

May 20, 2019

TECHNOLOGY/INFRASTRUCTURE SOFTWARE

**Stock Rating:**
**OUTPERFORM**

12-18 mo. Price Target CHF5.50  
WIHN - SWX CHF2.83

3-5 Yr. EPS Gr. Rate	15%
52-Wk Range	CHF5.15-CHF2.56
Shares Outstanding	33.9M
Float	25.8M
Market Capitalization	CHF107.5M
Avg. Daily Trading Volume	26,586
Dividend/Div Yield	\$0.00/0.00%
Book Value	\$0.29
Fiscal Year Ends	Dec
2019E ROE	NA
LT Debt	\$30.7M
Preferred	\$0.0M
Common Equity	\$4M
Convertible Available	Yes

EPS Diluted	Q1	Q2	Q3	Q4	Year	Mult.
2017A	--	--	--	--	(0.82)	NM
2018A	(0.22)	(0.10)	NA	NA	(0.48)	NM
2019E	(0.11)	(0.10)	(0.09)	(0.08)	(0.38)	NM
Prior (E)	(0.12)	(0.09)	--	--	--	NM

# WISeKey Int'l Hldg AG

## Steady 1Q19 Start; Investment for Growth Plan Intact

**SUMMARY**

On 5/7/19, WISeKey (WIHN) released 1Q19 preliminary Cybersecurity/IoT revenue of \$8.1M that was slightly behind our estimate of \$10.1M—when excluding revenue from QuoVadis's discontinued operations, we estimate it should have fared better. IoT revenue pipeline remains healthy at +\$250M over the next three years. Recent (4/3/19) investments include a 22% interest in Tarmin to integrate its secure cloud offering into WISeID.com in order to develop the WISeBox solution focus on managed cloud service. WISeCoin, a subsidiary of WIHN raised \$7M on a pre-STO round. WIHN provided an update on the key areas of focus to capture the \$250M+ revenue opportunities. We remain optimistic on WIHN's focus on the 4th Industrial Revolution strategy which is currently seeing investments in these critical growth areas. Reiterate Outperform.

**KEY POINTS**

- **1Q19 Revenue Announcement:** WIHN announced 1Q19 revenue of \$8.1M vs. our estimate of \$10.1M. The y/y revenue deceleration is mainly driven by the discontinued revenue from the sale of QuoVadis SSL and PKI businesses earlier this year. Cash as of 3/31/19 is at \$25.4M, an increase of 151% y/y, liquidity should remain sufficient in the near term.
- **Tarmin & STO:** On 4/3/19, WIHN acquired 22% of Tarmin in a move to jointly develop the WISeBox solution—a managed cloud service that integrates WIHN's technology (ROT & PKI) and Tarmin's Gridbank Data Management Platform. WISeCoin, a subsidiary of WIHN, raised \$7M via a pre-STO round to build secure infrastructure and microchip using blockchain authentication technology.
- **Cybersecurity/IoT +\$250M Pipeline:** WIHN provided an estimated greater than \$250M pipeline over the next three years driven by future IoT revenue opportunities. Key areas of focus include: 1) ISTANA (connected cars); 2) monetization of Blockchain platform; 3) Anti-Illlicit Trade Tech (WISeAuthentic); 4) Digicert partnerships; 5) expanded sales force; and 6) Foresight platform using APIs and keys on VaultIC IoT Chip as a service.
- **Estimates Update:** No financial guidance was provided by the company. We are, however, adjusting our FY19E revenue/LPS from \$45M/\$0.38 to \$38.4M/\$0.38. We are assuming an elevated capital spend in 2019 to achieve the strategic growth initiatives as set forth in the investment plan announced earlier this year.
- **Bottom Line:** We continue to believe that WIHN's current discounted valuation of 3.1x is unwarranted given the large and rapidly growing IoT and cybersecurity markets the company address. WIHN's investment for 2019 growth plan could yield attractive upside if executed successfully. Our PT of CHF5.50 is based on 5.5x our FY19 revenue estimate which we view as a reasonable multiple.

**Stock Price Performance**

**Company Description**

WISeKey International Holding AG provides digital identity and IoT security solutions to organizations and manufacturers worldwide. At its technology's core is a set of functions designed to be trusted by an operating system called the Root of Trust (RoT), exclusively licensed by WISeKey and embedded in nearly four billion devices worldwide.

