

BHP Group Ltd. (BHP.AX): 3Q FY21 result: Positive updates to FY21 iron ore, copper & oil guidance, Escondida copper production raised; Buy

BHP reported better than expected oil, met coal, copper and iron ore production for the March Q (vs. GSe). Some positive adjustments have been made to FY21 production guidance, most of which we already capture, with Escondida copper production upgraded (and cost guidance lowered), and now expected to be flat in FY22 (previously guided down), iron ore and oil to be at the upper end of the FY21 range, but coal (met and thermal) downgraded (to in-line with GSe) on wet weather and weak demand, and other copper (Spence ramp-up) trimmed slightly. We forecast -3% production growth (in Cu Eq terms) in FY21 but 3-6% growth in FY22/23 with the ramp-up of Spence hypogene copper in Chile together with production from several new conventional oil projects.

On growth, the Spence sulphide concentrator (increasing Spence copper production by >100ktpa to c. 300ktpa for 4 years) will take a touch longer to ramp-up (12 months and by end-2021), oil growth projects (Atlantis and Mad Dog II) are tracking ahead of schedule, and Jansen potash is on track for board approval in mid-21 (in GSe base case).

Key takeaways

- **Iron ore:** Pilbara production decreased 5% QoQ to 67Mt (in-line with GSe) with strong performances from Yandi and Jimblebar offset by weaker than expected production from Newman and Mining Area C. The South Flank mine starts commissioning in the June Q. Shipments decreased 7% QoQ to 66Mt (-1% vs. GSe 66.9Mt), Samarco shipments also began during the Q. **Pilbara shipments are expected to be at the upper end of 276-286Mt guidance range (GSe 284Mt).**
- **Copper** -9% QoQ to 391kt (but +3% vs. GSe) driven by a well flagged 13% drop in copper from Escondida on lower mill throughput. Olympic Dam and Antamina performed strongly and were in line with GSe. Escondida copper production has been upgraded by c. 30kt to 1,010-1,060kt (GSe was at 1,033kt, now 1,054kt), and cost guidance lowered by c. US10c to US95c-110c/lb net credits (GSe now US101c/lb). Also, Escondida copper production is now expected to be broadly flat in FY22 (previously guided down on lower grades), which will help offset smelter maintenance at Olympic Dam in 1H FY22. Olympic Dam and Antamina are expected to be at the top end of guidance for FY21. **FY21 group copper**

Paul Young
+61(2)9321-8302 | paul.young1@gs.com
Goldman Sachs Australia Pty Ltd

Matt Greene
+61(2)9321-8306 | matt.greene@gs.com
Goldman Sachs Australia Pty Ltd

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. Analysts employed by non-US affiliates are not registered/qualified as research analysts with FINRA in the U.S.

guidance has been increased to 1,535-1,660kt (GSe 1,633kt, was 1,611kt).

- **Petroleum** +7% QoQ to 25.4Mmboe and in line with GSe, with the Ruby/Delaware tie-in to the Angostura platform at T&T taking place during the March Q. On growth, the Mad Dog 2 semi-sub platform was delivered to the US, with first production expected in mid-CY22 (prior guidance has been CY22). The Invictus exploration drill rig is currently focused on tie-in opportunities around the Shenzi platform in the GoM, with two infill holes planned for the June Q. We endorse high returning conventional growth opportunities leveraging off BHP's increased interest in the Shenzi platform (72% from 44%) and export infrastructure. Oil exploration spend was also lowered by US\$50mn to US\$400mn. **FY21 guidance is now expected to be at the upper end of 95-102Mmboe (GSe 102Mmboe)**, which includes the recent Shenzi acquisition and first production from Atlantis Phase 3, mostly offsetting increased hurricane activity in the GoM.
- **Coal: Old met coal** production was up 1% QoQ at 9.6Mt and 4% above GSe. **Guidance has been lowered to 39-41Mt from 40-44Mt (GSe 39Mt, down from 40Mt)** due to wet weather, maintenance and likely scaling back of some volumes given the current pricing environment in our view. **Thermal production** was weak, whilst up 34% QoQ on labour strikes in the Dec Q, the March Q missed GSe by -18% and -17% YoY on wet weather at Mt Arthur and continued labour issues at Cerrejon at Colombia. **FY21 guidance has been further reduced to 18-20Mt (GSe 18Mt, down from 21Mt).**

EPS/NAV changes and Investment Thesis

We increase our FY22-FY23 EPS by 2%/3% on higher copper production and lower costs at Escondida vs. our prior forecasts. This results in our NAV increasing 1% to A\$49.4/sh. We raise our 12m TP slightly to A\$54.2/sh (from A\$53.5/sh).

