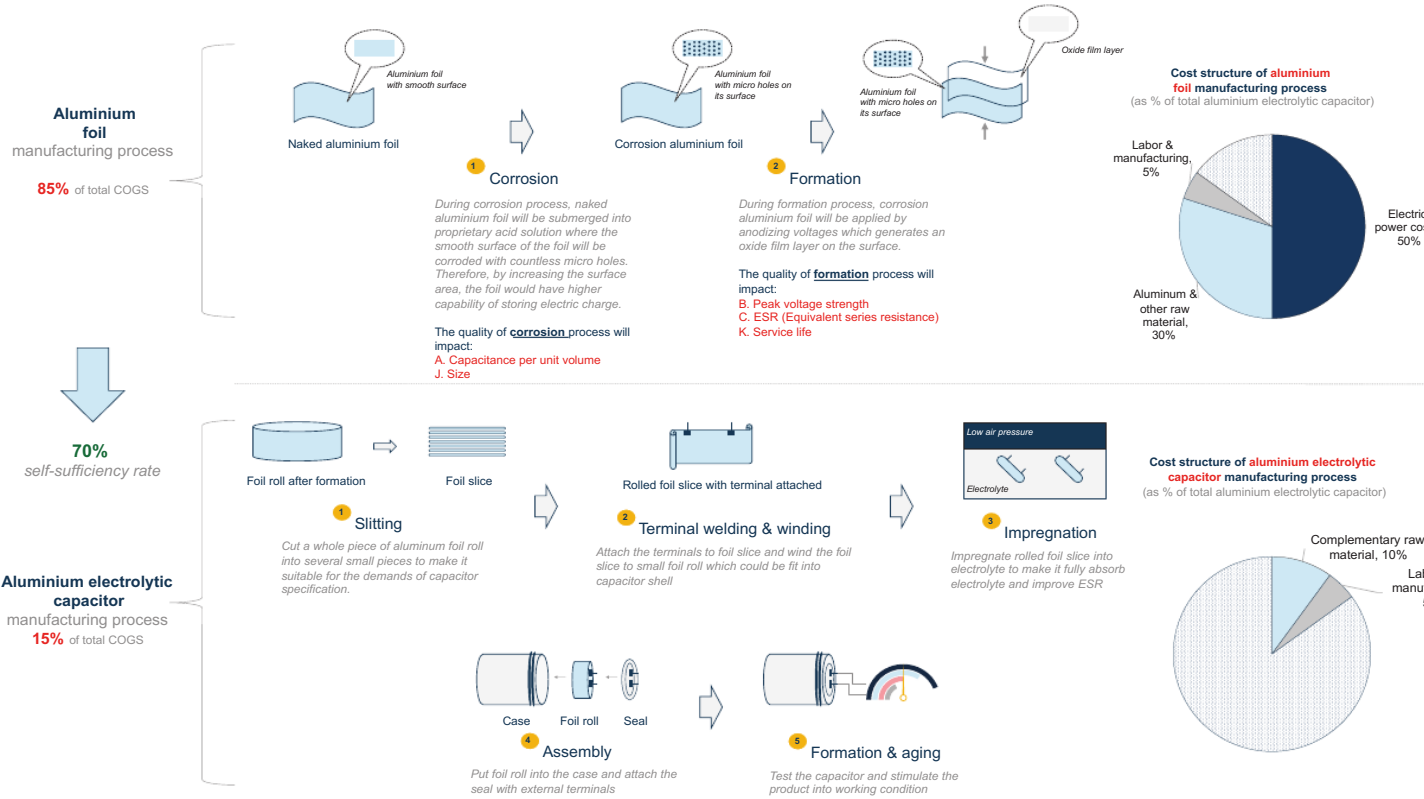
- **Impregnation:** Impregnate rolled foil slice into electrolyte to make it fully absorb electrolyte and improve ESR;
- **Assembly:** Put foil roll into the case and attach the seal with external terminals;
- **Formation & aging:** Test the capacitor and stimulate the product into working condition.

Vertical integration renders Jianghai with margin advantage to cope with rising competition

We see two factors that would play a key role in controlling cost levels in setting up formed foil production plan: 1) Low electricity cost because electric power cost accounts for c.50% of COGS for company's aluminum electrolytic capacitor products as discussed above; 2) Proximity to end markets as capacitor manufacturers can consistently gather feedback and offer customized solutions to various end market clients with idiosyncratic needs, as well as save on logistic costs.

With regard to electricity cost, all of Jianghai's formed foil factories are based in areas with low electricity costs in China: 1) Ulanqab factory: 15mn m²/year capacity for high power products; 2) Baoji factory: 1.8mn m²/year for high capacitance per unit volume products; 3) Yuncheng factory: 0.3mn m²/year capacity. As of 2021, China's comprehensive cost of using electricity energy service (including energy cost, distribution cost, environmental and fuel cost charges, and tax) came at US\$ 0.095/kWh for business use, 24% lower than global average of US\$ 0.126/kWh, according to GlobalPetrolPrices. In contrast, most formed foil factories of Jianghai's major Japanese peers' ("3-Cons", i.e. Nippon Chemi-con, Nichicon, and Rubycon) comprehensive cost of using electricity energy service was US\$ 0.175/kWh for business use, 84% higher than that of China. As a result, 3-Cons procure c.70% of formed foil raw material (vs. c.30% outside procurement rate for Jianghai) from outside foil suppliers - mostly China-based foil suppliers (as a reference, 3 major China-based foil suppliers, Zhonghe/Haixing/HEC, had c.26% product GPM on average during 2018-2021). Adding back Jianghai's ASP discount (5%-10%) we see Jianghai enjoys c.18% GPM gap versus its 3-Cons which we believe would serve as a buffer to cope with rising competition and obtaining new clients based on pricing advantages. With regard to proximity to end markets, we note that although some countries have lower comprehensive electricity costs (e.g. Vietnam), non of those countries have more than 5% formed foil capacity due to distance away from major end markets of manufacturing industries as implied by manufacture value-add.

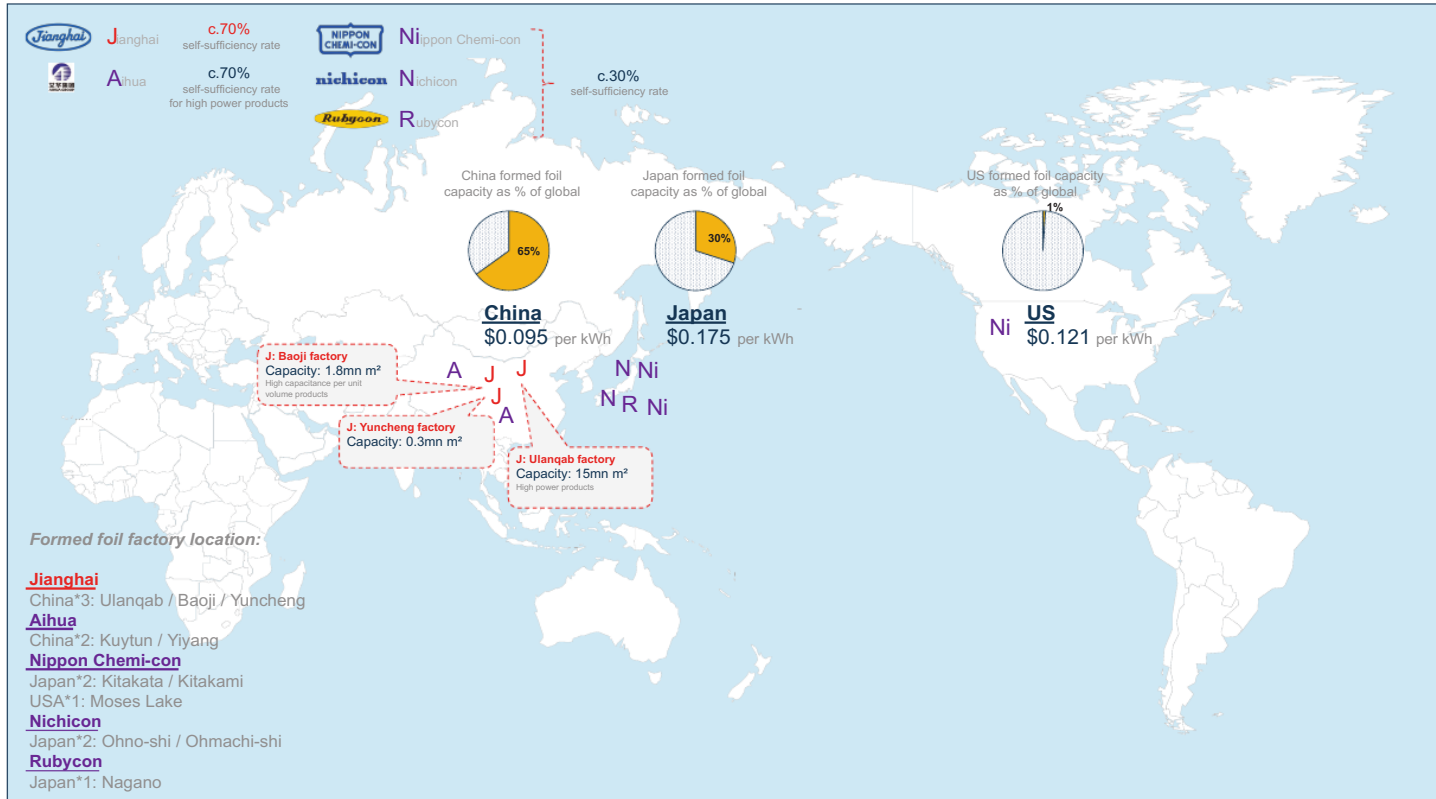
Exhibit 5: Jianghai's vertically integrated key aluminum electrolytic capacitor manufacturing processes have 70% self-sufficiency rate for formed foil
Key manufacturing processes overview for aluminum electrolytic capacitor



Source: Company data, Haixing, Adaptive

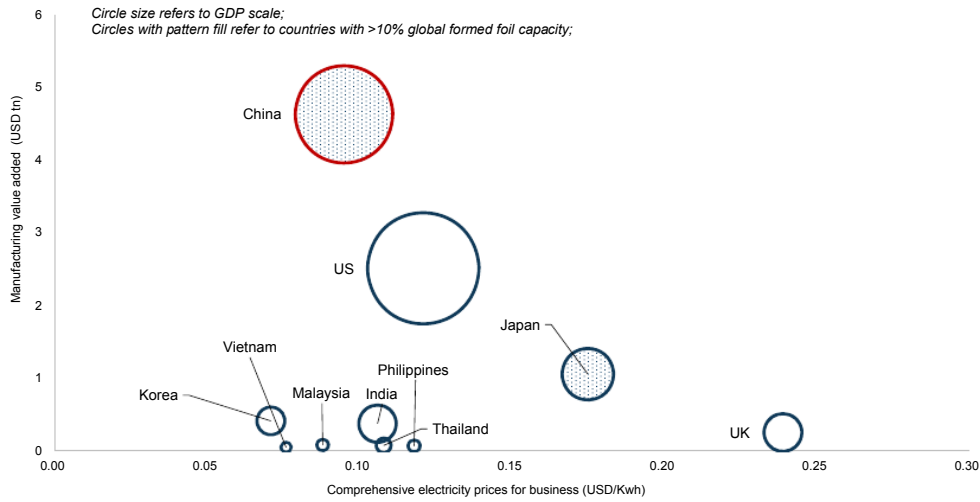
Exhibit 6: Jianghai has 70% self-sufficiency rate for formed foil vs 30% for “3 Cons” because most Japanese peers mainly procure supply from China-based foil suppliers due to costs in Japan

Formed foil capacity mapping for major aluminum electrolytic capacitor manufacturers



Source: Company data, prepared by Goldman Sachs Global Investment Research, GlobalPetrolPrices

