Taiwan Technology: PCB/CCL tour 2026 key takeaways: Upgrade pace accelerating; Expanding High ASP/Profitability ABF opportunity

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We hosted 4 meetings with companies in the Taiwan PCB/CCL/Substrate supply chain during the annual Taiwan PCB show (TPCA show) in Taipei on Oct 21, 2026, and visited more than 10 companies in the supply chain to see the current state of the PCB/CCL/Substrate industries. Our key takeaways as below:

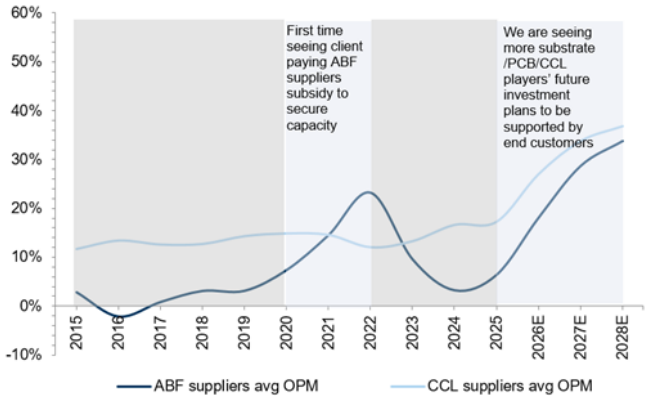
End demand remains solid into LT with customers' LTAs/subsidies/investments into new capacity for 2027-30

Despite some investors' concern on slower investment in the AI hardware supply chain in coming years, we continue to see a solid demand uptrend intact for all high-end PCB/CCL/Substrate and raw materials for their respective industries**. We are seeing more substrate/PCB/CCL material players' future investment plans (in 2027-30) supported by end customers (including via LTAs, subsidies on capacity expansion, prepayments and/or incentive fees), which we have not observed before (we see EMC, ZDT, Co-Tech and other high-end CCL companies being asked by their customers for LTAs/subsidies for dedicated capacity/plants; however, not all players are receptive to these arrangements)**, implying an even fiercer supply shortage condition in the coming years. We therefore anticipate a more favorable profitability outlook than we previously expected for the substrate and PCB/CCL/material suppliers in coming quarters/years (Exhibit 1), and we expect this (direct investment from end customers on the capacity) to strengthen investor confidence in the multi-year demand/pricing/profitability uptrend opportunity we see.

We expect this to benefit the bottom line as (1) depreciation should decrease with less equipment (Exhibit 2) and (2) profitability should increase as more pre-payment/subsidies are recognized. Also, for those companies that do not enter LTA/subsidy agreements, etc, with their customers, we believe they should find a better pricing outlook (like ABF substrate spot price players) in the long term, with more flexibility on selecting customers/projects. As a result, we view the structural changes in the supply chain positively and expect further valuation re-rating potential for PCB/CCL and material suppliers with additional capacity being booked by clients.

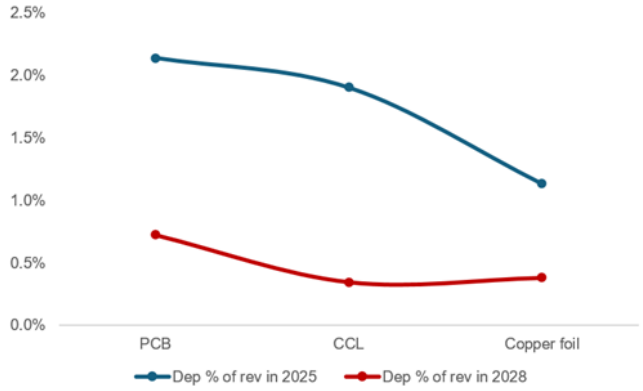
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Exhibit 1: We are seeing more substrate/PCB/CCL players' future investment plans in 2027-30 being supported by their end customers



Source: Company data, Goldman Sachs Global Investment Research

Exhibit 2: Depreciation % of total revenue should continue to go down with customers' investment in equipment or more prepayment/subsidy



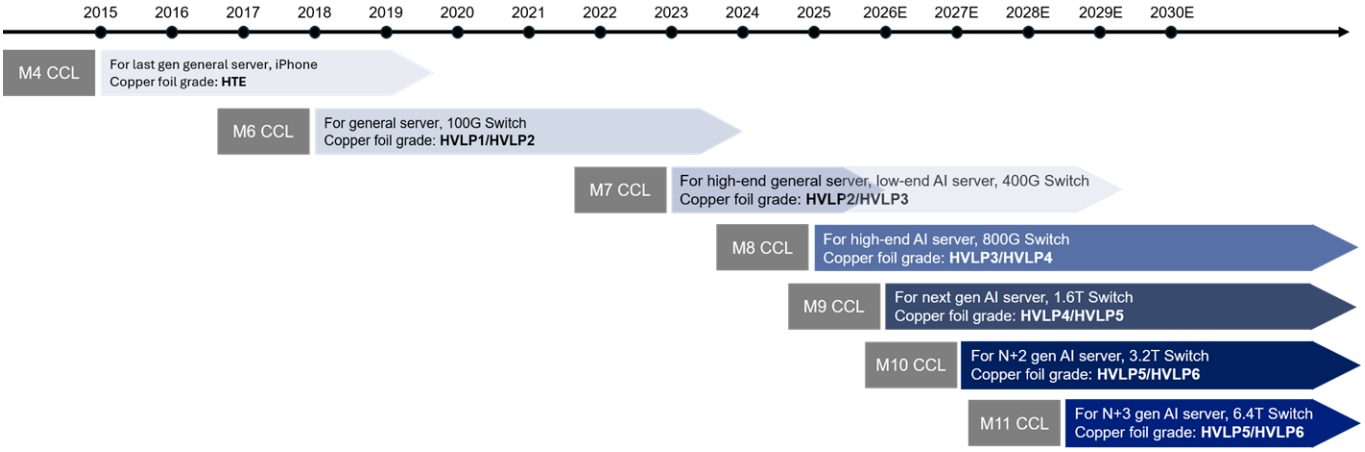
Source: Company data, Goldman Sachs Global Investment Research

PCB CCL upgrading continues: M10 is under qualification, which should start shipments from 2H27, while we expect M11 shipments to start no later than 2030
For the PCB CCL industry overall, the key revenue/profit driver in our view is the solid specification upgrading trend (e.g., AI M7 ramp up in 2024, the M8 ramp in 2025, and M9 in 2026, Exhibit 3) which continues to drive high-end CCL players' ASP growth by 25-50% YoY annually in 2024-2026, and we are seeing the trend continuing and accelerating in coming years, despite the concerns of some investors in our conversations that a technology migration slowdown is impacting CCL players' revenue/profit growth opportunity.

During the TPCA show, we saw both EMC and TUC launch their M10/M11 solutions at the event, while both companies mentioned they are closely engaging with end customers for the next-generation AI R&D projects, based on the M10/11 solution (+ under qualification now). We believe **EMC should start shipping its M10 products from 2H27 at the earliest** for specific AI customer's GPU AI rack solutions and that shipments should ramp up significantly in 2028 as more GPU and ASIC AI projects start adopting this solution. **For TUC's M10 products, we believe the company will start shipment from 2028** for not only high-end 3.2T Ethernet switch projects but also for some ASIC projects.

