# **Dil** Short-term defensive cut sets the stage for a tight oil market

The first monthly OPEC+ meeting to decide on the group's production ended with an unexpected two-month agreement: (1) Saudi announced an unexpected and unilateral production cut of 1 mb/d in February and March, (2) Russia and Kazakhstan will instead increase output modestly to meet seasonal needs while (3) other producers will remain at their January levels. Despite this bullish supply agreement, we believe Saudi's decision likely reflects signs of weakening demand as lockdowns return, with our updated 1Q21 balance actually weaker than previously. Saudi's action and the prospect for a tight market in 2Q21, as the rebound in demand stresses the ability to restart production, will likely support prices in coming weeks, leading us to reiterate our bullish oil view. We continue to recommend a long Dec-21 Brent trade (currently trading at \$52/bbl vs. our \$65/bbl forecast) and expect sustained backwardation and lower implied volatility. Fundamentals do matter, but we see the recent recovery in refining margins and product cracks as premature and the best way to express the expected weakness in near-term oil demand.

- The most significant decision was Saudi's pre-emptive measure to reduce output in the face of renewed lockdowns with OPEC+ production now expected below our prior forecast by 1.45 mb/d in February and 1.85 mb/d in March. Saudi's decision surprised as global demand beat expectations in December on shallower and shorter EU lockdowns and resilient jet demand. Further, by allowing Russia to increase production, Saudi undermined its efforts since April to have every producer implement similar cuts, with the Kingdom solely taking a fiscal hit. Finally, by lifting prices to their highest levels since last March, it risks extending the ongoing recovery in shale production, as WTI spot prices now at \$50/bbl can allow for higher activity and positive free cash flows (although such a response would likely take time to materialize with producers cautious of further OPEC surprises).
- This leaves a large expected slowdown in global oil demand as the most rational explanation for Saudi's cut, likely signaled through its term contract to Asian consumers where infections are rising quickly (Korea, Japan, South-East Asia). Our high-frequency of oil demand suggests indeed that the return of more aggressive lockdowns is already weighing on demand (although the seasonal drop in oil demand early each year makes for a difficult assessment of daily data). We are reflecting these headwinds in our balance, taking down January and February oil demand to 92.5 mb/d from an upward revised December

#### Damien Courvalin +1(212)902-3307 | damien courvalin@gs.cou

damien.courvalin@gs.com Goldman Sachs & Co. LLC

#### Jeffrey Currie +44(20)7552-7410 |

jeffrey.currie@gs.com Goldman Sachs International

#### Callum Bruce +1(212)902-3053 | callum.bruce@gs.com Goldman Sachs & Co. LLC

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 <a href="https://www.gs.com/research/hedge.html">www.gs.com/research/hedge.html</a>.

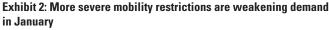
demand level of 93.5 mb/d. From a geopolitical perspective, the transition to a likely less supportive US administration may also have led Saudi to adopt a more supportive stance towards other Middle East producers, as illustrated in both today's unilateral cut and restoration of ties with Qatar.

Our updated 1Q21 balance is weaker than previously although with prospects for a tighter market in 2Q21. This new OPEC+ path and our demand downgrade lead us forecast a 1Q21 0.25 mb/d surplus vs. a commensurate deficit previously (only half offset by a tighter December). Importantly, OPEC+ March production level will still be low just as global demand starts rebounding sharply driven by warmer weather and rising vaccinations. This points to the group potentially struggling to ramp-up output quickly enough, with our balance currently reflecting a 1.3 mb/d deficit in April-July despite OPEC+ increasing production by 4 mb/d, a historically tall order. Net, we believe today's outcome will help support prices in the face of demand risks given Saudi's commitment to balance the market, the potential for them to cut more than demand actually disappoints, risks of a tighter 2Q21 balance and a growing consensus (Bloomberg) bullish outlook for crude fundamentals later this year. Our own year-end Brent forecast of \$65/bbl is still well above market forwards and consensus expectations.