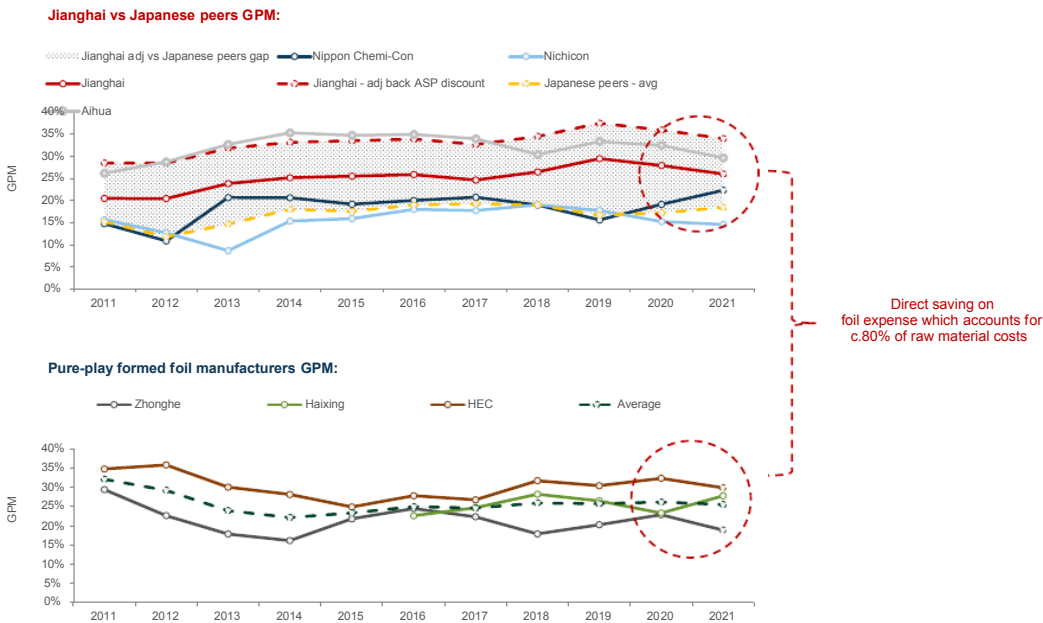
Exhibit 7: It is hard to shift capacity to ASEAN countries with lower energy costs as proximity to end markets is important in setting up formed foil production plant
 Manufacturing costs vs electricity price comp as of 2021



Electricity price refers to comprehensive cost for using electricity energy service, including energy cost, distribution cost, environmental and fuel cost charges, and tax

Source: World Bank, GlobalPetrolPrices

Exhibit 8: About 18% GPM gap between Jianghai and Japanese peers after adjusting for ASP discount
 Jianghai GPM vs Japanese peers



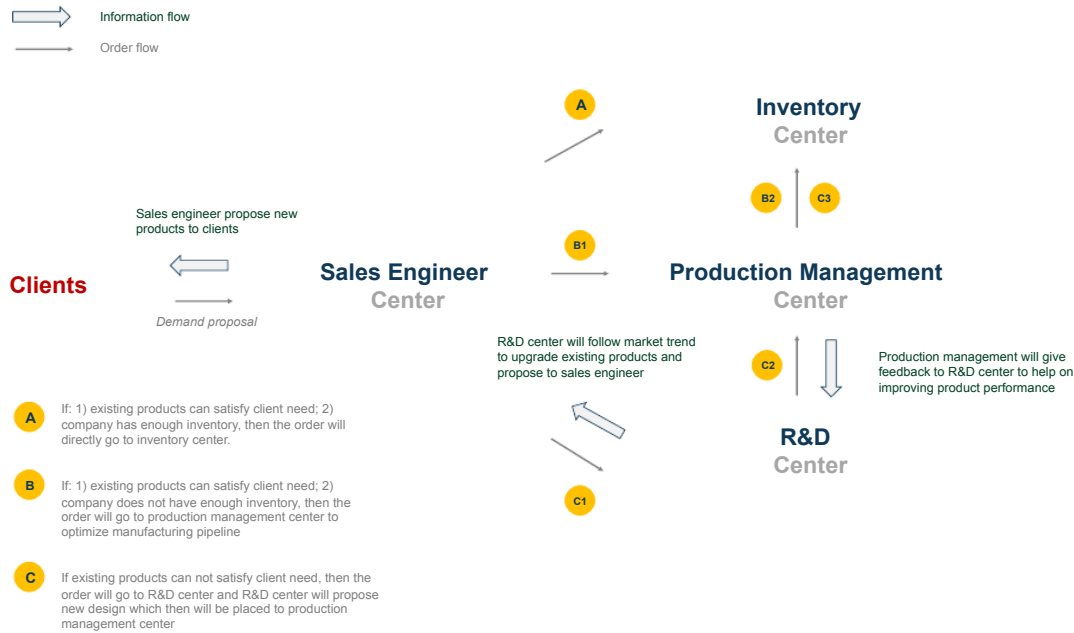
Source: Company data

Vertical integration enables Jianghai closer control of product quality and higher capability of offering customization capability

Capacitor manufacturers need to offer a customized design service in a timely manner

and consistently offer product upgrades to satisfy idiosyncratic client demand from various end markets. Moreover, leading manufacturers have to front-load the design service nowadays, i.e. R&D department has to closely follow market trend to initiate product upgrade process and propose the new product to end market clients through sales engineer before the client propose their demand. Since Jianghai vertically integrates key stages of aluminum electrolytic capacitor manufacturing, the company can move more adeptly in terms of offering a customized service and upgrade product performance.

Exhibit 9: Aluminum electrolytic capacitors need consistent upgrades based on the idiosyncratic demand from end market clients
Aluminum electrolytic capacitor design & order flow



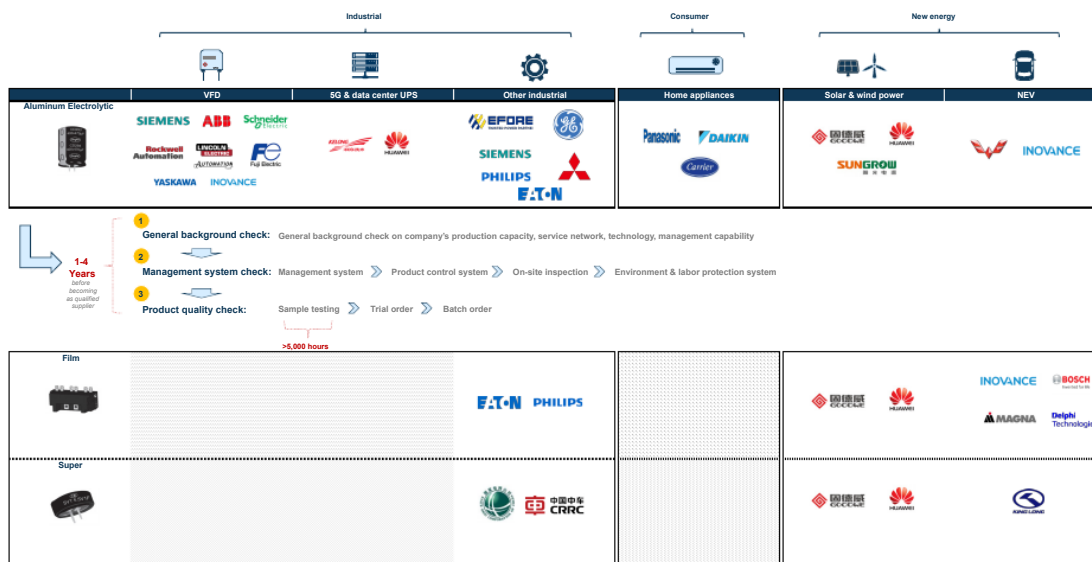
Source: Company data, Aihua

Strong client base with high entry barriers, with brand recognition the company could leverage into other segments

More than 60% of the company’s aluminum electrolytic capacitor products are for industrial clients, including VFD, UPS, and other general industrial equipment. Due to the nature of industrial equipment, clients in the industrial segment normally have stricter requirement for product service life, working stability, and product performance, on top of stable manufacturing capability of suppliers per se. Therefore, industrial segment clients tend to implement stricter supplier vetting process for aluminum electrolytic capacitor suppliers with the total vetting period spanning from 1 to 4 years for given types of products, including: 1) general background check which aims to assess supplier’s production capacity, service network, technology, and management capability; 2) management system check with assessment on supplier’s management/product control/environment & labor protection system; 3) product quality check including initial sample testing (normally more than 5000 hours test) and following trial order. However, once the client recognizes the supplier and includes it in qualified suppliers category, the

supplier will therefore establish a long-term and stable business relationship with the client and the client would not easily switch to another supplier for consideration of product stability, technology familiarity, and low price sensitivity. Building on its technology capability and long-term strategy of pursuing top industrial clients, Jianghai has established a strong client base including top industrial equipment manufacturers in China as well as globally. On one hand, we see the entry barrier for new players, especially small domestic players wishing to undercut through low price, to high end industrial clients is high. On the other hand, since Jianghai has already proved itself by entering into the supply chain system for top industrial clients, it would be just a matter of time for the company to further take additional market share within the industrial universe leveraging on its brand recognition on top of its price advantage. Moreover, there are many client overlap across the aluminum electrolytic segment and film/super capacitor segment. For example, Huawei and Inovance are both key clients in the new energy related film/super capacitor areas. Therefore, due to it being qualified by top tier industrial customers in China and globally, we believe Jianghai can leverage its brand recognition into other segments.

Exhibit 10: Qualified by top tier industrial clients, Jianghai has been leveraging its client recognition into other segments
Jianghai has a strong client base with high entry barriers



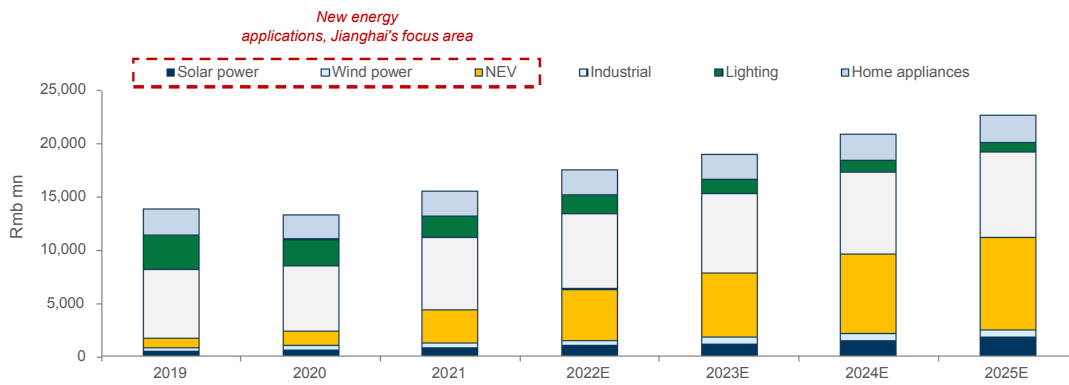
Source: Company data, Haixing

Pipeline business of film capacitor and super capacitor products about to bear fruit in coming years driven by emerging new energy demands

On top of its aluminum electrolytic business which accounted for c. 80% of 2021 revenue, over the years Jianghai has also been leveraging its brand and manufacturing strength in other capacitor fields to build extra growth drivers. Specifically, Jianghai moved into the film capacitor and super capacitor fields in 2011 and 2013 respectively which we believe will begin to bear fruit in the coming years driven by new energy demands. We expect the TAM for film capacitors, traditionally used mainly in industrial applications and consumer appliances, to reach US\$3.5bn by 2025E (10% 2022-25

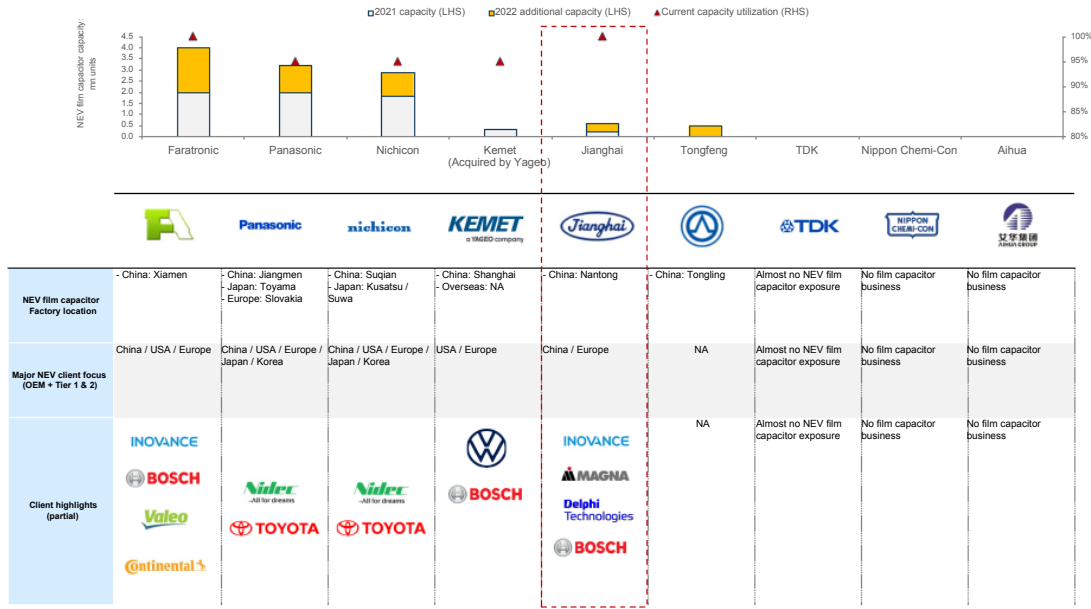
CAGR), driven by the increasing demand from new energy applications such as NEVs and solar/wind power installations (new energy application to deliver 27% 2022-25E CAGR). Jianghai mainly focuses on new energy applications in the film capacitor segment where we see: 1) For NEV products, against the backdrop of the fast ramp-up of end-market demand as well as the nature of NEV production line arrangements (OEMs tend to lock down component suppliers years ahead of mass production), Jianghai has been expanding capacity aggressively, aiming to double its capacity to 0.6mn modules at the end of 2022, making it the 2nd largest NEV film capacitor producer in China after Faratronic (4mn+ units in 2022); 2) For the solar and wind power segment, the company has successfully broken into the supply chain of top PV inverter makers such as Huawei (23% global market share as of 2020) since 1Q22. For super capacitors, which mainly serve as an energy storage alternative to LiB in new energy applications, Jianghai’s standard product performance has been coming close to industry leader Maxwell and has obtained orders from Huawei and CRRC in 2021.

