

## Andes Technology | Asia Pacific

# The only Risc-V CPU IP listed player, Initiate OW

Stock rating	Target Price
Over-weight	NT\$ 570.00

### Key Positive

#### Strong background and existence in the CPU IP market

Founded in 2005, Andes is an embedded microprocessor IP provider for high performance and lower power 32/64-bit processor with SoC platform. It is also a founding premier member of Risc-V international association.

Andes has been distributed 10 bn+ cumulative shipments of embedded Soc with ~1% in Risc-V and 99% from V3 (21A shipments ~3bn+ with 50%+ yoy), while Risc-V royalty will start to massively recognize in 22E.

The application of Andes core range from Edge to Cloud-based, including Wi-Fi/GPS IC, NFC Control, Touch panel IP, SSD IC, IoT, Switch Flash IC, Nissan X-Trial ADAS IC, etc. Andes also announced on March 23<sup>rd</sup> that it would launch its first automobile Risc-V core with ISO 26262 certification which have been sampled out to various countries, that there's no similar Risc-V core in the market now, reflecting the aggressive move of Andes business as always. For shareholder's background, the world-leading fabless player MediaTek (2454 TT) is Andes's largest shareholder (~13.3%) backing its past V3 revenue stream, while the revenue contributions outside the shareholder has been growing and the revenue weight from MediaTek has been decreased to less than 10% in 21H1, which is a positive signal to drive more diversified customer bases.

#### Strong top-line growth from Risc-V riding with emerging-tech tailwind

With Risc-V's open-source ISA feature and flexibility, Risc-V is estimated to gain a higher penetration rate in IoT, AI, and Automotive industry which is set to grow in the coming years. Benefiting from the rapid development of Risc-V industry with ~50% yoy TAM expansion from 20A-22E, Andes's 21A Risc-V licensing revenue has outgrown the industry and delivered ~68% yoy (Compared to 21A TAM yoy 53%). Moreover, the stable revenue stream of its IP business, Risc-V Royalty revenue, will be massively recognized since 22E. Mgmt indicated that Andes started to generate the Risc-V licensing revenue in 4Q17 and expected to receive royalty contributions as its clients enter mass production stage (4~5 yrs after mass production), **combining with stable V3 stream growth as before, we forecast a blended revenue CAGR of 44.2% from 22E-25E.**

#### Andes can benefit from China/US Chip localization at the same time

Risc-V has gained attention since the potential Nvidia x Arm Acquisition deal in 20A. Under the US-China tensions, China players started to fear the further control of upstream ISA structure from US players. Despite the Nvidia x Arm deal having been called off, **we still believe the chip autonomy attitude in China market is destined, and Risc-V open-sourced ISA could be the potential solution for AIoT processors in China chip localization.** Besides, Andes has benefitted from its political-neutral position in the past few years, with revenue contributions from China/US accounting for 20-30% respectively. On February 8, Andes announced that it'll join the IP Alliance of Intel IFS (Intel foundry service). The alliance is focusing on enabling and supporting designers to access high-quality IPs while optimizing for PPA. This is not only a positive signal for its future design expansions from Intel's large-scale committed capacity for foundries but also reflects **its sustainable position to benefit from the US market while not losing business from China.** In 21A 2H, Mgmt also announced they will double the R&D team size in the future 3-5 years in US/Canada to develop next-generation Risc-V products to capture the fast-growing IP demand globally.

### Global Equity Team

Arthur Tzeng

[arthurtzen@cuhkirs2022@gmail.com](mailto:arthurtzen@cuhkirs2022@gmail.com)

Eason Chou

[easonchoucuhkirs2022@gmail.com](mailto:easonchoucuhkirs2022@gmail.com)

### Andes Tech. (6533 TT)

Stock Rating	Over-weight
Target Price (NT\$)	NT\$ 570
Shr price (31/03/22)	NT\$405
Up/downside (%)	41%
52-Week Range (NT\$)	NT\$644-328
Shares Out. (mn)	50.7
Mkt Cap (NT\$ bn)	NT\$21 bn
EV (NT\$ bn)	NT\$17 bn
50 Days Mov AVG (NT\$)	NT\$417
200 Days Mov AVG (NT\$)	NT\$485

### Fiscal year (12/31 End)

(NT\$ mn)	2021A	2022E	2023E
Revenue	820	1258	1823
YoY (%)	41%	53%	45%
Gross Profit	818	1256	1820
GPM	100%	100%	100%
EBIT	159	325	544
OPM (%)	19%	26%	30%
Pretax Income	177	325	544
Net Income	162	296	495
NPM	20%	24%	27%
Basic EPS	3.6	5.8	9.8

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### Key Positive (cont.)

#### Arm & SiFive Valuation Boost in the past 2 years

As we indicated, Andes (6533 TT) is the first and only listed Risc-V CPU IP player. Its direct competitor in processor IP is Arm, while Andes is not intended to compete in the ISA IP market in mobile applications. For Risc-V, its main competitor is SiFive, while we found a subtle relationship between SiFive and Andes, Andes has been working with SiFive on setting Risc-V standardized framework and sharing their technical advantage to fight against Arm and existing ISA players. **The above implications further strengthen our convictions that Andes would grow with its peers SiFive to establish a Risc-V ecosystem.**

Besides, we do see active private market movements in these two players. In 2020 2H, Nvidia was said to acquire Arm at a US\$ 40 bn valuation, while based on the latest news on March 24<sup>th</sup> Softbank is seeking Arm IPO in 2023 with a size over US\$ 60bn ([Bloomberg](#), 2021), which Implies 21A P/S 30.3x / P/E 107x. In 2021 Q2, Intel was also said to acquire SiFive at a US\$ 2 bn valuation, but the deal failed as SiFive cannot reach a consensus with Intel on the financial clause and the maintenance of its neutral ISA position. Interestingly, according to SiFive latest post-money valuation announced on March 16<sup>th</sup>, its valuation exceeds US\$ 2.5 bn ([Sifive](#), 2022) and is ready to IPO next year, reflecting a 1.25x valuation boost within 1 year. In a nutshell, Andes has been a listed pioneer in CPU IP, and we do witness investors' interests in IP business from Andes's direct comparable companies in the private market.

**Besides, we deem both players' IPO plan in 2023 the catalyst for Andes's re-rate in 12-months as it reveals more transparent market size and valuation multiples implications.**

#### Initiate OW, with 12-month TP at NT\$ 570 (41% upside)

We first adopted a DCF model at TP NT\$ 568, and a discounted P/E valuation at TP NT\$ 576 to capture its long-term growth potential.

We further determine our **TP of NT\$ 570 (Implied 22E P/E of 98x) with a potential 41% upside as of closing price on 2022 March 31<sup>st</sup>.**

We justified this valuation is reasonable if we look at Arm's valuation level when it was traded in LSE before the 2016 privatization, it reached over 100x 1-yr forwarding P/E in 2013-2014 when smartphone came into mass production, and its current IPO price also indicated 107x 21A P/E. Besides, based on historical trading multiple of Andes, its maximum TTM PE also reached 98x before, which confirmed our bullish assumptions.

### Key Risk

#### Immature Risc-V ecosystem with still few large chipmakers' support

Standardization is becoming a great concern of Risc-V as its flexibility might lead to fragmental development and incompatibility across different Risc-V ISAs. It'll be difficult for Andes to scale up its market share if Risc-V industry fails to build a standardized environment.

#### R&D costs continue to rise, eroding the largest portion of the margin

The R&D costs of the company have been rising to the industry top 2 and are expected to sustain at a 40% R&D/Sales in order to expand the R&D team size in the next 3-5 years.

#### Strong Risc-V competitors in China

The Chinese government and semiconductor players have been strongly supporting their local Risc-V companies like T-Head. Furthermore, among all 17 premier members of Risc-V International, 11 of them are Chinese tech giants, including Huawei & Alibaba, and Chinese government agencies like the Institute of Software Chinese Academy of Sciences (ISCAS). Though Andes's current revenue size is larger than these players, we can't neglect potential competitions from China's peers in the future.

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## Financials

### Income Statement

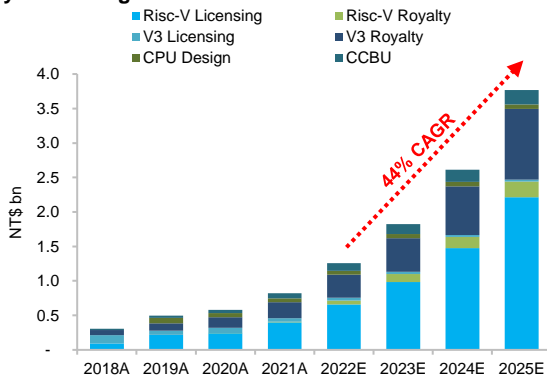
We model Andes's net income growth at a +54.6% CAGR in 2022E-25E, with revenue growth at +44.2% CAGR, reaching 25E NT\$ 3.8 bn revenue scale (Exhibit 1) and NT\$ 1 bn net profit (Exhibit 2).