Both EMC and TUC are currently under verification with clients for their M10/M11 grade CCL, which incorporates Q-glass. **In terms of the possibility of adopting PTFE-based CCL, the new solution continues to face production difficulties, making us less positive on the solution's progress, and we only expect the MP (mass production) time to occur after 2H28 at the earliest (our supply chain checks suggest the production yield for PTFE-based PCB is running at 10-15% vs. average yield of 80-90% for PCB with M9 grade CCL adopting Q-glass).** As a result, we believe the PCB upgrade for switch tray in Nvidia's Rubin Ultra GPU servers starting from 2H27 could have a high likelihood of adopting M9/M10 grade CCL with Q-glass/HC (Hydrocarbon) instead of PTFE, potentially implying better EMC/TUC share than we currently expect over the next 2-3 years).

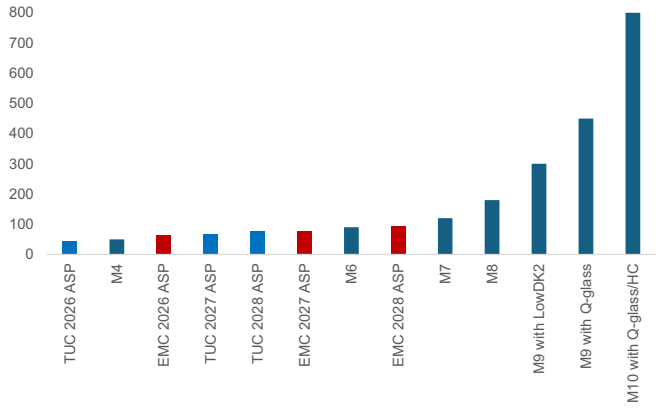
Exhibit 3: CCL/PCB upgrade pace is accelerating



Shaded area indicates the period of which each specific CCL grade is mainstream

Source: Goldman Sachs Global Investment Research

Exhibit 4: We see solid ASP upside potential for both TUC and EMC considering the expanding M8-11 grade CCL penetration rate we anticipate in coming years
US$



Source: Company data, Goldman Sachs Global Investment Research

New opportunity to enter the high ASP/GM ABF substrate supply chain for TW CCL supply chain players

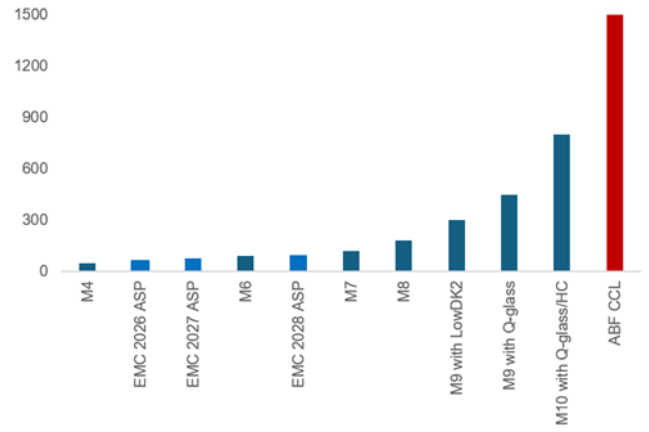
Given the relatively slow capacity investment to date from Japanese substrate material suppliers (ABF CCL/ T-glass/ micro thin copper foil etc.industries are mostly dominated by Japanese players, with more than 95% market share in the past 10+ years) while demand continues to trend up (we are seeing ABF substrates' material usage doubling every 1-2 years, due to the expanding substrate size/ increasing substrate layer counts / decreasing substrate production yield rate), **we started to see end customers qualification processes for Taiwan and mainland China ABF substrate supply chain vendors accelerate from 1H26, to better overcome supply constraints, implying a long term share gain trend from the Taiwan/mainland China new substrate material suppliers (including EMC and Co-Tech in our coverage space)**. We therefore believe **EMC likely starts taking ABF substrate CCL market share from 2H26** (TAM could be up from US$0.8bn-1.2bn in 2026 to US$2.0bn-2.5bn in 2027 and US$4.0bn-4.5bn in

2028, **accounting for ~15%/19%/22% of EMC's 2026/27/28E revenue**, per GSe, which not only suggests significant upside potential for EMC's ASP outlook (**ABF substrate CCL ASP per full sheet is ~US$1,500 vs. M7/8 only at US$130/180, Exhibit 5**) but should also lead to a solid GM uptrend. We estimate the **ABF substrate CCL GM is now at 50%+ which could further increase closer to the industry average of ~70%+ in the long term based on our industry checks (vs. our 2026/27/28 GM estimate on EMC is 35.2%/40.7%/43.4%)**. Also, we believe that micro-thin copper foil, which is dominated by Japan vendors, should also start to see some new suppliers starting from late 2027/early 2028, while Co-Tech said that it is preparing R&D resources and is working on designs for the new production lines for this new substrate-level product, which we estimate could start contributing to the company's revenue from 2H28 at the earliest per GSe.

Moreover, considering that the ABF substrate size/layer count both continue to increase, with less favorable yield rate and production efficiency, we expect the high-end AI ABF substrates consumption on ABF CCL to increase significantly. Based on prevailing specifications, we believe a quarter sheet of ABF CCL can currently produce ~6-8 units of high-end ABF substrates, but that number could decrease significantly to 2-3 units per quarter sheet in 2028 based on the substrate design, which should lead to a solid unit volume demand uptrend.

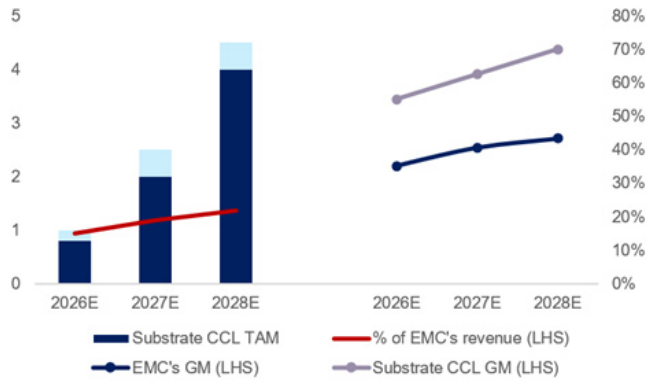
In terms of supply, EMC said that it could have 1.5mn sheets/month capacity by end of 2027 for ABF substrate CCL during TPCA event, which would then likely account for 50% of the global ABF substrate CCL capacity on our estimates, suggesting a strong focus by the company to compete in this high ASP/GM product segment.