Exhibit 11: We project film capacitors for new energy applications to deliver 27% 2022-25E CAGR
 Film capacitors growth prospect by end market



Source: Wind, HCIA, Goldman Sachs Global Investment Research, Gao Hua Securities Research

Exhibit 12: Jianghai's NEV film capacitor business booked significant progress in client acquisition
NEV film capacitor capacity comp



Capacity projection for Tongfeng is based on company announcements.

Source: Company data, Gao Hua Securities Research, Goldman Sachs Global Investment Research

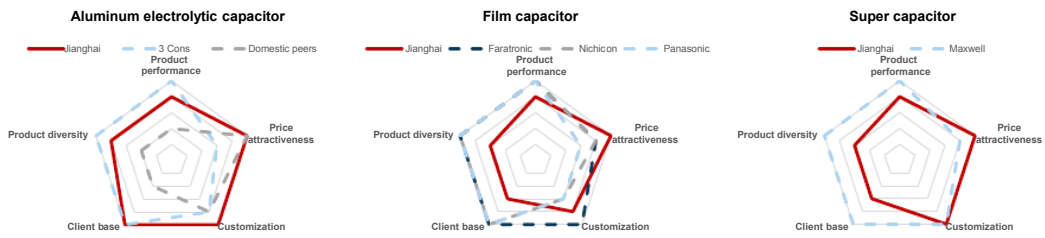
Exhibit 13: Jianghai’s standard super capacitor performance is close to that of Maxwell
Product performance comp Jianghai vs Maxwell

	 Jianghai SPR	 Maxwell Standard Series
STANDARD CELL		
Electrical		
Rated voltage	2.7V	2.7V
Rated Capacitance	100F	100F
Surge voltage	2.85V	2.85V
ESR (DC)	18mΩ	11mΩ
Leakage Current (72h)	0.18mA	0.26mA
Physical		
Weight	20g	21.1g
Size (D x H)	18mm x 60mm	22mm x 52mm
Thermal		
Operating temperature range	-40 ~ +65°C	-40 ~ +65°C
Life		
Cycle life (at room temperature)	500,000	500,000
MODULES		
Electrical		
Rated voltage	160V	160V
Rated Capacitance	10F	8F
ESR (DC)	240mΩ	200mΩ
Leakage Current	30mA	30mA
Physical		
Weight	9kg	6kg
Size (L x H x W)	420mm x 90mm x 300mm	381mm x 85mm x 253mm
Thermal		
Operating temperature range	-40 ~ +65°C	-40 ~ +65°C
Life		
Cycle life (at room temperature)	500,000	500,000

Red refers to better performance metric

Source: Company data

Exhibit 14: Jianghai has leading position in aluminum electrolytic while the gap in film/super areas vs top players is closing
Competitiveness comp analysis



Source: Gao Hua Securities Research

Exhibit 15: Jianghai mainly competes with Nippon Chemi-con, Nichicon, Rubycon globally in aluminum electrolytic capacitor, and has gradually leveraged into film and super capacitor areas
 Competition landscape

	Domestic			
	Jianghai (002484.SZ)	Aihua (603989.SS)	Faratronic (600563.SS)	Tongfeng (600237.SS)
Basic info				
Country	China	China	China	China
Year founded	1958	1993	1955	1996
IPO year	2010	2015	2002	2000
Headquarters	Nantong (Jiangsu, China)	Yiyang (Hunan, China)	Xiamen (Fujian, China)	Tongling (Anhui, China)
Capacitor products focus	Aluminum electrolytic	Aluminum electrolytic	Film	Film & Film raw material
Market cap (USD bn)	3.3	1.5	7.3	0.7
Revenue (Rmb mn, 2021)	3,550	3,234	1,891	1,000
Net income (Rmb mn, 2021)	438	490	556	50
Revenue breakdown (2021)				
Growth profile				
Revenue CAGR (2015-21)	22%	16%	12%	9%
Revenue CAGR (2021-25E)	16%	NA	23%	NA
Net income CAGR (2015-21)	21%	14%	17%	33%
Net income CAGR (2021-25E)	23%	NA	22%	NA
Other operational metrics				
Employees (No. of people, 2021)	3,868	5,176	3,232	1,785
Revenue per employee (Rmb mn, 2021)	0.92	0.62	0.58	0.56
NPAT per employee (Rmb mn, 2021)	0.11	0.09	0.17	0.03
R&D expense	197	174	75	36
R&D expense as % of revenue	6%	5%	4%	4%
GPM (% , 2021)	26%	30%	44%	20%
OPM (% , 2021)	14%	18%	31%	6%
ROE (% , 2021)	11%	17%	20%	5%

	Overseas			
	Nippon Chemi-Con (6997.T)	Nichicon (6996.T)	TDK (6762.T)	Kemet (Acquired by Yageo)
Basic info				
Country	Japan	Japan	Japan	USA
Year founded	1931	1950	1935	1919
IPO year	1970	1999	1961	NM
Headquarters	Tokyo (Japan)	Kyoto (Japan)	Tokyo (Japan)	Fort Lauderdale (USA)
Capacitor products focus	Aluminum electrolytic & Film	Aluminum electrolytic & Film	Ceramic & Aluminum electrolytic & Film	Polymer/Tantalum/Ceramic
Market cap (USD bn)	0.3	0.7	12.1	NM
Revenue (Rmb mn, 2021)	7,051	7,412	94,450	9,266
Net income (Rmb mn, 2021)	-609	109	5,067	1,272
Revenue breakdown (2021)				
Growth profile				
Revenue CAGR (2015-21)	3%	1%	5%	10%
Revenue CAGR (2021-25E)	NA	10%	12%	NA
Net income CAGR (2015-21)	NM	-5%	8%	NM
Net income CAGR (2021-25E)	NA	40%	20%	NA
Other operational metrics				
Employees (No. of people, 2021)	6,772	5,792	102,883	14,850
Revenue per employee (Rmb mn, 2021)	1.04	1.28	0.92	0.62
NPAT per employee (Rmb mn, 2021)	NM	0.02	0.05	0.09
R&D expense (Rmb mn, 2021)	186	319	8,231	NA
R&D expense as % of revenue	3%	4%	9%	NA
GPM (% , 2021)	22%	15%	28%	36%
OPM (% , 2021)	6%	1%	8%	21%
ROE (% , 2021)	NM	2%	9%	NA

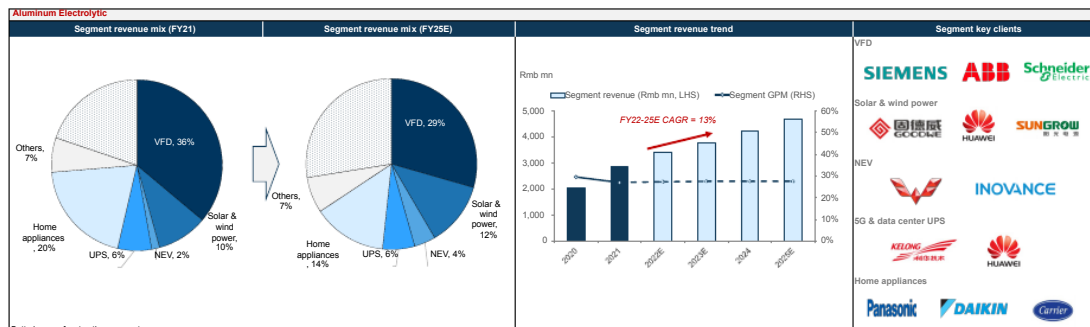
Estimates on Not Covered Chinese companies (Aihua/Tongfeng) are based on Wind consensus data; Estimates on Not Covered overseas companies (Nippon Chemi-con) are based on BBG consensus data; Rubycon is a private company and is not included in this comparison due to lack of information. Priced as of July 26, 2022

Source: Company data, Wind, Gao Hua Securities Research, Goldman Sachs Global Investment Research

Product categories, one by one

Aluminum electrolytic capacitors

Exhibit 16: We project 13% 2022-2025E CAGR for aluminum electrolytic capacitors segment
Aluminum electrolytic capacitors: Revenue analysis and key segment clients



Source: Company data, Gao Hua Securities Research

Aluminium electrolytic capacitors refer to capacitors which adopt etched surface aluminum foil as the anode electrode (the point at which current enters into a polarized electrical device) and aluminium oxide as the dielectric (electrical insulator). The aluminium electrolytic capacitor is one of the most widely adopted capacitor categories with 33% market share (as per ECIA), only after ceramic capacitors (MLCCs) with 52%. Compared with the peers, aluminium electrolytic capacitors mainly stand out in: 1) high capacitance per unit volume such that the capacitor has a higher capability in storing electric charges; 2) low cost (c.30-40% cheaper than film capacitors). Moreover, aluminium electrolytic capacitors stand in the middle of the spectrum of key technical metrics such as peak voltage strength (capacitors with high peak voltage strength could work in high voltage scenarios), temperature stability (functionality under extreme external temperature conditions), and service life. Therefore, aluminium electrolytic capacitors have a diverse set of end market applications ranging from high power industrial equipment to low power consumer electronic devices. For Jianghai, the company mainly focuses on the high-power industrial and new-energy end market (c.75% revenue exposure) in the aluminium electrolytic capacitor space with c.25% revenue exposure to the low-power consumer end-market side.

Jianghai launched its aluminum electrolytic capacitor business in 1970, first mainly focusing on assembly and gradually vertically integrated its upstream manufacturing process for formed foil. The end markets for Jianghai's aluminum electrolytic capacitor products can be categorized into three fields: 1) Industrial (61% of segment revenue), which includes VFD (variable frequency drive), UPS, and other general industrials; 2) New-energy end markets (14% of segment revenue), which mainly include solar & wind power and NEV charging stations; and 3) Home appliances (25% of segment revenue), which include various home appliance products such as TVs, ACs, and washing machines.

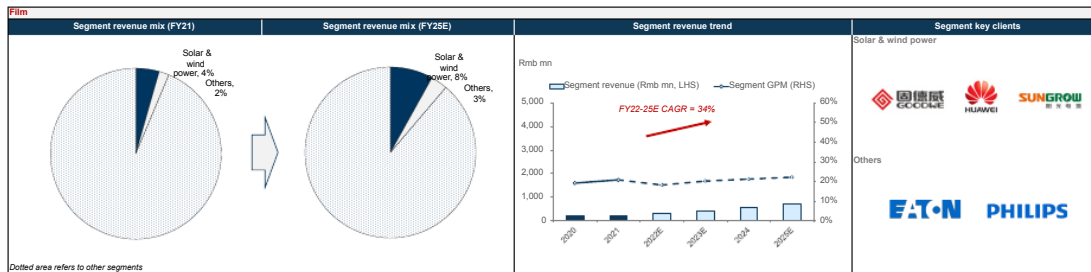
Within the Industrial segment, Jianghai has established a strong client base including

top industrial equipment manufacturers in China as well as globally. On one hand, although Jianghai still lags the 3-Cons in terms of selective high-end products, its technology gap is marginal, instead of fundamental, and has been consistently narrowing. We believe Jianghai could leverage its already established top-client network to gain further market share in the high-end product space or expand market share within clients where its market share is still small even for low and medium products. Within New-energy end markets, Jianghai’s aluminum electrolytic capacitor products are used as tier 1 wave filters in DC/AC inverters, in complement to film capacitors, for wind & solar power applications. Moreover, Jianghai’s aluminum electrolytic capacitor products are also adopted in charging stations as filters to smooth out voltage fluctuations. We believe New-energy end markets should also be regarded as part of the industrial space and see a high level of overlap in terms of key players within the two segments where Jianghai could enjoy cross selling. In addition, China-based manufacturers own the majority of the PV inverter and wind turbine market share which creates another advantage for Jianghai to obtain clients in its home market. For the Home appliances segment, Jianghai’s target is to maintain client relationships strategically, with top clients in the consumer space, in order to stay abreast of the latest industry trends and potential new opportunities, instead of making the segment a revenue driver. In Home appliances, Jianghai has to procure all the necessary low-power formed foil from outside suppliers as its formed foil plants are for high power products.

Overall, we see the most challenging aspect of the aluminium electrolytic capacitor segment as developing and maintaining relationships with top industrial clients, a process through which Jianghai has already successfully navigated. The remaining key challenge for Jianghai is to gain further market share, building on its already established client network and its price advantage driven by its vertical integration.