### Revenue growth will be mainly driven by Risc-V IP

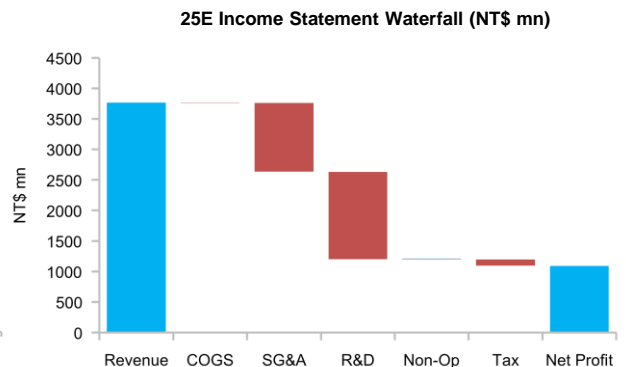
Andes's Risc-V licensing revenue had ~67% yoy in 20A-21A, which outgrew the industry TAM expansions. Looking at 22E, there's ~50% Risc-V industry size expansion in 22E (Deloitte, 2021), and 200%+ annual Risc-V core productions growth (Semico, 2019). We believe Risc-V licensing revenue can sustain the momentum and outgrow the industry expansions, implies NT\$ 660 mn to NT\$ ~2.2 bn revenue contributions in 22E-25E.

For Risc-V royalty, where IP company could recognize the revenue after mass productions kick-off (~4-5 yrs after licensing), Andes only recognized <10 mn Risc-V royalty revenue in 21A, while we expected it will contribute from NT\$ 60 mn to NT\$ 225 mn in coming 3 years given the aggregate V5 licensing from 2017A-2021A. With more Risc-V revenue contributions, it will account for ~60% of total revenue in 25E (Exhibit 3). For V3 royalty segment, which delivered consecutive 45%-50% yoy in past 3 years, we believe this will sustain as V3 has been a stable revenue stream for 10+ years, and we also model the CPU Design & Custom Computing (CCBU) grow in-line with historical trend. Combining above, there will be 44%+ yoy p.a. of total revenue in next 3 years, and this is reasonably higher than the consensus estimate of "40% p.a. in next 5 years" convictions (link, 2021).

**Exhibit 1: 22E-25E Revenue growth will be fueled by Risc-V segment**

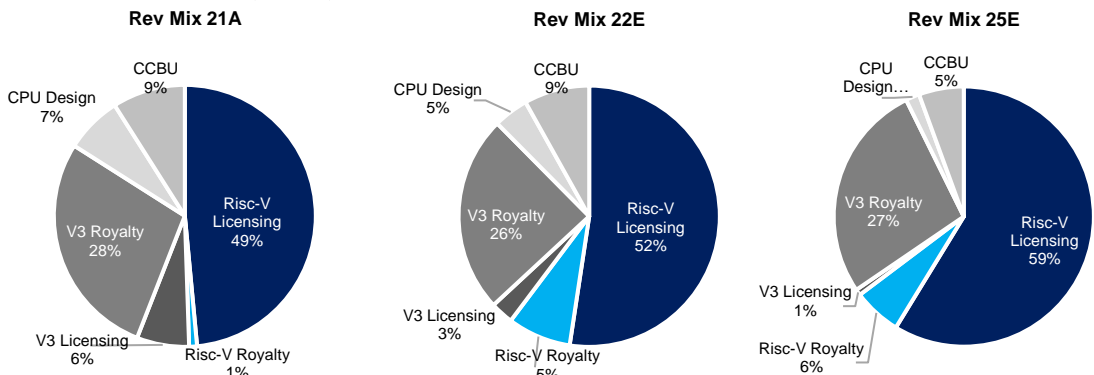


**Exhibit 2: We expect 25E Revenue approach 3.8B NTD with Net Income at 1B NTD**



**Exhibit 3: Risc-V Royalty Revenue would account for 8% - 10% of total revenue in 2021A – 2025E**

Andes revenue mix in 2021A, 2022E, 2025E



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# Financials

### Income Statement (Cont.)

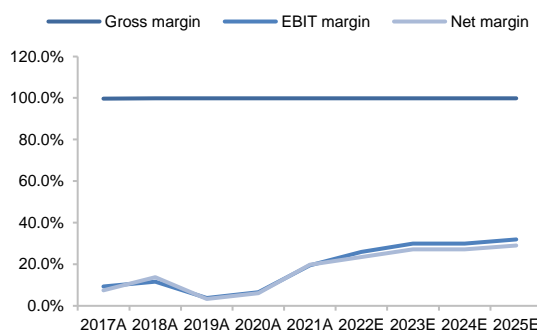
As for the Gross Margin, it has been stable at 99.8%+ for the past 10 years due to its design-dominant business model, we expect this to keep in line with historical trend.

Besides, as we asked about the R&D/Sales (~41% in 21A) implication for the coming years during the conference call in 2022/03/24, the Mgmt answered that Andes is doubling the size of the R&D team from 200 to 400+ employees in 22E-25E and heading into the expansion phase of Andes US operation for San Jose Headquarters & Portland R&D Office ([Link](#)). We therefore think 40% R&D/Sales is expected to sustain in the coming years. Although the constant high R&D/Sales is a potential downside for Andes (Exhibit 5), we regard this as an aggressive expansion of IP portfolio creation and believe it could boost great top-line growth in the coming years.

For the SG&A/Sales, we expect it can decrease at the historical trend of 20A-21A at 4-7% annual percentage improvement in 22E, while stay stable at 30% in 23E-25E considering more mature customer base and distribution efficiencies. Historically, the effective tax rate range from 3% to 9% from 18A-21A, we input a higher-end efficient tax rate given the potential increased tax obligation in Andes's global expansions.

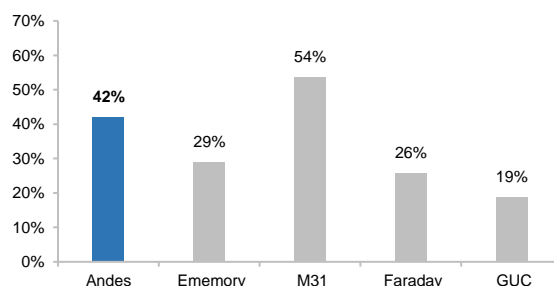
With above-mentioned assumptions of improved operating leverage, we expect the net margin to increase from 20% in 21A to 32% in 25E (Exhibit 4). For Dividends, we expect Andes would remain a 90% payout ratio due to sufficient in-house cash balance and improved OCF, identical to the 20A/21A payout policy.

**Exhibit 4: GM remain stable, NPM/EBIT difference enlarged due to increased tax obligation**



**Exhibit 5: Andes current R&D/Sales ranked no.2 in Taiwan listed IP Peers, and expected to sustain**

**21A Taiwan IP Peers R&D/Sales (%)**



### Balance Sheet

#### Net Cash (Exhibit 6):

Andes's 21A net cash position was around NT\$ 3.7 bn (~NT\$ 3.3 bn came from GDR issuance described below), while we model it to decrease to NT\$2.6 bn in 25E due to constant high dividend payout ratio and sustained high double-digit yoy of intangible asset by capitalization of R&D expense given more mature IPs, despite the improving operating cash flow. The net cash per share of NT\$ 82.6 in 21A decreased to NT\$51.7 in 25E was partially due to the share dilution effect from the 8 mn share issuance of GDR on 2021/10/06 ([link](#)), bringing the original 42.7 mn share count to 50.7 mn that would be fully recognized in 22E.

#### ROE (Exhibit 7):

We expect the ROE to increase from 21A 3.4% to 25E 18.6%, mainly driven by net margin improvement from 20% to 29% in 25E and improved asset turnover ratio from 0.2x to 0.6x, given slightly increased leverage of 1.05x to 1.1x, which is in line with historical trend. We regard this as healthy growth for Andes considering better efficiency in asset turnover and improving margin.

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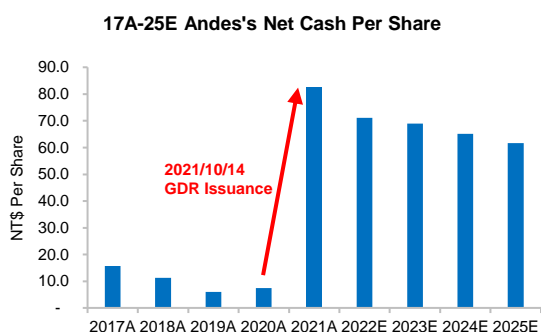
## Financials

### Balance Sheet (Cont.)

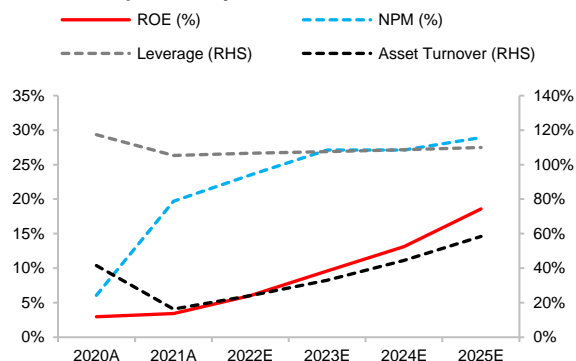
#### Cash Conversion Cycle:

As Andes's current cash conversion cycle is negative 376.5 days and was volatile historically, which is reasonable due to IP company's extremely light COGS structure giving a constant changing payable/inventory days. We therefore don't think it is a valuable metric to decide and project the business performance.

