

China trip: peak for electrodes looks imminent Supply/demand likely to gradually soften as China makes more needle coke and graphite electrodes

Investment stance: lowering rating to Neutral; forecasting softer supply/demand for graphite electrodes from 19/12

We have to date been bullish on the medium-term outlook for graphite electrodes, but we now expect global supply-demand to soften beginning in 19/12. After our trip to China in March, we are now of the view that graphite electrode production volumes in China are likely to increase sooner than we had previously forecast. We lower our earnings forecasts for Showa Denko for 19/12 onward, and lower our investment rating to Neutral. With our 18/12 EPS forecast as the baseline, we expect falling profits from graphite electrodes to result in EPS at Showa Denko declining at an average annual pace of about 8% over the medium term, considerably worse than the average forecast EPS CAGR of over 5% for the Russell/Nomura Large Cap index (ex financials). Also, whereas we had previously obtained our target price using our 18/12 EPS forecast and a P/E of 12x, we now think the shares would be fairly valued at a P/E of around 7x (vs. greater than 14x for the Russell/Nomura Large Cap index (ex financials)), given our lowered expectations for medium-term growth.

Takeaways from our China trip: more production capacity for graphite electrodes and needle coke on the way

We returned from our China trip with two takeaways in particular that relate to Showa Denko. First, supply shortages for needle coke (from which graphite electrodes are made) look likely to gradually ease going forward as a result of Chinese producers increasing their output. In particular, these producers are increasing the production of needle coke for graphite electrodes with diameters of 550mm or smaller. Second, graphite electrode manufacturers able to clear environmental regulatory hurdles look likely to install more production capacity in 2018-2020 (Figure 4). Although government-enforced curbs on production at SMEs have forced many of these smaller producers out of the market, we were able to confirm that companies that are properly compliant with environmental regulations have been adding production capacity since the latter half of 2017. Taking all of this on board, we lower our 2019 forecast for margins on graphite electrodes from \$6,000/t to \$3,800/t and our 2020 forecast from \$6,000/t to \$2,500/t. We expect margins on sales to Japan and the US to start falling in 19/12, taking into account the lag of six to twelve months at which movements in margins on graphite electrodes in China tend to show up in margins on sales to Japan or the US.

(Text continues on page 3).

Cons	17/12	18/12E			19/12E		20/12E	
	Actual	Old	New	Co's	Old	New	Old	New
Currency: JPY								
Sales (bn)	780.3	1,025.9	959.8	900.0	1,058.9	942.8	1,092.9	912.8
Ope profits (bn)	77.8	127.6	151.0	110.0	135.0	129.8	137.2	91.7
EPS	234.8	557.0	663.8	456.1	608.2	581.7	620.8	409.4
P/E (x)	19.4	8.2	6.8	N/A	7.5	7.8	7.3	11.1
EV/EBITDA (x)	8.2	5.5	4.6	N/A	5.4	4.7	5.3	5.6
P/B (x)	1.9	1.6	1.6	N/A	1.8	1.4	1.8	1.3
Dividend yield (%)	1.1	2.9	2.6	N/A	3.1	2.9	3.3	3.1

Source: Company data, Nomura estimates

Key company data: See next page for company data and detailed price/index chart.

Global Markets Research

3 April 2018

Rating Down from Buy	Neutral
Target Price Reduced from 6,700	JPY 4,700
Closing price 2 April 2018	JPY 4,545
Potential upside	+3.4%

Anchor themes

Our focus is on companies able to expand through their own efforts, including possession of products likely to see growth in global market share.

Catalyst

Potential upside catalysts include price hikes for graphite electrodes, a return to growth in the HDD market driven by expansion of new PC products, or growth in market share in high-capacity products.

Research analysts

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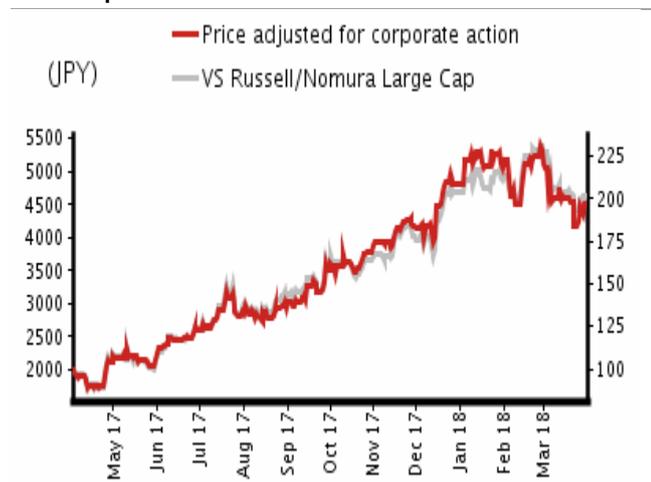
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Key data on Showa Denko

Rating

Stock	Neutral
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Relative performance chart



Source: ThomsonReuters, Nomura research

Performance

(%)	1M	3M	12M
Absolute	-10.0	-5.6	129.0
Relative to Russell/Nomura Large Cap	-9.9	0.5	117.1

Stock price data

Current stock price (JPY)	4,545
Market capitalization (JPY bn)	680.4
52-week low stock price (JPY)	1,693
52-week high stock price (JPY)	5,480
Shares out (mn)	149.7

