



## China Consumer Durables

# Revising white goods earnings amid coronavirus; consolidation opportunity for leaders; Buy Gree (on CL)

We cut our China white goods coverage earnings forecasts 5%-14% in 2020E-21E to reflect our expectation of slower revenue growth in 1H20 amid the COVID-19 outbreak and margin pressure from potential pricing competition in AC during 2Q20.

**Nicolas Yi**  
+86(21)2401-8922 | nicolas.yi@ghsl.cn  
Beijing Gao Hua Securities Company  
Limited

On the supply side, we expect a significant but manageable impact on white goods production in areas including labor supply, upstream vendors and logistics, primarily in 1Q20. Although our coverage companies' direct exposure to Hubei is limited, government's measures to contain the spread of the virus have made it difficult for factories to resume full production capacity. As a result, we expect such measures to cause total white goods production to decline by 20%-30% in 1Q20 with most impact on domestic orders. While we take no view on how the current outbreak develops in the future, based on current information we expect production to return to normal levels in 2Q20.

On the demand side, we are generally positive about a recovery in 2H20 as it is supported by a two-year property completion cycle starting from 4Q19. In our view, property-related demand is likely to be delayed but will not disappear. That said, we are cautious about the impact from a possible decline in disposable income. Demand could be fundamentally impaired if there is a prolonged impact on disposable income growth. Competition in AC will be a major focus for white goods in 2Q20 as both Gree and Midea are seeking to gain more market share through more pricing promotion. This is likely to put margin pressure on the industry but also provide an opportunity of faster market consolidation for leaders.

We highlight Gree (Buy, on CL) as our top pick in China white goods. We believe the company is among the best positioned to weather current industry difficulties and benefit from any potential demand recovery as well as market consolidation opportunity. We expect management to adopt a more proactive pricing strategy and balanced channel strategy focusing on the online channel, which will result in market share gain and margin expansion once demand recovers. Haier Electronics (Buy, on CL) is also one of our preferred names due to its consistent market share gain in washing machine and water heater markets and attractive valuation.

---

Goldman Sachs does and seeks to do business with companies covered in its research reports. As a result, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision. For Reg AC certification and other important disclosures, see the Disclosure Appendix, or go to [www.gs.com/research/hedge.html](http://www.gs.com/research/hedge.html). Analysts employed by non-US affiliates are not registered/qualified as research analysts with FINRA in the U.S.

# Manageable supply risk; demand risk hinges on impact from disposable income

## Production disrupted in 1Q20, yet recovering gradually

**We expect a significant but manageable impact on white goods production in areas including labor supply, upstream vendors and logistics in 1Q20 due to disruption from coronavirus outbreak.** The direct Hubei production exposure of our covered white goods companies is generally limited (less than 10% based on our estimates). However, government measures to contain the virus outbreak have created difficulty for migrant workers returning to factories, goods transportation, etc. As a result, we expect such measures to cause total white goods production to decline by 20%-30% in 1Q20. As the situation improves, labor supply and logistics have been gradually improving. While we take no view on how the current outbreak develops in the future, based on current information we expect production to return to normal levels in 2Q20.

**Direct production exposure to Hubei is limited.** The direct production exposure to Hubei for our white goods coverage amounts to less than 10% based on our estimates. Out of all the five white goods companies we cover, Midea and Haier Smart Home have relatively higher production exposure, each with two factories located in Hubei. That said, most of these companies have nation-wide manufacturing facilities and thus can leverage alternative manufacturing capacities to make up given generally lower production capacity utilization in 1Q.

### Exhibit 1: Direct production exposure to Hubei is limited (less than 10% based on our estimates)

Production and revenue exposure to Hubei for our covered companies

	Production			Revenue
	Subsidiary	Rev (mn)	Rev %	Hubei %
<b>White goods</b>				
Gree	格力电器 (武汉) 有限公司 Gree Electric (Wuhan) Co., Ltd.	13,786.2	6.9%	n/a
	武汉凌达压缩机有限公司 Wuhan Landa Compressor Co., Ltd.			
	格力暖通制冷设备 (武汉) 有限公司 Gree HVAC Equipment (Wuhan) Co., Ltd.			
	格力智能装备 (武汉) 有限公司 Gree Intelligent Equipment (Wuhan) Co., Ltd.	n/a	n/a	n/a
	格力精密模具 (武汉) 有限公司 Gree Precision Mould (Wuhan) Co., Ltd.			
Midea	美的集团武汉制冷设备有限公司 Midea Group Wuhan Refrigeration Equipment Co., Ltd.	n/a	< 20% AC capacity	n/a
	湖北美的电冰箱有限公司 Hubei Midea Refrigerator Co., Ltd.		c.40% fridge capacity	
Haier Smart Home	武汉海尔电器股份有限公司 Wuhan Haier Electric Co., Ltd.	2,251.0	1.2% (c.30% of AC capacity)	n/a
	武汉海尔电冰柜有限公司 Wuhan Haier Electric Freezer Co., Ltd.	n/a	< 15% of freezer capacity	n/a
	武汉海尔能源动力有限公司 Wuhan Haier Energy Power Co., Ltd.		n/a	
Haier Electronics	武汉海尔热水器有限公司 Wuhan Haier Water Heater Co., Ltd.	n/a	c.15% of water heater capacity	n/a
	青岛日日顺武汉物流公司 Qingdao Riri Shun Wuhan Logistics Company		n/a	
Hisense	武汉长荣 (特定第三方) Wuhan Changrong (specific third party)	n/a	n/a	n/a

Source: Company data, Gao Hua Securities Research

**Migrant workers gradually returned to work while labor gap remains.** Since

February 10, our covered white goods companies have gradually resumed production except in Hubei. Some companies have used chartered buses and sometimes planes to take employees back to work. Based on information released by the companies, industry leaders such as Midea, Gree and Haier have resumed 70% of their production. However, as government control on people migration persists, there is still a labor supply shortage. According to an article by Caixin, up to February 26, Midea had c.30,000 employees in Shunde, its headquarters, yet still had a labor gap of c.7,000 workers. Further resumption of labor supply hinges on the development of the outbreak and government controls on people migration.

#### Exhibit 2: Production has gradually resumed; over 70% for leading companies

Production resumption date and return rate

	Resume production since	Latest update
<b>Air conditioner</b>		
Gree	10-Feb (except Hubei)	70% resumed (21-Feb)
Midea	10-Feb (except Hubei)	70% resumed (26-Feb)
Haier	10-Feb (except Hubei)	90% resumed (26-Feb)
Hisense	10-Feb	
<b>Washing machine</b>		
Haier (Qingdao)	10-Feb	80% capacity (26-Feb)
Midea	10-Feb	70% resumed (26-Feb)

Source: IOL, Company news

**Supply chain risk tilted toward small vendors.** Production of white goods involves a large number of upstream vendors. Key suppliers such as GMCC, Landa and Sanhua have already resumed production since February 10. The direct exposure to Hubei of such suppliers is also limited. Compared to these large vendors, small vendors are more vulnerable to labor shortages and cash flow pressure. According to Caixin, a lot of small vendors have not resumed operation due to labor shortages. We note that the government has begun to issue labor and credit policy support for SMEs. However, if such policies fail to help small vendors weather the outbreak in the next 1-2 months, it may take a longer time for white goods companies to fully recover production.

#### Exhibit 3: Key suppliers have started to resume operation

Production resumption date and manufacturing facilities locations for key suppliers

Company	Resume production since	Production sites
<b>Compressor</b>		
Landa (subsidiary of Gree)	10-Feb (except Hubei)	Chongqing, Zhuhai, Hefei, Zhengzhou, <b>Wuhan</b>
GMCC (subsidiary of Midea)	10-Feb	Guangdong, Anhui, Zhejiang
Highly	10-Feb	Hangzhou, Sichuan
<b>Control valve</b>		
Sanhua	10-Feb	Zhejiang

Source: IOL, Company data

**Logistics are recovering.** According to data compiled by DB Schenker, by the end of February, road transportation has recovered to 50% and 36% in Guangdong and Shandong, respectively, where most major white goods companies reside. While

transportation controls still exist in certain regions, we expect such controls to be fully lifted in the next 1-2 months.