We **retain our Buy rating on BHP on: (1) Strong earnings growth and FCF:** We forecast a c. 50% increase in EBITDA and a doubling of FCF in FY21 (equating to c. 10% FCF yield), driven by our positive view on met coal, copper and oil prices. **(2) Strong production growth:** BHP's group Cu Eq production should increase by 3-4% (at GS LR prices) in FY22 and 6-7% in FY23, driven by a +250-270kt lift in copper volumes from Spence and Escondida, +5Mt of met coal with rebounding demand, and 10MMboe of oil volumes with new production from Mad Dog II and Atlantis Phase 3, and the recent 28% acquisition of Shenzi. BHP will likely also see a significant margin and FCF kicker in the Pilbara from the high grade South Flank deposit. BHP also has fewer Section 18s in the Pilbara under the WA Heritage Act and Traditional Owner Groups than RIO and FMG; we therefore see BHP better placed in the event of any change to WA Heritage laws and the possible impact on current and future mine approvals in the Pilbara. Longer term, we have a positive view on BHP's organic growth options, particularly in oil where we see possible 50% volume growth to +150MMboe driven by Trion, Calypso (formerly T&T North), Shenzi North (formerly Wildling), and Scarborough, and **(3) Potential benefits from ongoing portfolio optimisation:** Ongoing with the announcement to divest thermal and weak coking coal, and Bass Strait gas.