Source: ThomsonReuters, Nomura research

Valuation and ratio analysis

(JPY)	17/12	18/12E	19/12E	20/12E
EPS	234.8	663.8	581.7	409.4
BPS or NAV per share	2,445.0	2,876.9	3,322.0	3,584.6
DPS	50.0	120.0	130.0	140.0
ROE (%)	10.4	24.9	18.7	11.8

Income statement

(JPY bn)	17/12	18/12E	19/12E	20/12E
Sales	780.3	959.8	942.8	912.8
Operating profits	77.8	151.0	129.8	91.7
EBITDA	117.7	192.9	172.7	135.6
Interest & dividend income	1.9	3.8	3.8	3.8
Interest expense	3.1	6.2	6.1	5.7
Recurring profits	64.0	150.6	129.5	91.8
Pretax profits	46.6	141.6	125.5	87.8
Minority interest	2.3	5.4	4.6	3.3
Profits attributable to owners of parent	33.5	96.6	86.4	60.8
(Equity in net income of affiliates)	-7.7	2.0	2.0	2.0

Balance sheet

(JPY bn)	17/12	18/12E	19/12E	20/12E
Current assets	405	505	557	581
Operating receivables	176	178	174	169
Inventories	115	133	131	127
Long-term assets	619	616	610	603
Total assets	1,025	1,121	1,167	1,184
Operating payables (Current)	121	136	134	129
Interest-bearing debt	347	350	330	310
Total liabilities	660	675	653	628
Net assets	365	446	514	555
Shareholders' equity	348	427	494	534

Cash flow statement

(JPY bn)	17/12	18/12E	19/12E	20/12E
Operating cash flow	67	132	133	110
Profits attributable to owners of parent	33	97	86	61
Depreciation	39	41	42	43
Change in working capital	-39	-4	3	5
Investment cash flow	-30	-37	-36	-35
Capex	-38	-37	-36	-35
Free cash flow	37	95	97	75
Financial cash flow	-18	-15	-39	-41
Change in interest-bearing debt	-13	3	-20	-20
Dividend payments	-4	-18	-19	-21
Change in cash & equivalents	7	80	57	34

Source: Company data, Nomura estimates

Fig. 1: Showa Denko [4004]: consolidated operating profits by segment (data for HD media sales volume are Nomura estimates)

(¥bn, except where noted)

	17/12					18/12 Nomura E					19/12E	20/12E	18/12 Co's		
	Q1	Q2	Q3	Q4	Full	Q1E	Q2E	Q3E	Q4E	Full E	Full E	Full E	H1E	H2E	Full E
Operating profits (new)	19.7	15.3	20.9	21.9	77.8	20.0	33.6	49.9	47.5	151.0	129.8	91.7	41.0	69.0	110.0
Petrochemicals	10.6	5.6	7.9	9.3	33.4	3.0	3.5	8.0	7.5	22.0	25.0	22.0	4.0	15.0	19.0
Chemicals	3.1	3.8	4.4	5.2	16.5	4.0	4.5	4.6	4.9	18.0	19.0	19.5	7.0	10.0	17.0
Electronics	6.0	6.1	6.3	3.5	21.9	3.0	3.5	5.0	4.0	15.5	13.7	12.5	5.0	11.0	16.0
Inorganics	-0.1	0.2	2.3	4.7	7.1	10.0	22.0	32.0	31.0	95.0	71.0	36.0	27.0	33.0	60.0
Aluminum	1.5	1.7	1.6	1.9	6.7	1.8	1.9	2.0	1.9	7.6	8.1	8.6	2.5	3.5	6.0
Other	0.2	-0.1	0.4	0.1	0.6	0.2	0.2	0.3	0.3	1.0	1.3	1.6	-0.5	0.5	0.0
Adjustment	-1.7	-2.0	-2.0	-2.7	-8.4	-2.0	-2.0	-2.0	-2.1	-8.1	-8.3	-8.5	-4.0	-4.0	-8.0
Exchange rate assumptions (\$/¥)	113	111	111	113	112	105	105	105	105	105	105	105	110	110	110
HD media sales (mn units/month)	16.9	17.6	17.6	14.0	16.5	13.5	15.5	16.5	15.2	15.2	15.0	14.9			
Ethylene spread (\$/t)	684	591	665	650	650					650	550	550			
Graphite electrode price (\$/t)					3,000	6,000	8,000	10,000	10,000	8,500	6,000	4,000			
Needle coke prices (\$/t)					1,000	2,000	2,200	2,900	2,900	2,500	2,200	1,500			
Graphite electrode margins (\$/t)					2,000	4,000	5,800	7,100	7,100	6,000	3,800	2,500			



	17/12					18/12 Nomura E					19/12E	20/12E
	Q1	Q2	Q3	Q4E	Full	Q1E	Q2E	Q3E	Q4E	Full E	Full E	Full E
Operating profits (old)	19.7	15.3	20.9	17.4	73.3	-	-	-	-	127.6	135.0	137.2
Petrochemicals	10.6	5.6	7.9	5.9	30.0	-	-	-	-	23.0	22.0	22.0
Chemicals	3.1	3.8	4.4	4.7	16.0	-	-	-	-	17.0	18.0	19.0
Electronics	6.0	6.1	6.3	4.9	23.3	-	-	-	-	22.8	20.6	19.2
Inorganics	-0.1	0.2	2.3	4.1	6.5	-	-	-	-	64.0	73.0	75.0
Aluminum	1.5	1.7	1.6	1.7	6.5	-	-	-	-	8.5	9.0	9.5
Other	0.2	-0.1	0.4	-0.5	0.0	-	-	-	-	0.4	0.7	1.0
Adjustment	-1.7	-2.0	-2.0	-2.3	-8.0	-	-	-	-	-8.1	-8.3	-8.5
Exchange rate assumptions (\$/¥)	113	111	111	111	111	-	-	-	-	111	111	111
HD media sales (mn units/month)	16.9	17.6	17.6	17.2	17.3	-	-	-	-	17.3	17.1	16.9
Ethylene spread (\$/t)	684	591	665	650	650	-	-	-	-	600	500	500
Graphite electrode price (\$/t)					3,200					8,000	9,000	9,000
Needle coke prices (\$/t)					800					2,500	3,000	3,000
Graphite electrode margins (\$/t)					2,400					5,500	6,000	6,000