**For analyst certification and important disclosures, see the Disclosure Appendix.**

**Shaul Eyal**  
212-667-8411  
[Shaul.Eyal@opco.com](mailto:Shaul.Eyal@opco.com)

**Yi Fu Lee, CFA, CPA, CAIA**  
212-667-6142  
[yifu.lee@opco.com](mailto:yifu.lee@opco.com)

Disseminated: May 20, 2019 11:43 EDT; Produced: May 20, 2019 11:43 EDT

## 5-YEAR PRICE PERFORMANCE



Source: Bloomberg

### BASE CASE ASSUMPTION

- WIHN continues to successfully integrate its recent acquisitions
- WIHN ability to reallocate capital to areas of high growth as laid out in the FY19 Initiatives
- Revenue continues to grow >20% organically

### UPSIDE SCENARIO

- New products/initiatives drive increased adoption for WIHN solutions

## INVESTMENT THESIS

Based in Switzerland, WIHN is leveraging its neutral domicile to provide certificate services utilizing its exclusively-licensed Root of Trust (RoT) technology embedded in nearly four billion devices worldwide. We believe WIHN is addressing a sizable market opportunity within the IoT Security and eSignature space, which IDC estimates to grow at a CAGR of 13.8% over the next four years to a \$22.5B market.

### CATALYSTS

- Expansion of partnerships, particularly within the supply chain management and government sectors, as well as in the US, China and German regions
- IoT or hardware-level breaches/vulnerabilities (e.g. Spectre, Meltdown)

### DOWNSIDE SCENARIO

- Increased competition from incumbent vendors
- Growth from razor and blade business strategy stabilizes

## PRICE TARGET CALCULATION

To reach our CHF5.50 price target, we apply a 5.5x EV/revenue multiple to our FY19 estimate of \$33.9 million (excluding discontinued operations), reflecting an enterprise value of \$212 million. Subtracting net debt of \$25.5 million, dividing by the number of diluted shares outstanding of 33.9 million, we arrive at our CHF5.50 price target. We believe WIHN is addressing a sizable market opportunity in both cybersecurity and IoT that is increasing at a healthy growth rate, though given WISeKey is still early into its redeveloped business plan, we are applying a discounted valuation multiple to reflect the company's elevated risk profile.

## KEY RISKS TO PRICE TARGET

Risks to our price target include increased competition, a challenging overall macro environment, moderate IT spending, change in acceptance of the company's products, and the ability to demonstrate consistent financial performance. In addition, the stock's status as primarily overseas-listed may prevent some investors from owning it.

Note: We view WIHN, as a stock trading under \$5, as speculative and appropriate for risk-tolerant investors.

WiseKey		In millions except per share figures (In USD)									
Income Statement	2017A	Mar-18A	Jun-18A	Sept-18A	Dec-18A	2018A	Mar-19E	Jun-19E	Sept-19E	Dec-19E	2019E
Revenue	43.078	11.900	14.000			53.692	8.100	8.500	10.250	11.500	38.350
Cost of Sales	22.386	5.867	7.100			24.515	4.374	4.526	5.458	6.095	20.453
<b>Gross Profit</b>	<b>20.692</b>	<b>6.033</b>	<b>6.900</b>			<b>29.177</b>	<b>3.726</b>	<b>3.974</b>	<b>4.792</b>	<b>5.405</b>	<b>17.897</b>
<i>Operating Expenses</i>											
Research and Development	7.386	2.200	1.800			8.106	1.620	1.403	1.563	1.725	6.311
Sales and Marketing	6.254	1.700	2.400			8.598	1.620	1.615	1.742	1.725	6.703
General and Administrative	22.088	6.200	6.200			24.741	3.807	4.250	4.612	4.830	17.500
Other	(1.526)	-	(0.300)			(0.316)	0.500	0.500	0.500	0.500	2.000
<b>Income/Loss from Operations</b>	<b>(13.510)</b>	<b>(4.067)</b>	<b>(3.200)</b>			<b>(11.952)</b>	<b>(3.321)</b>	<b>(3.794)</b>	<b>(3.626)</b>	<b>(3.375)</b>	<b>(14.116)</b>
Total other income/(expense)	(12.420)	(2.900)	0.600			(4.465)	-	-	-	-	-
Income before Taxes	(25.930)	(6.967)	(2.600)			(16.417)	(3.321)	(3.794)	(3.626)	(3.375)	(14.116)
Income Tax Benefit (Expense)	1.037	(0.400)	(0.700)			0.152	(0.498)	(0.569)	(0.544)	(0.506)	(2.117)
Non-GAAP Net Income	(24.893)	(7.367)	(3.300)			(16.265)	(3.819)	(3.225)	(3.082)	(2.869)	(12.995)
Less: NI/(Loss) attributable to NCI	-					-					
<b>Non-GAAP Net Income attributable to WIHN</b>	<b>(24.893)</b>	<b>(5.067)</b>	<b>(1.700)</b>			<b>(16.265)</b>					
Weighted Average Shares - Basic	29.506	33.270	33.270			33.905	33.905	33.922	33.939	33.956	33.930
Weighted Average Shares - Diluted	29.506	33.270	33.270			33.905	33.905	33.922	33.939	33.956	33.930
<b>Non-GAAP EPS</b>	<b>(0.84)</b>	<b>(0.22)</b>	<b>(0.10)</b>			<b>(0.48)</b>	<b>(0.11)</b>	<b>(0.10)</b>	<b>(0.09)</b>	<b>(0.08)</b>	<b>(0.38)</b>
<b>Non-GAAP to GAAP Adjustments</b>											
Total Operating Adjustment	4.7	1.8	0.3			(2.9)	0.0	0.0	0.0	0.0	0.0
Total Non-Operating Adjustment	9.4	0.5	1.3			(3.5)	0.0	0.0	0.0	0.0	0.0
<b>GAAP Net Income</b>	<b>(10.8)</b>	<b>(7.4)</b>	<b>(3.3)</b>			<b>(9.9)</b>	<b>(3.8)</b>	<b>(3.2)</b>	<b>(3.1)</b>	<b>(2.9)</b>	<b>(13.0)</b>