Exhibit 1: BHP operating and financial summary

Commodity and FX assumptions		2019	2020	2021E	2022E	2023E	2024E	2025E	BHP 12m TP	US\$/sh	A\$/sh					
AUD:USD	x	0.72	0.67	0.75	0.76	0.75	0.72	0.72	NAV	34.60	49.4					
USD:CLP	x	674	772	746	718	773	827	827	NTM EV/EBITDA	41.21	58.9					
Iron ore fines (CFR, 62% Fe)	US\$/t	80	93	141	106	88	77	74	Target Price (BHP.AX)		54.2					
Oil - Brent	US\$/bbl	69	51	56	76	68	65	70	Current Share Price		47.5					
Oil - WTI	US\$/bbl	61	47	54	73	64	59	64	Upside / (Downside)		14%					
US Natural Gas	US\$/Mmbtu	3.01	2.05	2.33	2.30	3.12	3.16	3.21	GS Recommendation		BUY					
Copper	US\$/lb	279	257	359	505	541	497	453	SOTP NAV Valuation	US\$/bn	US\$/sh	A\$/sh				
Coking coal (Prem. HCC)	US\$/t	206	145	123	158	158	159	158	Petroleum (conventional)	27.5	5.5	7.8				
Semi-soft coking coal	US\$/t	115	77	78	88	91	92	93	Copper	53.4	10.6	15.1				
Thermal coal (6,000kcal)	US\$/t	99	64	76	78	75	75	76	Iron Ore	94.9	18.8	26.9				
Potash	US\$/t	231	249	244	367	370	385	395	Queensland Met Coal	16.0	3.2	4.5				
Energy Coal	US\$/t	27	23	18	24	26	26	26	Nickel West	1.5	0.3	0.4				
CuEq Prod. (GS LR prices)	Mt	5.40	5.34	5.19	5.40	5.77	5.80	5.68	Jansen	3.7	0.7	1.1				
CuEq YoY %	%	(1.2%)	(1.0%)	(2.9%)	4.1%	6.9%	0.6%	(2.0%)	Divisional Subtotal	198.2	39.3	56.2				
Unit Costs	US\$/lb	1.14	1.02	1.01	1.18	0.99	0.96	0.98	Corporate	(3.5)	(0.7)	(1.0)				
Escondida	US\$/lb	1.14	1.02	1.01	1.18	0.99	0.96	0.98	Provisions & Rehab	(13.1)	(2.6)	(3.7)				
WAIO (100%)	US\$/t	14.2	12.6	14.6	14.7	15.0	14.9	15.3	Exploration (expense)	(3.6)	(0.7)	(1.0)				
Met coal	US\$/t	69	68	82	77	75	72	74	Exploration (success)	4.0	0.8	1.1				
Energy coal	US\$/t	51	58	71	65	60	57	57	Total Corporate	182.0	36.1	51.6				
Financial summary	Units	2019	2020	2021E	2022E	2023E	2024E	2025E	Net (Debt)/Cash	(7.6)	(1.5)	(2.2)				
Revenue	US\$/bn	44.7	43.7	57.4	60.4	61.3	57.0	53.7	BHP NAV (8.9%)	174.4	34.6	49.4				
Underlying EBITDA	US\$/bn	23.2	22.1	34.8	36.9	37.7	33.9	30.5	EV/EBITDA Scorecard							
Margin	%	52%	50%	61%	61%	62%	59%	57%	Median sector multiple		5.5x					
Underlying earnings	US\$/bn	9.5	9.1	16.2	17.5	17.1	15.1	13.4	Financial metrics							
EPS (pre exceptionals)	US/cps	183	179	320	354	348	308	273	Gearing (high or low)			Positive				
EPS growth	%	1%	(2%)	79%	11%	(2%)	(11%)	(11%)	EPS growth (high or low)			Positive				
DPS (inc. specials)	US/cps	235	120	242	248	209	185	164	FCF growth (high or low)			Positive				
Payout ratio	%	129%	67%	75%	70%	60%	60%	60%	Capital management outlook			Positive				
Dividend yield	%	7.1%	3.6%	7.3%	7.5%	6.3%	5.6%	4.9%	ROCE (high or low)			Positive				
Cash flow	US\$/bn	16.8	15.1	25.3	25.9	27.4	24.0	21.8	Operating metrics							
Operating cash flow (OCF)	US\$/bn	16.8	15.1	25.3	25.9	27.4	24.0	21.8	Mine life (>10 yrs)			Positive				
Capex (incl. exploration)	US\$/bn	(6.6)	(7.1)	(7.2)	(8.0)	(8.3)	(8.3)	(9.2)	Cost/margin position			Positive				
Acquisitions and divestments	US\$/bn	(0.1)	0.1	(0.0)	(0.1)	(0.1)	(0.1)	0.0	CuEq growth - 2yr outlook			Positive				
FCF - excluding dividends	US\$/bn	10.0	8.1	17.6	17.9	19.0	15.6	12.6	Operating/sovereign risks			Positive				
FCF yield	%	5.8%	4.7%	10.2%	10.4%	11.0%	9.1%	7.3%	Adjusted multiple		6.0x					
Dividends (inc minorities)	US\$/bn	(12.6)	(7.9)	(9.5)	(15.8)	(14.4)	(13.2)	(11.6)	US\$/bn	2021E	2022E	NTM				
Buybacks and shares issued	US\$/bn	(5.4)	(0.1)	(0.2)	(4.1)	(0.1)	(0.1)	(0.1)	NTM EBITDA split	50%	50%					
FCF - before debt	US\$/bn	(8.0)	0.0	7.8	(2.0)	4.5	2.3	0.9	EBITDA	34.8	36.9	35.9				
Balance sheet and Returns	US\$/bn	2019	2020	2021E	2022E	2023E	2024E	2025E	Valuation	US\$/bn	US\$/sh	A\$/sh				
Net Debt/(Cash)	US\$/bn	9.4	12.0	6.0	9.2	5.9	3.7	3.0	NTM EBITDA	35.9						
Gearing (ND/ND+E)	%	15%	21%	11%	15%	10%	7%	6%	EV/EBITDA	6.0x						
Leverage ratio (ND/EBITDA)	x	0.4x	0.5x	0.2x	0.2x	0.2x	0.1x	0.1x	Enterprise value	215.3	42.7	61.0				
ROA	%	10.2%	9.3%	14.6%	17.8%	16.9%	14.4%	12.4%	Net (debt)/cash	(7.6)						
ROCE	%	16.6%	16.7%	26.5%	29.1%	27.6%	23.2%	19.7%	Equity Value	207.7	41.2	58.9				
Total Shares O/S	bn	5.05	5.05	5.04	4.91	4.91	4.90	4.90	BHP Divisional NPV Breakdown							
Divisional EBITDA	US\$/bn	2019	2020	2021E	2022E	2023E	2024E	2025E	Iron Ore, 94.9, 48%							
Petroleum (conventional)	US\$/bn	3.8	2.2	2.6	4.1	4.1	3.9	3.9	Queensland Met Coal, 16.0, 8%							
Copper	US\$/bn	4.6	4.3	8.4	13.3	17.2	15.4	13.1	Energy Coal, 1.2, 0%							
Iron ore	US\$/bn	10.2	14.5	23.2	17.4	13.8	11.8	11.0	Nickel West, 1.5, 1%							
Coal	US\$/bn	4.1	1.6	0.2	1.9	2.2	2.5	2.4	Jansen, 3.7, 2%							
Group and other	US\$/bn	0.6	(0.6)	0.5	0.2	0.4	0.3	0.0	Petroleum (conventional), 27.5, 14%							
Total underlying EBITDA	US\$/bn	23.2	22.1	34.8	36.9	37.7	33.9	30.5	BHP Divisional FY22 EBITDA Breakdown							
Divisional Capex	US\$/bn	2019	2020	2021E	2022E	2023E	2024E	2025E	Iron ore, 17.4, 48%							
Petroleum (conventional)	US\$/bn	0.6	0.9	1.3	2.1	2.8	3.0	4.0	Copper, 13.3, 36%							
Copper	US\$/bn	2.7	2.3	2.3	2.2	1.9	1.5	1.5	Coal, 1.9, 5%							
Iron ore	US\$/bn	1.6	2.3	2.2	1.6	1.4	1.4	1.4	Petroleum (conventional), 4.1, 11%							
Coal	US\$/bn	0.7	0.6	0.6	0.8	0.7	0.6	0.5	GSe Divisional Capex Forecast							
Group/other (includes Jansen, Nickel)	US\$/bn	0.6	0.6	0.6	1.2	1.4	1.4	1.4	2019	7.1	7.5	7.6	8.5	8.9	8.6	9.5
Exploration	US\$/bn	0.9	0.7	0.6	0.7	0.7	0.6	0.6	Petroleum (conventional)	0.6	0.9	1.3	2.1	2.8	3.0	4.0
Total capex	US\$/bn	7.1	7.5	7.6	8.5	8.9	8.6	9.5	Iron ore	2.7	2.3	2.3	2.2	1.9	1.5	1.5
Guidance			<8	7.3	8.5				Coal	0.6	0.6	0.6	0.8	0.7	0.6	0.5
									Group/other (includes Jansen, Nickel)	0.6	0.6	0.6	1.2	1.4	1.4	1.4
									Exploration	0.9	0.7	0.6	0.7	0.7	0.6	0.6