Note: We assume USD/JPY of 105. Shows Nomura estimates for HD media sales volume, in the absence of disclosure from the company.

Source: Company data, Nomura estimates

Added needle coke capacity gradually resolving the shortage in raw material for graphite electrodes

It was apparent to us on this trip to China that the Chinese producers and major globally active producers alike are increasing their needle coke output (Figures 3 and 4). Broadly speaking, there are three types of firms adding needle coke production capacity in China. First are electric arc furnace steelmakers and electrode manufacturers insourcing the production of needle coke for the sake of lower costs. Fangda Carbon, a major producer of graphite electrodes, is insourcing more of its needle coke production, while the major steelmaker Baowu Steel is forging ahead with the insourcing of both graphite electrodes and needle coke. Second are some mid-sized petroleum refineries in Shandong Province. These companies have made use of their plentiful petroleum products to conduct R&D into needle coke, and are now increasing their output of petroleum-based needle coke. Third are coal producers in Shanxi Province that are looking to put their ample coal resources to use in increasing production of coal-based needle coke. Meanwhile, major needle coke producers such as Mitsubishi Chemical Holdings [4188], Phillips 66, and JXTG Holdings [5020] may not be planning any major increases in production capacity, but we do think they are likely to increase their output going forward by means of improvements in productivity. As needle coke supply shortages clear up, we

expect the supply of graphite electrodes to increase, and we then expect margins on graphite electrodes to deteriorate beginning in 2019 as a result of downward price pressure paired with what we expect will be a medium-term downtrend in global capacity utilization (Figures 2 and 3).

Fig. 2: Global production capacity for graphite electrodes

Supply-demand looks likely to soften in 2019-2020

'000t/year	2013	2014	2015	2016	2017E	2018E	2019E	2020E
GrafTech International (GTI, US)	255	195	195	195	195	195	195	195
SGL Group (Germany)	148	148	148	148	-	-	-	-
Showa Denko	102	102	102	102	220	250	250	250
Tokai Carbon	110	66	66	66	96	96	96	96
Nippon Carbon	32	32	32	32	32	32	32	32
SEC Carbon	30	30	30	30	30	30	30	30
Graphite India (India)	80	80	80	80	85	85	85	85
HEG (India)	80	80	80	80	80	85	85	85
Fangda Carbon (China)	150	150	200	200	250	250	250	250
Pingmei Shenma (China)	75	75	100	100	100	100	100	100
Other Chinese producers	475	625	700	690	405	495	685	929
Other producers(ex China)	28	28	28	28	30	30	30	30
Global production capacity	1,565	1,611	1,761	1,751	1,523	1,648	1,838	2,082
Global demand	1,000	1,020	1,040	1,061	1,167	1,226	1,287	1,351
Capacity utilization	63.9%	63.3%	59.1%	60.6%	76.6%	74.4%	70.0%	64.9%

Note: Showa Denko had end-2017 graphite electrode production capacity of 220,000tpy (45,000tpy in North America, 42,000tpy in Japan, 15,000tpy in China, 90,000tpy in Europe, 28,000tpy in Southeast Asia). It is planning an increase of 30,000tpy in North America in 2018, which will bring the total to 250,000tpy. Operations at smaller producers in China have been limited, due in part to tighter environmental regulations.

Source: Nomura, based on data provided by each company

Fig. 3: Supply-demand balance for needle coke

Supply-demand looks likely to loosen in 2019-2020, although demand for needle coke for use in negative electrodes likely to increase

Supply/demand for needle coke ('000t/year)	2014	2015	2016	2017E	2018E	2019E	2020E
Capacity utilization (%)	75%	79%	83%	93%	89%	85%	82%
Production capacity ('000t/year)	1,217.5	1,195	1,195	1,160	1,316	1,501	1,714
y-y	-	-2%	0	-3%	13%	14%	14%
Demand ('000t/year)	910	940	990	1,080	1,170	1,270	1,400
y-y	-	3%	5%	9%	8%	9%	10%
Demand for needle coke for negative electrodes (batteries)	80	112	151	204	271	358	466
y-y	-	40%	35%	35%	33%	32%	30%
Demand for needle coke for graphite electrodes	830	830	838.3	880	898	916	934
y-y	-	0%	1%	5%	2%	2%	2%
Negative electrodes' (batteries) share of demand	9%	12%	15%	19%	23%	28%	33%
Graphite electrodes' share of demand	91%	88%	85%	82%	77%	72%	67%

Source: Nomura (estimates by Nomura)

Fig. 4: Production capacity increases planned for needle coke and graphite electrodes in China