#### Exhibit 4: Logistics are recovering; c.40% recovered excluding Hubei

Vehicle transportation compared with 2019 as of 26-Feb

Province (City)	Vehicle transportation compared with 2019 (26-Feb)
Hubei	4%
Internal Hubei to Wuhan	8%
Guangxi, Inner Mongolia, Liaoning, Shanxi	70%
Jilin, Qinghai, Gansu, Shaanxi, Sichuan, Hunan, Hebei, Anhui, Guizhou	60%
Ningxia, Shanghai, Guangdong, Fujian, Tianjin, Yunnan, Beijing, Jiangxi	50%
Chongqing, Jiangsu, Henan, Zhejiang, Hainan, Heilongjiang	40%
Shandong	36%
Xinjiang	22%

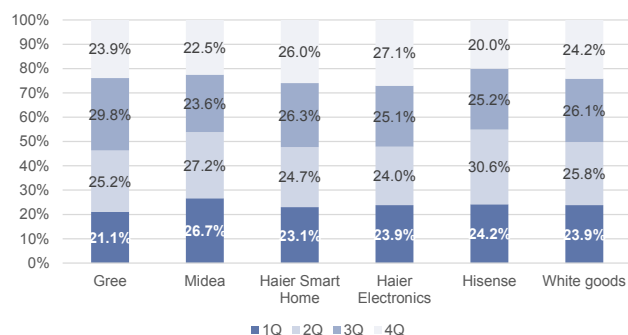
Source: DB Schenker

#### Adequate inventory, coupled with recovering supply, is likely to meet weaker 1Q demand.

White goods distributors usually take 10%-20% more inventory ahead of Chinese New Year preparing for the one-week factory close. Based on our channel check, distributors currently have c. 1-2 months of inventory for washing machines and refrigerators. For AC, overall channel inventory is much higher with the majority from Gree's distributors. Given 1Q is usually a seasonally weak quarter, which has been further weakened by the virus outbreak, we believe current inventory level, coupled with recovering supply, will be able to meet 1Q demand.

#### Exhibit 5: 1Q accounts for 23.9% of annual revenue for our covered white goods companies...

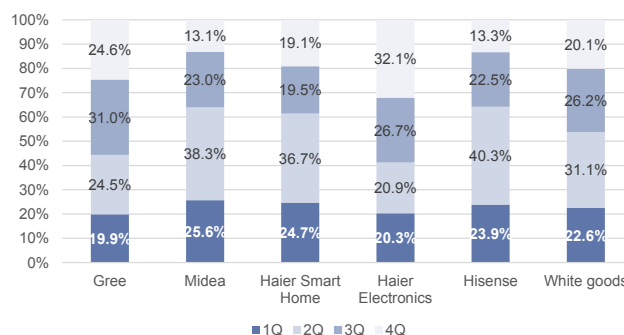
Average quarterly revenue composition in 2014-18 for our coverage (%)



Source: Company data, Gao Hua Securities Research

#### Exhibit 6: ...and 22.6% of annual profit

Average quarterly net profits composition in 2014-18 for our coverage (%)



Source: Company data, Gao Hua Securities Research

### Demand supported by property completion, uncertainty from income impact

In our view, demand plays a more important role than supply in determining how white goods sales perform during the rest of 2020. As we stated in our previous report (*China consumer durables: assessing the impact of the virus outbreak*), demand for white goods is primarily driven by long-term factors such as housing and upgrading, which are correlated with property completion and disposable income. Our real estate team expects property completion to increase by a 20% CAGR in 2020-21. With the disruption from the coronavirus outbreak, completion in 2020 may be delayed for 1-2 months, but

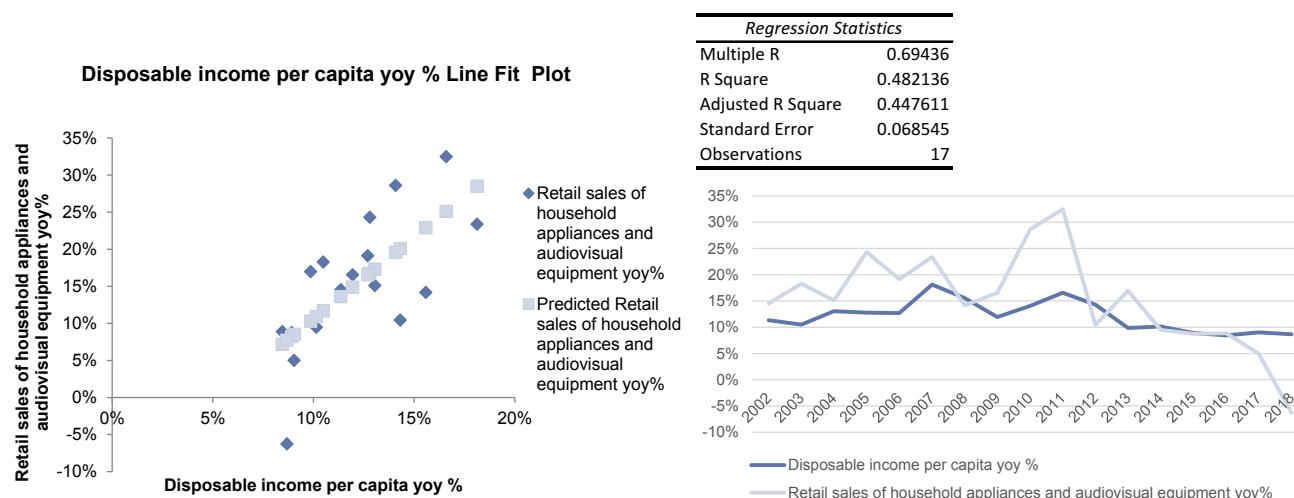
we expect limited impact in 2020-21. Compared to property completion, we think disposable income has a higher influence on upgrading demand. It is still uncertain how quickly the macro economy will recover from the disruption caused by the virus outbreak. However, it is possible that demand could be fundamentally impacted if there is a prolonged impact on the macro economy and disposable income growth.

**As a result, we revise our demand volume growth forecast in 2020 (2021) for AC/washing machine/refrigerator from 6.4% (8.0%)/4.9% (3.9%)/3.6% (4.2%) to 5.6% (8.9%)/4.0% (4.2%)/2.9% (4.5%) to reflect the impact from the coronavirus outbreak in 2020 and fulfillment of potential pent-up demand in 2021.**

We expect demand to recover mildly in 2Q20 as customer traffic returns to normal level and brands begin to launch promotions. However, we do not expect the lost demand in 1Q20 to be fully recovered in 2Q20 as overall demand is still relatively weak. We expect a more meaningful recovery in 2H20 as the overall economy stabilizes. In the short term, we expect companies with diversified revenue sources, especially higher online exposure, to be less affected.

**Demand could be fundamentally impacted in the case of a prolonged impact on disposable income growth.** Historical data shows there was strong correlation between disposable income growth and appliances consumption growth until 2013. After 2013, the correlation began to weaken as appliances consumption grew at slower pace compared to disposable income growth. In our view, the likely reason for the decoupling is that the marginal propensity for appliances consumption declined after 2013 as major appliance penetration has reached a relatively high level in China. From a data perspective, it remains unclear how much appliance consumption will be impacted if disposable income declines. However, in the case of declining disposable income, we think consumers are likely to be more prudent in making purchase decisions as appliances are large ticket items and thus more discretionary in nature.

**Exhibit 7: Regression shows retail sales of appliances is correlated with disposable income and the correlation is weakening since 2013**  
Regression results of retail sales of household appliances and audiovisual equipment growth on per capita disposable income growth



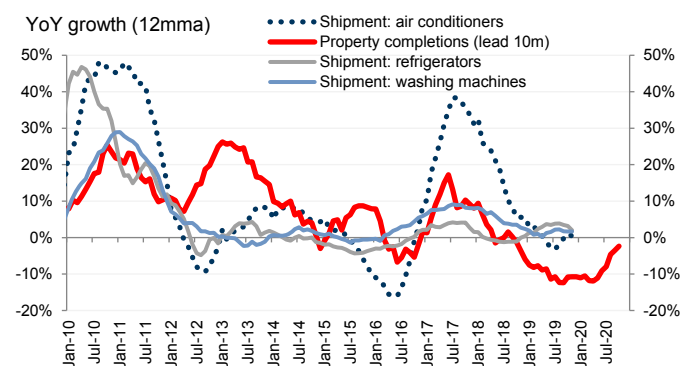
Source: NBS, Gao Hua Securities Research

**Property-related demand is likely to be delayed rather than disappear.** We expect

increasing property completion to be a major demand driver in an earlier report (refer to *China consumer durables: A new cycle in sight*). According to NBS, residential property completions grew by 17% yoy in 4Q19, the strongest pace in the past two years. While there might be 1-2 month delay for property completion in 2020, our real estate team expect limited impact on completion growth in 2020-21. We expect such property completion increase to translate into demand for related products once the outbreak is controlled, assuming no significant change in macroeconomic conditions.