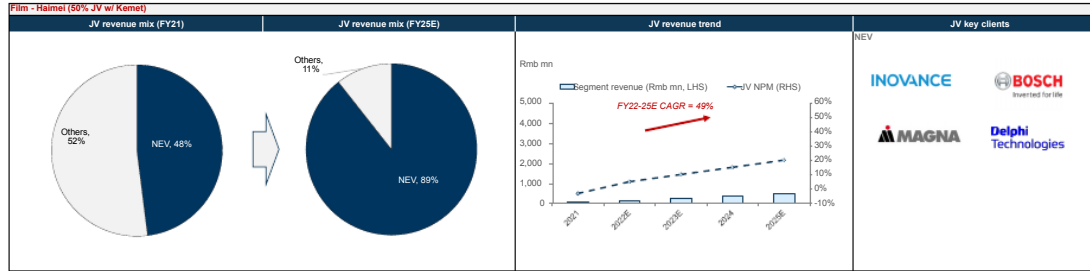
Film capacitor

Exhibit 17: We project 34% 2022-2025E CAGR for film capacitors segment
 Film capacitors: Revenue analysis and key segment clients



Source: Company data, Gao Hua Securities Research

Exhibit 18: We project 49% 2022-2025E CAGR for Haimei (NEV film capacitor JV w/Kemet)
 Film capacitors: Revenue analysis and key segment clients



Source: Company data, Gao Hua Securities Research

Film capacitors are capacitors which use plastic film as the dielectric. Compared with the comparable capacitors, as we detailed in our Faratronic initiation, film capacitors stand out in five areas which are critical in new-energy applications: 1) Peak voltage strength: which is the highest voltage level that can be applied to a capacitor in a working environment; 2) High maximum operating temperature: which is the highest temperature level at which a capacitor can still properly function; 3) Temperature stability, which refers to working stability in a changing external temperature environment; 4) Service life: which refers to the lifespan of capacitors. We believe film capacitors could benefit from the tailwinds of emerging new energy end-markets given film capacitor capabilities, particularly those that can function in severe environments, that are applicable to new energy applications such as those requiring high voltage strength and high operating temperatures. Therefore, we see the TAM for film capacitors, which have been traditionally used mainly in industrial applications and consumer appliances, reaching US\$3.5bn by 2025E (10% 2022-25E CAGR), driven by the increasing demand from new energy applications such as NEVs and solar/wind power installations (new energy applications to deliver 27% 2022-25E CAGR).

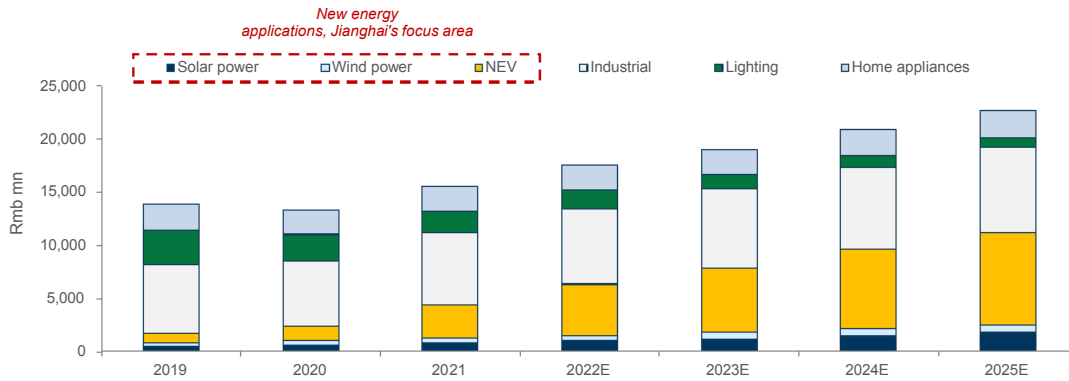
Jianghai began film capacitor research in 2011 and set up its first proprietary film capacitor production plant in 2014 (Jianghai also acquired Suzhou UP Technology, which was once an OEM supplier to Faratronic, to strengthen its film capacitor technology in 2013). Therefore, the company had completed its initial investment and its manufacturing infrastructure set up for the film capacitor business back when the segment was still mainly driven by traditional industry, and is now poised to benefit from segment TAM growth acceleration driven by new energy end markets. Specifically, for film capacitor products, Jianghai currently operates the business in two entities: 1) Jianghai entity: which mainly focuses on solar & wind power and general industrial end markets; and 2) Haimei entity: which is a 50% JV Jianghai established with Kemet and will mainly focus on film capacitor products for NEV's motor DC link and IGBT protection (the financial results of Haimei are not consolidated into Jianghai - only 50% of Haimei's net income will be booked as investment income in listco's consolidated income statement).

For solar & wind applications, film capacitors are normally adopted in input/output filter systems, DC boost, and DC link systems in the combiner box of solar power facilities, and DC/AC conversion mechanisms. Leveraging its established manufacturing

infrastructure and client network in the industrial aluminum electrolytic capacitor segment, Jianghai has passed the vetting process of top PV inverter players, such as Huawei, and began to ship products in 1Q22. For NEV end markets, Jianghai has recently become a motor DC link and IGBT protection film capacitor product supplier to top IGBT makers such as Bosch and Magna (Tier 1 for Volvo) and Inovance (Tier 1 for Chery/Xiaopeng/Changan). Against a backdrop of the fast ramp-up of end-market demand as well as the nature of NEV production line arrangements (OEMs tend to lock down component suppliers years ahead of mass production), Jianghai has been expanding capacity aggressively, aiming to double its capacity to 0.6mn modules at the end of 2022, making it the second largest NEV film capacitor after Faratronic (4mn+ units in 2022) ([Exhibit 20](#)).

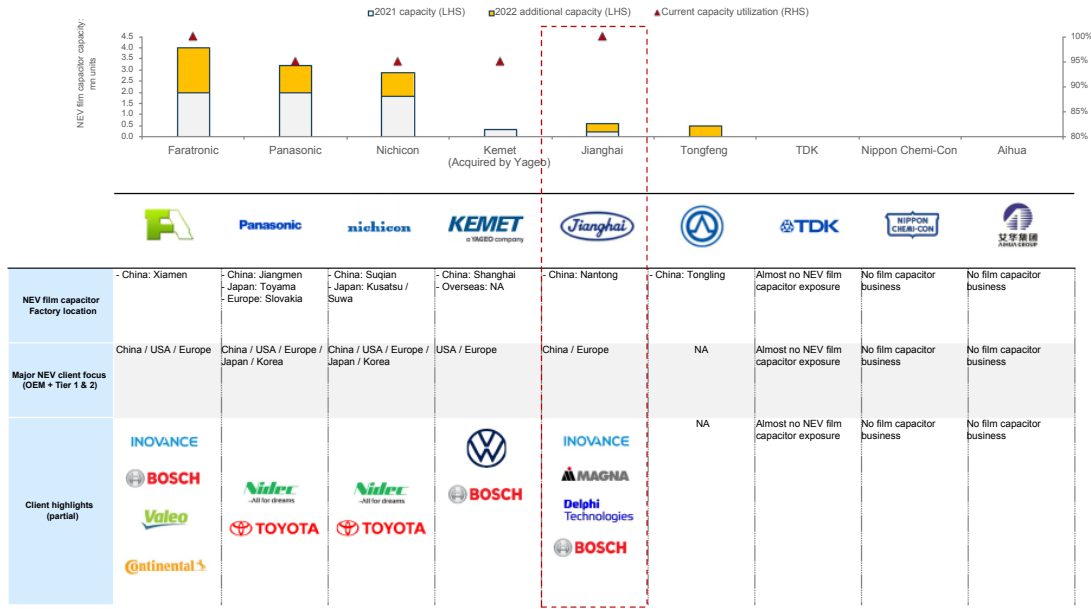
For the film capacitor segment as a whole, we believe Faratronic would still stand solidly as a top leader given its technology and capacity advantage. But we believe Jianghai could emerge as a major medium-sized domestic player from the current low base and make its film capacitor business an important growth driver going forward given its: 1) Strategy of focusing on new energy end markets where the company could leverage its client base strength in industrial aluminum electrolytic capacitors; and 2) Already established film capacitor production capacity to accommodate potential demand surge.

Exhibit 19: We project film capacitors for new energy applications to deliver 27% 2022-25E CAGR
 Film capacitors growth prospect by end market



Source: Wind, HCIA, Goldman Sachs Global Investment Research, Gao Hua Securities Research

Exhibit 20: Jianghai's NEV film capacitor business has booked significant progress in client acquisition
NEV film capacitor capacity comp

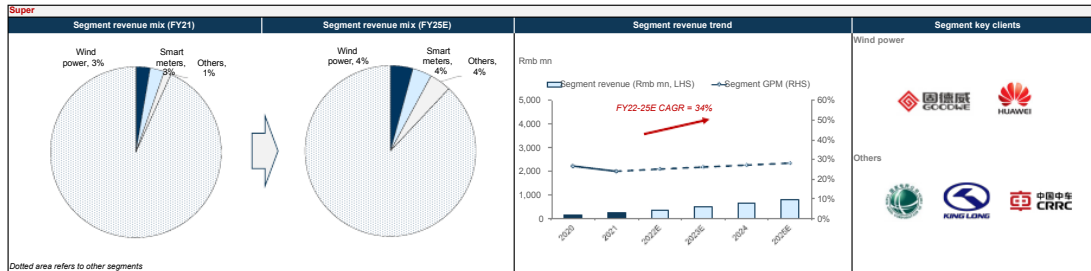


Capacity projection for Tongfeng is based on company announcements.

Source: Company data, Gao Hua Securities Research, Goldman Sachs Global Investment Research

Super capacitors

Exhibit 21: We project 34% 2022-2025E CAGR for super capacitors segment
Super capacitors: Revenue analysis and key segment clients



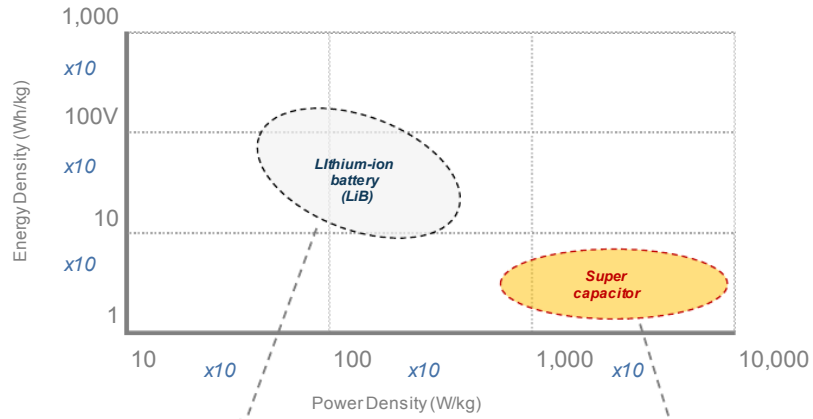
Source: Company data, Gao Hua Securities Research

From a technological structure point of view, super capacitors are not passive electronic components which belong to the traditional capacitor category. Instead, super capacitors are energy storage devices based on electric field features. Different from lithium-ion batteries which rely on a chemical reaction, the super capacitor uses conductive plates to physically store electric charges. Compared with lithium-ion batteries, the super capacitor has the following pros and cons: 1) Pros: Faster charge/discharge speed; Longer service life; Environment friendly; 2) Cons: Larger size; Low energy storage volume. Moreover, because the super capacitor has a higher level of reliability thanks to its mechanical structure, it is especially suitable for industrial equipment needed in remote areas with extreme weather conditions in order to

improve system reliability and reduce maintenance costs.

In terms of end markets, the super capacitor is still at an early stage of development, compared with the aluminum electrolytic and film capacitor, with a diverse set of potential working scenarios where end-market users have been exploring ways of fitting super capacitors into existing equipment to serve as an alternative energy source or even as a direct substitute to LiB. Jianghai began R&D on super capacitors in 2013 and has locked down several major end markets in the new energy segment which has started to bring stable recurring revenue. As of 2021, the top two major end markets for Jianghai are wind power equipment and smart meters. For wind power equipment, Jianghai's super capacitor products serve as power source for wind turbine pitch control systems where the super capacitor generates the power to pitch the blades certain degrees when wind changes direction so the rotor blade stays at the right angle and generates the highest power output. For the smart meter segment, against the backdrop of increasing demand for active meter equipment to consistently monitor/restore/upload usage information for household utilities, Jianghai's super capacitor products were adopted as a power source given their high instant power output level. On top of wind power and smart meters, Jianghai recently gained orders from CRRC Qingdao which adopts super capacitors on railway equipment to collect energy from regenerative braking process. For the remaining end markets, Jianghai covers a wide range of long-tail end markets such as power grid storage facilities and harbor equipment and machinery. In terms of product coverage, Jianghai's super capacitor products have full coverage of major potential end markets: 1) EDLC cell products, which mainly cover smart meters and wind turbine pitch control system end markets; 2) Lithium-ion cell products, which mainly cover rail regenerative braking end markets; and 3) Module products, which mainly cover power grid energy storage end markets. Although Jianghai still lags Maxwell in terms offering products customized in special usage scenarios such high shock and vibration environments which are critical for automotive, rail and hybrid bus markets, we see the product performance of Jianghai's standard cell and module products as having come close to segment leader Maxwell (20%+ domestic market share vs. Jianghai's c.8%) and well poised for domestic substitution opportunities for corresponding end markets.