Source: Company data, Goldman Sachs Global Investment Research

3Q FY21 key figures

Exhibit 2: BHP 3Q FY21 operating result vs GSe

		Mar'20	Jun'20	Sep'20	Dec'20	Mar'21		QoQ	PcP	vs. GSe
		Act	Act	Act	Act	Act	GSe	Diff	Diff	Diff
Conventional Petroleum	Mmboe	25.0	26.3	26.7	23.8	25.4	25.2	7%	1%	1%
Copper	kt	425	414	413	428	391	379	(9%)	(8%)	3%
Escondida	kt	290	294	285	288	249	234	(13%)	(14%)	6%
Other Copper	kt	136	120	129	141	142	145	1%	5%	(2%)
Iron ore	Mt	60.0	66.7	66.0	62.4	59.9	59.0	(4%)	(0%)	2%
WAIO (100%) - Production	Mt	68.2	75.6	74.2	70.4	66.7	66.9	(5%)	(2%)	(0%)
WAIO (100%) - Shipped	Mt	68.4	77.0	73.4	70.8	66.0	66.9	(7%)	(4%)	(1%)
Metallurgical Coal	Mt	9.2	11.6	9.7	9.5	9.6	9.3	1%	4%	4%
Energy Coal	Mt	5.8	5.7	4.7	3.6	4.8	5.9	34%	(17%)	(18%)

Source: Company data, Goldman Sachs Global Investment Research

Exhibit 3: FY21 production guidance vs GSe

Division	Units	FY19	FY20	FY21E		
		Act	Act	GSe previous	GSe revised	Guidance
Conventional petroleum	Mmboe	121	109	102	102	95-102
Copper	kt	1,689	1,724	1,611	1,633	1535-1660
Escondida	kt	1,135	1,185	1,033	1,054	1010-1060
Other Copper	kt	554	539	578	579	540-615
Iron Ore	Mt	238	248	253	253	245-255
WAIO (100%)	Mt	270	281	284	284	276-286
Met Coal	Mt	42	41	40	39	39-41
Energy Coal	Mt	27	23	21	18	18-20

Source: Company data, Goldman Sachs Global Investment Research

EPS and NAV changes, investment risks

- We increase our FY22-FY23 EPS by 2%/3% on higher copper production and lower costs at Escondida vs. our prior estimates. This results in our NAV increasing 1% to A\$49.4/sh. We raise our 12m TP slightly to A\$54.2/sh (from A\$53.5/sh); set at an equal blend of NAV at EV/EBITDA with an unchanged target multiple of 6x.