Capacity increase slated to increase substantially in 2019-2020

Plans for additional needle coke capacity ('000t/year)		Plans for additional graphite electrode capacity ('000t/year)	
2018		2018	
Baotailong	50	Xiujie Longfeng	20
Shandong Jingyang	100	Datong Tengyang	20
Shanxi Hongte	30	Inner Mogolia Hongfeng	30
2018 total	180	Ulanqab Xufeng carbon	20
as % of production capacity at end-2017	16%	2018 total	90
		as % of production capacity at end-2017	6%
2019		2019	
Shandong Jincheng	200	Hebei Huachen	60
Huaibei Coal Chemical	50	Jiaozhou Zhongzhou Carbon	50
2019 total	250	Sichuan Mulun Carbon	40
as % of production capacity at end-2017	22%	Fengzhen Jitan	40
		2019 total	190
		as % of production capacity at end-2017	12%
2020		2020	
Shanxi Hongte	100	Tongliao Yuanda Carbon	24
Shanxi Jinzhou Chemical	100	Huludao Longxintai Carbon	30
Fangda Carbon	40	Huludao Shenghong Carbon	50
Bawu Steel	50	Shanxi Baoguang	20
2020 total	290	Fengzhen Jitan	40
as % of production capacity at end-2017	25%	Ulanqab Xufeng Carbon	80
		2020 total	244
		as % of production capacity at end-2017	16%
Total increase planned for 2018-2020	720	Total increase planned for 2018-2020	524
as % of production capacity at end-2017	62%	Cumulative increase over production capacity at end-2017	34%

Source: Nomura, based on company data

18/12 forecasts: company using cautious assumption for graphite electrode prices; demand for PC hard drives weak

We estimate that the company's full-year 18/12 guidance assumes a graphite electrode price of \$6,500/t, for a margin of \$4,500/t over the needle coke input cost (Figure 1). We assume a significantly higher price of \$8,500/t (for a margin of \$6,000/t), as what we have learned in interviews suggests that supply-demand is still tight, and needle coke supply shortages are still a constraint on graphite electrode production. We accordingly forecast steep profit growth for the inorganics segment.

For the hard disk business, we forecast 18/12 operating profits of ¥15.5bn, down 29% y-y. The company's 18/12 guidance calls for a 5-10% decline in the HDD shipment volume, but we think an assumption of a 10% decline would be too conservative, given growth in demand from data centers. We accordingly forecast an 8% decline in the HDD shipment volume. We expect Jan-Mar 2018 to prove to have been the bottom for HDD shipment volumes, reflecting the usual seasonal pattern as well as reduced production of 500GB drives for notebook PCs. We then expect the HDD shipment volume to swing back to growth in June 2018. For the petrochemicals segment, we expect performance in 2018 to be led by firm demand for packaging materials, and forecast healthy supply-demand conditions, particularly for ethylene. We nevertheless expect operating profits in the segment to fall by 34% y-y in 18/12, to ¥22.0bn, due largely to scheduled shutdown maintenance. The company is conducting maintenance in March and April on a large scale only carried out once every four years, and this looks likely to lower profits by about ¥5bn. On balance, we forecast 18/12 operating profits of ¥151bn, up 94% y-y, with the increase powered by growth in the inorganics segments.

19/12 forecasts: expecting swing to falling profits on drop in graphite electrode prices

As noted earlier in this report, we expect graphite electrode prices to peak at \$8,500/t in 18/12 and then fall to \$6,000/t as supply-demand softens (Figure 1). However, we expect the supply of needle coke, which has been a bottleneck, to increase going forward, as we accordingly expect the 30,000t of annual graphite electrode capacity that the company is adding in North America to begin operating at full capacity in 2019.

For the hard disk business, we forecast 19/12 operating profits of ¥13.7bn, down 12% y-y. We forecast a 1% y-y decline in the volume of HDDs shipped in 19/12. Although we expect growth in shipments for data centers and game consoles, we expect growth in shipments for PCs to stall. We forecast a 14% increase in operating profits in the petrochemicals segment, to ¥25.0bn, on the rebound from the extensive scheduled shutdown maintenance that we expect will depress profits in 18/12. We forecast slight deterioration in ethylene margins, as we anticipate increased ethylene output in North America and China. We forecast steady growth in earnings in the chemicals segment (which includes the business of high-purity gases), led by firm semiconductor-related demand. We forecast chemicals segment operating profits of ¥19.0bn, up 6% y-y. All told, then, we expect companywide operating profits to fall by 14% y-y in 19/12, to ¥129.8bn.