Exhibit 5: High substrate CCL ASPs suggest solid upside potential for EMC's revenue/margin outlook
US$



Source: Company data, Goldman Sachs Global Investment Research

Exhibit 6: ABF CCL TAM vs. EMC revenue; ABF CCL could be a long term growth driver with its higher GM
US$bn



Source: Goldman Sachs Global Investment Research

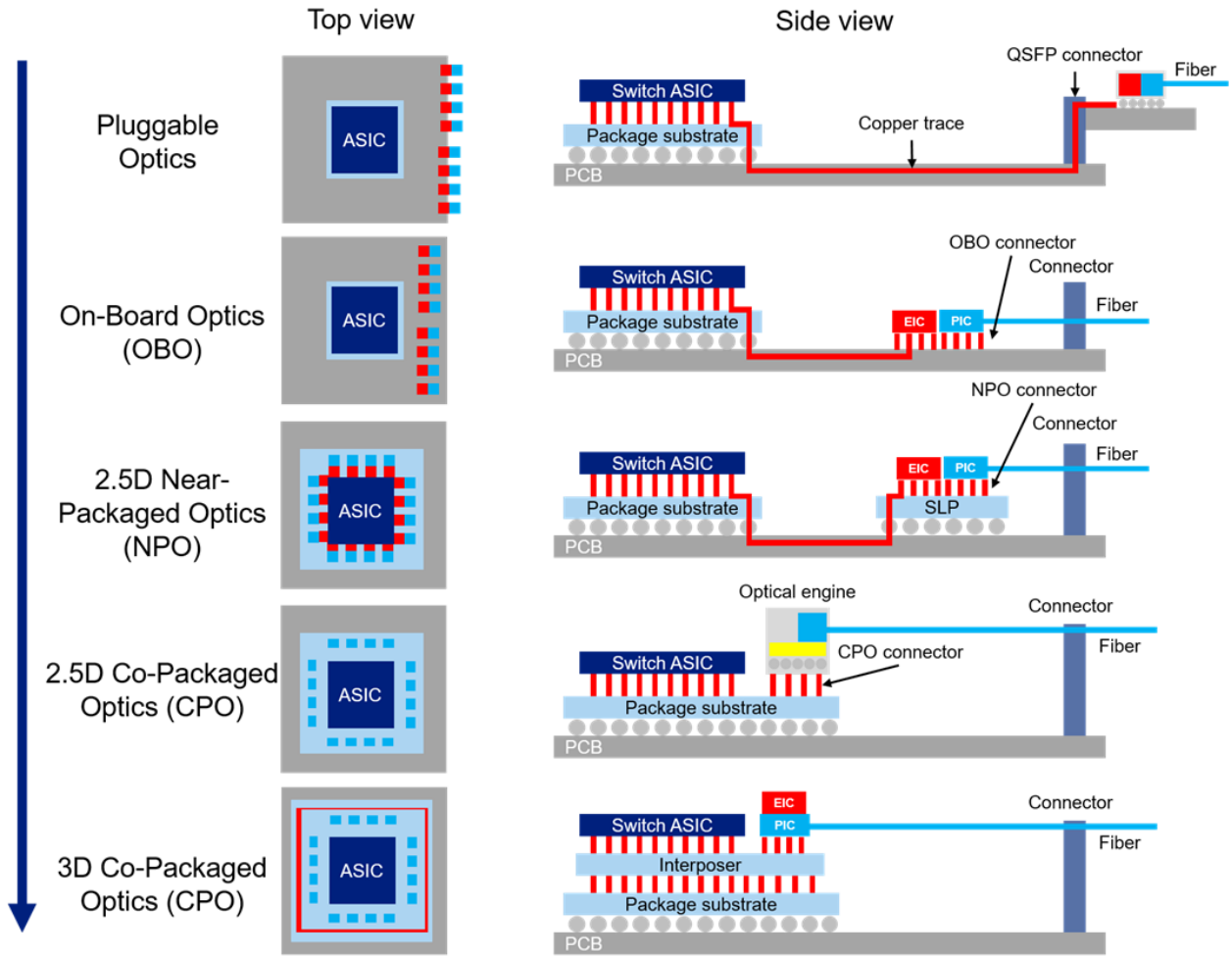
PCB/CCL upgrades to continue with limited risk from CPO adoption

We see limited near term risk of Co-Packaged Optics (CPO) adoption as the industry should start with switch trays in GPU servers from 2028E, when we estimate switch board to account for 14% of a total CCL TAM of US$48bn in 2028E. In considering an extreme case where all switch boards are downgraded to M4/M7 grade CCL, we would expect the impact to result in a <10% reduction in the 2028E CCL TAM, an impact which we believe would be manageable. At the TPCA show, we saw ZDT showcase its 30 layers

HDI PCB switch board, and the company said that it is confident that switch board will continue to see upgrades in terms of layer count and design complexity as optical transceivers are being used as the mainstream solution for scale out, which requires high end PCB/CCL for its longer electrical path comparing to CPO (Exhibit 7). ZDT mentioned the possibility of scale up adopting CPO, but is unsure on the MP timing at this point, and we see this technology as unlikely to be available before 2030E given its technology complexities.

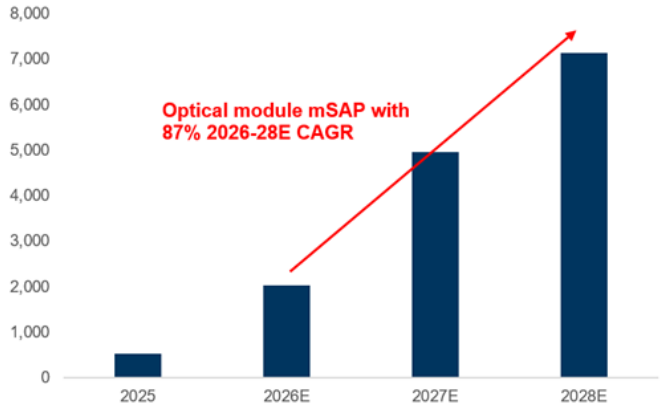
ZDT also showcased multiple optical module mSAP solutions, including 800G/1.6T/NPO/XPO, and we believe that optical transceivers, which rely on high end PCB/CCL in switch trays, will remain mainstream in the foreseeable future and thus is beneficial to the optical module mSAP suppliers (we expect optical module mSAP to see 87% 2026-28E CAGR, Exhibit 8). We believe ZDT is well-positioned to gain share in this fast growing market as we believe the company is proactively expanding mSAP capacity (we expect ZDT's mSAP capacity to reach 5x in the next 2 years, see here, as well as the company currently holds an industry-leading yield of 90%+ for its optical module mSAP products. Optical module mSAP GMs currently average 40%-45%, and could potentially reach 50%+ following pricing hikes and yield improvements, which would be beneficial to ZDT's profitability (our 2026/27/28 GM estimate on ZDT only at 24.7%/27.6%/31.4%).

Exhibit 7: Pluggable transceiver remains mainstream, the longer electrical path still relies heavily on high end PCB/CCL technology



Source: Company data

Exhibit 8: We expect optical module mSAP to register 87% 2026-28E CAGR
US$mn



Source: Company data, Goldman Sachs Global Investment Research

Investment view - Focus on new substrate/MSAP/M10 opportunity and market share

gainers

EMC to see solid upside on profit potential with the new substrate CCL opportunity

We continue to see EMC make progress in the new ABF substrate CCL business, a market which the company entered in early 2026 and started producing high-end ABF substrate CCL from 2H26, with monthly revenues reaching NT$150-200mn (<1% of the company's Sep monthly revenue) for the most high-end TPU substrate CCL market (see here). We believe EMC could become one of the market leaders within the next 3-5 years (we are expecting 20-30% market share in 2028E and trending up significantly afterward), given its track record of successfully entering new markets over the past two decades. Furthermore, the company is well-positioned to gain share in the tight supply market as the company is proactive with its substrate CCL expansion plans, and the company expects to expand its substrate CCL capacity to 4-5x of current level by 2027 (current substrate CCL capacity at 300k sheet/month), which should account for 50% of the global substrate CCL capacity by end of 2027E, implying a good opportunity for the company to further ramp up market share in the long term.