**Exhibit 6: Net Cash Per Share boost in 21A due to GDR Issuance, forecasted to be decrease slightly**



**Exhibit 7: Dupont Analysis**



### Cash Flow

#### Cash Flow from Investing (Exhibit 8):

Given Andes's IP business model, the capex requirement is significantly lower than foundry/IDM players - 21A CAPEX was mere NT\$ 9.1 mn (1% CAPEX/Sales). We model Andes's acquisition of intangible Assets to increase from NT\$ 212 mn – 440 mn from 21A - 25E (~29.4% CAGR), due to further capitalization of R&D expense, implied intangible/sales ratio decreases from 26% in 21A to 19% in 25E.

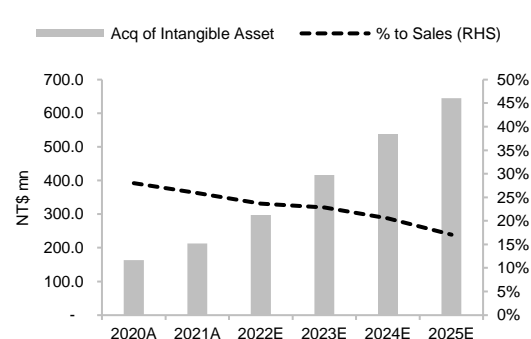
#### Free Cash Flow (Exhibit 9):

Andes's FCF was ~NT\$ 300 mn in 21A, we expect the free cash flow to grow at 21A-25E 35.6% CAGR due to improved OCF, to reach 25E FCF of NT\$ 1015 mn (Implied FCF/share NT\$ 20), indicating 21A 1.04% FCF yield and 25E 3.5% FCF yield under our NT\$ 570 target price.

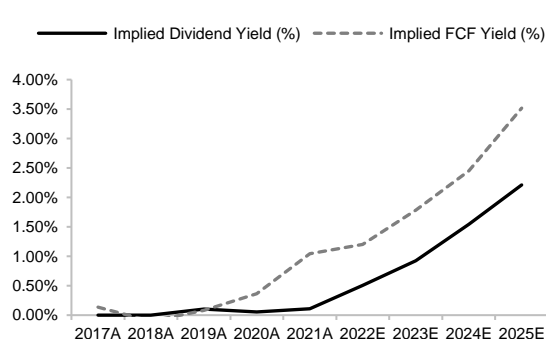
#### Dividend Yield (Exhibit 9):

Looking forward, we expect Andes's dividend payout ratio to be stable at 90% in 2021-25E (Identical to 20A/21A), which implies DPS from NT\$ 0.7 in 21A to NT\$12.6 in 25E, with an improving dividend yield of 0.11%/2.21% in 21A/25E.

**Exhibit 8: Andes's Acquisition of Intangible Asset**



**Exhibit 9: Andes FCF and Dividend Yield (%)**



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# Valuation

### #1 Absolute Valuation (DCF) – TP NT\$ 567.6 Per Share

Followed from previous base case projections on Andes (Net income growth at a +54.6% CAGR in 2022E-25E, with revenue growth at 44.2%, reaching 25E NT\$ 3.8 bn revenue scale and NT\$ 1 bn net profit), our NT\$567.6 price target is based on a 2-stage DCF reflecting long term growth of Andes with terminal exit year of 2031. Our base case assumes revenue growth will be normalized in 31E to yoy 9.4%, with an improving EBITDA margin ~2% p.a. We further apply 14.2% WACC (Note: Beta since IPO: 1.58, US 10-year treasury yield: 2.4%, TW 10 yr annualized market return 10%, Historical cost of financing: 2.3%) and a 3% terminal growth rate that implies 7.9x exit EV/EBITDA multiple, yielding our TP for NT\$ 567.6 target price from absolute valuation methodology.

### Cash Balance:

We use the 21A total debt and total cash balance for our valuation in our net debt calculation to reflect the real cash balance after Andes's cash proceed from GDR financing last year, and light-debt structure as before.

### Exhibit 10: DCF Valuation – TP at NT\$ 567.6

DCF - 6533 TT (NT\$ in mn)	Stage I (Ultra-High Growth)					Stage II (Normalization Period)				
	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
Revenue	1,257.9	1,822.7	2,611.2	3,769.3	5,064.1	6,550.4	8,145.5	9,721.6	11,116.7	12,156.2
Revenue growth	53.4%	44.9%	43.3%	44.4%	34.4%	29.4%	24.4%	19.4%	14.4%	9.4%
EBITDA	485.6	736.2	1,006.0	1,465.8	2,070.6	2,874.8	3,819.2	4,849.9	5,879.4	6,793.9
EBITDA margin	39%	40%	39%	39%	41%	44%	47%	50%	53%	56%
EBIT	324.8	543.5	778.6	1,199.3	1,712.5	2,411.7	3,243.3	4,162.5	5,093.4	5,934.3
EBIT margin	25.8%	29.8%	29.8%	31.8%	33.8%	36.8%	39.8%	42.8%	45.8%	48.8%
Tax rate	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%
EBIT*(1-Tax)	295.5	494.6	708.5	1,091.3	1,558.4	2,194.6	2,951.4	3,787.9	4,634.9	5,400.2
(plus) D&A	160.9	192.7	227.4	266.5	358.1	463.2	576.0	687.4	786.1	859.6
(less) changes in NWC	(101.9)	(164.3)	(220.3)	(335.1)	(351.9)	(369.4)	(387.9)	(407.3)	(427.7)	(449.1)
(less) Capex	(8.2)	(8.7)	(7.7)	(8.1)	(11.0)	(10.7)	(10.4)	(12.0)	(13.3)	(13.0)
Unlevered free cash flow	346.3	514.3	707.9	1,014.7	1,553.7	2,277.7	3,129.1	4,056.0	4,980.0	5,797.7
JFCF Growth YoY (%)	23.7%	48.5%	37.7%	43.3%	53.1%	46.6%	37.4%	29.6%	22.8%	16.4%
Discount Factor	1.0	0.9	0.8	0.7	0.6	0.5	0.5	0.4	0.3	0.3
Discounted UFCF	346.3	450.5	543.2	682.0	914.6	1,174.5	1,413.4	1,604.8	1,725.9	1,760.0

### Exhibit 11: WACC / EV Calculations

WACC calculation	
Beta	1.98
Risk free rate	2.4%
Market premium	7.60%
Cost of equity	14.4%
Cost of debt	2.3%
Debt/(Debt+Equity)	2.0%
Equity/(Debt+Equity)	98.0%
Effective Tax Rate	9.0%
Total Debt	96.8
Total Equity	4,771.3
WACC	14.2%

Enterprise Value Computations	
Stage I (22E-25E) NPV	2,021.9
Stage II (25E-35E) NPV	8,593.3
Terminal value	
Perpetual growth rate	3.0%
Terminal value	53,494.0
Implied EV/EBITDA	7.9x
Present value of terminal value	14,224.8
NPV of present value (Stage I + II)	10,615.1
Enterprise value	24,840.0
21A Total debt	96.8
21A Cash	4,004.7
Net debt	(3,907.9)
Minority interest	-
Equity value	28,747.9
Number of share outstanding	50.7
Indicated per share price (NT\$)	567.6

### Exhibit 12: Sensitivity Analysis

#### Sensitivity Analysis - Implied Terminal EV/EBITDA

		Perpetuity Growth						
		1.5%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%
WACC	12.7%	7.8x	8.2x	8.6x	9.1x	9.6x	10.2x	10.9x
	13.2%	7.4x	7.8x	8.2x	8.6x	9.1x	9.7x	10.3x
	13.7%	7.1x	7.5x	7.8x	8.2x	8.7x	9.2x	9.7x
	14.2%	6.8x	7.2x	7.5x	7.9x	8.3x	8.7x	9.2x
	14.7%	6.6x	6.9x	7.2x	7.5x	7.9x	8.3x	8.8x
	15.2%	6.3x	6.6x	6.9x	7.2x	7.6x	8.0x	8.4x
	15.7%	6.1x	6.4x	6.6x	6.9x	7.3x	7.6x	8.0x

#### Sensitivity Analysis - Share price (NT\$)

		Perpetuity Growth						
		1.5%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%
WACC	12.7%	619.7	636.2	654.2	674.1	696.2	720.9	748.6
	13.2%	587.2	601.6	617.4	634.8	653.9	675.2	698.9
	13.7%	557.6	570.4	584.3	599.4	616.1	634.5	654.9
	14.2%	530.7	542.0	554.2	567.6	582.2	598.2	615.9
	14.7%	506.1	516.1	527.0	538.7	551.6	565.6	581.0
	15.2%	483.5	492.5	502.1	512.5	523.8	536.2	549.7
	15.7%	462.8	470.8	479.4	488.6	498.7	509.5	521.4

## Andes Technology | Asia Pacific

# Valuation

### #2 Relative Valuation (Discounted P/E) – TP NT\$ 576 Per Share

Based on our research on APAC semiconductor pure IP peers' FY+1 multiples, we didn't find a strong correlation between top-line growth v.s. EV/Sales multiple (r-square < 0.01), we believe the reason is that, in APAC IP peers, their business is in a high growth stage and most of these companies are evaluated in a long-term view rather than short-term top-line expansions. Our analysis also shows that there is a positive correlation between forwarding 1yr EPS yoy v.s. P/E multiples (r-square 0.6, correlation ~ 0.8). We therefore believe APAC IP players with stronger earning growth will enjoy higher PE multiples.

For Andes, to capture the long-term upside in potential Risc-V expansions, with further improved margin while sustainable double-digit growth, we used discounted P/E as our relative valuation methodology. To derive our 12-month target price, we apply "end-game multiples" to 25E EPS, and discount it back to 2022E at Andes's cost of equity.