Fig. 5: Showa Denko [4004]: consolidated financial data

Income statement							Nomura E					Co's
	12/12	13/12	14/12	15/12	16/12	17/12	18/12E	19/12E	20/12E	21/12E	22/12E	18/12E
Sales	739.7	847.8	872.8	775.7	671.2	780.3	959.8	942.8	912.8	932.8	962.8	900.0
% y-y	-13.4%	14.6%	2.9%	-11.1%	-13.5%	251.1	23.0%	-1.8%	-3.2%	2.2%	3.2%	15.3%
Operating profits	28.1	26.0	20.7	33.5	42.1	77.8	151.0	129.8	91.7	90.7	85.8	110.0
% y-y	-40.7%	-7.5%	-20.4%	61.8%	25.7%	84.8%	94.1%	-14.0%	-29.4%	-1.1%	-5.4%	41.4%
Margin (%)	3.8%	3.1%	2.4%	4.3%	6.3%	10.0%	15.7%	13.8%	10.0%	9.7%	8.9%	
Nonoperating items	-4.7	-2.5	1.0	-1.5	-2.1	-13.8	-0.4	-0.3	0.1	0.4	0.8	-4.0
Net interest income	-3.5	-2.8	-0.8	-2.2	-1.6	-1.2	-2.4	-2.3	-1.9	-1.6	-1.2	
Interest/dividend received	1.1	1.3	3.7	1.9	1.6	1.9	3.8	3.8	3.8	3.8	3.8	
Interest paid	4.6	4.1	4.5	4.1	3.2	3.1	6.2	6.1	5.7	5.4	5.0	
Equity in net income of affiliates	0.3	-0.3	1.2	1.9	4.3	-7.7	2.0	2.0	2.0	2.0	2.0	
Other	-1.5	0.6	0.6	-1.2	-4.8	-4.9	0.0	0.0	0.0	0.0	0.0	
Recurring profits	23.4	23.5	21.7	32.1	38.7	64.0	150.6	129.5	91.8	91.1	86.6	106.0
% y-y	-41.5%	0.2%	-7.5%	47.5%	20.7%	65.3%	135.5%	-14.0%	-29.1%	-0.8%	-4.9%	65.7%
Extraordinary gains	0.8	6.3	3.5	8.4	1.7	4.6	1.0	1.0	1.0	1.0	1.0	
Extraordinary losses	13.0	5.7	16.7	34.4	22.8	22.0	10.0	5.0	5.0	5.0	5.0	
Pretax profits	11.3	24.0	8.6	6.1	17.5	46.6	141.6	125.5	87.8	87.1	82.6	
Corporation tax, etc	0.3	13.8	6.8	14.0	3.7	10.8	39.6	34.5	23.7	23.5	22.3	
Effective tax rate	2%	57%	80%	230%	21%	23%	28%	27%	27%	27%	27%	
Minority interests	1.7	1.2	-1.2	-8.8	1.5	2.3	5.4	4.6	3.3	3.3	3.1	
Profits attributable to owners of parent	9.4	9.1	2.9	0.9	12.3	33.5	96.6	86.4	60.8	60.3	57.2	65.0
% y-y	-45.0%	-3.2%	-67.7%	-68.6%	1235.9%	172.0%	188.6%	-10.6%	-29.6%	-0.8%	-5.1%	94.2%
By segment							Nomura E					Co's
	12/12	13/12	14/12	15/12	16/12	17/12	18/12E	19/12E	20/12E	21/12E	22/12E	18/12E
Sales	739.7	847.8	872.8	775.7	671.2	780.3	959.8	942.8	912.8	932.8	962.8	900.0
Petrochemicals (ethylene etc)	190.9	286.7	281.4	231.3	186.0	251.1	240.0	250.0	260.0	270.0	280.0	235.0
Chemicals (semiconductor gases and AN etc)	127.3	130.4	138.7	142.3	135.0	148.8	158.7	168.7	173.7	178.7	183.7	154.0
Electronics (HD, rare earths etc)	163.3	137.0	138.5	131.5	103.0	123.1	119.0	116.0	114.0	112.0	110.0	116.0
Inorganics (graphite electrodes etc)	65.6	65.9	67.6	63.5	51.0	73.4	230.0	190.0	140.0	140.0	150.0	193.0
Aluminum	92.2	90.3	97.9	100.8	99.0	105.4	125.5	130.5	135.5	140.5	145.5	110.0
Other	135.3	176.5	191.6	147.2	129.0	133.6	135.6	137.6	139.6	141.6	143.6	137.0
Adjustment	-34.9	-39.0	-42.9	-40.9	-31.8	-55.1	-49.0	-50.0	-50.0	-50.0	-50.0	-45.0
Operating profits	28.1	26.0	20.7	33.5	42.1	77.8	151.0	129.8	91.7	90.7	85.8	110.0
Petrochemicals (ethylene etc)	-1.0	4.4	-4.9	10.5	20.7	33.4	22.0	25.0	22.0	21.0	16.0	19.0
Chemicals (semiconductor gases and AN etc)	-0.9	2.6	5.5	10.7	13.8	16.5	18.0	19.0	19.5	20.0	20.5	17.0
Electronics (HD, rare earths etc)	32.3	21.9	25.8	17.5	13.9	21.9	15.5	13.7	12.5	11.4	10.4	16.0
Inorganics (graphite electrodes etc)	3.0	-0.9	-0.3	-1.2	-5.8	7.1	95.0	71.0	36.0	36.0	36.0	60.0
Aluminum	1.6	5.8	3.0	2.6	4.4	6.7	7.6	8.1	8.6	9.1	9.6	6.0
Other	0.1	-0.6	-1.0	1.3	0.6	0.6	1.0	1.3	1.6	1.9	2.2	0.0
Adjustment	-7.0	-7.2	-7.4	-7.9	-6.8	-8.4	-8.1	-8.3	-8.5	-8.7	-8.9	-8.0
Operating margin	3.8%	3.1%	2.4%	4.3%	6.3%	10.0%	15.7%	13.8%	10.0%	9.7%	8.9%	12.2%
Petrochemicals (ethylene etc)	-0.5%	1.5%	-1.7%	4.5%	11.1%	13.3%	9.2%	10.0%	8.5%	7.8%	5.7%	8.1%
Chemicals (semiconductor gases and AN etc)	-0.7%	2.0%	4.0%	7.5%	10.2%	11.1%	11.3%	11.3%	11.2%	11.2%	11.2%	11.0%
Electronics (HD, rare earths etc)	19.8%	16.0%	18.6%	13.3%	13.5%	17.8%	13.0%	11.8%	11.0%	10.2%	9.5%	13.8%
Inorganics (graphite electrodes etc)	4.6%	-1.4%	-0.4%	-1.9%	-11.4%	9.7%	41.3%	37.4%	25.7%	25.7%	24.0%	31.1%
Aluminum	1.7%	6.4%	3.1%	2.6%	4.4%	6.4%	6.1%	6.2%	6.3%	6.5%	6.6%	5.5%
Other	0.1%	-0.3%	-0.5%	0.9%	0.5%	0.4%	0.7%	0.9%	1.1%	1.3%	1.5%	0.0%
\$/ ¥	80	98	106	121	109	111	105	105	105	105	105	110
Ethylene spread (\$/t)		378	554	613	686	635	650	550	550	550	550	
HD media sales (mn units/month, est)	24.4	19.5	19.0	16.9	15.9	16.5	15.2	15.0	14.9	14.7	14.6	
HD media sales (\$mn) (est)	1,665	1,235	1,167	1,004	917	915	825	793	769	746	724	
HD media price (\$/unit) (est)	5.7	5.3	5.1	5.0	4.8	4.6	4.5	4.4	4.3	4.2	4.1	