Source: Company Reports, Oppenheimer Estimates

<b>WISeKey Margin Analysis</b>	<b>2017A</b>	<b>Mar-18A</b>	<b>Jun-18A</b>	<b>Sept-18A</b>	<b>Dec-18A</b>	<b>2018A</b>	<b>Mar-19E</b>	<b>Jun-19E</b>	<b>Sept-19E</b>	<b>Dec-19E</b>	<b>2019E</b>
<i>Margins</i>											
Gross Margins	48.0%	50.7%	49.3%			54.3%	46.0%	46.8%	46.8%	47.0%	46.7%
<i>As a % of Total Revenue</i>											
Research and Development	17.1%	18.5%	12.9%			15.1%	20.0%	16.5%	15.3%	15.0%	16.5%
Sales and Marketing	14.5%	14.3%	17.1%			16.0%	20.0%	19.0%	17.0%	15.0%	17.5%
General and Administrative	51.3%	52.1%	44.3%			46.1%	47.0%	50.0%	45.0%	42.0%	45.6%
<b>Operating Margins</b>	<b>(31.4%)</b>	<b>(34.2%)</b>	<b>(22.9%)</b>			<b>(22.3%)</b>	<b>(41.0%)</b>	<b>(44.6%)</b>	<b>(35.4%)</b>	<b>(29.3%)</b>	<b>(36.8%)</b>
Profit Margin	(57.8%)	(61.9%)	(23.6%)			(30.3%)	(47.2%)	(37.9%)	(30.1%)	(24.9%)	(33.9%)
Tax Rate	(4.0%)	5.7%	26.9%			(0.9%)	15.0%	15.0%	15.0%	15.0%	15.0%
<i>QoQ</i>											
Revenue		12.4%	17.6%					4.9%	20.6%	12.2%	
Weighted Avg. Shares Outstanding			0.0%				0.1%	0.1%	0.1%	0.1%	
<i>YoY</i>											
<b>Revenue</b>	<b>291.6%</b>	<b>65.3%</b>	<b>30.5%</b>			<b>24.6%</b>	<b>(15.0%)</b>	<b>(39.3%)</b>	<b>(23.6%)</b>	<b>(14.3%)</b>	<b>(28.6%)</b>
Gross Profit	359.8%	83.0%	64.8%			41.0%	(38.2%)	(42.4%)			(38.7%)
R&D	413.6%	57.1%	8.4%			9.7%	(26.4%)	(22.1%)			(22.1%)
S&M	(62.0%)	70.0%	84.0%			37.5%	(4.7%)	(32.7%)			(22.0%)
G&A	(3.3%)	113.8%	100.4%			12.0%	(38.6%)	(31.5%)			(29.3%)
Operating Profit	(62.7%)	103.0%	71.0%			(11.5%)	(18.4%)	18.6%			18.1%
Weighted Avg. Shares Outstanding						14.9%	1.9%	2.0%			0.1%