With long-term EPS growth at 54.6% CAGR in 22E-25E, we apply a 40x target PE multiple to Andes's 2025E EPS of NT\$21.5. The 40x multiple is derived from the group median of matured EDA/IC Design/IP players' FY+1 P/E multiples. The COE of 14.4% is based on identical assumptions illustrated in the absolute valuation section on the previous page. Out TP of NT\$ 570.0 implies a 2022E/23E PE of 98.7x/59.0x, which we view as justified valuation multiples given the 10 years' historical TTM PE of Andes falls in the range of 51x-98x, and FY+1 multiples normally can be higher or lower than TTM range from the historical trend of Andes price.

Exhibit 13: Discounted P/E Valuation – TP at NT\$ 576

(NT\$ in mn)	2018A	2019A	2020A	2021A	2022E	2023E	2024E	2025E
<b>Revenue</b>	<b>304.8</b>	<b>494.9</b>	<b>581.0</b>	<b>819.8</b>	<b>1,257.9</b>	<b>1,822.7</b>	<b>2,611.2</b>	<b>3,769.3</b>
YoY Growth (%)	5%	62%	17%	41%	53%	45%	43%	44%
<b>Gross Profit</b>	<b>304.3</b>	<b>494.0</b>	<b>579.8</b>	<b>818.3</b>	<b>1,255.6</b>	<b>1,819.4</b>	<b>2,606.4</b>	<b>3,762.4</b>
Gross Margin (%)	100%	100%	100%	100%	100%	100%	100%	100%
<b>Operating Income (Loss)</b>	<b>35.3</b>	<b>18.6</b>	<b>37.6</b>	<b>158.7</b>	<b>324.8</b>	<b>543.5</b>	<b>778.6</b>	<b>1,199.3</b>
Operating Margin (%)	12%	4%	6%	19%	26%	30%	30%	32%
<b>Pretax Income (Loss), GAAP</b>	<b>43.0</b>	<b>17.8</b>	<b>38.7</b>	<b>177.1</b>	<b>324.8</b>	<b>543.5</b>	<b>778.6</b>	<b>1,199.3</b>
<b>Net Income, GAAP</b>	<b>41.6</b>	<b>16.0</b>	<b>35.1</b>	<b>161.7</b>	<b>295.5</b>	<b>494.6</b>	<b>708.5</b>	<b>1,091.3</b>
Net Margin (%)	14%	3%	6%	20%	23%	27%	27%	29%
Basic EPS, GAAP	1.0	0.4	0.8	3.6	5.8	9.8	14.0	21.5
EPS Growth YoY (%)	n.a.	-60.8%	115.8%	337.1%	62.8%	67.4%	43.3%	54.0%
*25E Target PE (x)								40.0x
*Endgame Valuation (Target PE x 25E EPS)								NT\$ 862
<b>Target Price Per Share (NT\$, 22E Based)</b>					<b>NT\$576</b>			
Implied 22E-25E P/E (x)					98.7x	59.0x	41.2x	26.7x

Cost of Equity Assumptions - Discount From 25E-22E	
Beta	1.58
Risk-Free Rate	2.40%
Market Risk Premium	7.60%
<b>Cost of Equity</b>	<b>14.4%</b>

Exhibit 14: Global Mature Peers' 22E PE (x)

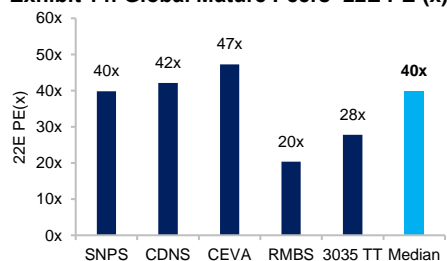


Exhibit 15: APAC IP peers' PE, EV/Sales vs EPS/Sales YoY correlation

Ticker	22E PE (x)	EPS YoY	Ticker	22E EV/S (x)	Sales YoY
6533 TT	83.4x	38%	6533 TT	14.7x	40%
3529 TT	83.0x	42%	3529 TT	41.7x	31%
6643 TT	32.6x	29%	6643 TT	8.3x	20%
3035 TT	29.3x	129%	3035 TT	5.2x	63%
3443 TT	37.1x	28%	3443 TT	3.4x	21%
688521 CH	160.8x	776%	688521 CH	8.0x	37%
688256 CH	-27.9x	7%	688256 CH	21.8x	40%
<b>Correl.</b>	<b>1.00</b>	<b>0.78</b>	<b>Correl.</b>	<b>1.00</b>	<b>-0.08</b>
<b>R-Square</b>	<b>1.00</b>	<b>0.61</b>	<b>R-Square</b>	<b>1.00</b>	<b>0.01</b>

## Andes Technology | Asia Pacific

# Valuation

### Valuation Summary – TP NT\$ 570 Per Share

To drive further scenario analysis under bull case/bear case, we think adopting current trending multiples is necessary to tie to the market dynamic and historical valuation movements.

### Bull, Bear, Base scenarios under 22E P/E & EV/Sales Frameworks:

#### NT\$ 665 ~ 673 Bull Case (60%+ Upside):

Assume the company breaks consensus EPS by 25% (Implied NT\$ 6.2 22E EPS) with implied Arm's 21A P/E 107x under US\$ 60 bn IPO Price. Sales break consensus by 25% with 21x EV/Sales (10 yr Median +1.9SD), yielding Bull Case TP NT\$ 665 ~ 673 and 60%+ upside.

#### NT\$ 560 Base Case (44% Upside):

Assume the base case valuation logic of previous pages holds. Implied a 97.7x 22E P/E & 19.8x EV/Sales.

#### NT\$ 317 ~ 322 Bear Case (-21% Downside):

Assume EPS delivered lower than consensus by 30% (slightly higher than 21A NT\$ 3.6 EPS), with 83.4x PE (10 yr Median – 1SD). Sales fall under the consensus by 10% with EV/Sales 11.6x (Min EV/Sales Trend), yielding Bear Case TP NT\$ 317~322, reflecting a near -22% downside.

### Exhibit 16: Valuation Summary – Scenario Analysis Analysis

#### Valuation Summary - Implied P/E, EV/S Framework

##### Company Info

Name	ANDES TECH	
Ticker	6533 TT	
Market Cap (US\$mn)	717	
Share outs (mm)	51	
Price (Trading Currency)	405	NT\$ (NTD)
Fund to Price FX	1.00	
Pricing Currency	NT\$ (NTD)	
Fund Currency	NT\$ (NTD)	
Net Debt	-3908	

##### Key Financial Metrics

Consensus	2020	2021	2022	2023
Sales	581	820	1,150	1,593
Net Income	35	162	251	481
EPS	0.8	3.6	5.0	9.5
CUIRS Est.	2020	2021	2022	2023
Sales	581	820	1258	1823
Net Income	35	162	296	495
EPS	1	3.6	5.8	9.8

##### Andes (6533 TT)'s Historical TTM Valuation Multiples

10y History	P/E	EV/EBITD A	EV/Sales
Median	66.9x	36.9x	15.1x
SD	13.4x	8.3x	3.1x
Max	97.7x	56.6x	22.7x
Min	51.2x	27.5x	11.6x

##### 22E P/E Framework - Implied Multiple Method

	EPS	PE (x)	TP	Rtn (%)
Upside	6.2	107.0x	665	64%
Base	5.8	97.7x	570	41%
Downside	3.8	84.3x	322	-20%

##### 22E EV/Sales Framework - Implied Multiple Method

	Sales	EV/Sales	TP	Rtn (%)
Upside	1438	21.0x	673	66%
Base	1258	19.8x	570	41%
Downside	1045	11.6x	317	-22%

##### Selected Comps Multiples

Multiples	EV/Sales			P/E		
	21A	22E	23E	21A	22E	23E
ANDES TECH	20.6x	14.7x	10.6x	129.6x	83.4x	43.5x
EMEMORY TECH	54.7x	41.7x	35.7x	119.6x	83.0x	66.5x
M31 TECHNOLOGY	9.9x	8.3x	7.0x	42.2x	32.6x	24.9x
FARADAY TECH	8.5x	5.2x	4.8x	67.0x	29.3x	29.1x
GLOBAL UNICHIP	4.1x	3.4x	2.9x	47.5x	37.1x	30.1x
VERISILICON MI-A	11.0x	8.0x	6.0x	NM	160.8x	86.0x
CAMBRICON-A	30.6x	21.8x	15.6x	NM	NM	NM

##### Simple AVG - Excluding Target

Max	54.7x	41.7x	35.7x	119.6x	160.8x	86.0x
Q3	36.6x	26.8x	20.6x	106.5x	121.9x	76.3x
Median	10.4x	8.1x	6.5x	57.3x	37.1x	30.1x
Q1	7.4x	4.8x	4.3x	43.5x	30.9x	27.0x
Min	4.1x	3.4x	2.9x	42.2x	29.3x	24.9x

##### Outputs

Years	Sales Growth YoY (%)			Net Margin (%)		
	21E	22E	23E	21E	22E	23E
ANDES TECH	41%	40%	39%	20%	22%	30%
EMEMORY TECH	33%	31%	17%	47%	51%	55%
M31 TECHNOLOGY	3%	20%	18%	25%	27%	30%
FARADAY TECH	43%	63%	9%	14%	19%	17%
GLOBAL UNICHIP	11%	21%	16%	10%	10%	11%
VERISILICON MI-A	43%	37%	33%	1%	5%	7%
CAMBRICON-A	55%	40%	40%	-123%	-91%	-48%



## Andes Technology | Asia Pacific

# Industry Introduction

### Embedded Processor IP Licensing Industry

#### Industry Summary

Processors are categorized into 2 types - (1) General processors, which are often used in the PC system, such as Intel Core processors or AMD processors, and (2) Application or embedded processors, which are designed for handling specific needs of an embedded system.