Exhibit 22: Super capacitors also target new energy applications which serve as a complement to LiB
 Performance comp between LiB and supercapacitors



Function	LiB (general)	Super capcaitor
Charge time	10 - 60 minutes	1 - 10 seconds
Cycle life	500+	1 million
Cell voltage	3.6 - 3.7v	2.3 - 2.75v
Specific energy (Wh / kg)	100 - 200	5 (typical)
Specific power (W / kg)	1,000 - 3,000	Up to 10,000
Cost per Wh	\$0.50 - \$1.00 (large system)	\$20 (typical)
Service life	5 - 10 years	10 - 15 years
Charge temperature	0°C to +45°C	-40°C to +60°C
Discharge tempreature	-20°C to +45°C	-40°C to +60°C
Massive production easiness	Low	Medium

Red text indicates better performance metric

Source: Battery University, batterypowertips

Exhibit 23: Jianghai's standard super capacitor performance is close to that of Maxwell
 Product performance comp Jianghai vs. Maxwell

	 Jianghai SPR 	 Maxwell Standard Series 
STANDARD CELL		
Electrical		
Rated voltage	2.7V	2.7V
Rated Capacitance	100F	100F
Surge voltage	2.85V	2.85V
ESR (DC)	18mΩ	11mΩ
Leakage Current (72h)	0.18mA	0.26mA
Physical		
Weight	20g	21.1g
Size (D x H)	18mm x 60mm	22mm x 52mm
Thermal		
Operating temperature range	-40 ~ +65°C	-40 ~ +65°C
Life		
Cycle life (at room temperature)	500,000	500,000
MODULES		
Electrical		
Rated voltage	160V	160V
Rated Capacitance	10F	8F
ESR (DC)	240mΩ	200mΩ
Leakage Current	30mA	30mA
Physical		
Weight	9kg	6kg
Size (L x H x W)	420mm x 90mm x 300mm	381mm x 85mm x 253mm
Thermal		
Operating temperature range	-40 ~ +65°C	-40 ~ +65°C
Life		
Cycle life (at room temperature)	500,000	500,000

Red text indicates better performance metric

Source: Company data

Financials

Exhibit 24: Key financial metrics comp with Faratronic



Source: Company data, Gao Hua Securities Research

Revenue: Overall, we expect Jianghai to deliver a 16% revenue CAGR through 2022-25E, mainly supported by continued market share gains in the aluminum electrolytic capacitor segment as well as growth of pipeline business in film capacitor and super capacitor. For the aluminum electrolytic segment, we expect the company to deliver a 13% revenue CAGR through 2022-25E, on the back of continued market share gains building on the company’s low cost advantage, customization capability, and strong client base. For the film and super capacitor segments, we project Jianghai to respectively deliver 34%/34% 2022-25E growth, driven by accelerated growth in new energy end markets demand in solar & wind power and NEV.

Margin: Jianghai’s overall GPM witnessed a clear improvement path from 16% in 2008 to 26% in 2021, mainly thanks to its initiative to vertically integrate the aluminum electrolytic capacitor manufacturing value chain and its technology capability which enables it to consistently roll out products in the industrial end market. The GPM decreased 2pp in 2021, mainly due to commodity inflation especially electricity price hike (as electricity accounts for 50% of COGS for aluminum electrolytic capacitor). However, in 1Q22, overall GPM witnessed a margin recovery with 2.7pp qoq improvement vs 4Q21 mainly due to an alleviation of electricity & raw material price hikes as well as a rise in its ASP. Going forward, we see a moderate recovery in GPM from 25.9% in 2021 to 26.6% in 2025E from: 1) Moderate electricity and raw material

inflation outlook; 2) the company's ability to raise ASP and self-sufficiency in order to hedge power price hike risks for aluminum electrolytic capacitors; 3) Economies of scale to come into play for film and super capacitor.

Exhibit 25: Income statement

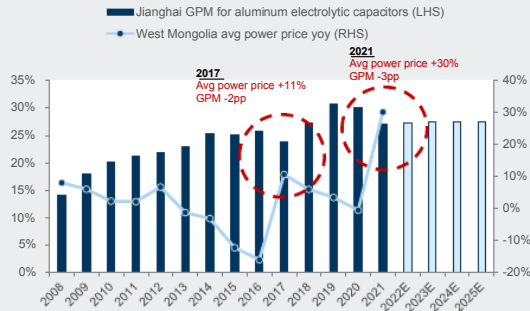
Income statements	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022E	2023E	2024E	2025E
Total sales/revenues	1,037	966	1,109	1,155	1,091	1,224	1,667	1,961	2,123	2,635	3,550	4,352	4,967	5,710	6,486
yoy %		(7%)	15%	4%	(6%)	12%	36%	18%	8%	24%	35%	23%	14%	15%	14%
COGS	(825)	(769)	(845)	(865)	(813)	(908)	(1,257)	(1,443)	(1,499)	(1,901)	(2,629)	(3,219)	(3,656)	(4,193)	(4,751)
Others															
Total COGS	(825)	(769)	(845)	(865)	(813)	(908)	(1,257)	(1,443)	(1,499)	(1,901)	(2,629)	(3,219)	(3,656)	(4,193)	(4,751)
Gross profit	212	197	264	290	278	316	410	518	625	734	920	1,133	1,311	1,517	1,735
yoy %		(7%)	34%	10%	(4%)	14%	30%	26%	21%	18%	25%	23%	16%	16%	14%
SG&A	(104)	(105)	(121)	(144)	(169)	(180)	(216)	(262)	(336)	(359)	(423)	(479)	(546)	(600)	(668)
Other operating income/(expense)	(2)	(9)	(5)	(8)	(7)	(14)	(12)	(26)	(33)	(17)	(25)	(30)	(35)	(40)	(45)
Total operating expense	(106)	(113)	(127)	(152)	(176)	(193)	(229)	(308)	(369)	(377)	(449)	(509)	(581)	(640)	(713)
EBITDA	142	128	190	198	167	199	273	309	365	483	631	815	940	1,111	1,282
yoy %		(10%)	49%	4%	(16%)	20%	37%	13%	18%	33%	31%	29%	15%	18%	15%
Depreciation	(35)	(42)	(51)	(58)	(63)	(74)	(87)	(93)	(106)	(123)	(155)	(184)	(204)	(227)	(254)
Amortization	(1)	(2)	(2)	(2)	(2)	(2)	(4)	(5)	(4)	(3)	(4)	(7)	(7)	(7)	(7)
EBIT (operating profit)	105	84	137	138	101	122	182	210	255	358	472	624	730	877	1,022
yoy %		(21%)	64%	1%	(27%)	21%	48%	16%	22%	40%	32%	32%	17%	20%	16%
Interest income	13	12	12	13	10	6	4	6	5	5	6	7	8	10	12
Interest expense	(1)	(1)	(3)	(1)	(1)	(0)	(5)	(3)	(4)	(6)	(8)	(8)	(8)	(8)	(8)
Net interest income/expense	12	11	9	12	9	6	(1)	3	1	(1)	(2)	(1)	0	2	4
Profit/loss on disposal of assets (pre-tax)	0	0	0	0	0	0	0	0	22	14	1	-	-	-	-
Foreign exchange gain/(loss)	5	(0)	3	1	(15)	(15)	15	(11)	(3)	24	5	-	-	-	-
Share of profit of JV & associates	16	11	13	15	13	13	18	10	(1)	3	7	4	12	26	49
Other investment income	0	0	(0)	18	0	7	31	35	4	4	4	1	-	-	-
Government subsidy	0	0	0	0	0	0	24	28	23	24	26	44	50	57	65
Other non-operating income/expense	(11)	10	(0)	0	48	48	(32)	9	2	2	(16)	-	-	-	-
Non-operating income/(loss)	23	32	25	47	55	58	55	74	47	69	29	48	62	85	118
Pre-tax profit (income before tax)	128	115	161	185	156	181	237	284	303	426	501	672	791	963	1,140
yoy %		(10%)	40%	15%	(16%)	15%	23%	20%	6%	41%	17%	34%	18%	22%	18%
Income taxes	(17)	(15)	(23)	(23)	(20)	(22)	(33)	(26)	(36)	(43)	(63)	(61)	(65)	(116)	(137)
Minority interest	(7)	(3)	(10)	(9)	(8)	(10)	(14)	(26)	(10)	(10)	(3)	6	10	15	21
Preferred dividends	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Extraordinary gain/(loss)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NET income	104	98	129	154	129	149	190	244	241	373	435	588	692	842	998
yoy %		(6%)	32%	19%	(16%)	15%	27%	28%	(1%)	55%	17%	35%	18%	22%	18%

Source: Company data, Gao Hua Securities Research

Assessing electricity price impact on GPM

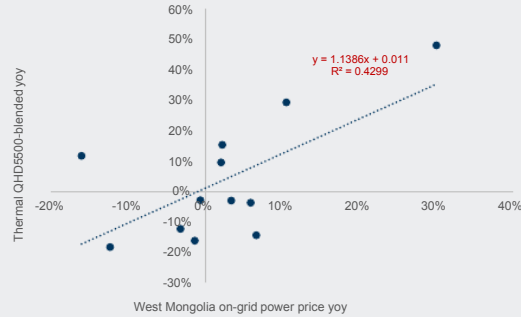
Aluminum electrolytic capacitor products make up the biggest product category for Jianghai (80% revenue mix as of 2021) and electricity costs accounts for c.50% of COGS of aluminum electrolytic capacitor products. Around 90% of Jianghai's formed foil was manufactured in the company's Ulanqab production plants which uses the regional pricing standard of West Inner Mongolia. Our analysis of the company's historical GPM for aluminum electrolytic capacitors and the West Inner Mongolia power price trend indicates that only a drastic (>10%) power price increase would decrease GPM by >1% for the aluminum electrolytic capacitors business as the company could raise ASP (80% hedge) and self-sufficiency of formed foil to hedge the impact. One major cause for 2021's dramatic power price hike was the high price inflation of coal (thermal QHD5500 coal price +48% in 2021) as >70% of electricity power in China is from coal-fired plants. Looking forward, GS' China commodity team projects China thermal coal price to fall from 2021's peak and stay largely flat thereafter as a result of supply additions. Although electricity is a highly regulated power source in China and coal cost is far from being the sole determinant for electricity price, we believe it signals that a dramatic power price hike is less likely to emerge in the short term, as also evidenced by the moderate power price trend in West Inner Mongolia in 2022 YTD.

Exhibit 26: Aluminum electrolytic capacitors GPM only suffers under drastic (>10%) power price increase as the company uses ASP hike (80% hedge) and higher self-sufficiency of formed foil to hedge the impact
Impact of power price analysis



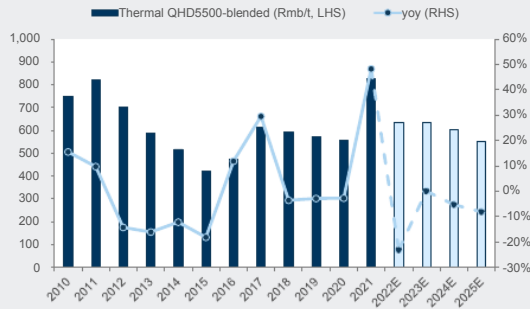
Source: Company data, Gao Hua Securities Research, CHNG

Exhibit 27: Although electricity is a highly regulated power source in China and coal cost is far from being the sole determinant for electricity price, it still plays as an important factor for electricity price given >70% electricity power in China is from coal-fired plants
Regression of power price against coal cost



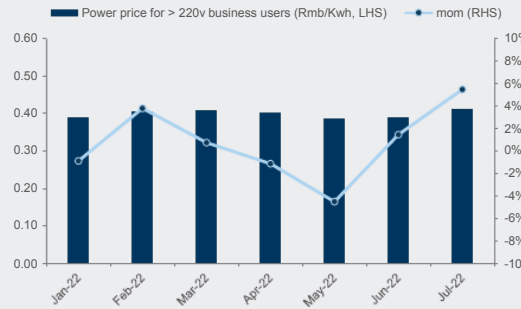
Source: Wind, CHNG

Exhibit 28: GS China commodity team projects coal price to fall from 2021's peak and stay flat thereafter
Coal cost trend



Source: Company data, Gao Hua Securities Research, Wind

Exhibit 29: Power price in 2022 YTD remains stable in West Inner Mongolia for high power (>220v) business users
2022 YTD West Inner Mongolia power price trend



Source: IMPC

Working capital management: Jianghai mainly relies on a direct sales model to distribute products (91% revenue mix through direct sales and the rest is through distributors). The company recognizes revenue once the client receives and tests products. Jianghai has a diverse client exposure (top 5 clients concentration was 13% as of 2021) due to the nature of capacitor products being a fundamental electronic component with wide end market applications. On the supplier side, for aluminum electrolytic capacitor products, Jianghai has to procure 30% of its formed foils from outside suppliers, which we estimate accounts for c.20% of total COGS as of 2021. For film capacitors, the company has to procure all naked film and more than 30% metalized film from outside suppliers, which we estimate accounts for c.5% of total COGS as of 2021. The technology barrier for formed foil/naked film/metalized film is relatively high, however, we see the supplier base is still wide and diverse except for certain high end film materials used in the NEV IGBT protection module which is mainly supplied by top

Japanese suppliers such as Toray. Other raw materials are mainly general materials such as copper and tin terminals and aluminium case which we believe have a relatively low technology barrier with abundant supply. As of 2021, the top 5 supplier concentration was 32%. In the future, we see Jianghai's bargaining power remaining stable across the value chain with a slight improvement given a larger procurement volume, and we project cash conversion days to decline to 130 days on average during 2022-2025E vs 2019-2021 average of 142 days.