Source: Company Reports, Oppenheimer Estimates

WiSeKey		In millions except per share figures (In USD)										
Consolidated Balance Sheet		2017A	Mar-18A	Jun-18A	Sept-18A	Dec-18A	2018A	Mar-19E	Jun-19E	Sept-19E	Dec-19E	2019E
Assets												
Cash and cash equivalents	9.6	10.1					9.8	25.4				(2.2)
Accounts receivable	4.0						7.6					4.4
Notes receivable	0.9						0.0					0.0
Inventories	3.5						4.2					2.7
Prepaid expenses	0.8						0.5					0.4
Deferred charges, current	0.0						0.2					0.0
Other current assets	7.4						9.8					9.8
Total current assets	26.1						32.1					15.1
Notes receivable	0.0						0.0					0.0
Equity securities	0.6						7.9					9.4
Deferred income tax assets	0.0						0.0					0.0
Deferred tax credits	2.9						2.5					1.9
PPE	3.0						2.4					2.8
Intangible assets	1.6						1.1					1.4
Goodwill	8.3						8.3					10.0
Deferred charges, noncurrent	0.0						0.2					
Other noncurrent assets	24.7						23.9					28.7
Total noncurrent assets	41.1						46.3					54.2
Total assets	67.2						78.5					69.3
Liabilities												
Accounts payable	12.2						12.9					6.5
Notes payable	0.1						6.8					6.8
Deferred revenue, current	0.3						0.1					0.1
Convertible note payable	0.0						0.0					0.0
Income Tax payable	0.1						0.0					0.0
Derivative liabilities	0.0						0.0					0.0
Other current liabilities	11.1						15.1					10.2
Total current liabilities	23.7						34.9					23.6
Convertible note payable	18.6						23.9					23.9
Deferred revenue, noncurrent	0.0						0.0					0.0
Indebtedness to related parties	1.0						0.0					0.0
Employee benefit plan obligation	4.6						4.5					3.0
Deferred income tax liability	0.0						0.0					0.0
Other noncurrent liabilities	5.7						11.2					11.2
Total noncurrent liabilities	29.8						39.6					38.2
Total liabilities	53.6						74.5					61.7
Equity												
Stockholders' Equity	13.6						4.0					7.6
Total Liabilities and Equity	67.2						78.5					69.3

Source: Company Reports, Oppenheimer Estimates

WISeKey		In millions except per share figures (In USD)										
Consolidated Cash Flow Statement		2017A	Mar-18A	Jun-18A	Sept-18A	Dec-18A	2018A	Mar-19E	Jun-19E	Sept-19E	Dec-19E	2019E
Net Loss		(24.8)					(16.3)	(3.8)	(3.2)	(3.1)	(2.9)	(13.0)
Interest and other non cash items		1.5					1.2					1.3
Depreciation of PPE		1.4					1.4					1.0
Amortization of intangible assets		3.6					2.0					2.5
Stock based comp		2.2					1.7					4.5
Other		2.6					1.9					1.9
Change in Working Capital												
Accounts receivables		2.6					(2.9)					3.3
Inventories		(0.5)					(0.7)					1.5
Other assets		(0.0)					1.3					0.0
Accounts payable		1.5					(0.1)					(6.5)
Deferred revenue		4.6					6.0					0.0
Income taxes payable		0.1					0.3					(0.0)
Other current liabilities		0.2					(4.4)					(4.8)
Net cash provided by operating activities		(4.9)					(8.5)					(8.4)
Acquisition of PPE		(0.7)					(1.2)					(5.0)
Acquisition of a business		(11.6)					0.0					0.0
Other		(0.6)					(3.0)					0.0
Net cash provided by investing activities		(12.9)					(4.2)					(5.0)
Proceeds of issuance of common stock		5.0					3.1					0.0
Other		20.5					8.8					0.0
Net cash provided by financing activities		25.5					11.9					0.0
Effect of exchange rate changes on cash		(0.7)					(0.2)					0.0
Net (decrease) increase in cash and cash equiv		7.0					(1.1)					(13.3)
Cash at beginning of period		5.2					12.2					11.2
Cash at end of period		12.2					11.2					(2.2)

Source: Company Reports, Oppenheimer Estimates

## Disclosure Appendix

**Oppenheimer & Co. Inc. 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.**

**Analyst Certification** - The author certifies that this research report accurately states his/her personal views about the subject securities, which are reflected in the ratings as well as in the substance of this report. The author certifies that no part of his/her compensation was, is, or will be directly or indirectly related to the specific recommendations or views contained in this research report.