Note: The HD media and rare earth businesses are part of the electronics segment. HD media sales volume, sales value, and average price are Nomura estimates.

Source: Company data, Nomura estimates

Fig. 6: Showa Denko [4004]: consolidated financial indicators and balance sheet

(¥bn, except where noted)

Financial indicators	12/12	13/12	14/12	15/12	16/12	17/12	18/12E	19/12E	20/12E	21/12E	22/12E	18/12E
EPS (¥)	62.6	60.6	19.9	6.4	86.3	234.8	663.8	581.7	409.4	406.0	385.2	456.1
CFPS (¥)	371.3	326.5	296.3	301.2	358.3	505.0	942.1	861.2	695.5	698.9	684.8	
BPS (¥)	1,822.3	2,012.6	2,097.6	2,076	2,080.9	2,445.0	2,876.9	3,322.0	3,584.6	3,843.8	4,082.1	
DPS (¥)	30.0	30.0	30.0	30.0	0.0	50.0	120.0	130.0	140.0	140.0	140.0	70.0
Payout ratio	48%	50%	151%	465%	0%	21%	18%	22%	34%	34%	36%	
Shares out (year-avg, mn)	149.7	149.7	147.3	142.8	142.6	142.5	145.5	148.5	148.5	148.5	148.5	
Shares out (year-end, mn)	149.7	149.7	142.8	142.8	142.5	142.5	148.5	148.5	148.5	148.5	148.5	
ROE	3.6%	3.2%	1.0%	0.3%	4.1%	10.4%	24.9%	18.7%	11.8%	10.9%	9.7%	
ROA	3.0%	2.7%	2.1%	3.4%	4.5%	7.9%	14.1%	11.3%	7.8%	7.6%	7.0%	
ROIC	4.5%	4.0%	3.5%	5.1%	6.5%	11.5%	20.5%	16.3%	11.2%	10.8%	10.0%	
Net assets ratio to total assets	29.2%	30.6%	29.7%	31.5%	31.8%	34.0%	38.1%	42.4%	45.1%	47.5%	49.7%	
D/E ratio (x)	1.3	1.2	1.3	1.2	1.2	1.0	0.8	0.7	0.6	0.5	0.4	
Net D/E ratio (x)	1.1	0.9	1.1	1.0	1.0	0.8	0.5	0.2	0.1	0.0	-0.0	
Balance sheet												
	12/12	13/12	14/12	15/12	16/12	17/12	18/12E	19/12E	20/12E	21/12E	22/12E	
Current assets	342	375	381	332	335	405	505	557	581	614	647	
Cash & equivalents	52	68	67	64	70	77	157	214	249	275	299	
Account receivable	138	156	156	135	144	176	178	174	169	173	178	
Inventory assets	122	120	124	106	91	115	133	131	127	129	134	
Other current assets	31	30	35	26	30	37	37	37	37	37	37	
Long-term assets	591	611	631	609	598	619	616	610	603	593	581	
PPE/intangible long-term assets	484	505	528	515	499	518	515	509	502	492	480	
Investments, other assets, etc	107	106	103	94	99	101	101	101	101	101	101	
Total assets	933	986	1,012	940	933	1,025	1,121	1,167	1,184	1,207	1,229	
Accounts payable	107	124	127	104	104	121	136	134	129	132	136	
Interest-bearing debt	354	354	383	369	360	347	350	330	310	290	270	
Other liabilities	157	162	180	160	158	192	189	189	189	189	189	
Total liabilities	618	640	691	632	621	660	675	653	628	611	595	
Net assets	315	346	319	308	311	365	446	514	555	596	633	
Shareholders' equity	273	301	300	297	297	348	427	494	534	574	610	
Minority interests	42	45	19	12	15	17	18	20	21	22	23	
Total liabilities & net assets	933	986	1,010	940	933	1,025	1,121	1,167	1,184	1,207	1,229	
Cash flow												
	12/12	13/12	14/12	15/12	16/12	17/12	18/12E	19/12E	20/12E	21/12E	22/12E	
Operating cash flow	53	64	67	61	69	67	132	133	110	101	97	
Profits attributable to owners of parent	9	9	3	1	12	33	97	86	61	60	57	
Depreciation	46	40	41	42	39	39	41	42	43	44	45	
Change in working capital	-2	15	23	18	18	-5	-6	5	6	-3	-4	
Investment cash flow	-35	-55	-47	-43	-54	-30	-37	-36	-35	-34	-33	
Capex	-43	-44	-44	-41	-37	-38	-37	-36	-35	-34	-33	
Other	8	4	-3	-2	-17	8	0	0	0	0	0	
Free cash flow	18	8	20	19	15	37	95	97	75	67	65	
Financial cash flow	-20	-7	-25	-21	-13	-18	-15	-39	-41	-41	-41	
Change in interest-bearing debt	6	0	29	-14	-9	-13	3	-20	-20	-20	-20	
Dividend payments	-4	-4	-4	-4	-4	-4	-18	-19	-21	-21	-21	