The licenses of the embedded processor SIPs are divided into 3 categories – (1) Normal or soft core license, which is typically offered as synthesizable RTL codes and allows customers to perform the optimal logic synthesis and physical design on their processors, (2) Hard core license, which SIP vendors have to complete the logic synthesis and physical design in advance, and (3) Architecture license, which is needed when customers intend to add functions and features different than those of the soft license.

Embedded processor IP licensing companies are positioned upstream of the semiconductor industry and normally don't directly involve in the manufacture. Their customers are mainly system companies that use SoC Chips, electronic manufacturing companies, and brand companies in the downstream of IC industry.

#### Future Prospect

With the development of various applications such as smart devices, wearable electronics, automotive electronics, IoT, 5G, and machine learning, embedded processor licensing industry is facing competition and challenges in (1) The flexibility of the design and function units of the architecture, (2) The trade-off between energy-saving and performance, and (3) Launching products corresponding to various industrial standards and applications. Due to the application needs and advancement of the IC fabrication processes, System on a Chip (SoC) has become the mainstream of IC chips. SoCs are IC chips that combine system integration and provide specific uses. It must consist of the embedded CPU with computing capability, memory, digital logic circuit, analog circuit, and other necessary I/O interfaces. Currently, only ARM, ARC, MIPS, SiFive, Andes, and other small companies in Europe and USA can provide reusable embedded processor IPs.

### Risc-V Industry

#### Industry Summary

Currently, processors from Intel and ARM with closed and proprietary instruction set architectures (ISAs, including the popular x86 and ARM architectures) have made up nearly all CPUs deployed globally.

Risc-V is a relatively new ISA for chip design, and it offers several advantages over proprietary ISAs – (1) Open source, which both saves the high licensing fees for companies and prevents it from being affected by export restrictions, and (2) Greater design flexibility, which allows it to be compatible with a wider range of innovative applications like AI, IoT, and 5G. Based on Deloitte Research, at a more technical level, Risc-V designs are easier to modify than traditional ISAs, allowing for greater flexibility, they are also compatible with a wide range of applications, even though some doubters argue Risc-V could face challenges across ecosystems, companies are tapping into Risc-V cores for all of AI image sensors, security management, AI computing, and machine control system for 5G. Other companies are planning on using it for different storage, graphics and machine learning applications. Even Intel's foundry services division is partnering with Risc-V player SiFive ([Deloitte](#), 2021). Now Andes is also in partnerships with Intel's foundry service alliance.

## Andes Technology | Asia Pacific

# Industry Introduction

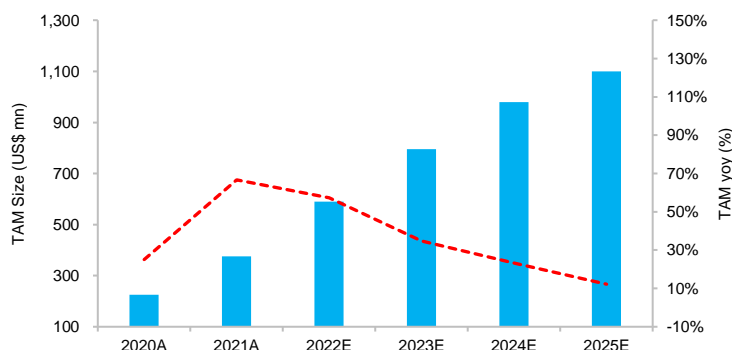
### Risc-V Industry (cont.)

#### Total Addressable Market (TAM):

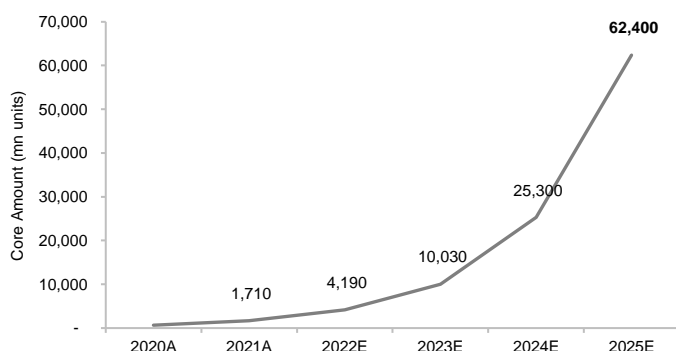
Combining with above-mentioned characteristics, the key growth factor of Risc-V lies in IoT - The big data collected by IoT applications also drives the upgrading demands for the infrastructure, such as storage and network equipment, and emerging technologies such as AI/Machine learning from so-called edge computing. Since 2020, the 5G/AI/Datacenter/AR/VR industry has been growing, and the penetration of Electric Vehicle also increase the demand for semiconductors, there are lots of dimensions that Risc-V industry could grow from, other than PC industry (dominant by Intel X86 ISA) and Mobile Industry (dominant by Arm ISA). Risc-V is penetrating from high computing power, MCU, IoT, and receiving more and more attention under the current unstable political environment, that every country are trying to strengthen localization ability and develop a chip industry that can not be easily sanctioned, and Risc-V's open source and neutral positions are expected to penetrate more markets and applications ([link](#), 2023).

According to Deloitte, the TAM of Risc-V industry will likely reach close to US\$ 720 mn in 23E, up from less than US\$ 350 mn in 21A, and is expected to approach US\$ 1 bn by 25E, which implies a 31.5% CAGR from 21A-25E ([Deloitte](#), 2021). Besides, based on Semico's estimation, Risc-V accumulated CPU cores will reach ~62.4 bn units by 2025, with a compound annual growth rate of 146% from 19A-25E ([Semico](#), 2019).

**Exhibit. 17 Risc-V Market Size (Deloitte, 2021)**



**Exhibit. 18 Risc-V Accumulated Core Amount (Semico, 2019)**



## Andes Technology | Asia Pacific

# Industry Introduction

### Competition Landscape

Currently there's no public resource to indicate how much market share that Andes has as it is the only listed embedded processor licensing company focusing on Risc-V. We also learned from the March 24<sup>th</sup> Andes conference call that there's no reliable figures to show how many market share it has, yet the chairman mentioned Andes and SiFive are the largest player in the market.

We've listed out the major private peers which are more direct comparable:

Company	Description
ARM	Largest embedded processor company globally. Dominating in smartphones and other mobile devices markets.
ARC	Owned by Synopsys, the top IP EDA and interface IP company. The configurable structure of ARC enables its IPs to provide various functions in different applications.
MIPS	Based on Risc ISA, MIPS structure was once the strongest competitor for x86 and ARM. While it still owns the third largest market share, the company has decided to move its focus to Risc-V.
SiFive	The pioneer and the top player in Risc-V industry with many founders of the Risc-V ISA. It sold its customization SIP segment OpenFive to Alphawave IP recently for US\$ 210 mn and raised US\$ 175 mn in its Series F financing with a post-money valuation around US\$ 2.5 bn.
West Digital	Co-founding member of the Risc-V Foundation. The firm launched its first Risc-V CPU core in 2018 and announced to transform its future products into Risc-V architecture.
T-Head	Owned by Alibaba, T-Head is the first company in China developing RISC technology. T-Head's products has covered data center chips and processor IPs with applications including IoT, communication, and data storage industry.

Besides, we also list out the current listed Semiconductor IP / Design Service companies even they are not covering the exactly same industry. Yet we use them to evaluate the industry trading multiples.

### Exhibit. 19 TW Listed Peer Comparisons

Company	eMemory	M31	Andes	Faraday*	GUC*	Alchip*
Chinese Name	力旺	M31	晶心科	智原	創意電子	世芯電子
Ticker	3529 TT	6643 TT	6533 TT	3035 TT	3443 TT	3661 TT
Founding Year	2000	2011	2005	1993	1998	2001
Pure IP Player?	Yes	Yes	Yes	No	No	No
License% of total 20A IP Sales	27.60%	88.45%	72.67%	100%	100%	-
Royalty% of total 20A IP Sales	72.40%	11.55%	27.33%	0%	0%	-
IP Strengths	Embedded non-volatile memory IP	Foundation IP, Analog IP, High Speed Transmission IP	Risc-V IP, CPU IP	Analog IP, Interface IP	Analog IP, ASIC	ASIC, SoC, Analog IP
IP Portfolio	Embedded non-volatile memory IP (OTP, MTP, EEPROM)	Foundation IP (I/O, Standard Cell), Functional IP (Analog IP)	16/32/64-bit Processor IP (Curr. ~60% Revenue are Risc-V)	Analog IP, Interface IP (Ethernet, USB), I/O, Memory Compiler	HBM2 (High Band Width), T-Cam, Die-To-Die SerDes, Analog IP (Focused on customized functional IP)	Analog IP(PHY, ADC / DAC, PLL / DLL, LDO, BGR, I/O, RTC, POR, etc.)
IP Application	PMIC, LCD/OLED DDIC, Fingerprint, RFID, Connectivity IC SSD Controller, Bluetooth, TDDI, MCU, Surveillance, DRAM, Embedded Flash, FPGA 190	Smartphone AP, Wearable, Smart Home/Speaker, DDIC, PMIC, Audio, AI Image Recognition, ADAS, Surveillance	Smart Speaker, Datacenter Machine, Learning Computer, Datacenter switch router, 5G Networking, Wi-Fi 6, AI Processor	Mainly for UMC Sponsored IP Library and Faraday's ASIC Business	Mainly For GUC's ASIC Business and partly for TSMC's sponsored IP	AI.HPC/Communication market, HDTV, Mobile Phones, Digital Cameras, Surveillance systems, bitcoin mining machine
R&D Team Size	190 (All IP Team)	140 (All IP Team)	200 (Expanding to 400 within 3 years)	800 (Total)	550 (Total)	~300 (Total)
2020 R&D/Sales	33.9%	42.9%	40.8%	33.7%	16.5%	11.1%
2021 Q3 R&D/Sales, %	28.8%	46.7%	48.3%	22.9%	20.7%	8.8%