M10/11 upgrades still the key to earnings growth for EMC & TUC in the next 3+ years, while the favorable S/D outlook should continue to drive the like-for-like base pricing in coming quarters

We see EMC and TUC being well-positioned in the ongoing CCL upgrade trend as both companies are currently under verification with clients for their respective next generation M10/M11 grade CCL and are also future proofing their product-portfolios by continuing to develop PTFE-based CCL. For the new M10 grade CCL, we expect EMC will start shipments from 2Q27-3Q27 while TUC should start shipments from 2028, leading to meaningful upside potential for each company's revenue, as EMC/TUC's current ASPs have been approximately US$63/46 in 2026 while the M10 grade CCL ASP is currently priced at ~US$800 per sheet, implying substantial ASP upside potential from here, all else equal.

We continue to see a solid S/D outlook for high-end CCLs in coming years (see here) as capacity expansion for these CCLs continues to track slower than demand growth (see here). However, we note TUC revised up its capacity target and expects it to increase 2.5x+ over 2026-30 (8/5/30% upward revision to the year-end target capacity for 2026/27/28 from previous guidance), and based on company comments we believe the new capacity is fully booked by clients, implying a solid revenue/profit growth outlook.

Co-Tech is currently obtaining LTAs to secure high-end copper foil capacity, suggesting a solid long term market share and revenue outlook

We believe Co-Tech is well-positioned to benefit from the structural demand for high end copper foil in a shortage environment, as the company announced capacity expansion plans for a new Plant 4 in Malaysia, with capacity being secured by more than one client, per the company. The company now target its annual HVLP3+ effective capacity to reach 10K/20K/30K tons by end of 2027/28/29 (equivalent of 833/1666/2500 tons/month by 2027/28/29 end vs. current HVLP3+ effective capacity of ~250 tons/month). This should enable the company to achieve further gains in market share amid high end copper foil supply shortage environment (see here), as well as seeing a better pricing environment going forward.

We expect Co-Tech's new capacity, after ramp up, should continue to see 100% UTR, as

most of the new capacity has been booked/sponsored by end customers already, implying a solid market share and revenue outlook in coming years. Moreover, we believe the company will start to recognize customer subsidies from 2027 at the earliest, implying further incremental upside to profitability in coming years.

ZDT continues to maintain key one-stop shop status for all ABF/BT/HDI/HLC/mSAP products, suggesting solid market share outlook in long term

We remain positive on ZDT as the company continues to make progress with its optical module mSAP and AI PCB business, and the company mentioned that both of these business are seeing capacity bookings by clients. We believe ZDT will become a market share leader in the optical module mSAP industry (see here), as we expect the company to expand mSAP capacity by 5x over the next two years based on announced capex plans. Most suppliers in the optical module mSAP industry are proactively expanding capacity as CPO adoption risk remains limited.

Also, considering that ZDT is the only company that manufactures all types of ABF/BT/HDI/HLC/mSAP products, it is well positioned for further share gains not only in the optical transceiver market, but also in the AI PCB, ABF, BT markets. Additionally, we estimate that these new products will likely carry 35-50%+ GMs in 2027, implying a solid revenue/profit outlook for the company going forward.

We also see other companies within the CCL/IC substrate sector flagging supply tightness across the whole supply chain as industry expansion has not been sufficient to meet prevailing demand. This is in line with our view that suppliers with timely capacity expansion plans are better positioned to make further market share gains and benefit from stronger pricing/profitability amid a supply-constrained environment.

P&L

Exhibit 9: EMC P&L summary

NT$mn	1Q26	2Q26	3Q26E	4Q26E	1Q27E	2Q27E	3Q27E	4Q27E	1Q28E	2Q28E	3Q28E	4Q28E	2024	2025	2026E	2027E	2028E
Revenue	33,067	47,275	57,349	59,952	67,047	81,696	94,459	109,822	122,256	139,528	153,104	165,161	64,377	94,261	197,643	353,024	580,049
Gross profit	9,729	16,003	21,117	22,649	26,204	32,690	38,502	46,151	52,156	60,074	66,695	72,969	17,970	28,120	69,498	143,548	251,894
Operating expense	(2,601)	(3,269)	(3,556)	(3,897)	(4,392)	(4,616)	(4,912)	(5,162)	(5,502)	(6,000)	(6,277)	(6,606)	(5,818)	(9,012)	(13,322)	(19,081)	(24,385)
Operating income	7,128	12,734	17,561	18,752	21,813	28,075	33,591	40,990	46,655	54,074	60,418	66,362	12,152	19,108	56,176	124,467	227,509
Pretax income	7,194	12,785	17,561	18,752	21,813	28,075	33,591	40,990	46,655	54,074	60,418	66,362	12,133	18,876	56,293	124,467	227,509
Taxes expense	(1,855)	(2,914)	(4,039)	(4,126)	(5,017)	(6,457)	(7,726)	(9,428)	(10,731)	(12,437)	(13,896)	(15,263)	(2,564)	(4,231)	(12,934)	(28,628)	(52,327)
Net income	5,340	9,873	13,522	14,627	16,796	21,618	25,865	31,562	35,924	41,637	46,522	51,099	9,578	14,649	43,362	95,840	175,182
EPS, NT$	**14.90**	**27.55**	**37.73**	**40.81**	**46.87**	**60.32**	**72.17**	**88.07**	**100.24**	**116.18**	**129.81**	**142.58**	**27.81**	**41.67**	**121.03**	**267.52**	**488.99**
Ratio analysis and assumption																	
As % of sales																	
Gross margin	29.4%	33.9%	36.8%	37.8%	39.1%	40.0%	40.8%	42.0%	42.7%	43.1%	43.6%	44.2%	27.9%	29.8%	35.2%	40.7%	43.4%
Operating expense ratio	7.9%	6.9%	6.2%	6.5%	6.6%	5.7%	5.2%	4.7%	4.5%	4.3%	4.1%	4.0%	9.0%	9.6%	6.7%	5.4%	4.2%
Operating margin	21.6%	26.9%	30.6%	31.3%	32.5%	34.4%	35.6%	37.3%	38.2%	38.8%	39.5%	40.2%	18.9%	20.3%	28.4%	35.3%	39.2%
Net margin	16.1%	20.9%	23.6%	24.4%	25.1%	26.5%	27.4%	28.7%	29.4%	29.8%	30.4%	30.9%	14.9%	15.5%	21.9%	27.1%	30.2%
QoQ growth (%)																	
Revenue	32.7%	43.0%	21.3%	4.5%	11.8%	21.8%	15.6%	16.3%	11.3%	14.1%	9.7%	7.9%	-	-	-	-	-
Gross profit	36.6%	64.5%	32.0%	7.3%	15.7%	24.8%	17.8%	19.9%	13.0%	15.2%	11.0%	9.4%	-	-	-	-	-
Operating income	44.5%	78.6%	37.9%	6.8%	16.3%	28.7%	19.6%	22.0%	13.8%	15.9%	11.7%	9.8%	-	-	-	-	-
Net income	42.9%	84.9%	37.0%	8.2%	14.8%	28.7%	19.6%	22.0%	13.8%	15.9%	11.7%	9.8%	-	-	-	-	-
YoY growth (%)																	
Revenue	52.5%	110.0%	128.1%	140.5%	102.8%	72.8%	64.7%	83.2%	82.3%	70.8%	62.1%	50.4%	56%	46%	110%	79%	64%
Gross profit	47.6%	134.3%	178.7%	217.9%	169.3%	104.3%	82.3%	103.8%	99.0%	83.8%	73.2%	58.1%	59%	56%	147%	107%	75%
Operating income	57.0%	174.2%	251.9%	280.0%	206.0%	120.5%	91.3%	118.6%	113.9%	92.6%	79.9%	61.9%	65%	57%	194%	122%	83%
Net income	53.9%	183.9%	241.0%	291.4%	214.5%	118.9%	91.3%	115.8%	113.9%	92.6%	79.9%	61.9%	75%	53%	196%	121%	83%