Exhibit 30: Balance sheet

Balance sheets	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022E	2023E	2024E	2025E
Cash and equivalents	555	574	529	488	456	834	540	447	478	689	549	735	878	1,110	1,353
Net receivables	264	298	343	375	438	534	600	688	920	1,163	1,308	1,550	1,789	2,034	2,310
Inventory/stocks	193	193	220	246	247	270	317	371	467	684	853	970	1,102	1,264	1,432
Other current assets	27	22	30	71	79	1,162	1,172	966	780	571	458	458	458	458	458
Current assets	1,038	1,087	1,121	1,181	1,221	2,599	2,629	2,474	2,646	3,097	3,266	3,713	4,207	4,865	5,553
Gross PP&E/Fixed assets	502	578	738	765	930	991	1,179	1,374	1,575	2,478	2,634	2,895	3,226	3,591	4,024
Less accumulated depreciation	(171)	(199)	(251)	(290)	(346)	(373)	(520)	(617)	(683)	(1,167)	(1,250)	(1,435)	(1,639)	(1,866)	(2,120)
Net PP&E/Fixed assets	331	379	486	475	585	618	659	757	892	1,312	1,383	1,460	1,587	1,725	1,904
Gross intangibles	32	48	94	94	95	106	290	279	353	344	344	344	344	344	344
Accumulated amortization	(7)	(9)	(11)	(13)	(15)	(17)	(23)	(26)	(31)	(107)	(101)	(108)	(114)	(121)	(128)
Net intangibles	25	39	83	81	79	88	267	254	248	247	243	237	230	224	217
Total investments	71	69	100	130	133	142	237	127	130	151	155	160	172	198	247
Other long-term assets	63	72	26	88	33	31	86	436	585	358	525	664	733	768	835
Total assets	1,527	1,647	1,816	1,955	2,051	3,478	3,848	4,057	4,501	5,164	5,973	6,234	6,929	7,780	8,756
Accounts payable	137	166	174	226	218	333	446	507	549	752	812	970	1,102	1,264	1,432
Short-term debt and current portion of long-term debt	0	0	55	6	13	0	61	11	160	190	202	202	202	202	202
Other current liabilities	16	26	23	24	21	32	63	59	133	142	80	127	153	191	230
Current liabilities	153	192	252	257	252	366	570	577	841	1,083	1,094	1,299	1,457	1,656	1,863
Long-term debt	-	-	3	3	3	-	-	-	-	19	22	22	22	22	22
Other long-term liabilities/creditors	8	2	9	12	22	34	48	42	63	117	122	134	147	162	178
Total long-term liabilities	8	2	12	15	25	34	48	42	63	136	144	156	169	184	200
Total liabilities	163	194	263	271	277	400	619	619	904	1,219	1,238	1,455	1,626	1,840	2,063
Preferred shares	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Common stock	1,059	1,073	1,086	1,107	1,127	2,330	2,355	2,387	2,397	2,585	2,694	2,694	2,694	2,694	2,694
Retained earnings	210	284	373	475	551	645	747	892	1,037	1,309	1,603	2,043	2,563	3,194	3,943
Other common equity	-	-	-	-	-	-	13	(30)	(4)	5	4	4	4	4	4
Total common equity	1,270	1,357	1,460	1,582	1,678	2,975	3,116	3,249	3,429	3,899	4,301	4,741	5,260	5,892	6,641
Minority interest (balance sheet)	95	97	93	101	96	103	113	189	168	46	34	38	42	47	52
Total shareholders funds/equity	1,364	1,454	1,552	1,683	1,774	3,078	3,229	3,438	3,597	3,945	4,335	4,780	5,303	5,939	6,693
Total liabilities and equity	1,527	1,647	1,816	1,955	2,051	3,478	3,848	4,057	4,501	5,164	5,973	6,234	6,929	7,780	8,756

Source: Company data, Gao Hua Securities Research

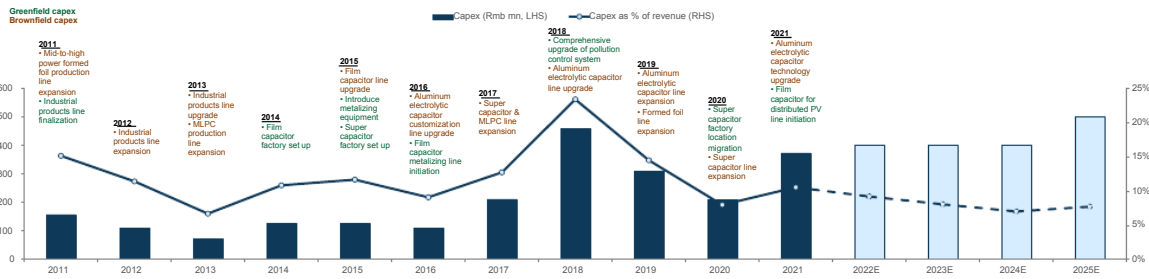
Capex: Over the past decade, usage of Jianghai's capex could be roughly divided into 2 categories: 1) Brownfield capex: which refers to capex for consistent capacity expansion & technology upgrade for existing capacity, especially for aluminum electrolytic capacitor related production plants (including formed foil plants). We believe capex in this category is recurring in nature in order to support continued revenue growth; 2) Greenfield capex: which refers to capex on brand new facilities for pipeline businesses such as film and super capacitor as well as onetime firm-wide infrastructure upgrade for non-production facilities in compliance with regulatory requirements (such as 2018's upgrade of the pollution control system). We see capex in this category as non-recurring in nature or with a low occurring frequency. We believe the company's initial investments in film and super capacitor products will begin to bear fruit in the coming years driven by emerging new energy demands and the next capex investments are likely to be more for supporting capacity expansion on its existing production base to accommodate continued revenue growth instead of an entire new production plants. Going forward, we project the company's capex as a % of revenue to maintain around 9% which is in accordance with the previous level of brownfield capex.

Exhibit 31: Cash flow statement

Cash flow statement	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022E	2023E	2024E	2025E
Income pre-preferred share dividends	104	98	129	154	129	149	190	244	241	373	435	588	692	842	998
Minority interest add-back	7	3	10	9	8	10	14	14	26	10	3	4	4	5	5
Depreciation and amortization add-back	36	44	53	60	65	77	91	99	110	126	159	191	211	234	260
Net income from associates and jointly controlled entities	(16)	(12)	(13)	(33)	(13)	(19)	(49)	(45)	(3)	(6)	(15)	(5)	(12)	(26)	(49)
Net loss (gain) on asset sales	1	1	0	1	0	0	0	0	(4)	0	1	-	-	-	-
(Increase)/decrease in working capital :	(101)	(10)	(44)	(27)	(51)	(23)	(10)	(118)	(278)	(227)	(271)	(203)	(219)	(265)	(276)
Accounts receivable	(30)	(41)	(9)	(61)	(78)	(137)	13	(85)	(232)	(232)	(276)	(244)	(219)	(265)	(276)
Inventory	(38)	(2)	(14)	(27)	(3)	(24)	(14)	(6)	(97)	(145)	(171)	(117)	(132)	(162)	(168)
Accounts payable	(33)	33	(21)	61	30	138	(8)	(48)	52	150	177	158	132	162	168
Other operating cash flow items	5	5	7	6	(15)	(18)	4	(0)	11	10	(1)	12	13	15	16
Cash flow from operations	36	129	141	168	123	176	239	194	102	286	311	586	690	805	955
Capital expenditure	(157)	(110)	(74)	(125)	(127)	(111)	(212)	(459)	(308)	(210)	(374)	(400)	(400)	(400)	(500)
(Acquisitions)/divestitures	(0)	-	(68)	-	-	-	(77)	-	-	-	-	-	-	-	-
Net investments	-	3	(33)	(12)	-	(1,030)	19	208	110	194	157	-	-	-	-
Other investment cash flow items	0	1	1	13	0	1	20	34	47	14	-	-	-	-	-
Cash flow from investing	(157)	(107)	(174)	(124)	(127)	(1,140)	(250)	(216)	(150)	(2)	(216)	(400)	(400)	(400)	(500)
Dividends paid (common and preferred)	(61)	(13)	(46)	(36)	(48)	(41)	(75)	(81)	(83)	(75)	(112)	(100)	(147)	(173)	(211)
Share repurchase/issue (change in common stock)	-	-	-	1	-	1,181	-	-	-	19	37	-	-	-	-
Borrowings	40	57	66	6	27	6	178	21	168	208	213	-	-	-	-
Repayment of loans	(43)	(48)	(43)	(55)	(20)	(22)	(187)	(41)	(19)	(160)	(198)	-	-	-	-
Increase/(decrease) in preferred shares	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Change in minority interest	-	1	10	2	5	3	4	7	7	2	3	-	-	-	-
Other financing cash flow items	32	-	4	(2)	(8)	-	-	5	3	(38)	(60)	-	-	-	-
Cash flow from financing	(33)	(4)	(10)	(84)	(44)	1,127	(80)	(89)	76	(45)	(118)	(100)	(147)	(173)	(211)
Effect of foreign exchange rate changes	(5)	0	(3)	(1)	15	15	(2)	18	3	(28)	(17)	-	-	-	-
Total cash flow	(159)	19	(46)	(40)	(32)	177	(93)	(93)	31	211	(40)	86	143	232	244

Source: Company data, Gao Hua Securities Research

Exhibit 32: Jianghai has invested consistently in its film & super capacitor business which we believe is about to bear fruit, on top of regular capacity expansion & technology upgrades for its aluminum electrolytic capacitor products
Jianghai capex trend



Source: Company data, Gao Hua Securities Research

Company background: A vertically integrated aluminum electrolytic capacitor leader leveraging its strength into film and super capacitor segments

50-year veteran in aluminum electrolytic capacitors

Established in 1958, Jianghai is a leading aluminum electrolytic capacitor manufacturer, currently ranked 5th largest among film capacitor players globally (7% share) and is the largest industrial aluminum electrolytic capacitor maker in China. The company listed on the Shenzhen Stock Exchange in 2010. Jianghai mainly focuses on industrial end-markets such as VFD, UPS, solar & wind power, NEV, and various kinds of industrial equipment. Jianghai vertically integrates key aluminum electrolytic capacitor manufacturing processes with an 70% self-sufficiency rate for formed foil, deploying its formed foil factories in Ulanqab/Baoji/Yuncheng where electricity costs are lower accounting for c.50% of COGS for aluminum electrolytic capacitor. Jianghai has established a strong client base in the industrial aluminum electrolytic capacitor segment which has high entry barriers, especially among top industrial clients globally including: Siemens, Rockwell, Yaskawa, ABB, Huawei, and Inovance. Building on its strength in the Industrial segment, Jianghai established its film capacitor and super capacitor businesses in 2011 and 2013, respectively. As of 2020, the company was ranked 37th among China's top 100 electronic components manufacturers.

In terms of ownership structure, management (8%) and the company's largest strategic investor Yiwei Investments (32%) together control 40% of the company. In addition, Yiwei and Jianghai's management teams have a strategic agreement that: 1) Buyers of Yiwei's shares of Jianghai must get approval by Jianghai's management team; 2) Buyers of Yiwei's shares of Jianghai cannot seek to change the management structure of Jianghai ([Exhibit 36](#)). Jianghai's management team have been with the firm since the early stage in their careers ([Exhibit 37](#)).