Exhibit 4: BHP.AX TP, NAV and earnings revisions

YE	Crncy	Rating	Target Price A\$/sh	NAV A\$/sh	EBITDA (\$bn)			EPS (cps)		
					2021	2022	2023	2021	2022	2023
BHP	June	USD	Previous	48.8	34.76	36.08	36.97	321	346	339
			Current	54.2	34.85	36.91	37.70	320	354	348
			% Change	-	0%	2%	2%	0%	2%	3%

Source: Company data, Goldman Sachs Global Investment Research

- **Downside Risk:** Stronger AUD, weaker commodity prices, higher costs, production output issues. Project execution (Spence, Mad Dog II, South Flank, Olympic Dam, Jansen). M&A: potentially value destructive.

BHP.AX12m Price Target: **A\$54.20**Price: **A\$47.45**Upside: **14.2%****Buy****GS Forecast**

Market cap: A\$239.5bn / \$185.6bn	Revenue (\$ mn) New	6/20	6/21E	6/22E	6/23E
Enterprise value: A\$286.0bn / \$221.7bn	Revenue (\$ mn) Old	43,708.0	57,403.2	60,411.3	61,278.3
3m ADTV: A\$289.9mn / \$223.9mn	EBITDA (\$ mn)	13,480.0	32,711.0	36,347.4	37,264.8
Australia	EPS (\$) New	1.79	3.20	3.54	3.48
ANZ Resources	EPS (\$) Old	1.79	3.21	3.46	3.39
M&A Rank: 3	FCF yield (%)	5.3	8.2	7.6	8.0
Leases incl. in net debt & EV?: Yes	Dividend yield (%)	4.9	6.6	6.7	5.7
	EV/EBITDA (X)	7.4	6.4	6.1	6.0
	ROCE (%)	16.7	26.5	29.1	27.6
		12/20	6/21E	12/21E	6/22E
	EPS (\$)	1.19	2.01	1.84	1.70

Source: Company data, Goldman Sachs Research estimates, FactSet. Price as of 20 Apr 2021 close.

Disclosure Appendix

Reg AC

We, Paul Young and Matt Greene, hereby certify that all of the views expressed in this report accurately reflect our personal views about the subject company or companies and its or their securities. We also certify that no part of our compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed in this report.

Unless otherwise stated, the individuals listed on the cover page of this report are analysts in Goldman Sachs' Global Investment Research division.

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: BHP Group Limited

The rating(s) for BHP Group Ltd. is/are relative to the other companies in its/their coverage universe:

Alumina, BHP Group Ltd., Champion Iron Ltd., Coronado Global Resources Inc., Deterra Royalties Ltd., Evolution Mining Ltd., Fortescue Metals Group, IGO Ltd., Iluka Resources, Mineral Resources, New Hope Corp., Newcrest Mining, Northern Star Resources Ltd., OZ Minerals Ltd., OceanaGold, Regis Resources, Resolute Mining, Rio Tinto Ltd., Sandfire Resources, South32 Ltd, St. Barbara, Western Areas, Whitehaven Coal Ltd.

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: BHP Group Ltd. (A\$47.45)

Goldman Sachs expects to receive or intends to seek compensation for investment banking services in the next 3 months: BHP Group Ltd. (A\$47.45)

Goldman Sachs had an investment banking services client relationship during the past 12 months with: BHP Group Ltd. (A\$47.45)

Goldman Sachs had a non-securities services client relationship during the past 12 months with: BHP Group Ltd. (A\$47.45)

A director and/or employee of Goldman Sachs is a director: BHP Group Ltd. (A\$47.45)

Goldman Sachs makes a market in the securities or derivatives thereof: BHP Group Ltd. (A\$47.45)

Goldman Sachs is a specialist in the relevant securities and will at any given time have an inventory position, "long" or "short," and may be on the opposite side of orders executed on the relevant exchange: BHP Group Ltd. (A\$47.45)