**Exhibit 8: We expect increasing property completion to further boost sales of appliances in 2020**

Correlation between growths of property completion and major appliances shipment



Source: NBS, IOL, Gao Hua Securities Research

**Companies with higher online exposure are likely to recover first.** The offline channel has been mostly severely impacted due to less foot traffic. In comparison, the online channel is the least impacted as some demand has shifted from offline to online despite the short-term issues of logistics and installation services. Revenue from the developer channel is likely to be postponed due to a delay in construction activities. The risk with sales in the overseas market, once considered a safe haven, has increased as the virus has spread outside China.

**Exhibit 9: Companies with diversified sales channels are likely to be less affected**

Channel and product breakdown of covered white goods companies

		Gree	Midea	Haier Smart Home	Haier Electronics	Hisense
<i>Revenue exposure to new property related demand</i>						
Re. property	Rev as %	14.6%	7.6%	6.2%	17.1%	17.3%
<i>Revenue exposure to different channels</i>						
Domestic	Rev as %	83.4%	59.6%	53.0%	97.0%	72.9%
Retail	Rev as %	81.1%	58.3%	52.6%	96.5%	67.4%
Offline	Rev as %	68.6%	40.4%	39.3%	72.5%	49.2%
Online	Rev as %	12.5%	17.9%	13.2%	24.0%	18.2%
Developer	Rev as %	2.3%	1.3%	0.4%	0.5%	5.5%
Overseas	Rev as %	16.6%	40.4%	47.0%	3.0%	27.1%
<i>Revenue exposure to different product categories</i>						
VRF/VRV		4.5%	4.8%	1.2%	0.0%	26.7%
Split ACs		70.9%	32.0%	11.2%	16.9%	29.0%
Washing machines		0.0%	10.0%	13.5%	39.1%	0.0%
Refrigerators		0.0%	10.0%	20.2%	20.3%	34.6%
Kitchen appliances		0.0%	0.0%	6.6%	6.8%	0.0%
Small appliances		2.8%	20.0%	0.0%	0.0%	0.0%
Others		21.8%	23.2%	47.3%	17.0%	9.7%
Total		100.0%	100.0%	100.0%	100.0%	100.0%

Source: Company data, Gao Hua Securities Research

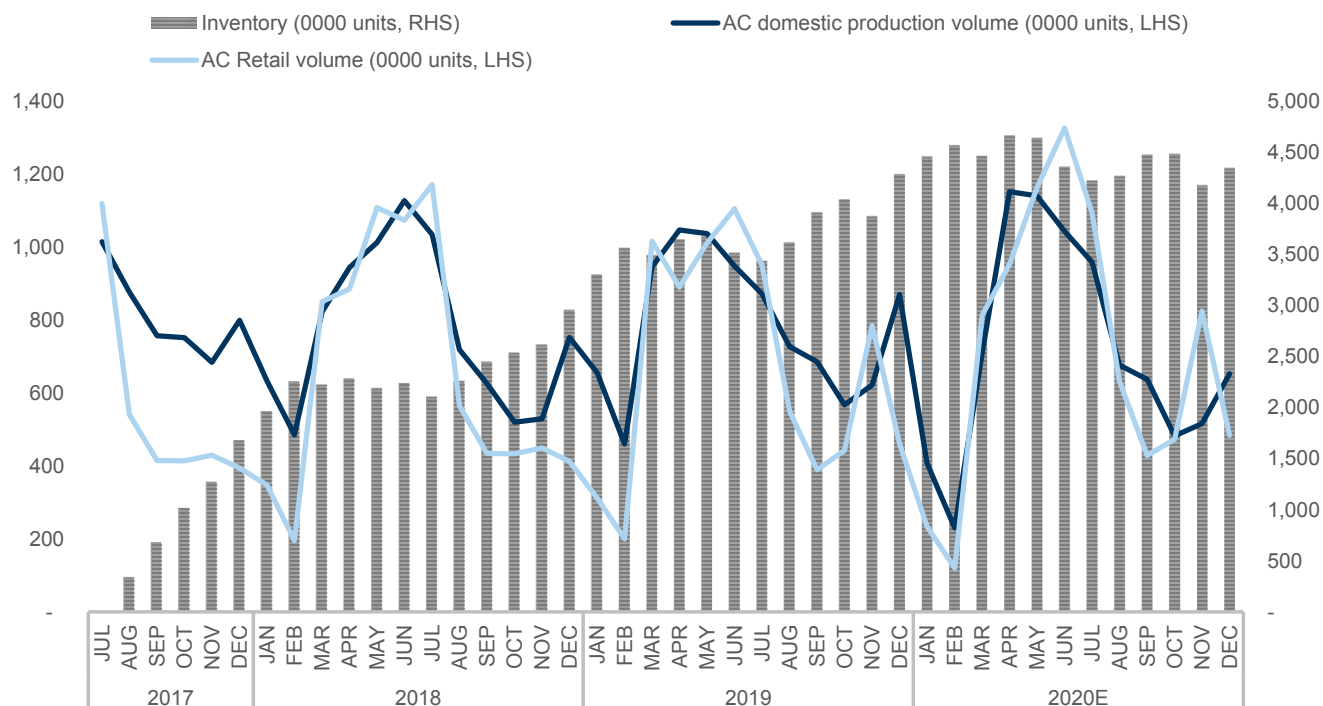
## Increasing pricing pressure for AC in 2020

Although we are positive about the premiumization trend and its boost for ASP in the mid-to-long term, we have seen increasing risk of declining retail prices for split AC in 2020 due to: 1) high channel inventory; 2) competition between Gree and Midea; and 3) change of national split AC energy standards.

Based on our estimates, there were c.45mn units of inventory for split ACs as of Jan 2020, most of which are with Gree distributors. Gree began to clear channel inventory by offering significant promotion since “Single’s Day” in 2019, but this has been unexpectedly disrupted by the coronavirus outbreak. Based on our conversations with distributors, we believe both Gree and Midea are preparing for a new round of promotion, likely in either late March or early April once demand recovers. Given the current inventory level and cash flow pressure on distributors due to halted business activities, we expect more pressure on split AC retail prices in 2020.

**Exhibit 10: Considering current high inventory level, we expect increasing retail pricing risk for split ACs in 2020**

Inventory, production and retail volume of AC



Source: IOL, CMM, Gao Hua Securities Research

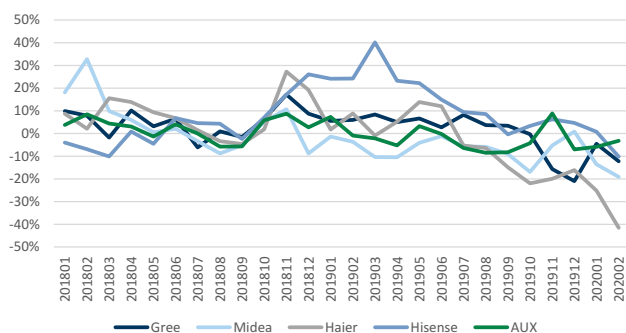
The planned promotion is also concurrent with the proposed split AC energy efficiency standards change. According to the new energy efficiency standards, manufacturers are required to improve efficiency of their split AC products and stop manufacturing less efficient models by July 1, 2020. We expect major split AC companies to try to clear less energy efficient products before the new standards take effect.

We expect less pricing risk for washing machines and refrigerators in 1H20 due to low inventory and a stable competitive landscape. However, the industry's trend of premiumization might be disrupted as industry leaders have delayed the launch of new products.