Source: Company data, Goldman Sachs Global Investment Research

Exhibit 10: TUC P&L summary

NT$mn	1Q26	2Q26	3Q26E	4Q26E	1Q27E	2Q27E	3Q27E	4Q27E	1Q28E	2Q28E	3Q28E	4Q28E	2024	2025	2026E	2027E	2028E
Revenue	10,054	14,301	17,621	19,785	21,664	25,821	33,587	39,348	41,153	45,886	55,305	60,569	23,070	30,340	61,760	120,421	202,913
Gross profit	2,529	4,250	5,835	6,897	7,712	9,395	12,468	14,883	15,466	17,196	21,093	23,533	5,342	6,898	19,510	44,457	77,288
Operating expense	(701)	(892)	(1,022)	(1,108)	(1,181)	(1,381)	(1,511)	(1,613)	(1,708)	(1,790)	(1,963)	(2,271)	(2,010)	(2,554)	(3,723)	(5,687)	(7,732)
Operating income	1,828	3,358	4,813	5,789	6,531	8,013	10,956	13,270	13,758	15,407	19,130	21,262	3,332	4,344	15,787	38,770	69,556
Pretax income	1,874	3,427	4,813	5,269	6,011	7,613	10,956	13,270	13,722	15,372	19,130	21,262	3,378	4,519	15,383	37,850	69,485
Taxes expense	(614)	(1,085)	(1,155)	(1,265)	(1,503)	(1,903)	(2,739)	(3,317)	(3,431)	(3,843)	(4,782)	(5,315)	(773)	(1,109)	(4,119)	(9,463)	(17,371)
Net income	1,260	2,342	3,658	4,005	4,508	5,710	8,217	9,952	10,292	11,529	14,347	15,946	2,604	3,409	11,264	28,388	52,114
EPS, NT$	**4.36**	**8.02**	**12.53**	**13.72**	**15.44**	**19.56**	**28.14**	**34.08**	**35.25**	**39.48**	**49.14**	**54.61**	**9.56**	**12.13**	**38.63**	**97.22**	**178.48**
Ratio analysis and assumption																	
As % of sales																	
Gross margin	25.1%	29.7%	33.1%	34.9%	35.6%	36.4%	37.1%	37.8%	37.6%	37.5%	38.1%	38.9%	23.2%	22.7%	31.6%	36.9%	38.1%
Operating expense ratio	7.0%	6.2%	5.8%	5.6%	5.5%	5.4%	4.5%	4.1%	4.2%	3.9%	3.6%	3.8%	8.7%	8.4%	6.0%	4.7%	3.8%
Operating margin	18.2%	23.5%	27.3%	29.3%	30.1%	31.0%	32.6%	33.7%	33.4%	33.6%	34.6%	35.1%	14.4%	14.3%	25.6%	32.2%	34.3%
Net margin	12.5%	16.4%	20.8%	20.2%	20.8%	22.1%	24.5%	25.3%	25.0%	25.1%	25.9%	26.3%	11.3%	11.2%	18.2%	23.6%	25.7%
QoQ growth (%)																	
Revenue	10.2%	42.2%	23.2%	12.3%	9.5%	19.2%	30.1%	17.2%	4.6%	11.5%	20.5%	9.5%	-	-	-	-	-
Gross profit	25.5%	68.1%	37.3%	18.2%	11.8%	21.8%	32.7%	19.4%	3.9%	11.2%	22.7%	11.6%	-	-	-	-	-
Operating income	41.7%	83.7%	43.3%	20.3%	12.8%	22.7%	36.7%	21.1%	3.7%	12.0%	24.2%	11.1%	-	-	-	-	-
Net income	16.4%	85.8%	56.2%	9.5%	12.6%	26.6%	43.9%	21.1%	3.4%	12.0%	24.4%	11.1%	-	-	-	-	-
YoY growth (%)																	
Revenue	57.8%	110.9%	118.5%	116.8%	115.5%	80.6%	90.6%	98.9%	90.0%	77.7%	64.7%	53.9%	44%	32%	104%	95%	69%
Gross profit	64.9%	196.1%	204.7%	242.3%	205.0%	121.1%	113.7%	115.8%	100.5%	83.0%	69.2%	58.1%	69%	29%	183%	128%	74%
Operating income	95.3%	293.9%	280.3%	348.9%	257.4%	138.6%	127.7%	129.2%	110.7%	92.3%	74.6%	60.2%	134%	30%	263%	146%	79%
Net income	87.4%	259.3%	264.8%	270.0%	257.8%	143.8%	124.7%	148.5%	128.3%	101.9%	74.6%	60.2%	216%	31%	230%	152%	84%