## Andes Technology | Asia Pacific

# Company Profile

### Company Introduction

Andes is a leading embedded processor intellectual property supplier in Taiwan developing high-performance/low-power 32/64-bit processors and their associated SoC platforms. According to Industry Research, Andes Technology is among the top 10 silicon IP vendors in the world ([Industry Research](#), 2022). In its 32/64-bit ISA (AndeStar™), it has evolved from V1, V2, and V3 to V5 architecture. Since 2018, the V3 revenue portion has decreased from ~70% to 34% in 21A, and the rest portions are Risc-V and other segments. Andes have produced over 3 bn AndeStar V3 SoCs in 2021, and the accumulative total has exceeded 10 bn. Until the fourth quarter, Risc-V and AndeStar V3 products continued to be licensed for SoC development. And from the latest interview with the CEO, normally there is a 25-30 years product life of a CPU IP, marking the stable revenue streams for coming decades ([link](#), March 28<sup>th</sup>). As the industry introduction mentioned, Risc-V is merely an instruction set architecture. Yet It needs microarchitecture implementation and other associated products (such as compiler, development tools, and platform) to provide a complete CPU IP solution. Andes sees the potential of Risc-V a few years ago and it is joining forces with partners of Risc-V community to grow the ecosystem by bringing Andes' CPU IP experiences together with Risc-V's technology. Andes becomes one of the Founding members of Risc-V Foundation (2016) and a Premier member of Risc-V International (2020).

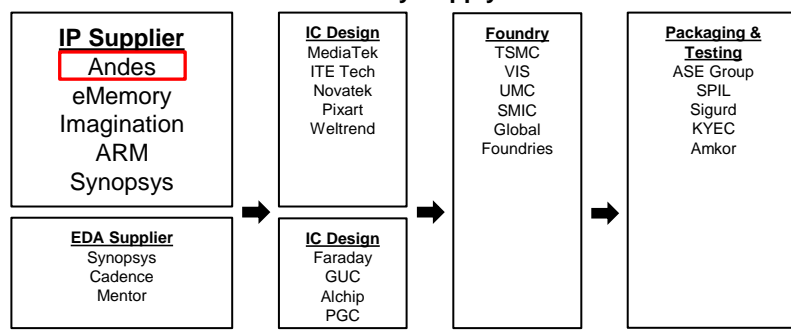
### Business Model

As an IP vendor company focusing on softcore licensing, Andes is positioned upstream of the fabless in the semiconductor industry. Uniquely among Risc-V IP suppliers, Andes provides world's leading customer-instruction extension capability IP and tool. With years of customers interaction, Andes is a leader in designing capability important to SoC designers. Its technical service team is organized to provide customers in-depth knowledge, technical support and consulting service on Andes product lines. Andes mainly profits from (1) licensing SIP to IC design companies and (2) the royalty after the IC design companies decided to adapt their design and entered the mass production process.

### Supply Chain Position

As above mentioned, the main products of the Company are to grant licenses of the embedded IP processors, as well as related platforms and services. In short, the Semi IP vendor exists as fabless/system companies wishing to fabricate a complex device that may license the rights to use the IP vendors' well-tested functional blocks such as a microprocessor, instead of developing their own design, which would require additional time and cost. **The supply chain breakdown of Andes Technology is as follows:**

**Exhibit 20. Semiconductor Industry Supply Chain**



## Andes Technology | Asia Pacific

# Company Profile

### Products & Services Summary

#### License of CPU IP revenues, key products including:

**AndeCore™:** A series of configurable CPU core families and their Companion IPs.

**AndeSight™:** An integrated software development environment that is an optimized tool for software/hardware development and debugging.

**AndeStar™:** An instruction set includes 16-bit and 32-bit mixed-length instructions.

**AndeSoft™:** The optimized targets running on AndeCore™ processors, including system software, driver, and middleware.

**AndeSentry™:** Safety protection architecture, including software and hardware solutions.

**\*License fee:** Andes has granted the licenses of its CPU IPs and Platform IPs to SoC design companies and charges the license fee based on the quantity used.

#### Custom Computing Business Unit (CCBU):

Established in response to the accelerated architectural trend of special applications and customized needs

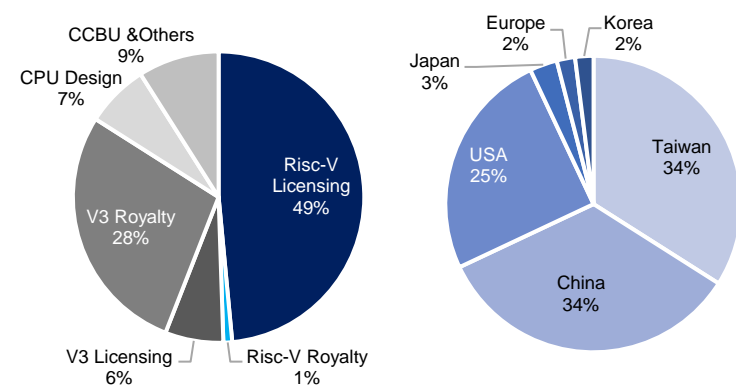
#### Royalty revenues:

Customers use licensed CPU IPs to design SoC ICs. Andes collects royalties based on its sales volume after mass production.

#### Maintenance services and others:

Maintenance fee is paid by customers every year to obtain CPU IP and development tool updates. Other refers to AndeShape™, an integrated hardware development environment including development platforms and Platform IPs that help customers quickly develop their SoC. It is mainly sold to customers and universities for R&D, chip debugging, or teaching.

**Exhibit 21. FY21 Revenue Analysis by Products / by Region**



## Andes Technology | Asia Pacific

# Company Profile

### People – Key Management

**A Tech-oriented firm: 80% of 240+ employees are engineers**

#### Frankwell Jyh-Ming Lin (Co-founder, Chairman and CEO)

**Responsibilities:**

Analyse, plan, and execute corporate strategies.

**Work experience:**

Company	Description	Position
Faraday	ASIC development & SIP	VP
UMC	Semiconductor foundry	Business Manager

#### Charlie Hong-Men Su (Co-founder, President and CTO)

**Responsibilities:**

Develop CPU and other IP related design, maintenance, and test.

**Work experience:**

Company	Description	Position
Faraday	ASIC development & SIP	Chief Architect

#### Yung-Ching Hsiao (Senior VP of R&D Division)

**Responsibilities:**

Develop CPU and other IP related design, maintenance, and test.

**Work experience:**

Company	Description
Sun Microsystems	UltraSPARC IV+ design and verification

#### Justin Jen-Chih Tseng (Senior VP of Technology & New Business)

**Responsibilities:**

Develop CPU and other IP related design, maintenance, and test. Provide technical service, customers training course, reply the technical questions, and developing the online service system.

**Work experience:**

Company	Description	Position
Sun Microsystems	Design and verification for server-grade microprocessors	Design Engineer

#### AI Kuo-Chi Lin (Vice President of Sales, Headquarters)

**Responsibilities:**

Sell IP Business related product and service, develop customers, maintain customer relationship and manage sales operation.