**Exhibit 11: Online ASP for AC continues to decline since November 2019**

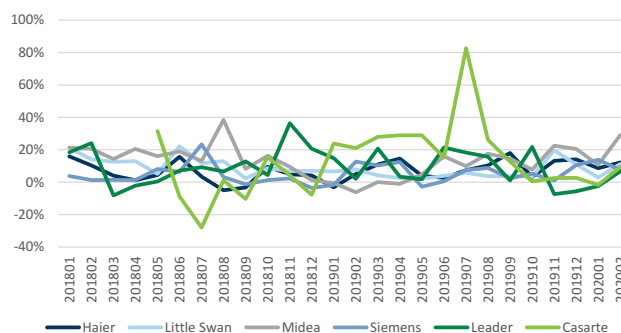
Online ASP yoy change by selected AC brands



Source: Taosj

**Exhibit 12: Meanwhile online ASP remains largely stable for washing machines...**

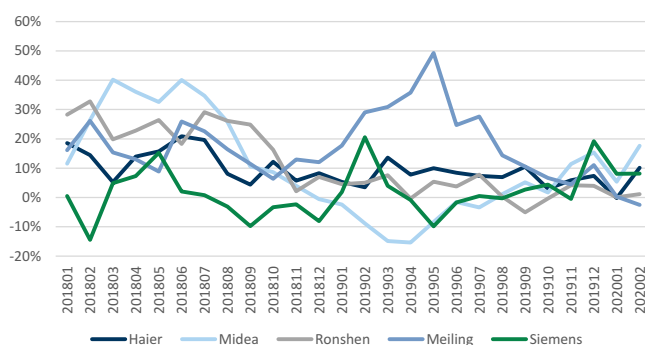
Online ASP yoy change by selected washing machine brands



Source: Taosj

**Exhibit 13: ...and refrigerators**

Online ASP yoy change by selected refrigerator brands



Source: Taosj

## Implications for the industry

The coronavirus outbreak has caused short-term disruption to white goods supply and demand. However, we think it may also have implications for the industry in the mid and long term.

**Accelerating industry consolidation.** We believe large companies could better weather the outbreak than small companies due to their advantages in terms of: 1) stronger balance sheets; and 2) better control over labor supply and the supply chain. The outbreak has put pressure on cash flows for both the manufacturers and distributors. Industry leaders have both higher cash balance and easier access to cheap bank credit, which they could use to fund their own operations and support distributors. We note that Gree and Midea recently announced plans to issue Rmb18bn and Rmb20bn of corporate bonds, respectively. Gree has also proposed extending a Rmb1.4bn credit line to Henan Shengshixinxing, one of its largest distributors. Similarly, large companies have better control over labor supply and supply chain and thus could

resume operations faster than small competitors.

**Diversifying channel strategy.** The shift from offline to online for white goods has been a long-term trend for the industry and is still ongoing. We think the current outbreak is going to accelerate the process as most white goods companies have placed more resources into online marketing.

## Summary of earnings and TP revisions

---

We revise down our 2020E net income estimates for our white goods coverage by 5%-14% to reflect demand disruptions and margin pressure from AC price competition in 1H20. We expect industry leaders to benefit from accelerating industry consolidation and a diversifying channel strategy in the long run. We summarize our updated forecasts and investment views for individual company below.

**Gree:** We cut Gree's NI by 9.7% in 2020E and 7.2% in 2021E to reflect demand disruptions in 1H20E due to the virus outbreak and expected margin pressure from price competition. We now expect revenue to grow by 6.6%/8.4% in 2020E/21E, driven by both an AC demand recovery and market share gains due to the company's proactive pricing strategy. We expect NI to grow by -18.5%/17.6% in 2020E/21E, driven by operational improvements post the mixed ownership reform. As management's shareholding increases after the reform, we expect it to boost revenue growth through a proactive pricing strategy and revamped online strategy, as well as to optimize capital allocation through a dividend payout increase and a better CAPEX plan. We believe Gree is still the best positioned to weather any industry difficulties and benefit from any potential demand recovery.

Our new 12-m TP of Rmb71.0 (previously Rmb76.0) is derived by applying an unchanged 14X exit P/E (industry P/E) to 2023E EPS, discounting back to 2020E using a COE of 9%. Key risks include: 1) a prolonged disruption from the coronavirus outbreak that could drag on AC demand; 2) rising material costs such as those for steel and copper, which could erode GPM; 3) high channel inventory, which could negatively impact ex-factory shipments and thus revenue growth; and 4) diversification into other areas including other home appliances, which could reduce return on capital in the short term.

**Midea:** We cut Midea's NI by 9.5% in 2020E and 7.5% in 2021E to reflect lower sales in 1H20E and margin pressure from AC price competition. We now expect revenue to grow by 2.6%/9.4% in 2020E/21E, driven by its flexible product/channel strategy and market consolidation. We expect NI to grow by 6.9%/19.1% in 2020E/21E, driven by operating margin expansion. We expect Midea, similar to Gree, to be another major beneficiary of the potential AC market consolidation.

Our new 12-m TP of Rmb62.0 (previously Rmb65.0) is based on applying an unchanged 14X industry average exit P/E to 2023E EPS, discounted back to 2020E using a COE of 9%. Key risks include: 1) a prolonged disruption from the coronavirus outbreak that could drag on white goods demand; 2) rising material costs affecting product margins; 3) execution risk of its premiumization strategy; 4) rising competition in the low-to-mid end

segment; and 5) failure to integrate KUKA and realize acquisition synergies.

**Haier Smart Home:** We cut Haier Smart Home's NI by 5.9% in 2020E and 5.6% in 2021E to reflect sales disruptions in 1H20E and margin pressure from AC price competition. We now expect revenue to grow by 3.5%/6.7% in 2020E/21E, driven by share gain in its core washing machine and refrigerator market, AC strategy adjustment and overseas market expansion. We expect NI to grow by -7.6%/14.2% in 2020E/21E, driven by operating efficiency improvement from the company's ongoing channel reform.

Our new 12-m TP of Rmb19.0 (previously Rmb20.0) is derived by applying an unchanged 14X industry average exit P/E to 2023E EPS, discounted back to 2020E using a COE of 9%. Key risks include: 1) a prolonged disruption from the coronavirus outbreak that could drag on white goods demand; 2) slower-than-expected growth of Casarte; 3) higher-than-expected marketing/channel expenses; 4) failure to integrate Candy; 5) Revenue growth and margin risk for air conditioners (ACs).

**Haier Electronics:** We cut Haier Electronics' NI by 8.3% in 2020E and 4.7% in 2021E to reflect slower sales growth in 2020E. We now expect revenue to grow by 0.4%/9.4% in 2020E/21E, driven by its market share gain in washing machine and water heater markets. We expect NI to grow by -43.7%/15.3% in 2020E/21E, driven by increasing share of higher-margin Casarte products. We remain positive on Haier Electronics' share gain in washing machine and water heater market through the Casarte (premium) and Leader (value-for-money) brands. We expect the company to be the major beneficiary once demand for these products recovers.

Our new 12-m TP of HK\$26.0 (previously HK\$27.0) is derived by applying an unchanged 14X industry average exit P/E to 2023E EPS, discounted back to 2020E using a COE of 9%. Key risks include: 1) a prolonged disruption from the coronavirus outbreak that could drag on white goods demand; 2) slower-than-expected growth in premium products such as Casarte could impact overall revenue growth and operating margins.

**Hisense Home Appliances:** We cut Hisense's NI by 13.7% in 2020E and 13.1% in 2021E to reflect negative sales growth in 1Q20 and margin pressure of split AC. Unlike Gree and Midea, Hisense has a much thinner AC EBIT margin (c. 2%) and is likely to be more severely hit by pricing competition. We now expect revenue to grow by 2.0%/5.8% in 2020E/21E, driven by demand recovery in 2H20. We expect NI to grow by -0.1%/13.7% in 2020E/21E, driven by changing AC operating leverage and growth in its VRF products. We expect Hisense-Hitachi to continue gaining share in China's VRF market by leveraging its well-recognized brand and balanced distribution network. We expect the company to gradually re-rate as VRF contributes to an increasing portion of its net profits.

Our new 12-m A/H share TPs of Rmb15.0/HK\$11.0 (previously Rmb16.0/HK\$12.0) are based on a 2023E discounted P/E valuation approach. We assign 16X/5X exit multiples to Hisense-Hitachi JV/legacy white goods EPS in 2022E and discount back to 2020E using a 9% cost of equity in line with our coverage. Key risks include: 1) a prolonged disruption from the coronavirus outbreak that could drag on white goods demand; 2)

increasing competition from domestic players that may jeopardize the leading position of the Hisense-Hitachi JV; 3) increasing penetration in the developer channel that may result in margin dilution; 4) below-expectations integration of the Hisense-Hitachi JV; and 5) lower-than-expected performance of the company's legacy white goods business.