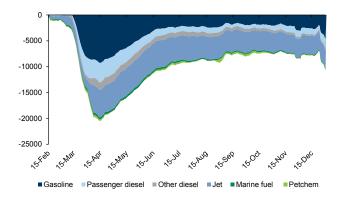
Global oil stocks vs 31-Dec-19 levels (mb) 1200 1000 800 600 400 200 May 20 Jun-20 111-20 AUG'20 Septo APT-20 octra Ŷ Landed products Crude on water Landed crude Products on water -- Tota

Exhibit 1: Despite lockdowns, stock draws continued through all of

Source: Kpler, Kayrros, EIA, PJK ARA, PAJ, IE Singapore, Goldman Sachs Global Investment Research



Demand impact of COVID-19 relative to counterfactual path (kb/d)

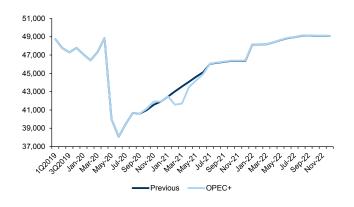


Source: Google COVID-19 Community Mobility Reports, Reuters, OAG, Kpler, IIR, Goldman Sachs Global Investment Research

4020

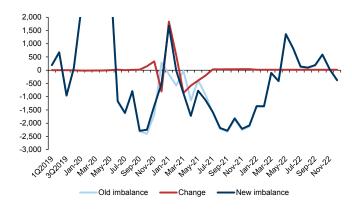
0il

**Exhibit 3: We expect OPEC+ to reach similar production 3021 levels but with a much larger and challenging ramp-up needed in 2021** OPEC+ production (kb/d)



Source: IEA, OPEC, Reuters, OPEC, Goldman Sachs Global Investment Research

**Exhibit 5: Prolonged OPEC cuts will offset the weaker 1021 demand** GS global oil imbalance (kb/d)



Source: IEA, Woodmac, Kpler, Google COVID-19 Community Mobility Reports, Apple, National sources, JODI, Goldman Sachs Global Investment Research