Source: Company data, Goldman Sachs Global Investment Research

Exhibit 11: Co-Tech P&L summary

NT$mn	1Q26	2Q26	3Q26E	4Q26E	1Q27E	2Q27E	3Q27E	4Q27E	1Q28E	2Q28E	3Q28E	4Q28E	2025	2026E	2027E	2028E	2029E
Revenue	2,532	2,805	3,230	3,356	4,160	5,047	5,973	7,079	7,100	7,236	7,788	8,647	7,880	11,923	22,259	30,771	41,803
Gross profit	727	768	907	1,094	1,613	2,002	2,345	3,015	3,212	3,301	3,396	3,962	1,715	3,496	8,975	13,871	20,177
Operating expense	(78)	(83)	(89)	(99)	(119)	(146)	(179)	(198)	(206)	(210)	(218)	(254)	(268)	(349)	(643)	(888)	(1,058)
Operating income	649	685	818	995	1,494	1,855	2,166	2,817	3,006	3,092	3,178	3,708	1,447	3,147	8,332	12,983	19,119
Pretax income	649	688	818	995	1,494	1,855	2,166	2,817	3,106	3,192	3,278	3,808	1,341	3,151	8,332	13,383	19,119
Taxes expense	(129)	(143)	(161)	(199)	(295)	(362)	(425)	(563)	(614)	(623)	(644)	(762)	(278)	(632)	(1,646)	(2,642)	(3,772)
Net income	520	545	657	796	1,199	1,493	1,740	2,253	2,493	2,569	2,634	3,046	1,063	2,518	6,686	10,741	15,347
EPS, NT$	**2.06**	**2.16**	**2.61**	**3.16**	**4.75**	**5.92**	**6.90**	**8.93**	**9.88**	**10.18**	**10.44**	**12.08**	**4.21**	**9.98**	**26.51**	**42.58**	**60.84**
Ratio analysis and assumption																	
As % of sales																	
Gross margin	28.7%	27.4%	28.1%	32.6%	38.8%	39.7%	39.3%	42.6%	45.2%	45.6%	43.6%	45.8%	21.8%	29.3%	40.3%	45.1%	48.3%
Operating expense ratio	3.1%	3.0%	2.8%	3.0%	2.9%	2.9%	3.0%	2.8%	2.9%	2.9%	2.8%	2.9%	3.4%	2.9%	2.9%	2.9%	2.5%
Operating margin	25.6%	24.4%	25.3%	29.7%	35.9%	36.8%	36.3%	39.8%	42.3%	42.7%	40.8%	42.9%	18.4%	26.4%	37.4%	42.2%	45.7%
Net margin	20.5%	19.4%	20.4%	23.7%	28.8%	29.6%	29.1%	31.8%	35.1%	35.5%	33.8%	35.2%	13.5%	21.1%	30.0%	34.9%	36.7%
QoQ growth (%)																	
Revenue	17.0%	10.8%	15.1%	3.9%	24.0%	21.3%	18.3%	18.5%	0.3%	1.9%	7.6%	11.0%	-	-	-	-	-
Gross profit	28.3%	5.7%	18.1%	20.7%	47.4%	24.1%	17.1%	28.6%	6.5%	2.8%	2.9%	16.7%	-	-	-	-	-
Operating income	33.2%	5.5%	19.5%	21.6%	50.1%	24.2%	16.7%	30.1%	6.7%	2.8%	2.8%	16.7%	-	-	-	-	-
Net income	37.7%	4.9%	20.6%	21.1%	50.6%	24.5%	16.5%	29.5%	10.6%	3.0%	2.5%	15.7%	-	-	-	-	-
YoY growth (%)																	
Revenue	46.5%	40.1%	62.6%	55.1%	64.3%	79.9%	84.9%	110.9%	70.7%	43.4%	30.4%	22.2%	15.5%	51.3%	86.7%	38.2%	35.9%
Gross profit	100.4%	103.4%	122.3%	93.1%	121.8%	160.6%	158.6%	175.6%	99.2%	64.9%	44.8%	31.4%	26.7%	103.9%	156.7%	54.6%	45.5%
Operating income	112.3%	115.8%	142.7%	104.3%	130.2%	170.9%	164.7%	183.1%	101.2%	66.6%	46.7%	31.6%	26.6%	117.4%	164.8%	55.8%	47.3%
Net income	96.1%	226.4%	159.6%	111.0%	130.7%	174.0%	164.7%	183.1%	107.9%	72.0%	51.4%	35.2%	15.3%	137.0%	165.5%	60.7%	42.9%

Source: Company data, Goldman Sachs Global Investment Research

Exhibit 12: ZDT P&L summary

NT$mn	1Q26	2Q26	3Q26E	4Q26E	1Q27E	2Q27E	3Q27E	4Q27E	1Q28E	2Q28E	3Q28E	4Q28E	2025	2026E	2027E	2028E	2029E
Revenue	40,728	48,431	64,324	74,492	72,587	82,511	101,729	115,762	107,568	127,860	162,600	189,606	182,522	227,975	372,589	587,634	787,166
Gross profit	8,812	11,186	16,700	19,686	17,504	21,297	29,949	34,184	29,849	38,225	53,477	63,198	36,136	56,384	102,934	184,748	266,597
Operating expense	(6,308)	(7,425)	(8,748)	(9,088)	(8,652)	(9,386)	(11,080)	(12,385)	(11,403)	(14,251)	(16,914)	(19,107)	(22,205)	(31,569)	(41,503)	(61,676)	(77,751)
Operating income	2,503	3,761	7,952	10,598	8,852	11,912	18,869	21,799	18,445	23,974	36,562	44,091	13,932	24,815	61,432	123,072	188,847
Pretax income	2,400	4,931	8,452	11,598	9,252	12,262	18,919	22,299	18,495	24,024	36,612	44,391	14,063	27,382	62,732	123,522	189,497
Taxes expense	(353)	(1,204)	(1,268)	(1,740)	(1,573)	(2,084)	(2,838)	(3,345)	(3,144)	(4,084)	(5,492)	(6,659)	(3,458)	(4,565)	(9,840)	(19,379)	(30,144)
Net income	1,426	2,392	5,071	6,959	5,505	7,210	11,351	13,379	11,005	14,126	21,967	26,634	6,791	15,847	37,446	73,732	112,959
EPS, NT$	**1.33**	**2.19**	**4.65**	**6.38**	**5.05**	**6.61**	**10.41**	**12.27**	**10.10**	**12.96**	**20.15**	**24.43**	**6.91**	**14.56**	**34.35**	**67.64**	**103.63**
Ratio analysis and assumption																	
As % of sales																	
Gross margin	21.6%	23.1%	26.0%	26.4%	24.1%	25.8%	29.4%	29.5%	27.7%	29.9%	32.9%	33.3%	19.8%	24.7%	27.6%	31.4%	33.9%
Operating expense ratio	15.5%	15.3%	13.6%	12.2%	11.9%	11.4%	10.9%	10.7%	10.6%	11.1%	10.4%	10.1%	12.2%	13.8%	11.1%	10.5%	9.9%
Operating margin	6.1%	7.8%	12.4%	14.2%	12.2%	14.4%	18.5%	18.8%	17.1%	18.7%	22.5%	23.3%	7.6%	10.9%	16.5%	20.9%	24.0%
Net margin	3.5%	4.9%	7.9%	9.3%	7.6%	8.7%	11.2%	11.6%	10.2%	11.0%	13.5%	14.0%	3.7%	7.0%	10.1%	12.5%	14.4%
QoQ growth (%)																	
Revenue	-28.4%	18.9%	32.8%	15.8%	-2.6%	13.7%	23.3%	13.8%	-7.1%	18.9%	27.2%	16.6%	-	-	-	-	-
Gross profit	-31.3%	26.9%	49.3%	17.9%	-11.1%	21.7%	40.6%	14.1%	-12.7%	28.1%	39.9%	18.2%	-	-	-	-	-
Operating income	-57.7%	50.2%	111.4%	33.3%	-16.5%	34.6%	58.4%	15.5%	-15.4%	30.0%	52.5%	20.6%	-	-	-	-	-
Net income	-54.9%	67.8%	112.1%	37.2%	-20.9%	31.0%	57.4%	17.9%	-17.7%	28.4%	55.5%	21.2%	-	-	-	-	-
YoY growth (%)																	
Revenue	1.6%	26.8%	35.8%	31.0%	78.2%	70.4%	58.2%	55.4%	48.2%	55.0%	59.8%	63.8%	6%	25%	63%	58%	34%
Gross profit	49.7%	59.6%	60.4%	53.4%	98.6%	90.4%	79.3%	73.6%	70.5%	79.5%	78.6%	84.9%	11%	56%	83%	79%	44%
Operating income	137.1%	55.1%	75.5%	79.0%	253.6%	216.7%	137.3%	105.7%	108.4%	101.3%	93.8%	102.3%	20%	78%	148%	100%	53%
Net income	125.4%	295.3%	112.0%	120.1%	286.1%	201.5%	123.8%	92.3%	99.9%	95.9%	93.5%	99.1%	-26%	133%	136%	97%	53%

Source: Company data, Goldman Sachs Global Investment Research

Investment Thesis - Elite Material

EMC, a key supplier of high-end HDI material (70%+ market share) and SLP material (90%+ market share), has been focusing on the high-speed switch/server CCL market for 3-5+ years. We are positive on its market share trajectory in the server industry and expect EMC to increase its share from <10% in the Purley generation to 15-20%/20+% in the Whitley/Eagle Stream platforms. EMC is also proactively expanding its share in the switch market (40%/30%+ in 2024/23 vs. <5% before 2019), with an expanding AI customer base (only one 400G customer in 3Q20, to being one of the largest suppliers in 2023), which should continue to benefit the company's top/bottom line growth over time. We believe EMC's leading position in the AI server CCL market should drive strong revenue growth and GM/OPM expansion in the long term, given that it is the major supplier for all Nvidia/Google/AWS AI server projects, and we expect it to maintain its leadership position. Considering its leading position in the high-end CCL industry, solid production skills and earnings growth outlook, we are Buy rated on the stock. With the shares trading at a 2026E P/E below AI server component suppliers and supported by a solid growth outlook, we view valuation as attractive.