**Exhibit 14: Summary of changes to our estimates and 12-m TPs**

Company	Ticker	Reporting Date	Rating	Price	Target Price					EPS change								
										2019E			2020E			2021E		
					new	old	change	U/D %		new	old	Change	new	old	Change	new	old	Change
Midea Group	000333.SZ	4/29/2020	Buy	Rmb	54.5	62.0	65.0	-4.6%	13.8% Rmb	3.44	3.44	0.0%	3.67	4.06	-9.5%	4.38	4.73	-7.5%
Gree Electric Appliances Inc.	000651.SZ	4/29/2020	Buy*	Rmb	59.6	71.0	76.0	-6.6%	19.1% Rmb	5.70	5.70	0.0%	4.65	5.15	-9.7%	5.47	5.89	-7.2%
Haier Smart Home Co.	600690.SS	4/29/2020	Buy	Rmb	17.4	19.0	20.0	-5.0%	9.5% Rmb	1.41	1.41	0.0%	1.31	1.39	-5.9%	1.49	1.58	-5.6%
									18.5% Rmb	2.63	2.63	0.0%	1.48	1.61	-8.3%	1.70	1.79	-4.7%
Hisense Home Appliances	000921.SZ	3/26/2020	Buy	Rmb	10.4	15.0	16.0	-6.3%	44.2% Rmb	1.05	1.05	-0.4%	1.05	1.21	-13.7%	1.19	1.37	-13.1%
Hisense Home Appliances	0921.HK	3/26/2020	Buy	HK\$	8.1	11.0	12.0	-8.3%	35.1% Rmb	1.05	1.05	-0.4%	1.05	1.21	-13.7%	1.19	1.37	-13.1%

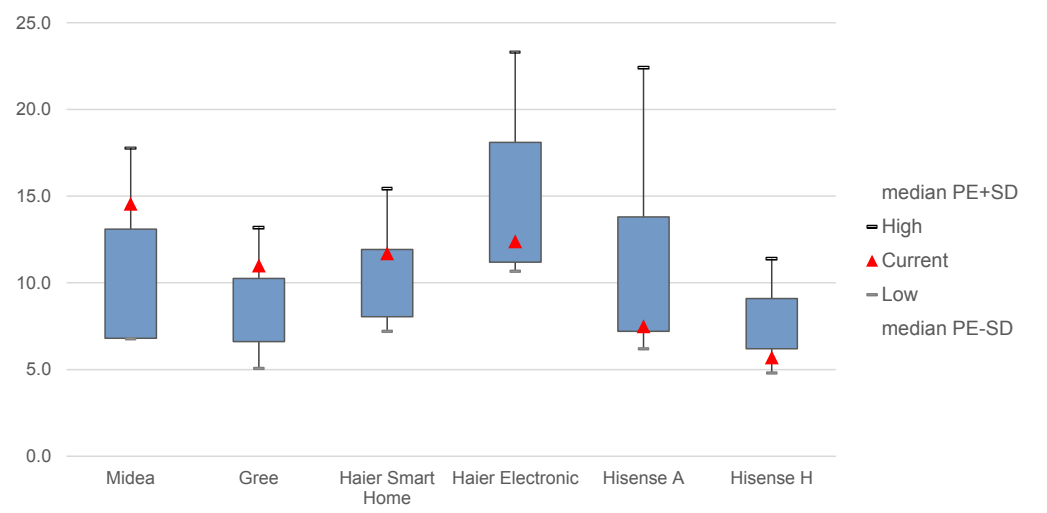
Source: Gao Hua Securities Research

**Exhibit 15: Summary of quarterly and semi-annual forecasts**

Ticker	Company name		1Q20E	2Q20E	3Q20E	4Q20E	1H20E	2H20E
000333.SZ	Midea Group	Sales	63,588	85,092	74,934	63,873	148,680	138,807
		yoy	(15.8%)	7.9%	11.1%	9.4%	(3.7%)	10.3%
		OP	5,460	9,793	7,483	3,803	15,252	11,286
		yoy	(28.0%)	5.2%	21.3%	47.0%	(10.2%)	28.9%
		OPM	8.6%	11.5%	10.0%	6.0%	10.3%	8.1%
		NI	5,403	8,985	7,076	4,033	14,388	11,109
		yoy	(11.9%)	(0.8%)	15.4%	59.1%	(5.9%)	28.2%
000651.SZ	Gree Electric Appliances Inc.	Sales	26,949	63,080	70,002	56,917	90,029	126,920
		yoy	(34.3%)	10.0%	20.0%	21.3%	(8.5%)	20.6%
		OP	4,258	8,263	11,620	7,407	12,521	19,027
		yoy	(31.7%)	(6.4%)	24.4%	35.7%	(16.9%)	28.6%
		OPM	15.8%	13.1%	16.6%	13.0%	13.9%	15.0%
		NI	3,927	7,306	10,137	6,583	11,233	16,721
		yoy	(30.8%)	(9.6%)	21.2%	(45.9%)	(18.3%)	(18.5%)
600690.SS	Haier Smart Home Co.	Sales	42,736	54,016	54,864	51,188	96,752	106,052
		yoy	(11.0%)	6.0%	9.9%	8.6%	(2.3%)	9.3%
		OP	2,642	3,331	2,352	3,351	5,973	5,704
		yoy	(17.0%)	5.5%	22.1%	48.0%	(5.8%)	36.1%
		OPM	6.2%	6.2%	4.3%	6.5%	6.2%	5.4%
		NI	1,901	2,350	1,713	2,362	4,251	4,076
		yoy	(11.0%)	(22.1%)	(34.7%)	91.5%	(17.5%)	5.7%
1169.HK	Haier Electronics Group	Sales	13,738	19,054	21,207	22,373	32,792	43,580
		yoy	(26.6%)	5.2%	17.9%	5.3%	(11.0%)	11.1%
		OP					1,710	2,946
		yoy					(20.5%)	16.6%
		OPM					5.2%	6.8%
		NI					1,557	2,573
		yoy					(13.8%)	(53.5%)
000921.SZ 0921.HK	Hisense Home Appliances	Sales	6,748	11,174	9,040	7,711	17,921	16,751
		yoy	(22.3%)	8.9%	12.2%	10.7%	(5.4%)	11.5%
		OP	94	112	25	(55)	206	(30)
		yoy	(62.4%)	(49.3%)	(150.1%)	(63.0%)	(56.2%)	(84.9%)
		OPM	1.4%	1.0%	0.3%	(0.7%)	1.1%	(0.2%)
		NI	336	486	359	248	822	607
		yoy	(20.4%)	(9.6%)	(7.8%)	202.6%	(14.4%)	28.8%

Source: Gao Hua Securities Research

Exhibit 16: 12-m forward P/Es of our coverage companies vs. the historical range (since 2012)



Source: Wind

# Disclosure Appendix

## Reg AC

I, Nicolas Yi, hereby certify that all of the views expressed in this report accurately reflect my personal views about the subject company or companies and its or their securities. I also certify that no part of my compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed in this report.

## GS Factor Profile

The Goldman Sachs Factor Profile provides investment context for a stock by comparing key attributes to the market (i.e. our coverage universe) and its sector peers. The four key attributes depicted are: Growth, Financial Returns, Multiple (e.g. valuation) and Integrated (a composite of Growth, Financial Returns and Multiple). Growth, Financial Returns and Multiple are calculated by using normalized ranks for specific metrics for each stock. The normalized ranks for the metrics are then averaged and converted into percentiles for the relevant attribute. The precise calculation of each metric may vary depending on the fiscal year, industry and region, but the standard approach is as follows:

**Growth** is based on a stock's forward-looking sales growth, EBITDA growth and EPS growth (for financial stocks, only EPS and sales growth), with a higher percentile indicating a higher growth company. **Financial Returns** is based on a stock's forward-looking ROE, ROCE and CROCI (for financial stocks, only ROE), with a higher percentile indicating a company with higher financial returns. **Multiple** is based on a stock's forward-looking P/E, P/B, price/dividend (P/D), EV/EBITDA, EV/FCF and EV/Debt Adjusted Cash Flow (DACF) (for financial stocks, only P/E, P/B and P/D), with a higher percentile indicating a stock trading at a higher multiple. The **Integrated** percentile is calculated as the average of the Growth percentile, Financial Returns percentile and (100% - Multiple percentile).

Financial Returns and Multiple use the Goldman Sachs analyst forecasts at the fiscal year-end at least three quarters in the future. Growth uses inputs for the fiscal year at least seven quarters in the future compared with the year at least three quarters in the future (on a per-share basis for all metrics).

For a more detailed description of how we calculate the GS Factor Profile, please contact your GS representative.

## M&A Rank

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 a 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 price target, and may or may not be discussed in research.