**Work experience:**

Company	Position
Faraday	Sales Deputy Director
Trecenti Technology	RD manager
UMC	RD engineer

## Andes Technology | Asia Pacific

# Appendix

### Andes 2017A-2025E Financial Summary

#### Income Statement (NT\$ mn)

	2017A	2018A	2019A	2020A	2021A	2022E	2023E	2024E	2025E
<b>Revenue</b>	<b>289.4</b>	<b>304.8</b>	<b>494.9</b>	<b>581.0</b>	<b>819.8</b>	<b>1,257.9</b>	<b>1,822.7</b>	<b>2,611.2</b>	<b>3,769.3</b>
Cost of Good Sold	(0.9)	(0.4)	(0.8)	(1.2)	(1.5)	(2.3)	(3.3)	(4.8)	(6.9)
<b>Gross Profit</b>	<b>288.4</b>	<b>304.3</b>	<b>494.0</b>	<b>579.8</b>	<b>818.3</b>	<b>1,255.6</b>	<b>1,819.4</b>	<b>2,606.4</b>	<b>3,762.4</b>
SG&A	(153.5)	(149.8)	(236.4)	(268.2)	(315.8)	(415.1)	(546.8)	(783.4)	(1,130.8)
R&D	(108.1)	(117.2)	(227.7)	(237.1)	(343.8)	(515.7)	(729.1)	(1,044.5)	(1,432.3)
D&A	(3.0)	(17.5)	(68.6)	(101.9)	(147.7)	(160.9)	(192.7)	(227.4)	(266.5)
Prov for Doubtful Asset	-	2.0	(11.3)	(37.0)	-	-	-	-	-
Other OPEX	3.0	13.5	68.6	101.9	147.7	160.9	192.7	227.4	266.5
<b>EBIT</b>	<b>26.9</b>	<b>35.3</b>	<b>18.6</b>	<b>37.6</b>	<b>158.7</b>	<b>324.8</b>	<b>543.5</b>	<b>778.6</b>	<b>1,199.3</b>
Non-Operating P&L	(3.2)	7.7	(0.5)	1.1	18.4	-	-	-	-
<b>Pre-tax Profit</b>	<b>23.7</b>	<b>43.0</b>	<b>17.8</b>	<b>38.7</b>	<b>177.1</b>	<b>324.8</b>	<b>543.5</b>	<b>778.6</b>	<b>1,199.3</b>
Tax Expense	(2.2)	(1.4)	(1.8)	(3.5)	(15.4)	(29.2)	(48.9)	(70.1)	(107.9)
Minority Interest	-	-	-	-	-	-	-	-	-
<b>Net Income, GAAP</b>	<b>21.5</b>	<b>41.6</b>	<b>16.0</b>	<b>35.1</b>	<b>161.7</b>	<b>295.5</b>	<b>494.6</b>	<b>708.5</b>	<b>1,091.3</b>
EBITDA	29.9	52.8	87.1	139.5	306.4	485.6	736.2	1006.0	1465.8
<b>EPS (Basic, NT\$)</b>	<b>0.5</b>	<b>1.0</b>	<b>0.4</b>	<b>0.8</b>	<b>3.6</b>	<b>5.8</b>	<b>9.8</b>	<b>14.0</b>	<b>21.5</b>
<b>EPS (Diluted, NT\$)</b>	<b>0.5</b>	<b>1.0</b>	<b>0.4</b>	<b>0.8</b>	<b>3.6</b>	<b>5.8</b>	<b>9.7</b>	<b>13.9</b>	<b>21.5</b>
Wtdavg Shares out. (basic) (mn)	42.0	42.7	42.7	42.7	45.1	50.7	50.7	50.7	50.7
Wtdavg Shares out. (diluted) (mn)	42.0	42.7	42.7	42.7	45.1	50.8	50.8	50.8	50.8
DPS (Basic)	-	-	0.7	0.3	0.7	2.9	5.3	8.8	12.6

#### Growth & Margins (%)

Total revenue growth	38.7%	5.3%	62.4%	17.4%	41.1%	53.4%	44.9%	43.3%	44.4%
EBITDA growth	-182.8%	76.9%	65.0%	60.1%	119.6%	58.5%	51.6%	36.7%	45.7%
EPS growth	-162.8%	88.6%	-60.8%	115.8%	337.1%	62.8%	67.4%	43.3%	54.0%
DPS growth	n.a.	n.a.	n.a.	-51.2%	106.0%	310.0%	82.8%	67.4%	43.3%
Gross margin	99.7%	99.9%	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%
EBIT margin	9.3%	11.6%	3.8%	6.5%	19.4%	25.8%	29.8%	29.8%	31.8%
Net margin	7.4%	13.6%	3.2%	6.0%	19.7%	23.5%	27.1%	27.1%	29.0%

#### Balance Sheet (NT\$ mn)

Cash & cash equivalents	688.7	528.4	471.9	526.7	4,004.7	3,908.2	3,740.4	3,466.4	3,199.2
Short-term investments	394.0	420.0	325.5	180.0	180.0	180.0	180.0	180.0	180.0
Accounts receivable	45.5	56.1	115.4	112.8	154.5	237.1	343.5	492.1	710.4
Notes receivable	-	-	-	-	-	-	-	-	-
Unbilled revenues	-	60.1	87.1	133.0	157.6	252.4	365.8	524.0	756.4
Inventories	1.1	0.9	1.6	2.0	1.1	(1.9)	(2.9)	(4.6)	(6.6)
Other current assets	9.9	16.8	26.6	22.6	20.0	20.0	20.0	20.0	20.0
<b>Total current assets</b>	<b>1,139.2</b>	<b>1,082.3</b>	<b>1,028.0</b>	<b>977.1</b>	<b>4,517.9</b>	<b>4,595.8</b>	<b>4,646.7</b>	<b>4,677.9</b>	<b>4,859.4</b>
Net PP&E	3.2	23.2	150.7	129.4	119.8	115.5	111.0	104.8	98.5
Other long-term assets	42.1	131.7	211.2	296.4	391.4	540.3	776.9	1,100.1	1,492.2
<b>Total assets</b>	<b>1,184.4</b>	<b>1,237.1</b>	<b>1,389.9</b>	<b>1,402.9</b>	<b>5,029.2</b>	<b>5,251.6</b>	<b>5,534.6</b>	<b>5,882.9</b>	<b>6,450.1</b>
Accounts payable	0.0	1.1	0.0	0.3	2.9	3.4	3.9	4.5	5.1
Other payables & accruals	24.7	27.4	50.7	69.0	129.3	201.3	255.2	339.5	452.3
Short-term debt	-	-	17.5	17.1	14.0	14.0	14.0	14.0	14.0
Deferred revenue	5.4	19.6	37.8	28.9	28.9	28.9	28.9	28.9	28.9
<b>Total current liabilities</b>	<b>30.1</b>	<b>48.1</b>	<b>105.9</b>	<b>115.2</b>	<b>175.1</b>	<b>247.5</b>	<b>301.9</b>	<b>386.8</b>	<b>500.3</b>
Long-term debt	-	-	109.7	92.3	82.8	82.8	82.8	82.8	82.8
<b>Total long-term liabilities</b>	<b>-</b>	<b>-</b>	<b>109.7</b>	<b>92.3</b>	<b>82.8</b>	<b>82.8</b>	<b>82.8</b>	<b>82.8</b>	<b>82.8</b>
<b>Total liabilities</b>	<b>30.1</b>	<b>48.1</b>	<b>215.6</b>	<b>207.5</b>	<b>257.9</b>	<b>330.3</b>	<b>384.7</b>	<b>469.6</b>	<b>583.1</b>
Preferred shares	(3.0)	(2.0)	(1.0)	-	-	-	-	-	-
<b>Total common equity</b>	<b>1,154.3</b>	<b>1,189.0</b>	<b>1,174.3</b>	<b>1,195.4</b>	<b>4,771.3</b>	<b>4,921.3</b>	<b>5,149.9</b>	<b>5,413.3</b>	<b>5,867.0</b>
Minority interest	-	-	-	-	-	-	-	-	-
<b>Total liabilities &amp; equity</b>	<b>1,184.4</b>	<b>1,237.1</b>	<b>1,389.9</b>	<b>1,402.9</b>	<b>5,029.2</b>	<b>5,251.6</b>	<b>5,534.6</b>	<b>5,882.9</b>	<b>6,450.1</b>
BVPS (TWD)	27.6	27.9	27.6	28.0	105.8	97.2	101.7	106.9	115.8
Net Cash Per Share (NT\$)	15.7	11.3	6.0	7.5	83.1	70.6	66.3	59.2	51.7

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# Appendix

### Andes 2017A-2025E Financial Summary

#### Cashflow Statement (NT\$ mn)

	2017A	2018A	2019A	2020A	2021A	2022E	2023E	2024E	2025E
Net income	21.5	41.6	16.0	35.1	161.7	295.5	494.6	708.5	1,091.3
D&A add-back	3.0	17.5	68.6	101.9	147.7	160.9	192.7	227.4	266.5
Minority interest add-back	-	-	-	-	-	-	-	-	-
Net (inc)/dec working capital	9.3	(69.4)	(67.5)	(65.9)	0.2	(101.9)	(164.3)	(220.3)	(335.1)
<b>Cash flow from operations</b>	<b>42.1</b>	<b>(7.9)</b>	<b>30.9</b>	<b>108.1</b>	<b>309.5</b>	<b>354.5</b>	<b>523.0</b>	<b>715.6</b>	<b>1,022.8</b>
CAPEX	(2.7)	(21.8)	(7.7)	(3.3)	(9.1)	(8.2)	(8.7)	(7.7)	(8.1)
Acq of Intangible Asset	(42.7)	(100.4)	(125.7)	(162.9)	(212.3)	(297.2)	(416.1)	(536.8)	(644.2)
Chg in ST Investment	(0.1)	(31.0)	95.0	145.5	-	-	-	-	-
<b>Cash flow from investing</b>	<b>(439.5)</b>	<b>(153.2)</b>	<b>(38.4)</b>	<b>(20.7)</b>	<b>(221.4)</b>	<b>(305.5)</b>	<b>(424.8)</b>	<b>(544.5)</b>	<b>(652.3)</b>
Dividend paid	-	-	(29.7)	(14.5)	(31.6)	(145.5)	(266.0)	(445.1)	(637.7)
Net cash from debt	-	-	(17.8)	(17.5)	(12.6)	-	-	-	-
Share issuance/(repurchase)	331.4	-	-	-	3,434.1	-	-	-	-
<b>Cash flow from financing</b>	<b>331.4</b>	<b>-</b>	<b>(47.6)</b>	<b>(32.0)</b>	<b>3,389.9</b>	<b>(145.5)</b>	<b>(266.0)</b>	<b>(445.1)</b>	<b>(637.7)</b>
Effect of foreign exchange rates	(1.2)	0.7	(1.4)	(0.6)	-	-	-	-	-
<b>Total cash flow</b>	<b>(67.2)</b>	<b>(160.3)</b>	<b>(56.5)</b>	<b>54.8</b>	<b>3,478.0</b>	<b>(96.5)</b>	<b>(167.9)</b>	<b>(274.0)</b>	<b>(267.1)</b>
Free cash flow	39.4	(29.6)	23.2	104.8	300.4	346.3	514.3	707.9	1,014.7
Free cash flow per share (basic) (\$)	0.9	(0.7)	0.5	2.5	6.7	6.8	10.2	14.0	20.0