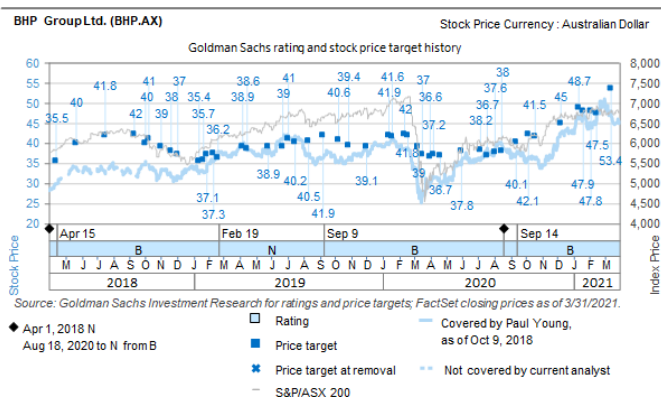
Distribution of ratings/investment banking relationships

Goldman Sachs Investment Research global Equity coverage universe

	Rating Distribution			Investment Banking Relationships		
	Buy	Hold	Sell	Buy	Hold	Sell
Global	52%	35%	13%	65%	58%	50%

As of April 1, 2021, Goldman Sachs Global Investment Research had investment ratings on 3,027 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 universe 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.

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:** Goldman Sachs (Singapore) Pte. (Company Number: 198602165W), which is regulated by the Monetary Authority of Singapore, accepts legal responsibility for this research, and should be contacted with respect to any matters arising from, or in connection with, this research. **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 and United Kingdom: 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 (including as that Delegated Regulation is implemented into United Kingdom domestic law and regulation following the United Kingdom's departure from the European Union and the European Economic Area) 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 universe 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 universe. 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 Universe: A list of all stocks in each coverage universe is available by primary analyst, stock and coverage universe 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. Available Weekdays (except holidays), from 9am to 6pm. Ouvidoria Goldman Sachs Brasil: 0800 727 5764 e/ou 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.

Effective from the date of the United Kingdom's departure from the European Union and the European Economic Area ("Brexit Day") the following information with respect to distributing entities will apply:

Goldman Sachs International ("GSI"), authorised by the Prudential Regulation Authority ("PRA") and regulated by the Financial Conduct Authority ("FCA") and the PRA, has approved this research in connection with its distribution in the United Kingdom.

European Economic Area: GSI, authorised by the PRA and regulated by the FCA and the PRA, disseminates research in the following jurisdictions within the European Economic Area: the Grand Duchy of Luxembourg, Italy, the Kingdom of Belgium, the Kingdom of Denmark, the Kingdom of Norway, the Republic of Finland, Portugal, the Republic of Cyprus and the Republic of Ireland; GS - Succursale de Paris (Paris branch) which, from Brexit Day, will be authorised by the French Autorité de contrôle prudentiel et de résolution ("ACPR") and regulated by the Autorité de contrôle prudentiel et de résolution and the Autorité des marchés financiers ("AMF") disseminates research in France; GSI - Sucursal en España (Madrid branch) authorized in Spain by the Comisión Nacional del Mercado de Valores disseminates research in the Kingdom of Spain; GSI - Sweden Bankfilial (Stockholm branch) is authorized by the SFSa as a "third country branch" in accordance with Chapter 4, Section 4 of the Swedish Securities and Market Act (Sw. lag (2007:528) om värdepappersmarknaden) disseminates research in the Kingdom of Sweden; Goldman Sachs Bank Europe SE ("GSBE") is a credit institution incorporated in Germany and, within the Single Supervisory Mechanism, subject to direct prudential supervision by the European Central

Bank and in other respects supervised by German Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht, BaFin) and Deutsche Bundesbank and disseminates research in the Federal Republic of Germany and those jurisdictions within the European Economic Area where GSI is not authorised to disseminate research and additionally, GSBE, Copenhagen Branch filial af GSBE, Tyskland, supervised by the Danish Financial Authority disseminates research in the Kingdom of Denmark; GSBE - Sucursal en España (Madrid branch) subject (to a limited extent) to local supervision by the Bank of Spain disseminates research in the Kingdom of Spain; GSBE - Succursale Italia (Milan branch) to the relevant applicable extent, subject to local supervision by the Bank of Italy (Banca d'Italia) and the Italian Companies and Exchange Commission (Commissione Nazionale per le Società e la Borsa "Consob") disseminates research in Italy; GSBE - Succursale de Paris (Paris branch), supervised by the AMF and by the ACPR disseminates research in France; and GSBE - Sweden Bankfilial (Stockholm branch), to a limited extent, subject to local supervision by the Swedish Financial Supervisory Authority (Finansinspektionen) disseminates research in the Kingdom of Sweden.

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 universe 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. 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.

© 2021 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.