## Quantum

Quantum is Goldman Sachs' proprietary database providing access to detailed financial statement histories, forecasts and ratios. It can be used for in-depth analysis of a single company, or to make comparisons between companies in different sectors and markets.

## Disclosures

### Financial advisory disclosure

Goldman Sachs and/or one of its affiliates is acting as a financial advisor in connection with an announced strategic matter involving the following company or one of its affiliates: Haier Electronics Group Co., Ltd.

### Coverage group(s) of stocks by primary analyst(s)

Nicolas Yi: A-share Consumer Durables.

A-share Consumer Durables: Gree Electric Appliances Inc., Guangzhou Shangpin Home Collection, Haier Electronics Group, Haier Smart Home Co., Hangzhou Robam Appliances, Hisense Home Appliances Group (A), Hisense Home Appliances Group (H), Joyoung Co., Midea Group, Opple Home Group, Opple Lighting Co., Suofeiya Home Collection Co., Zhejiang Supor Co..

### Company-specific regulatory disclosures

The following disclosures relate to relationships between The Goldman Sachs Group, Inc. (with its affiliates, "Goldman Sachs") and companies covered by the Global Investment Research Division of Goldman Sachs and referred to in this research.

Goldman Sachs has received compensation for investment banking services in the past 12 months: Gree Electric Appliances Inc. (Rmb59.63) and Haier Smart Home Co. (Rmb17.35)

Goldman Sachs expects to receive or intends to seek compensation for investment banking services in the next 3 months: Gree Electric Appliances Inc. (Rmb59.63), Haier Electronics Group (HK\$21.95), Haier Smart Home Co. (Rmb17.35) and Midea Group (Rmb54.47)

Goldman Sachs had an investment banking services client relationship during the past 12 months with: Gree Electric Appliances Inc. (Rmb59.63), Haier Electronics Group (HK\$21.95), Haier Smart Home Co. (Rmb17.35) and Midea Group (Rmb54.47)

Goldman Sachs had a non-securities services client relationship during the past 12 months with: Gree Electric Appliances Inc. (Rmb59.63), Haier Electronics Group (HK\$21.95), Haier Smart Home Co. (Rmb17.35), Hisense Home Appliances Group (A) (Rmb10.40), Hisense Home Appliances Group (H) (HK\$8.14) and Midea Group (Rmb54.47)

Goldman Sachs makes a market in the securities or derivatives thereof: Haier Electronics Group (HK\$21.95)

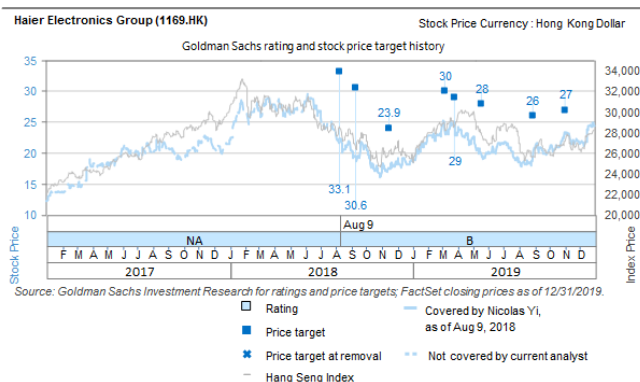
### Distribution of ratings/investment banking relationships

Goldman Sachs Investment Research global Equity coverage universe

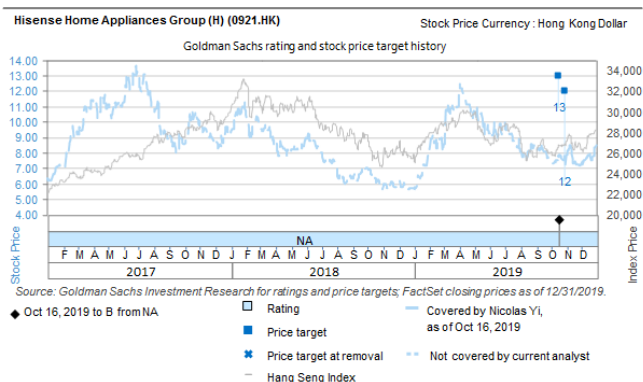
	Rating Distribution			Investment Banking Relationships		
	Buy	Hold	Sell	Buy	Hold	Sell
Global	44%	40%	16%	63%	57%	51%

As of January 1, 2020, Goldman Sachs Global Investment Research had investment ratings on 3,054 equity securities. Goldman Sachs assigns stocks as Buys and Sells on various regional Investment Lists; stocks not so assigned are deemed Neutral. Such assignments equate to Buy, Hold and Sell for the purposes of the above disclosure required by the FINRA Rules. See 'Ratings, Coverage groups and related definitions' below. The Investment Banking Relationships chart reflects the percentage of subject companies within each rating category for whom Goldman Sachs has provided investment banking services within the previous twelve months.

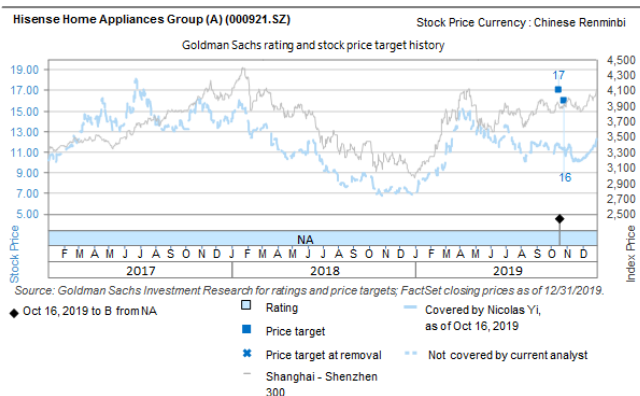
## Price target and rating history chart(s)



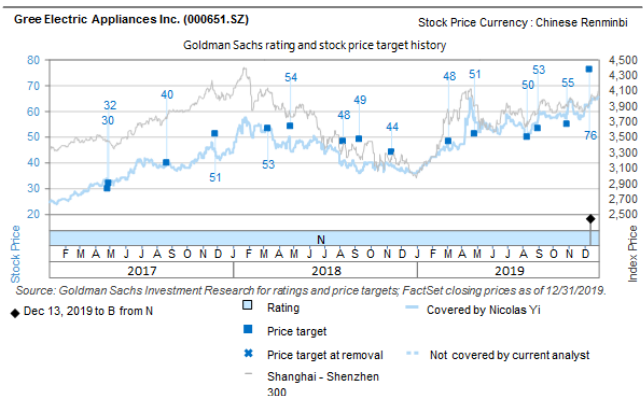
The price targets shown should be considered in the context of all prior published Goldman Sachs research, which may or may not have included price targets, as well as developments relating to the company, its industry and financial markets.



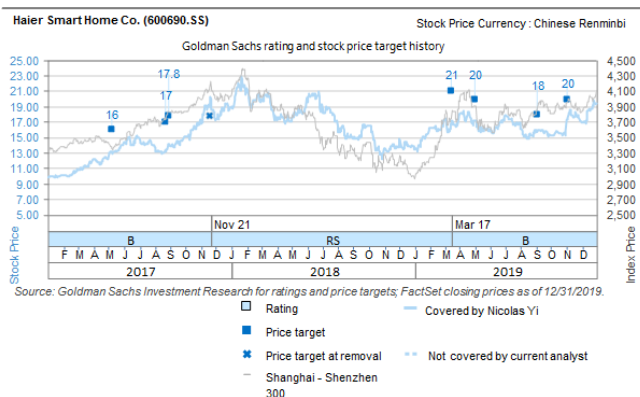
The price targets shown should be considered in the context of all prior published Goldman Sachs research, which may or may not have included price targets, as well as developments relating to the company, its industry and financial markets.



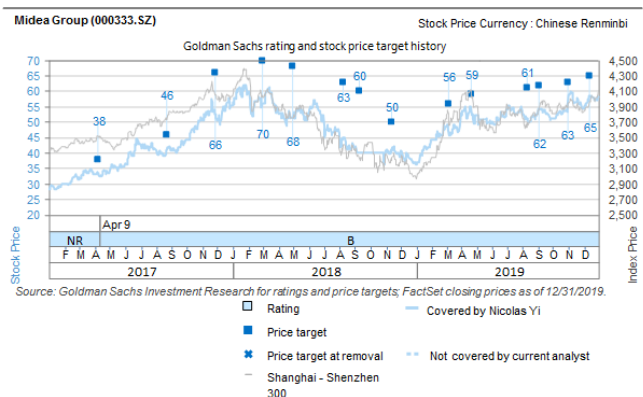
The price targets shown should be considered in the context of all prior published Goldman Sachs research, which may or may not have included price targets, as well as developments relating to the company, its industry and financial markets.