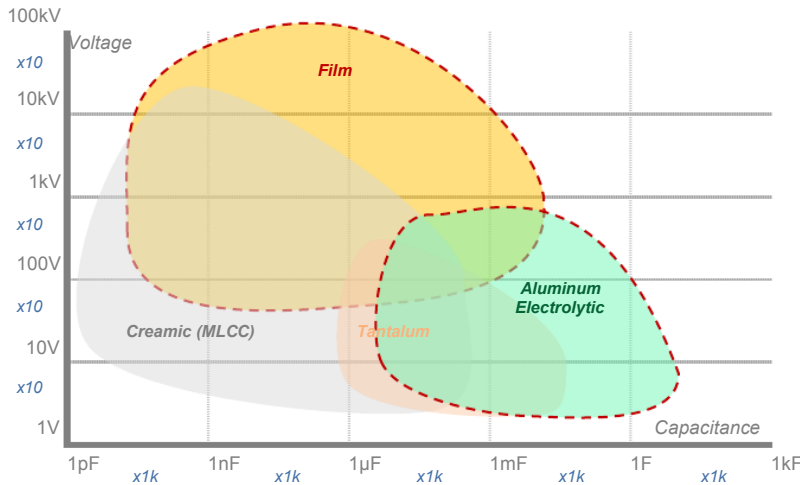
Exhibit 33: With its leading position in aluminum electrolytic capacitors, Jianghai has gradually leveraged its strength into film and super capacitor areas
Product universe of major capacitor types

Performance metrics	Why this metric matters?	Tantalum Electrolytic	Ceramic (incl. MLCC)	Aluminum Electrolytic	Film	Super
A. Capacitance per unit volume	Higher capacitance per unit volume ensures higher capability in storing electric charge	High	Low	High	Medium	
B. Peak voltage strength	Capacitors with high peak voltage strength could work in high voltage scenarios such as EV powertrain and solar power inverter	Low	Medium	Medium	High	
C. ESR (Equivalent series resistance)	Capacitors with low ESR could entail lower ripple effect and ensure system working stability & system life	Low	Low	High to Moderate	Moderate	
D. Polarity on termination	Non-polarized capacitors could be connected to AC circuits because of their indifference in positive and negative polarities	Yes	No	Yes	No	
E. Maximum operating temperature	Ensure functionality in high temperature scenarios such as industrial	125°C	200°C	125°C	200°C	
F. Temperature stability	Ensure operational stability scenarios with high temperature variance such as EV powertrain and solar power inverter	Good	Moderate to Good	Low to Moderate	Good	
G. MTBF (Mean time between failures)	Ensure system operational stability	~60,000 Hours - 200,000 Hours	>1,000,000 Hours	~40,000 Hours	>50,000 Hours	
H. Cost	Lower cost level	High	Low	Low	Medium	
I. Typical failure mode	Open circuit is generally considered more safe than short circuit in terms of protecting system	Short Circuit	Short Circuit	Open Circuit	Open Circuit	
J. Size	Small size could ensure more efficient space usage	Small	Small	Large	Large	
K. Service life	Long service life could reduce frequency of component replacement	Medium	Long (10+ yrs)	Medium	Long (10+ yrs)	
L. Self-heating	Capacitor with self-healing capability could restore itself in the event of a fault and improve safety and working stability	No	No	No	Yes	
	Main application areas	Telecommunications, auto, aerospace	Wide range of applications including aerospace, 3C, medical medical electronics, industrial equipment, auto	Industrial equipment, auto, power, lighting, 3C	Power, auto, 3C, lighting	Industrial equipment, auto, power
	Global market split	7%	52%	33%	8%	Not applicable
	Key Players	Overseas: Kemet (Yageo) Domestic: Torch Electron/Hongda	Overseas: Murata/TDK Domestic: Fenghua/Torch Electron	Overseas: Nichicon Domestic: Jianghai/Alhua	Overseas: Panasonic/Nichicon/TDK/Kemet (Yageo) Domestic: Faratron/Jianghai/Tongfeng	Overseas: Maxwell/Panasonic/Cellegy Domestic: Jianghai

Global market split in 2021


Source: Kyocera, ECIA, TDK

Exhibit 34: Jianghai manufactures capacitor products with high voltage/capacitance features which are important for industrial and new energy applications
Voltage/capacitance matrix for major capacitor products



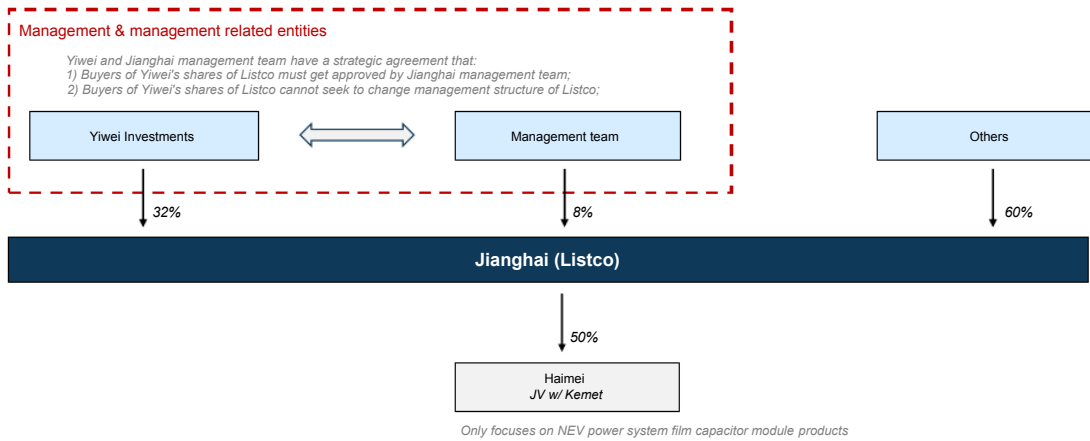
Source: Kyocera

Exhibit 35: Jianghai is an industry veteran with over 50 years of experience in developing & manufacturing capacitors
Company development timeline

	1958	1970	1999	2007	2010
	<ul style="list-style-type: none"> Foundation of the company 	<ul style="list-style-type: none"> Initiated aluminum electrolytic capacitor business 	<ul style="list-style-type: none"> Established JV with AIC to develop foil formation technology 	<ul style="list-style-type: none"> Established Inner Mongolia subsidiary focusing on foil formation 	<ul style="list-style-type: none"> IPO
	2011	2013	2018	2018	2020
	<ul style="list-style-type: none"> Initiate film capacitor business unit 	<ul style="list-style-type: none"> Acquires ACT's all super capacitor technologies to initiate super capacitor business 	<ul style="list-style-type: none"> Acquires Suzhou UP technology to strengthen film capacitor technology 	<ul style="list-style-type: none"> Established JV with Kemet to develop NEV film capacitor products 	<ul style="list-style-type: none"> Acquires AIC to strengthen formation technology Ranked 57th in China's top 100 electronic components manufacturers

Source: Company data

Exhibit 36: Management (8%) and the company's largest strategic investor Yiwei Investments (32%) together control 40% of the company
Shareholding structure



Source: Company data

Exhibit 37: Jianghai's management team have been with the company for many years, rotating from various business units
Key management team & independent director background (as of 2021)

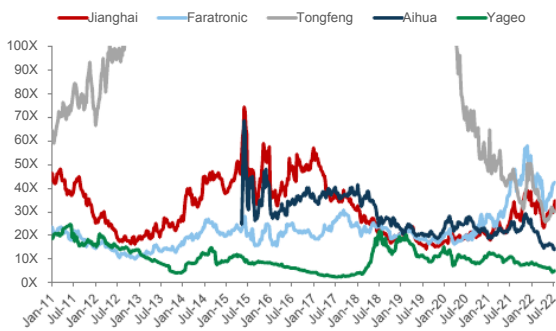
Name	Position	Experience	Number of years with Jianghai
Key management team			
Weidong Chen	Chairman	<ul style="list-style-type: none"> • 1981 - present: Head of R&D department; Head of equipment department; Deputy GM; GM; CEO; Chairman 	41
Jun Lu	Director / CEO	<ul style="list-style-type: none"> • 1981 - present: GM assistant; Deputy GM; Vice Chairman; GM; CEO 	41
Jihua Ding	Director / VP / Chief Engineer	<ul style="list-style-type: none"> • 1995 - present: Head of R&D department; Head of domestic business development department; VP & Chief Engineer 	27
Hongzhong Gu	VP	<ul style="list-style-type: none"> • 1987 - present: Deputy Head of sales department; Deputy Head of international business development department; GM assistant; Deputy GM; VP 	35
Jun Wang	VP / CFO	<ul style="list-style-type: none"> • 1989 - present: Manufacturing engineer; Quality inspection engineer; Head of 10th production line; GM assistant; Deputy GM; VP / CFO 	33
Hanming Wang	Board Secretary	<ul style="list-style-type: none"> • 1987 - present: Administration office manager; CEO assistant; Board Secretary 	35
Key independent director			
Qun Gu	Independent Director	<ul style="list-style-type: none"> • Present: General Secretary of China Electronic Components Association 	Not applicable
Xiaoyan Shen	Independent Director	<ul style="list-style-type: none"> • 2009 - 2016: Associate Professor in Business at Nantong University • 2016 - 2018: Professor & Deputy Chair of Business School at Nantong University • 2018 - present: Professor & Deputy Chair of College of Economics and Management at Nantong University 	Not applicable

Source: Company data

Valuation

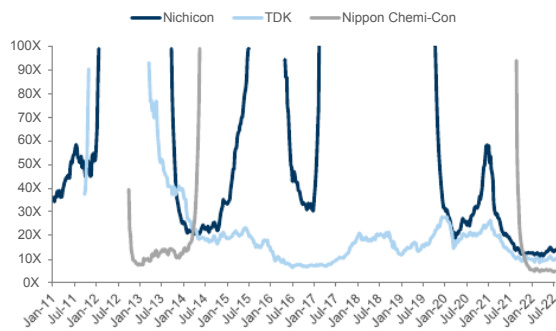
We adopt a discounted 2025E P/E methodology in deriving our 12-month target price to better capture the company’s visible long-term growth prospects (same methodology across our China Industrial Tech coverage group). Specifically, we derive our TP by applying a 2025E P/E of 28X and discounting back to 2023E with a CoE of 10.5% (which is consistent across our electrification coverage). The 28X multiple is based on a 40% premium (2015-2019 historical premium of key component stocks vs. equipment stocks) to 1x PEG applied to the company’s long run EPS CAGR of 20%. Based on our M&A Framework (see Appendix for details), we do not incorporate an M&A value for Jianghai in our target price, given its M&A rank of 3. Our target price of Rmb 27.5 implies upside of 1% vs our coverage median of +18%. We initiate on the stock at Neutral.

Exhibit 38: Rolling 12M forward P/E trading trend for domestic peers



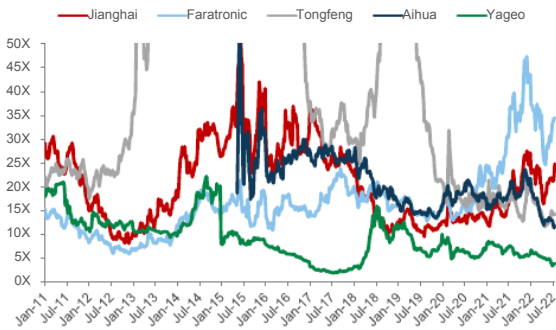
Source: Wind, Gao Hua Securities Research

Exhibit 39: Rolling 12M forward P/E trading trend for overseas peers



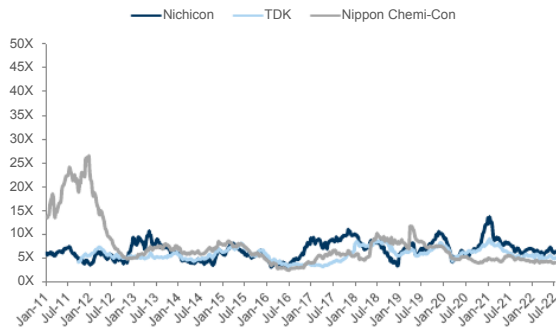
Source: Wind, Goldman Sachs Global Investment Research

Exhibit 40: Rolling 12M forward EV/EBITDA trading trend for domestic peers



Source: Wind, Gao Hua Securities Research

Exhibit 41: Rolling 12M forward EV/EBITDA trading trend for overseas peers



Source: Wind, Goldman Sachs Global Investment Research

Exhibit 42: We derive our TP by applying a 2025E P/E of 28X and discounting back to 2023E with a CoE of 10.5%
Valuation methodology