### Potential Conflicts of Interest:

Equity research analysts employed by Oppenheimer & Co. Inc. are compensated from revenues generated by the firm including the Oppenheimer & Co. Inc. Investment Banking Department. Research analysts do not receive compensation based upon revenues from specific investment banking transactions. Oppenheimer & Co. Inc. generally prohibits any research analyst and any member of his or her household from executing trades in the securities of a company that such research analyst covers. Additionally, Oppenheimer & Co. Inc. generally prohibits any research analyst from serving as an officer, director or advisory board member of a company that such analyst covers. In addition to 1% ownership positions in covered companies that are required to be specifically disclosed in this report, Oppenheimer & Co. Inc. may have a long position of less than 1% or a short position or deal as principal in the securities discussed herein, related securities or in options, futures or other derivative instruments based thereon. Recipients of this report are advised that any or all of the foregoing arrangements, as well as more specific disclosures set forth below, may at times give rise to potential conflicts of interest.



All price targets displayed in the chart above are for a 12- to 18-month period. Prior to March 30, 2004, Oppenheimer & Co. Inc. used 6-, 12-, 12- to 18-, and 12- to 24-month price targets and ranges. For more information about target price histories, please write to Oppenheimer & Co. Inc., 85 Broad Street, New York, NY 10004, Attention: Equity Research Department, Business Manager.

### Oppenheimer & Co. Inc. Rating System as of January 14th, 2008:

**Outperform(O)** - Stock expected to outperform the S&P 500 within the next 12-18 months.

**Perform (P)** - Stock expected to perform in line with the S&P 500 within the next 12-18 months.

**Underperform (U)** - Stock expected to underperform the S&P 500 within the next 12-18 months.

**Not Rated (NR)** - Oppenheimer & Co. Inc. does not maintain coverage of the stock or is restricted from doing so due to a potential conflict of interest.

### Oppenheimer & Co. Inc. Rating System prior to January 14th, 2008:

**Buy** - anticipates appreciation of 10% or more within the next 12 months, and/or a total return of 10% including dividend payments, and/or the ability of the shares to perform better than the leading stock market averages or stocks within its particular industry sector.

**Neutral** - anticipates that the shares will trade at or near their current price and generally in line with the leading market averages due to a perceived absence of strong dynamics that would cause volatility either to the upside or downside, and/or will perform less well than higher rated companies within its peer group. Our readers should be aware that when a rating change occurs to Neutral from Buy, aggressive trading accounts might decide to liquidate their positions to employ the funds elsewhere.

**Sell** - anticipates that the shares will depreciate 10% or more in price within the next 12 months, due to fundamental weakness perceived in the company or for valuation reasons, or are expected to perform significantly worse than equities within the peer group.

Distribution of Ratings/IB Services Firmwide				
Rating	Count	Percent	IB Serv/Past 12 Mos.	
			Count	Percent
OUTPERFORM [O]	375	65.33	171	45.60
PERFORM [P]	198	34.49	65	32.83
UNDERPERFORM [U]	1	0.17	0	0.00

Although the investment recommendations within the three-tiered, relative stock rating system utilized by Oppenheimer & Co. Inc. do not correlate to buy, hold and sell recommendations, for the purposes of complying with FINRA rules, Oppenheimer & Co. Inc. has assigned buy ratings to securities rated Outperform, hold ratings to securities rated Perform, and sell ratings to securities rated Underperform.

Note: Stocks trading under \$5 can be considered speculative and appropriate for risk tolerant investors.

## Company Specific Disclosures

KDS.AMS, OXB-LSE, PHARM, POXEL-PA, STLC.CN, WIHN: This research report is intended for use only by institutions to which the subject security or securities may be sold pursuant to an exemption from state securities registration in the state in which the institution is located.

In the past 12 months Oppenheimer & Co. Inc. has provided investment banking services for WIHN.

In the past 12 months Oppenheimer & Co. Inc. has received compensation for investment banking services from WIHN.

Oppenheimer & Co. Inc. expects to receive or intends to seek compensation for investment banking services in the next 3 months from WIHN.

Oppenheimer & Co. Inc. is acting as exclusive financial advisor to WiseKey in the sale of its QuoVadis SSL and PKI businesses to Digicert.

### Additional Information Available

**Company-Specific Disclosures:** Important disclosures, including price charts, are available for compendium reports and all Oppenheimer & Co. Inc.-covered companies by logging on to <https://www.oppenheimer.com/client-login.aspx> or writing to Oppenheimer & Co. Inc., 85 Broad Street, New York, NY 10004, Attention: Equity Research Department, Business Manager.