Source: Company data, Nomura estimates

Appendix A-1

Analyst Certification

We, Yifan Zhang and Shigeki Okazaki, hereby certify (1) that the views expressed in this Research report accurately reflect our personal views about any or all of the subject securities or issuers referred to in this Research report, (2) no part of our compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this Research report and (3) no part of our compensation is tied to any specific investment banking transactions performed by Nomura Securities International, Inc., Nomura International plc or any other Nomura Group company.

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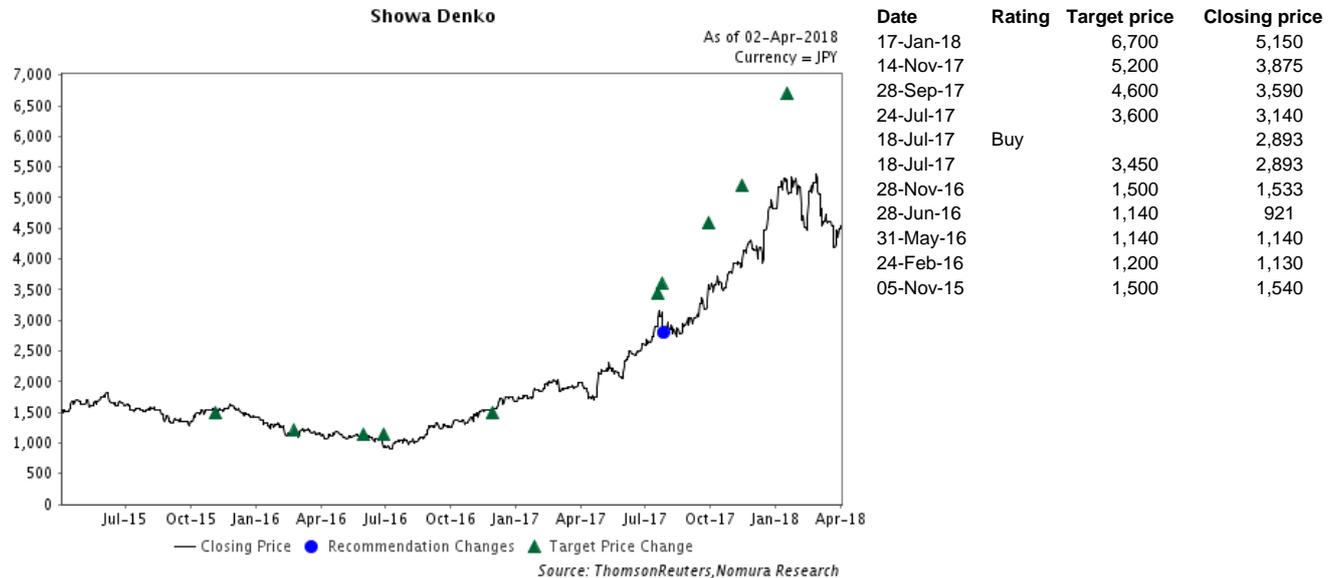
Issuer	Ticker	Price	Price date	Stock rating	Sector rating	Disclosures
Showa Denko	4004 JP	JPY 4,545	02-Apr-2018	Neutral	N/A	A4,A5,A6,A7,A11

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Showa Denko (4004 JP)

JPY 4,545 (02-Apr-2018) Neutral (Sector rating: N/A)

Rating and target price chart (three year history)



For explanation of ratings refer to the stock rating keys located after chart(s)

Valuation Methodology With our 18/12 EPS forecast as the baseline, we expect falling profits from graphite electrodes to result in EPS at Showa Denko declining at an average annual pace of about 8% over the medium term, considerably worse than the average forecast EPS CAGR of over 5% for the Russell/Nomura Large Cap index (ex financials). We therefore obtain our target price of ¥4,700 using our 18/12 EPS forecast and a P/E of around 7x, versus a P/E of greater than 14x for the Russell/Nomura Large Cap index (ex financials).

Risks that may impede the achievement of the target price Developments that could potentially lift the share price to well above our target price include market growth in the industry of HDDs for data centers and sustained tight supply-demand for graphite electrodes used in electric arc furnaces. The share price could substantially undershoot our target price as a result of

deterioration in the HDD industry. Showa Denko's performance is quite sensitive to developments in the HDD industry, which is the customer industry for a large proportion of the company's sales, and price declines for the company's core HD media could cause earnings to deteriorate. In addition, supply-demand conditions for graphite electrodes could soften if the Chinese government eases up on environmental regulation.