The price targets shown should be considered in the context of all prior published Goldman Sachs research, which may or may not have included price targets, as well as developments relating to the company, its industry and financial markets.



The price targets shown should be considered in the context of all prior published Goldman Sachs research, which may or may not have included price targets, as well as developments relating to the company, its industry and financial markets.



The price targets shown should be considered in the context of all prior published Goldman Sachs research, which may or may not have included price targets, as well as developments relating to the company, its industry and financial markets.

## Regulatory disclosures

### Disclosures required by United States laws and regulations

See company-specific regulatory disclosures above for any of the following disclosures required as to companies referred to in this report: manager or co-manager in a pending transaction; 1% or other ownership; compensation for certain services; types of client relationships; managed/co-managed



public offerings in prior periods; directorships; for equity securities, market making and/or specialist role. Goldman Sachs trades or may trade as a principal in debt securities (or in related derivatives) of issuers discussed in this report.

The following are additional required disclosures: **Ownership and material conflicts of interest:** Goldman Sachs policy prohibits its analysts, professionals reporting to analysts and members of their households from owning securities of any company in the analyst's area of coverage.

**Analyst compensation:** Analysts are paid in part based on the profitability of Goldman Sachs, which includes investment banking revenues. **Analyst as officer or director:** Goldman Sachs policy generally prohibits its analysts, persons reporting to analysts or members of their households from serving as an officer, director or advisor of any company in the analyst's area of coverage. **Non-U.S. Analysts:** Non-U.S. analysts may not be associated persons of Goldman Sachs & Co. LLC and therefore may not be subject to FINRA Rule 2241 or FINRA Rule 2242 restrictions on communications with subject company, public appearances and trading securities held by the analysts.

**Distribution of ratings:** See the distribution of ratings disclosure above. **Price chart:** See the price chart, with changes of ratings and price targets in prior periods, above, or, if electronic format or if with respect to multiple companies which are the subject of this report, on the Goldman Sachs website at <https://www.gs.com/research/hedge.html>.

## Additional disclosures required under the laws and regulations of jurisdictions other than the United States

The following disclosures are those required by the jurisdiction indicated, except to the extent already made above pursuant to United States laws and regulations. **Australia:** Goldman Sachs Australia Pty Ltd and its affiliates are not authorised deposit-taking institutions (as that term is defined in the Banking Act 1959 (Cth)) in Australia and do not provide banking services, nor carry on a banking business, in Australia. This research, and any access to it, is intended only for "wholesale clients" within the meaning of the Australian Corporations Act, unless otherwise agreed by Goldman Sachs. In producing research reports, members of the Global Investment Research Division of Goldman Sachs Australia may attend site visits and other meetings hosted by the companies and other entities which are the subject of its research reports. In some instances the costs of such site visits or meetings may be met in part or in whole by the issuers concerned if Goldman Sachs Australia considers it is appropriate and reasonable in the specific circumstances relating to the site visit or meeting. To the extent that the contents of this document contains any financial product advice, it is general advice only and has been prepared by Goldman Sachs without taking into account a client's objectives, financial situation or needs. A client should, before acting on any such advice, consider the appropriateness of the advice having regard to the client's own objectives, financial situation and needs. A copy of certain Goldman Sachs Australia and New Zealand disclosure of interests and a copy of Goldman Sachs' Australian Sell-Side Research Independence Policy Statement are available at: <https://www.goldmansachs.com/disclosures/australia-new-zealand/index.html>. **Brazil:** Disclosure information in relation to CVM Instruction 598 is available at <https://www.gs.com/worldwide/brazil/area/gir/index.html>. Where applicable, the Brazil-registered analyst primarily responsible for the content of this research report, as defined in Article 20 of CVM Instruction 598, is the first author named at the beginning of this report, unless indicated otherwise at the end of the text. **Canada:** Goldman Sachs Canada Inc. is an affiliate of The Goldman Sachs Group Inc. and therefore is included in the company specific disclosures relating to Goldman Sachs (as defined above). Goldman Sachs Canada Inc. has approved of, and agreed to take responsibility for, this research report in Canada if and to the extent that Goldman Sachs Canada Inc. disseminates this research report to its clients. **Hong Kong:** Further information on the securities of covered companies referred to in this research may be obtained on request from Goldman Sachs (Asia) L.L.C. **India:** Further information on the subject company or companies referred to in this research may be obtained from Goldman Sachs (India) Securities Private Limited, Research Analyst - SEBI Registration Number INH000001493, 951-A, Rational House, Appasaheb Marathe Marg, Prabhadevi, Mumbai 400 025, India, Corporate Identity Number U74140MH2006FTC160634, Phone +91 22 6616 9000, Fax +91 22 6616 9001. Goldman Sachs may beneficially own 1% or more of the securities (as such term is defined in clause 2 (h) the Indian Securities Contracts (Regulation) Act, 1956) of the subject company or companies referred to in this research report. **Japan:** See below. **Korea:** This research, and any access to it, is intended only for "professional investors" within the meaning of the Financial Services and Capital Markets Act, unless otherwise agreed by Goldman Sachs. Further information on the subject company or companies referred to in this research may be obtained from Goldman Sachs (Asia) L.L.C., Seoul Branch. **New Zealand:** Goldman Sachs New Zealand Limited and its affiliates are neither "registered banks" nor "deposit takers" (as defined in the Reserve Bank of New Zealand Act 1989) in New Zealand. This research, and any access to it, is intended for "wholesale clients" (as defined in the Financial Advisers Act 2008) unless otherwise agreed by Goldman Sachs. A copy of certain Goldman Sachs Australia and New Zealand disclosure of interests is available at: <https://www.goldmansachs.com/disclosures/australia-new-zealand/index.html>. **Russia:** Research reports distributed in the Russian Federation are not advertising as defined in the Russian legislation, but are information and analysis not having product promotion as their main purpose and do not provide appraisal within the meaning of the Russian legislation on appraisal activity. Research reports do not constitute a personalized investment recommendation as defined in Russian laws and regulations, are not addressed to a specific client, and are prepared without analyzing the financial circumstances, investment profiles or risk profiles of clients. Goldman Sachs assumes no responsibility for any investment decisions that may be taken by a client or any other person based on this research report. **Singapore:** Further information on the covered companies referred to in this research may be obtained from Goldman Sachs (Singapore) Pte. (Company Number: 198602165W). **Taiwan:** This material is for reference only and must not be reprinted without permission. Investors should carefully consider their own investment risk. Investment results are the responsibility of the individual investor. **United Kingdom:** Persons who would be categorized as retail clients in the United Kingdom, as such term is defined in the rules of the Financial Conduct Authority, should read this research in conjunction with prior Goldman Sachs research on the covered companies referred to herein and should refer to the risk warnings that have been sent to them by Goldman Sachs International. A copy of these risks warnings, and a glossary of certain financial terms used in this report, are available from Goldman Sachs International on request.

**European Union:** Disclosure information in relation to Article 6 (2) of the European Commission Delegated Regulation (EU) (2016/958) supplementing Regulation (EU) No 596/2014 of the European Parliament and of the Council with regard to regulatory technical standards for the technical arrangements for objective presentation of investment recommendations or other information recommending or suggesting an investment strategy and for disclosure of particular interests or indications of conflicts of interest is available at <https://www.gs.com/disclosures/europeanpolicy.html> which states the European Policy for Managing Conflicts of Interest in Connection with Investment Research.

**Japan:** Goldman Sachs Japan Co., Ltd. is a Financial Instrument Dealer registered with the Kanto Financial Bureau under registration number Kinsho 69, and a member of Japan Securities Dealers Association, Financial Futures Association of Japan and Type II Financial Instruments Firms Association. Sales and purchase of equities are subject to commission pre-determined with clients plus consumption tax. See company-specific disclosures as to any applicable disclosures required by Japanese stock exchanges, the Japanese Securities Dealers Association or the Japanese Securities Finance Company.