#### Ratios

	2017A	2018A	2019A	2020A	2021A	2022E	2023E	2024E	2025E
<b>ROE (%)</b>	<b>1.9%</b>	<b>3.5%</b>	<b>1.4%</b>	<b>2.9%</b>	<b>3.4%</b>	<b>6.0%</b>	<b>9.6%</b>	<b>13.1%</b>	<b>18.6%</b>
Asset/Equity Ratio (x)	1.03x	1.04x	1.18x	1.17x	1.05x	1.07x	1.07x	1.09x	1.10x
Asset Turnover (x)	0.24x	0.25x	0.36x	0.41x	0.16x	0.24x	0.33x	0.44x	0.58x
Net debt/EBITDA (x)	-23.1x	-10.0x	-4.0x	-3.0x	-12.8x	-7.8x	-4.9x	-3.3x	-2.1x
Net debt/equity (%)	-60%	-44%	-29%	-35%	-82%	-77%	-71%	-62%	-53%
Inventory days	411.2	799.3	715.8	616.8	267.7	300.0	320.0	350.0	350.0
Receivable days	57.3	67.2	85.1	70.9	68.8	68.8	68.8	68.8	68.8
Payable Days	15.5	972.2	12.9	79.0	713.0	534.4	424.1	340.4	271.2
Cash Conversion Cycle	453.0	-105.6	787.9	608.6	-376.5	-165.6	-35.3	78.4	147.6
Unbilled Revenue/Sales (%)	0%	20%	18%	23%	20%	20%	20%	20%	20%
Other Payable/Sales (%)	9%	9%	10%	12%	16%	16%	14%	13%	12%



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## Appendix

Exhibit: APAC IP Peers Broad Comps – Key Financials

Metrics	Forecast Year	Ticker	Sales YoY			Gross Margin			EBITDA Margin			Net Margin		
			21A	22E	23E	21A	22E	23E	21A	22E	23E	21A	22E	23E
ANDES TECH	6533	TT	41.1%	40.3%	38.5%	99.9%	99.8%	99.8%	32.0%	37.4%	44.6%	19.7%	21.8%	30.2%
EMEMORY TECH	3529	TT	33.0%	31.2%	16.8%	100.0%	100.0%	100.0%	56.1%	64.4%	65.3%	46.6%	51.1%	54.7%
M31 TECHNOLOGY	6643	TT	3.1%	19.9%	17.8%	100.0%	100.0%	100.0%	36.3%	35.9%	39.0%	25.0%	26.9%	30.0%
FARADAY TECH	3035	TT	43.5%	62.8%	9.3%	50.4%	50.2%	48.3%	18.3%	22.5%	25.0%	13.5%	19.0%	17.5%
GLOBAL UNICHIP	3443	TT	11.3%	21.4%	16.2%	34.9%	34.4%	34.4%	15.2%	15.8%	16.1%	9.7%	10.2%	10.8%
VERISILICON MI-A	688521	CH	42.9%	37.4%	32.7%	39.9%	40.7%	41.5%	3.1%	7.3%	9.7%	0.9%	5.3%	7.5%
CAMBRICON-A	688256	CH	54.8%	40.4%	40.1%	53.8%	54.6%	52.9%	-126.0%	-93.6%	-41.7%	-123.2%	-91.4%	-48.3%
AVG			32.8%	36.2%	24.5%	68.4%	68.5%	68.1%	26.8%	30.5%	33.3%	19.2%	22.4%	25.1%

Exhibit: APAC IP Peers Broad Comps – Multiples (x)

Metrics	Forecast Year	Ticker	EV/Sales			EV/GP			EV/EBITDA			P/E		
			21A	22E	23E	21A	22E	23E	21A	22E	23E	21A	22E	23E
ANDES TECH	6533	TT	20.6x	14.7x	10.6x	20.6x	14.7x	10.6x	64.3x	39.2x	23.7x	129.6x	83.4x	43.5x
EMEMORY TECH	3529	TT	54.7x	41.7x	35.7x	54.7x	41.7x	35.7x	97.4x	64.7x	54.6x	119.6x	83.0x	66.5x
M31 TECHNOLOGY	6643	TT	9.9x	8.3x	7.0x	9.9x	8.3x	7.0x	27.3x	23.0x	18.0x	42.2x	32.6x	24.9x
FARADAY TECH	3035	TT	8.5x	5.2x	4.8x	16.9x	10.4x	9.9x	46.5x	23.3x	19.1x	67.0x	29.3x	29.1x
GLOBAL UNICHIP	3443	TT	4.1x	3.4x	2.9x	11.7x	9.8x	8.5x	27.0x	21.4x	18.0x	47.5x	37.1x	30.1x
VERISILICON MI-A	688521	CH	11.0x	8.0x	6.0x	27.5x	19.6x	14.5x	353.7x	110.0x	62.3x	1281.9x	160.8x	86.0x
CAMBRICON-A	688256	CH	30.6x	21.8x	15.6x	56.8x	39.9x	29.4x	-24.3x	-23.3x	-37.3x	-29.1x	-27.9x	-37.7x
AVG			19.9x	14.7x	11.8x	28.3x	20.6x	16.5x	102.7x	46.9x	32.6x	281.3x	71.0x	46.7x

Exhibit: Price Band – TTM P/E – Current at ~110.4x TTM P/E

6533 TT Price Band (TTM P/E)

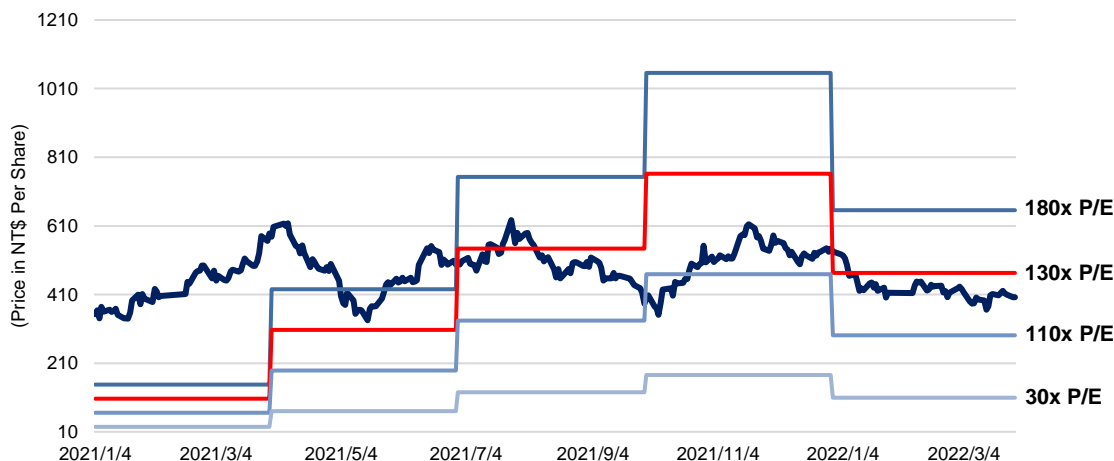
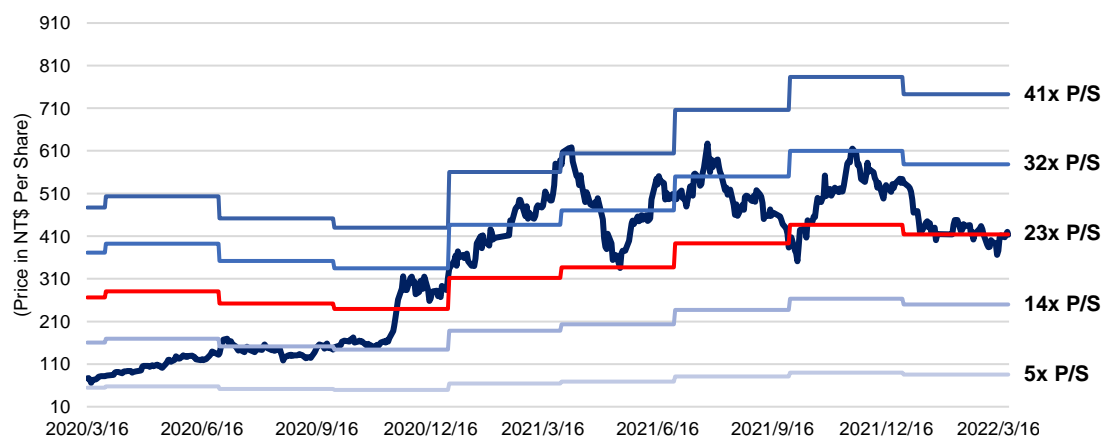


Exhibit: Price Band – TTM P/S – Current at ~23x TTM P/S

6533 TT Price Chart (TTM P/S)



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