Ticker	Company Name	Pricing Currency (PCY)	Target P/E multiple	LT EPS CAGR	2022E-25E EPS CAGR	Cost of equity	TP (PCY)	2025E valuation implied EV/EBITDA	2025E valuation implied EV/DACF	2022E-25E avg CROCI	Latest closing px	Up/down side	Rating
002484.SZ	Jianghai	CNY	28x	20%	23%	10.5%	27.5	24.1x	25.2x	17%	27.3	+1%	Neutral
600563.SS	Faratronic	CNY	32x	23%	22%	10.5%	213.4	26.2x	29.0x	32%	211.0	+1%	Neutral
600885.SS	Hongfa	CNY	32x	25%	19%	10.5%	53.7	16.4x	18.1x	21%	39.8	+35%	Buy
002179.SZ	AVIC Jonhon	CNY	30x	25%	20%	9.5%	66.5	23.0x	24.1x	23%	63.5	+5%	Neutral
002518.SZ	Kstar	CNY	25x	20%	29%	10.5%	36.5	22.3x	23.0x	19%	30.6	+19%	Buy
002335.SZ	Kehua	CNY	25x	20%	20%	10.5%	39.7	15.4x	14.5x	15%	37.2	+7%	Buy
002050.SZ	Sanhua Intelligent Control	CNY	30x	25%	26%	10.5%	29.0	22.8x	24.1x	20%	28.9	+0%	Neutral
002837.SZ	Shenzhen Envicool	CNY	30x	20%	29%	10.5%	32.9	27.2x	25.7x	17%	28.1	+17%	Buy

TPs are on a 12-month time frame; priced as of July 26, 2022

Source: Wind, Gao Hua Securities Research

Exhibit 43: We initiate Jianghai at Neutral with a 12m TP at Rmb27.5
Global capacitor players valuation comp

Company	Ticker	PCY	Last closing price	12m-Target price	Upside/ (downside)	Rating	Mkt Cap (US\$bn)	P/E				P/B				EV/EBITDA				ROE			
								2021	2022E	2023E	2024E	2021	2022E	2023E	2024E	2021	2022E	2023E	2024E	2021	2022E	2023E	2024E
Domestic																							
Jianghai	002484.SZ	CNY	27.3	27.5	1%	Neutral	3.4	52.2x	38.6x	32.8x	27.0x	5.2x	4.8x	4.3x	3.8x	22.1x	27.5x	23.7x	19.8x	11%	13%	14%	15%
Faratronic	600563.SS	CNY	211.0	213.4	1%	Neutral	7.3	57.2x	48.8x	38.4x	31.2x	13.8x	11.8x	10.0x	8.4x	36.0x	41.4x	32.7x	26.6x	26%	26%	26%	26%
Tongfeng	600237.SS	CNY	7.6	NC	NC	NC	0.7	84.7x	40.7x	24.1x	18.1x	3.7x	3.4x	3.1x	2.7x	26.6x	17.5x	12.0x	9.3x	5%	8%	13%	15%
Aihua	603880.SS	CNY	25.0	NC	NC	NC	1.5	20.5x	19.3x	13.1x	11.8x	3.4x	2.9x	2.5x	2.2x	18.8x	na	na	na	0%	17%	18%	17%
Yageo	2327.TW	TWD	542.5	915.0	167%	Buy*	6.2	7.4x	6.4x	5.3x	4.6x	2.1x	1.6x	1.4x	1.2x	8.2x	5.0x	3.8x	3.2x	31%	28%	28%	28%
Median								57.2x	40.7x	24.1x	18.1x	3.7x	3.4x	3.1x	2.7x	26.6x	29.5x	22.3x	18.0x	5%	17%	18%	17%
Overseas																							
Nichicon	6999.T	JPY	1,293	1,500	16%	Buy	0.7	51.8x	11.2x	14.0x	15.8x	1.0x	1.0x	0.9x	0.8x	10.2x	7.1x	7.1x	7.2x	6%	9%	7%	6%
TDK	6942.T	JPY	4,210	5,400	28%	Buy	11.7	20.9x	9.2x	11.2x	11.8x	1.8x	1.2x	1.1x	1.0x	7.0x	5.8x	5.0x	4.4x	9%	15%	11%	9%
Murata	6981.T	JPY	7,956	9,600	21%	Buy	39.4	21.5x	16.2x	14.4x	14.8x	2.7x	2.2x	2.0x	1.8x	10.5x	9.4x	7.7x	7.0x	13%	15%	15%	13%
Nippon Chemi-Con	6997.T	JPY	1708.0	NC	NC	NC	5.3	na	5.3x	4.8x	na	na	na	na	na	0.2x	0.2x	0.2x	na	0%	0%	0%	0%
Median								21.8x	11.2x	14.0x	14.8x	1.8x	1.2x	1.1x	1.0x	10.2x	7.1x	7.1x	7.0x	9%	15%	11%	9%

Closing price as of July 26, 2022; *Stock on Conviction List. Not Covered (NC) company estimates are based on Wind consensus

Source: Company data, Gao Hua Securities Research, Wind

Key investment risks

Up/downside risks

- **Significant development/pullback of key downstream segments** such as NEV/solar power/wind power would reduce demand for film capacitors in corresponding segments which are deemed to serve as major growth drivers for the company's future growth and therefore create a boost/pressure on the company's trading multiple due to a dimmed outlook.
- **Faster/slower-than-expected business development in NEV film capacitor and super capacitor:** We expect the company can leverage its advantage in the aluminum electrolytic capacitor segment to make NEV film capacitor and super capacitor products, which have higher exposure to new energy end markets, as important growth drivers in the long run. Faster/slower-than-expected business development in NEV film capacitor and super capacitor would drive/drag the company's growth and compress the valuation level.
- **Lower/higher-than-expected price hike of electricity:** Electricity costs account for more than 50% of COGS for the company's aluminum electrolytic products. Significant price decline/hike of electricity price would positively/negatively impact the company's profitability and bottom line growth outlook.

Appendix 1: M&A Framework - Rank of 3

Across our global coverage, we examine stocks using an M&A framework, considering both qualitative factors and quantitative factors (which may vary across sectors and regions) to incorporate the potential that certain companies could be acquired. We then assign an M&A rank as a means of scoring companies under our rated coverage from 1 to 3, with 1 representing high (30%-50%) probability of the company becoming an acquisition target, 2 representing medium (15%-30%) probability, and 3 representing low (0%-15%) probability. For companies ranked 1 or 2, in line with our standard departmental guidelines we incorporate an M&A component into our target price. M&A rank of 3 is considered immaterial and therefore does not factor into our target price, and may or may not be discussed in research.

For Jianghai, we apply the framework first introduced for Asia Machinery companies in our July 4, 2016 *"Introducing M&A framework"* report.

Attractiveness/industry growth (score of 2): We believe demand from fast-growing new energy segments (i.e. NEV/solar power/wind power) will serve as short-to-medium term drivers (to both established businesses such as aluminum electrolytic capacitors as well as emerging businesses such as film capacitors and super capacitors). Aided by favorable downstream segment momentum and the company's potential to leverage its strength in industrial aluminum electrolytic capacitors into film & super capacitor product categories, we forecast Jianghai to deliver a revenue/EPS CAGR of 16%/23% in 2022-2025E. Hence, we assign a score of 2.

Valuation (score of 3): The company's shares have traded at an average of 31x forward P/E and 22x forward EV/EBITDA in the past 12 months vs a 2022-25E EPS CAGR of 23%. Hence, we assign a score of 3.

M&A execution viability (score of 3): Management (8%) and the company's largest strategic investor Yiwei Investments (32%) together control 40% of Jianghai's ownership (as of 2021). In addition, Yiwei and Jianghai's management teams have a strategic agreement that: 1) Buyers of Yiwei's shares of Jianghai must get approved by Jianghai management; 2) Buyers of Yiwei's shares of Jianghai cannot seek to change the management structure of Jianghai. We believe it would be difficult for outside bidders to successfully gain a controlling interest and operate the company without consent from the management. Therefore, we believe the shareholder structure is not favorable for a potential M&A opportunity in the future, and hence we assign a score of 3.

Against this backdrop, despite its attractive industry and growth profile, we view Jianghai as unlikely to become an acquisition target. Accordingly, we assign an overall M&A rank of 3 and do not incorporate any M&A component in our target price.

Exhibit 44: M&A rank of 3 for Jianghai

Company	Ticker	Rating	Attractiveness/Industry growth				Valuation			M&A executable?					Overall M&A score	M&A weight in target price	
			EBIT margin (22-25E)	EPS CAGR (22-25E)	ROIC (22-25E)	Score	22E P/E	22E EV/EBITDA	Score	Mkt cap (\$bn)	Mgmt ownership%	SOE?	Mgmt openness	Regulation			Score
Jianghai	002484.SZ	Neutral	15%	23%	18%	2	39x	27x	3	3.4	8%	No	Low	High	3	3	0%

Priced as of July 26, 2022

Source: Gao Hua Securities Research

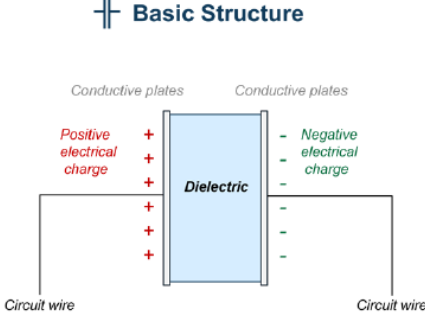
Appendix 2: Capacitor 101

A capacitor is a passive electronic component which can store electrical energy based on its electrical field structure. In terms of the structure, a capacitor normally consists of two parallel conductive plates (made by metal foils which acts as electrode) and dielectric material functioning as insulator. Building on its electrical energy storage capacity, capacitors have a wide array of applications and serve as **one of the most fundamental electronic components across various electronic devices & equipment**. Specifically, capacitors are adopted in electronic devices to perform one or more of the 6 functions as below:

- **Rectified AC wave filter:** The capacitors help to smooth the power wave by filling major dips in the rectified DC wave. Essentially, the capacitor cuts the waveform below a certain level and ensures correct operation of power circuitry.
- **Suppression & snubber:** Suppression & snubber capacitors could reduce the parasitic inductance of electric wiring or extreme fluctuation. Moreover, electric surge can also be suppressed when an appropriate snubber capacitor is installed.
- **Noise & interference filter:** The capacitors are designed to prevent a certain range of frequency signals or interference from entering into another circuit, ensuring the safety of critical circuit components and the stability of the system.
- **Coupling:** The capacitors are adopted to separate the AC and DC components, based on its capability of passing AC while blocking DC signals.
- **DC Link:** DC link refers to the junction between two power conversion stages. DC link capacitors normally act as the buffer between the transition stages, performing multiple functions such as protecting the inverter system from sudden voltage spikes, surges and EMI (electromagnetic interference).
- **Energy storage:** Capacitors could be used as temporary energy storage units in complement to chemical batteries, maintaining power supply while chemical batteries are being changed. However, chemical battery normally has better storage capacity and output stability.

Exhibit 45: Capacitor is one of the fundamental electronic components across various electronic devices & equipment, serving a wide array of applications
 Basic structure and major applications of capacitors

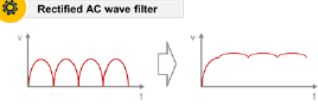
Basic Structure



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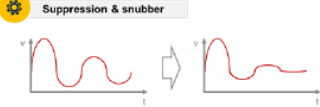
Major Functions

Rectified AC wave filter



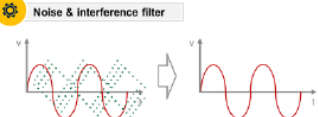
The capacitors help to smooth the power wave by filling major dips in the rectified DC wave. Essentially the capacitor cut the waveform below certain level and ensure correct operation of power circuitry.

Suppression & snubber



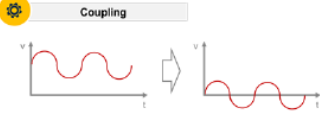
Suppression & snubber capacitors could reduce the parasitic inductance of electric wiring or extreme fluctuation. Moreover, electric surge could also be suppressed when appropriate snubber capacitor is installed.

Noise & interference filter




The capacitors designed to prevent a certain range of frequency signals or interference from entering into another circuit, ensuring the safety of critical circuit components and stability of system.

Coupling




The capacitors adopted to separate the AC and DC components, based on its capability of passing AC while blocking DC signals.

DC Link



DC link refers to the junction between two power conversion stages. DC link capacitors normally act as the buffer between the transition stages, performing multiple functions such as protecting the inverter system from sudden voltage spikes, surges and EMI (electromagnetic interference).

Energy storage



Capacitors could be used as temporary energy storage units in complement to chemical batteries, maintaining power supply while chemical batteries are being charged. However chemical battery normally has better storage capacity and output stability.

Source: Kemet Engineering Center, Watelectronics, Tech Web, Components101, Compiled by Gao Hua Securities Research.

31 July 2022

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Disclosure Appendix

Reg AC

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Goldman Sachs Investment Research global Equity coverage universe

	Rating Distribution			Investment Banking Relationships		
	Buy	Hold	Sell	Buy	Hold	Sell
Global	50%	35%	15%	65%	58%	45%

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