# Exhibit 6: GS Summary oil balance

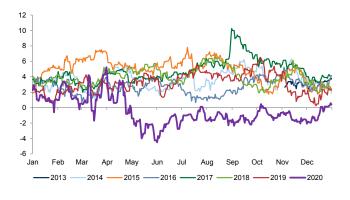
kb/d

	102019	202015	30,2019	4Q2019	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	lar-22 .	Apr-22 M	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Old supply		100,022	100,078	101,422	100,573	99,819	100,544	100,422	88,086	88,046	90,467	91,298	90,827	91,367	92,117	92,968	93,648	94,275	94,928	95,439	96,035	97,018	98,261	98,396	98,050	98,785	99,024	98,970	100,766	100,936 1	01,084 1	101,508 1	02,059 1	102,658	103,080	103,366	102,933	103,432	103,557 :	103,457
OPEC+ ex Saud	. 0	) (	) (	-3	-13	-14	-11	-11	0	19	0	12	18	148	370	5	36	-302	-587	-414	-275	-137	31	33	35	37	39	40	17	18	18	18	18	18	15	15	15	18	18	18
Saudi	0		) (	0 0	0	0	0	0	0	0	0	0	2	4	-37	-9	0	-1,143	-1,272	-168	-116	-65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Net change	0		) (	-3	-13	-14	-11	-11	0	19	0	12	20	152	333	-4	36	-1,445	-1,859	-583	-392	-201	31	33	35	37	39	40	17	18	18	18	18	18	15	15	15	18	18	18
New supply	100,016	100,022	100,078	101,419	100,560	99,805	100,533	100,411	88,086	88,065	90,467	91,310	90,847	91,518	92,449	92,964	93,683	92,830	93,068	94,856	95,643	96,816	98,292	98,430	98,085	98,822	99,062	99,010	100,783	100,955 1	01,102 1	101,526 1	02,077 1	102,676	103,095	103,381	102,948	103,450	103,575	103,475
Old demand	99 822	99.349	101 036	101.343	98 273	95 628	91 991	80 432	84 541	89 235	92 083	92 099	93 135	93 767	93 789	92 672	93 803	94 847	94 948	96 578	96.416	97 941	99 870	100 613	100.368	100 640	101 275	101 096	102 138	102 316 1	01 201 1	101 935 1	100 714	101 854	102 957	103 282	102 755	102 859	103 543	103 850
Change																800		-2000																						
New demand	99,822	99,349	9 101,036	101,343	98,273	95,628	91,991	80,432	84,541	89,235	92,083	92,099	93,135	93,767	93,789	93,472	92,003	92,847	93,948	96,578	96,416	97,941	99,870	100,613	100,368	100,640	101,275	101,096	102,138	102,316 1	01,201 1	101,935 1	00,714 1	101,854	102,957	103,282	102,755	102,859	103,543	103,850
Old imbalance	194	673	-958	1 79	2,299	4,191	8,553	19,990	3,545	-1,189	-1,616	-801	-2,308	-2,401	-1,672	296	-156	-572	-21	-1,139	-381	-923	-1,609	-2,216	-2,319	-1,855	-2,251	-2,126	-1,372	-1,380	-118	-427	1,346	804	123	84	178	573	14	-393
Change	0		) (	-3	-13	-14	-11	-11	0	19	0	12	20	152	333	-804	1,836	555	-859	-583	-392	-201	31	33	35	37	39	40	17	18	18	18	18	18	15	15	15	18	18	18
New imbalance	194	673	2 -958	1 76	2,286	4,177	8,542	19,979	3,545	-1,170	-1,616	-789	-2,288	-2,249	-1,340	-508	1,680	-17	-880	-1,722	-773	-1,125	-1,578	-2,183	-2,283	-1,818	-2,213	-2,086	-1,355	-1,362	-99	-409	1,364	822	138	99	193	591	32	-375

Source: Goldman Sachs Global Investment Research

# Exhibit 4: Refining margins have rebounded despite worsening demand

NW European cracking refining margins adjusted for yields, slate, and freight (USD/bbl)



Source: Reuters, ICE, Platts, IEA, Goldman Sachs Global Investment Research

# **Disclosure Appendix**

# **Reg AC**

We, Damien Courvalin, Jeffrey Currie and Callum Bruce, hereby certify that all of the views expressed in this report accurately reflect our personal views, which have not been influenced by considerations of the firm's business or client relationships.

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

# **Disclosures**

## **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.

#### 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 <a href="https://www.gs.com/disclosures/europeanpolicy.html">https://www.gs.com/disclosures/europeanpolicy.html</a> 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.

# **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 (Singapore) Pte. (Company Number: 198602165W); and in the United States of America by Goldman Sachs & Co. LLC. 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 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 resolution ("ACPR") and regulated by the Autorité de contrôle prudentiel et de resolution and the Autorité des marches 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, Tyksland, 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 (Finansinpektionen) 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 (<u>https://www.sipc.org</u>).

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.

We and our affiliates, officers, directors, and employees, 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, unless otherwise prohibited by regulation or Goldman Sachs policy.

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 focused on investment themes across markets, industries and sectors. It does not attempt to distinguish between the prospects or performance of, or provide analysis of, individual companies within any industry or sector we describe.

Any trading recommendation in this research relating to an equity or credit security or securities within an industry or sector is reflective of the investment theme being discussed and is not a recommendation of any such security in isolation.

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 <u>https://www.theocc.com/about/publications/character-risks.jsp</u> 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 <a href="https://research.gs.com">https://research.gs.com</a>.

Disclosure information is also available at <a href="https://www.gs.com/research/hedge.html">https://www.gs.com/research/hedge.html</a> 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.