Key downside risks include: (1) RCC to replace all high-end smartphone HDI design; (2) rising trade tensions, which could lead to weaker smartphone and server shipments; and (3) rising competition from mainland China peers.

Price Target Risks and Methodology - Elite Material

Valuation methodology: Our 12m TP of NT$10,200 is based on 27x 2H27-1H28E P/E (in line with the peak P/E multiple for AI component suppliers in the past 3 years).

Key downside risks: (1) RCC to replace all high-end smartphone HDI design; (2) rising trade tensions, which could lead to weaker smartphone and server shipments; and (3) rising competition from mainland China peers.

Investment Thesis - Taiwan Union Technology Corp.
TUC is a key high-end global CCL supplier that focuses on M7+ grade high-speed CCL (key applications include high-end switches (100G+) and AI server materials), with 20%+ market share in the past two years. The company continues to expect its unit market share in the server industry to increase from 15% in Whitley and Purley processors to higher in the Eagle Stream generation, and plans to launch two types of products for low-end and high-end customers (T2A and T2C) to gain market share. Also, strong growth in 400G/800G switch shipments and new 800G switch shipments, scheduled for launch in 2025-27, should continue to be a key demand driver for TUC, in our view. Additionally, the company is working on high-end AI projects with CSP and enterprise players, which we believe should drive revenue momentum in the long term. We view the stock as undervalued vs. Taiwan CCL peers on a P/E basis and rate it Buy.

Key downside risks include: (1) slower-than-expected share gains in the low-loss CCL segment; (2) rising trade tensions, which could lead to weaker server and switch shipments globally; and (3) rising competition from mainland China peers.

Price Target Risks and Methodology - Taiwan Union Technology Corp.
Valuation methodology: Our 12m TP of NT$3,010 is based on a 22x 2027E P/E (+2x STDV higher than the past 3-year industry average P/E multiple).

Key downside risks: (1) slower-than-expected share gains in the low-loss CCL segment; (2) rising trade tensions, which could lead to weaker server and switch shipments globally; and (3) rising competition from mainland China peers.

Investment Thesis - Co-Tech
Co-Tech is a global leading general server copper foil supplier, with ~60% market share in 2025 per GSe. We expect the company to enjoy solid share gain opportunities in the near term, considering its proactive HVLP capacity expansion plan and strong know-how in the advanced copper foil industry. Also, adoption of HVLP4 copper foil from AI servers and 1.6T networking switches starting in 2H26 should be a key demand driver for Co-Tech, in our view. Additionally, the company's proactive pricing strategy and ability to improve production yield should drive revenue momentum in the long term.

We are Buy rated as we believe Co-Tech will see better revenue/profitability in the long term given its shift to a more premium product mix along with proactive capacity plans (Plant 3 to be ready by end of 2027) and this should lead to strengthened valuations.

Valuation methodology: Our 12m TP of NT$940 is based on a 22x 2028E P/E, which is +1SD above the company's average upcycle valuation in the past 10-years.

Key downside risks: (1) earlier than expected CPO adoption in the computing IC, (2) slower than expected yield rate improvement speed, and (3) much stronger than expected capacity growth from HVLP peers, limiting pricing power

Investment Thesis - Zhen Ding Technology

Zhen Ding Technology (ZDT) is the global leading PCB supplier (top 1 in market share in sales) with 7-10% market share, and started its ABF substrate business from 2023 in Shenzhen, China; it has the highest ABF revenue exposure to the China market compared to all other ABF substrate suppliers. We believe ZDT will hold more than 40% ABF substrate market share in China by 2027E (up from 31% in 2024) and benefit the most from the strong and growing China ABF substrate market (53% 2025-27E CAGR) due to the increasing in-sourcing ratio for the AI computing ASIC/GPU market in China. We also expect the increasing foldable smartphone penetration rate in the long term to drive ZDT's FPC TAM, and account for 39% of the company's total revenue in 2027E. We see further revenue upside potential from foldable phones. We are Buy rated mainly due to our positive view on the company's China ABF substrate business opportunity, which should not only drive ZDT's revenue growth, but also improve its OPM level in the long term. We see upside for the stock price considering the company's solid growth opportunity, and our TP implied P/E multiple is still lower than the company's past 10+ year P/E average, which we believe is fair considering the potential upside from China ABF substrate market and increasing foldable phone penetration rate.

Valuation: Our 12-month TP of NT$1,025 is based on a SOTP valuation methodology, including (1) 3.5x blended 2028E P/B for ABF & BT substrate, (2) 20x 2028E P/E for high-growth AI server/switch related PCB (in line with industry average), and (3) 8x 2028E P/E for low-growth consumer electronics PCB (in line with industry downcycle average valuation).

Key downside risks include: (1) weaker-than-expected iPhone demand or slower content upgrade, (2) delay in new substrate capacity or slower-than-expected yield rate ramp up progress, and (3) fiercer competition in China ABF market.

Disclosure Appendix

Reg AC

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

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

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Unless otherwise stated, the individuals listed in the Contributing Authors disclosure of this report are analysts in Goldman Sachs' Global Investment Research division.

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

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

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Disclosures

The rating(s) for Co-Tech Development Corp., Elite Material, Taiwan Union Technology Corp. and Zhen Ding Technology Holding is/are relative to the other companies in its/their coverage universe: AVC, AWSC, Airtac International Group, Asus, Auras, Chenbro, Co-Tech Development Corp., Compal, Delta Electronics, E Ink, Elite Material, Fositek, GCE, Gigabyte, HTC Corp., Hiwin Corp., ITEQ Corp, Inventec, Kinsus, Lotes, NYPCB, Pegatron, Quanta, Shengyi Tech, Shennan Circuits, Taiwan Union Technology Corp., Unimicron Technology, Victory Giant, WNC, WUS, Win Semiconductors Corp., Yageo Corp., Zhen Ding Technology Holding

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Goldman Sachs beneficially owned 1% or more of common equity (excluding positions managed by affiliates and business units not required to be aggregated under US securities law) as of the month end preceding this report: Co-Tech Development Corp. (NT$438.50), Elite Material (NT$5,070.00), Taiwan Union Technology Corp. (NT$1,420.00) and Zhen Ding Technology Holding (NT$567.00)

Goldman Sachs expects to receive or intends to seek compensation for investment banking services in the next 3 months: Zhen Ding Technology Holding (NT$567.00)