## Other Disclosures

This report is issued and approved for distribution by Oppenheimer & Co. Inc. Oppenheimer & Co. Inc. transacts business on all principal exchanges and is a member of SIPC. This report is provided, for informational purposes only, to institutional and retail investor clients of Oppenheimer & Co. Inc. and does not constitute an offer or solicitation to buy or sell any securities discussed herein in any jurisdiction where such offer or solicitation would be prohibited. The securities mentioned in this report may not be suitable for all types of investors. This report does not take into account the investment objectives, financial situation or specific needs of any particular client of Oppenheimer & Co. Inc. Recipients should consider this report as only a single factor in making an investment decision and should not rely solely on investment recommendations contained herein, if any, as a substitution for the exercise of independent judgment of the merits and risks of investments. The analyst writing the report is not a person or company with actual, implied or apparent authority to act on behalf of any issuer mentioned in the report. Before making an investment decision with respect to any security recommended in this report, the recipient should consider whether such recommendation is appropriate given the recipient's particular investment needs, objectives and financial circumstances. We recommend that investors independently evaluate particular investments and strategies, and encourage investors to seek the advice of a financial advisor. Oppenheimer & Co. Inc. will not treat non-client recipients as its clients solely by virtue of their receiving this report. Past performance is not a guarantee of future results, and no representation or warranty, express or implied, is made regarding future performance of any security mentioned in this report. The price of the securities mentioned in this report and the income they produce may fluctuate and/or be adversely affected by exchange rates, and investors may realize losses on investments in such securities, including the loss of investment principal. Oppenheimer & Co. Inc. accepts no liability for any loss arising from the use of information contained in this report, except to the extent that liability may arise under specific statutes or regulations applicable to Oppenheimer & Co. Inc. All information, opinions and statistical data contained in this report were obtained or derived from public sources believed to be reliable, but Oppenheimer & Co. Inc. does not represent that any such information, opinion or statistical data is accurate or complete (with the exception of information contained in the Important Disclosures section of this report provided by Oppenheimer & Co. Inc. or individual research analysts), and they should not be relied upon as such. All estimates, opinions and recommendations expressed herein constitute judgments as of the date of this report and are subject to change without notice. Nothing in this report constitutes legal, accounting or tax advice. Since the levels and bases of taxation can change, any reference in this report to the impact of taxation should not be construed as offering tax advice on the tax consequences of investments. As with any investment having potential tax implications, clients should consult with their own independent tax adviser. This report may provide addresses of, or contain hyperlinks to, Internet web sites. Oppenheimer & Co. Inc. has not reviewed the linked Internet web site of any third party and takes no responsibility for the contents thereof. Each such address or hyperlink is provided solely for the recipient's convenience and information, and the content of linked third party web sites is not in any way incorporated into this document. Recipients who choose to access such third-party web sites or follow such hyperlinks do so at their own risk.

This research is distributed in the UK and elsewhere throughout Europe, as third party research by Oppenheimer Europe Ltd, which is authorized and regulated by the Financial Conduct Authority (FCA). This research is for information purposes only and is not to be construed as a solicitation or an offer to purchase or sell investments or related financial instruments. This research is for distribution only to persons who are eligible counterparties or professional clients. It is not intended to be distributed or passed on, directly or indirectly, to any other class of persons. In particular, this material is not for distribution to, and should not be relied upon by, retail clients, as defined under the rules of the FCA. Neither the FCA's protection rules nor compensation scheme may be applied. <https://opco2.bluematrix.com/sellside/MAR.action>

**Distribution in Hong Kong:** This report is prepared for professional investors and is being distributed in Hong Kong by Oppenheimer Investments Asia Limited (OIAL) to persons whose business involves the acquisition, disposal or holding of securities, whether as principal or agent. OIAL, an affiliate of Oppenheimer & Co. Inc., is regulated by the Securities and Futures Commission for the conduct of dealing in securities and advising on securities. For professional investors in Hong Kong, please contact [researchasia@opco.com](mailto:researchasia@opco.com) for all matters and queries relating to this report. This report or any portion hereof may not be reprinted, sold, or redistributed without the written consent of Oppenheimer & Co. Inc.

This report or any portion hereof may not be reprinted, sold, or redistributed without the written consent of Oppenheimer & Co. Inc. Copyright © Oppenheimer & Co. Inc. 2019.