## Ratings, coverage groups and related definitions

**Buy (B), Neutral (N), Sell (S)** -Analysts recommend stocks as Buys or Sells for inclusion on various regional Investment Lists. Being assigned a Buy or Sell on an Investment List is determined by a stock's total return potential relative to its coverage. Any stock not assigned as a Buy or a Sell on an Investment List with an active rating (i.e., a stock that is not Rating Suspended, Not Rated, Coverage Suspended or Not Covered), is deemed Neutral. Each region's Investment Review Committee manages Regional Conviction lists, which represent investment recommendations focused on the size of the total return potential and/or the likelihood of the realization of the return across their respective areas of coverage. The addition or removal of stocks from such Conviction lists do not represent a change in the analysts' investment rating for such stocks.

**Total return potential** represents the upside or downside differential between the current share price and the price target, including all paid or anticipated dividends, expected during the time horizon associated with the price target. Price targets are required for all covered stocks. The total return potential, price target and associated time horizon are stated in each report adding or reiterating an Investment List membership.



**Coverage groups:** A list of all stocks in each coverage group is available by primary analyst, stock and coverage group at <https://www.gs.com/research/hedge.html>.

**Not Rated (NR).** The investment rating and target price have been removed pursuant to Goldman Sachs policy when Goldman Sachs is acting in an advisory capacity in a merger or strategic transaction involving this company and in certain other circumstances. **Rating Suspended (RS).** Goldman Sachs Research has suspended the investment rating and price target for this stock, because there is not a sufficient fundamental basis for determining, or there are legal, regulatory or policy constraints around publishing, an investment rating or target. The previous investment rating and price target, if any, are no longer in effect for this stock and should not be relied upon. **Coverage Suspended (CS).** Goldman Sachs has suspended coverage of this company. **Not Covered (NC).** Goldman Sachs does not cover this company. **Not Available or Not Applicable (NA).** The information is not available for display or is not applicable. **Not Meaningful (NM).** The information is not meaningful and is therefore excluded.

## Global product; distributing entities

The Global Investment Research Division of Goldman Sachs produces and distributes research products for clients of Goldman Sachs on a global basis. Analysts based in Goldman Sachs offices around the world produce research on industries and companies, and research on macroeconomics, currencies, commodities and portfolio strategy. This research is disseminated in Australia by Goldman Sachs Australia Pty Ltd (ABN 21 006 797 897); in Brazil by Goldman Sachs do Brasil Corretora de Títulos e Valores Mobiliários S.A.; Ombudsman Goldman Sachs Brazil: 0800 727 5764 and / or [ouvidoriagoldmansachs@gs.com](mailto:ouvidoriagoldmansachs@gs.com). Available Weekdays (except holidays), from 9am to 6pm. Ouvidoria Goldman Sachs Brasil: 0800 727 5764 e/ou [ouvidoriagoldmansachs@gs.com](mailto:ouvidoriagoldmansachs@gs.com). Horário de funcionamento: segunda-feira à sexta-feira (exceto feriados), das 9h às 18h; in Canada by either Goldman Sachs Canada Inc. or Goldman Sachs & Co. LLC; in Hong Kong by Goldman Sachs (Asia) L.L.C.; in India by Goldman Sachs (India) Securities Private Ltd.; in Japan by Goldman Sachs Japan Co., Ltd.; in the Republic of Korea by Goldman Sachs (Asia) L.L.C., Seoul Branch; in New Zealand by Goldman Sachs New Zealand Limited; in Russia by OOO Goldman Sachs; in Singapore by Goldman Sachs (Singapore) Pte. (Company Number: 198602165W); and in the United States of America by Goldman Sachs & Co. LLC. Goldman Sachs International has approved this research in connection with its distribution in the United Kingdom and European Union.

**European Union:** Goldman Sachs International authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority, has approved this research in connection with its distribution in the European Union and United Kingdom.

## General disclosures

This research is for our clients only. Other than disclosures relating to Goldman Sachs, this research is based on current public information that we consider reliable, but we do not represent it is accurate or complete, and it should not be relied on as such. The information, opinions, estimates and forecasts contained herein are as of the date hereof and are subject to change without prior notification. We seek to update our research as appropriate, but various regulations may prevent us from doing so. Other than certain industry reports published on a periodic basis, the large majority of reports are published at irregular intervals as appropriate in the analyst's judgment.

Goldman Sachs conducts a global full-service, integrated investment banking, investment management, and brokerage business. We have investment banking and other business relationships with a substantial percentage of the companies covered by our Global Investment Research Division. Goldman Sachs & Co. LLC, the United States broker dealer, is a member of SIPC (<https://www.sipc.org>).

Our salespeople, traders, and other professionals may provide oral or written market commentary or trading strategies to our clients and principal trading desks that reflect opinions that are contrary to the opinions expressed in this research. Our asset management area, principal trading desks and investing businesses may make investment decisions that are inconsistent with the recommendations or views expressed in this research.

The analysts named in this report may have from time to time discussed with our clients, including Goldman Sachs salespersons and traders, or may discuss in this report, trading strategies that reference catalysts or events that may have a near-term impact on the market price of the equity securities discussed in this report, which impact may be directionally counter to the analyst's published price target expectations for such stocks. Any such trading strategies are distinct from and do not affect the analyst's fundamental equity rating for such stocks, which rating reflects a stock's return potential relative to its coverage group as described herein.

We and our affiliates, officers, directors, and employees, excluding equity and credit analysts, will from time to time have long or short positions in, act as principal in, and buy or sell, the securities or derivatives, if any, referred to in this research.

The views attributed to third party presenters at Goldman Sachs arranged conferences, including individuals from other parts of Goldman Sachs, do not necessarily reflect those of Global Investment Research and are not an official view of Goldman Sachs.

Any third party referenced herein, including any salespeople, traders and other professionals or members of their household, may have positions in the products mentioned that are inconsistent with the views expressed by analysts named in this report.

This research is not an offer to sell or the solicitation of an offer to buy any security in any jurisdiction where such an offer or solicitation would be illegal. It does not constitute a personal recommendation or take into account the particular investment objectives, financial situations, or needs of individual clients. Clients should consider whether any advice or recommendation in this research is suitable for their particular circumstances and, if appropriate, seek professional advice, including tax advice. The price and value of investments referred to in this research and the income from them may fluctuate. Past performance is not a guide to future performance, future returns are not guaranteed, and a loss of original capital may occur. Fluctuations in exchange rates could have adverse effects on the value or price of, or income derived from, certain investments.

Certain transactions, including those involving futures, options, and other derivatives, give rise to substantial risk and are not suitable for all investors. Investors should review current options and futures disclosure documents which are available from Goldman Sachs sales representatives or at <https://www.theocc.com/about/publications/character-risks.jsp> and [https://www.fiadocumentation.org/fia/regulatory-disclosures\\_1/fia-uniform-futures-and-options-on-futures-risk-disclosures-booklet-pdf-version-2018](https://www.fiadocumentation.org/fia/regulatory-disclosures_1/fia-uniform-futures-and-options-on-futures-risk-disclosures-booklet-pdf-version-2018). Transaction costs may be significant in option strategies calling for multiple purchase and sales of options such as spreads. Supporting documentation will be supplied upon request.

**Differing Levels of Service provided by Global Investment Research:** The level and types of services provided to you by the Global Investment Research division of GS may vary as compared to that provided to internal and other external clients of GS, depending on various factors including your individual preferences as to the frequency and manner of receiving communication, your risk profile and investment focus and perspective (e.g., marketwide, sector specific, long term, short term), the size and scope of your overall client relationship with GS, and legal and regulatory constraints. As an example, certain clients may request to receive notifications when research on specific securities is published, and certain clients may request that specific data underlying analysts' fundamental analysis available on our internal client websites be delivered to them electronically through data feeds or otherwise. No change to an analyst's fundamental research views (e.g., ratings, price targets, or material changes to earnings estimates for equity securities), will be communicated to any client prior to inclusion of such information in a research report broadly disseminated through electronic publication to our internal client websites or through other means, as necessary, to all clients who are entitled to receive such reports.

All research reports are disseminated and available to all clients simultaneously through electronic publication to our internal client websites. Not all research content is redistributed to our clients or available to third-party aggregators, nor is Goldman Sachs responsible for the redistribution of our

research by third party aggregators. For research, models or other data related to one or more securities, markets or asset classes (including related services) that may be available to you, please contact your GS representative or go to <https://research.gs.com>.

Disclosure information is also available at <https://www.gs.com/research/hedge.html> or from Research Compliance, 200 West Street, New York, NY 10282.

© 2020 Goldman Sachs.

**No part of this material may be (i) copied, photocopied or duplicated in any form by any means or (ii) redistributed without the prior written consent of The Goldman Sachs Group, Inc.**