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As at 31 March 2018.

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Transactions involving convertible bonds are subject to a sales commission of up to 1.08% of the transaction amount (or a commission of ¥4,320 if this would be less than ¥4,320). When convertible bonds are purchased via OTC transactions (including offerings), only the purchase price shall be paid, with no sales commission charged. However, Nomura Securities may charge a separate fee for OTC transactions, as agreed with the customer. Convertible bonds carry the risk of losses owing to factors such as interest rate fluctuations and price fluctuations in the underlying stock. In addition, convertible bonds denominated in foreign currencies also carry the risk of losses owing to factors such as foreign exchange rate fluctuations.

When bonds are purchased via public offerings, secondary distributions, or other OTC transactions with Nomura Securities, only the purchase price shall be paid, with no sales commission charged. Bonds carry the risk of losses, as prices fluctuate in line with changes in market interest rates. Bond prices may also fall below the invested principal as a result of such factors as changes in the management and financial circumstances of the issuer, or changes in third-party valuations of the bond in question. In addition, foreign currency-denominated bonds also carry the risk of losses owing to factors such as foreign exchange rate fluctuations.

When Japanese government bonds (JGBs) for individual investors are purchased via public offerings, only the purchase price shall be paid, with no sales commission charged. As a rule, JGBs for individual investors may not be sold in the first 12 months after issuance. When JGBs for individual investors are sold before maturity, an amount calculated via the following formula will be subtracted from the par value of the bond plus accrued interest: (1) for 10-year variable rate bonds, an amount equal to the two preceding coupon payments (before tax) x 0.79685 will be used, (2) for 5-year and 3-year fixed rate bonds, an amount equal to the two preceding coupon payments (before tax) x 0.79685 will be used.

When inflation-indexed JGBs are purchased via public offerings, secondary distributions (uridashi deals), or other OTC transactions with Nomura Securities, only the purchase price shall be paid, with no sales commission charged. Inflation-indexed JGBs carry the risk of losses, as prices fluctuate in line with changes in market interest rates and fluctuations in the nationwide consumer price index. The notional principal of inflation-indexed JGBs changes in line with the rate of change in nationwide CPI inflation from the time of its issuance. The amount of the coupon payment is calculated by multiplying the coupon rate by the notional principal at the time of payment. The maturity value is the amount of the notional principal when the issue becomes due. For J17 and subsequent issues, the maturity value shall not undercut the face amount. Purchases of investment trusts (and sales of some investment trusts) are subject to a purchase or sales fee of up to 5.4% of the transaction amount. Also, a direct cost that may be incurred when selling investment trusts is a fee of up to 2.0% of the unit price at the time of redemption. Indirect costs that may be incurred during the course of holding investment trusts include, for domestic investment trusts, an asset management fee (trust fee) of up to 5.4% (annualized basis) of the net assets in trust, as well as fees based on investment performance. Other indirect costs may also be incurred. For foreign investment trusts, indirect fees may be incurred during the course of holding such as investment company compensation.

Investment trusts invest mainly in securities such as Japanese and foreign equities and bonds, whose prices fluctuate. Investment trust unit prices fluctuate owing to price fluctuations in the underlying assets and to foreign exchange rate fluctuations. As such, investment trusts carry the risk of losses. Fees and risks vary by investment trust. Maximum applicable fees are subject to change; please thoroughly read the written materials provided, such as prospectuses or documents delivered before making a contract.

In interest rate swap transactions and USD/JPY basis swap transactions ("interest rate swap transactions, etc."), only the agreed transaction payments shall be made on the settlement dates. Some interest rate swap transactions, etc. may require pledging of margin collateral. In some of these cases, transaction payments may exceed the amount of collateral. There shall be no advance notification of required collateral value or collateral ratios as they vary depending on the transaction. Interest rate swap transactions, etc. carry the risk of losses owing to fluctuations in market prices in the interest rate, currency and other markets, as well as reference indices. Losses incurred as such may exceed the value of margin collateral, in which case margin calls may be triggered. In the event that both parties agree to enter a replacement (or termination) transaction, the interest rates received (paid) under the new arrangement may differ from those in the original arrangement, even if terms other than the interest rates are identical to those in the original transaction. Risks vary by transaction. Please thoroughly read the written materials provided, such as documents delivered before making a contract and disclosure statements.

In OTC transactions of credit default swaps (CDS), no sales commission will be charged. When entering into CDS transactions, the protection buyer will be required to pledge or entrust an agreed amount of margin collateral. In some of these cases, the transaction payments may exceed the amount of margin collateral. There shall be no advance notification of required collateral value or collateral ratios as they vary depending on the financial position of the protection buyer. CDS transactions carry the risk of losses owing to changes in the credit position of some or all of the referenced entities, and/or fluctuations of the interest rate market. The amount the protection buyer receives in the event that the CDS is triggered by a credit event may undercut the total amount of premiums that he/she has paid in the course of the transaction. Similarly, the amount the protection seller pays in the event of a credit event may exceed the total amount of premiums that he/she has received in the transaction. All other conditions being equal, the amount of premiums that the protection buyer pays and that received by the protection seller shall differ. In principle, CDS transactions will be limited to financial instruments business operators and qualified institutional investors. No account fee will be charged for marketable securities or monies deposited. Transfers of equities to another securities company via the Japan Securities Depository Center are subject to a transfer fee of up to ¥10,800 per issue transferred depending on volume.

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