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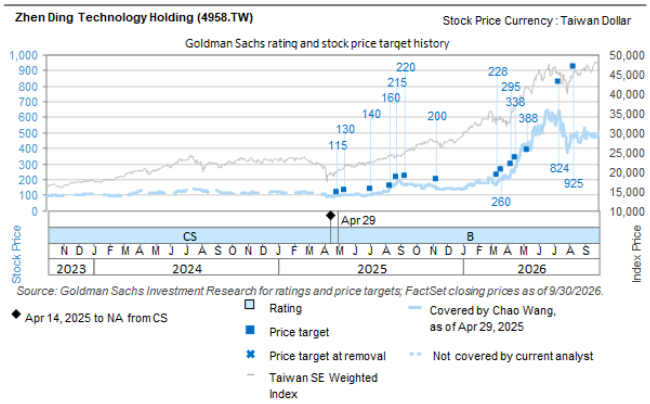
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	Rating Distribution			Investment Banking Relationships		
	Buy	Hold	Sell	Buy	Hold	Sell
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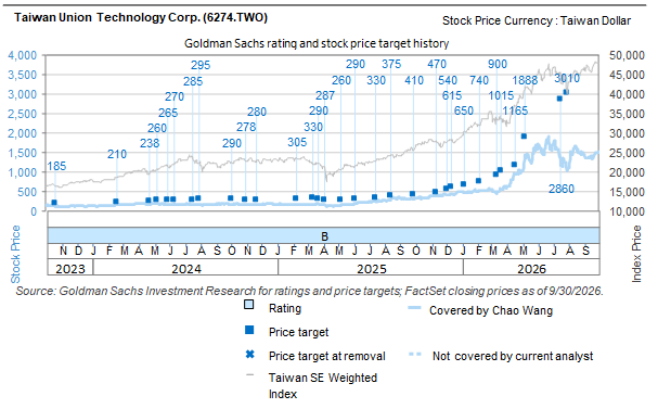
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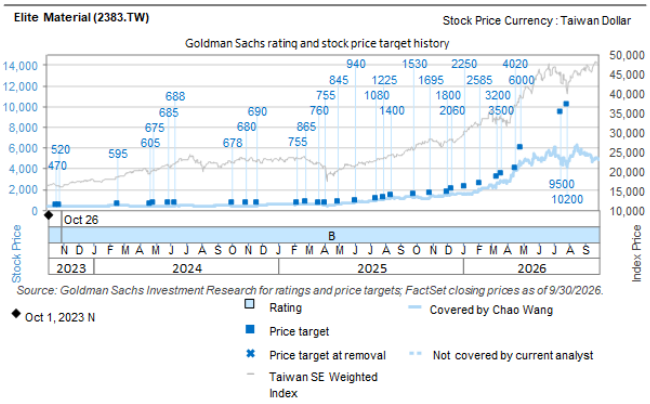
Price target and rating history chart(s)



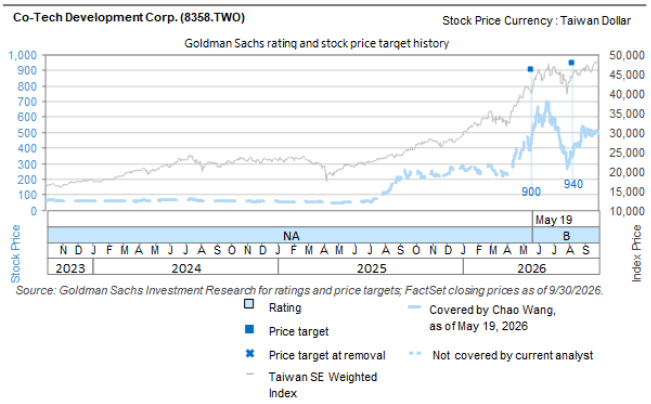
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Target price history table(s)

Taiwan Union Technology Corp. (6274.TWO)

Date of report	Target price (NT$)	Closing price (NT$)
29-Jul-26	3,010.00	1,020.00
17-Jul-26	2,860.00	1,170.00
06-May-26	1,888.00	1,315.00
17-Apr-26	1,165.00	946.00
20-Mar-26	1,015.00	554.00
12-Mar-26	900.00	452.50
05-Feb-26	740.00	520.00
06-Jan-26	650.00	476.00
12-Dec-25	615.00	443.00
04-Dec-25	540.00	411.00
12-Nov-25	470.00	407.00
29-Sep-25	410.00	298.00
13-Aug-25	375.00	282.50
15-Jul-25	330.00	264.00
05-Jun-25	290.00	188.50
07-May-25	260.00	142.50
06-Apr-25	287.00	159.00
24-Mar-25	290.00	176.50
12-Mar-25	330.00	160.50
09-Feb-25	305.00	163.50

Elite Material (2383.TW)

Date of report	Target price (NT$)	Closing price (NT$)
29-Jul-26	10,200.00	4,100.00
17-Jul-26	9,500.00	4,495.00
29-Apr-26	6,000.00	4,440.00
17-Apr-26	4,020.00	3,800.00
20-Mar-26	3,500.00	2,810.00
12-Mar-26	3,200.00	2,600.00
05-Feb-26	2,585.00	1,950.00
06-Jan-26	2,250.00	1,695.00
12-Dec-25	2,060.00	1,605.00
04-Dec-25	1,800.00	1,425.00
30-Oct-25	1,695.00	1,275.00
29-Sep-25	1,530.00	1,225.00
13-Aug-25	1,400.00	1,200.00
30-Jul-25	1,225.00	1,005.00
15-Jul-25	1,080.00	970.00
05-Jun-25	940.00	789.00
30-Apr-25	845.00	556.00
06-Apr-25	755.00	527.00
24-Mar-25	760.00	604.00
25-Feb-25	865.00	576.00

Taiwan Union Technology Corp. (6274.TWO)

Date of report	Target price (NT$)	Closing price (NT$)
20-Nov-24	280.00	155.00
30-Oct-24	278.00	162.00
03-Oct-24	290.00	175.00
31-Jul-24	295.00	160.00
17-Jul-24	285.00	168.00
11-Jun-24	270.00	164.50
29-May-24	265.00	167.00
08-May-24	260.00	185.50
23-Apr-24	238.00	164.50
18-Feb-24	210.00	156.50

Elite Material (2383.TW)

Date of report	Target price (NT$)	Closing price (NT$)
09-Feb-25	755.00	615.00
20-Nov-24	690.00	447.50
30-Oct-24	680.00	419.50
03-Oct-24	678.00	442.00
11-Jun-24	688.00	422.50
29-May-24	685.00	427.00
30-Apr-24	675.00	412.00
23-Apr-24	605.00	376.00
18-Feb-24	595.00	534.00
26-Oct-23	520.00	388.50

Zhen Ding Technology Holding (4958.TW)

Date of report	Target price (NT$)	Closing price (NT$)
15-Oct-26	1,025.00	519.00
11-Aug-26	925.00	490.00
12-Jul-26	824.00	588.00
12-May-26	388.00	407.00
17-Apr-26	338.00	282.00
08-Apr-26	295.00	247.50
20-Mar-26	260.00	209.50
13-Mar-26	228.00	188.50
12-Nov-25	200.00	144.50
10-Sep-25	220.00	168.50
25-Aug-25	215.00	180.50
12-Aug-25	160.00	147.00
04-Jul-25	140.00	103.00
13-May-25	130.00	104.50
29-Apr-25	115.00	97.10

Co-Tech Development Corp. (8358.TWO)

Date of report	Target price (NT$)	Closing price (NT$)
09-Aug-26	940.00	352.00
19-May-26	900.00	429.00

Price targets shown in table(s) are unadjusted for corporate actions.

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