GLOBAL: BATTERIES

ESS helps, but we are not yet calling a cyclical bottom in batteries

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Our battery supply-demand model (on an EV+ESS basis) points to a 2027E trough in ex-China demand-to-supply ratio. We now include energy storage system (ESS) in our global battery supply-demand model, after previously using an EV-only framework. On a combined EV+ESS basis, the ex-China battery demand-to-supply ratio bottoms at 104%/32% in 2027E (before/after adjusting for potential Chinese exports), down from 110%/33% in 2026E, before recovering to 131%/40% in 2030E. Given the projected deterioration in the demand-to-supply ratio towards 2027E, we remain selective and focused on relative value in the battery space, and would need confirmation from capacity closures and stronger EV penetration before turning more constructive. This caution holds even as our base-case battery demand trajectory already runs above forecasts from third-party consultancies such as Wood Mackenzie.

Regional markets: US surplus pressure vs. selective European stabilization. The US battery market faces medium-term surplus pressure, as demand-to-local-supply ratios fall toward 70% in 2028E before rebounding moderately into 2030E. In Europe, despite severe Chinese import competition, we observe early signs of market share stabilization among Korean battery manufacturers, driven by OEM diversification strategies and the commercial adoption of new form factors (such as 4680 cylindrical cells). However, this traction remains largely confined to higher-end OEMs and has yet to translate into a broad-based market share recovery across Korean cell makers.

Stock highlights: In Korea, our top picks are Buy-rated LG Chem and LGES, supported by ESS mix expansion and utilization recovery. We are Sell-rated on Ecopro BM and Posco Future M where valuations largely reflect our bull-case ESS outcomes. In China, we continue to prefer Buy-rated CATL (on CL), where the transition from cell manufacturer to integrated ESS provider should structurally improve its long-term earnings profile, and Zenergy, on continued EV customer diversification, rising utilization and early expansion into ESS.

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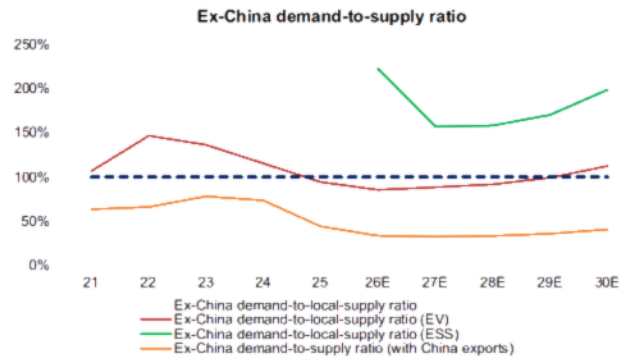
ESS helps, but we are not yet calling a cyclical bottom in batteries

Our battery supply-demand model (on EV+ESS basis) points to a 2027E trough in ex-China demand-to-supply ratio. We now include ESS in our global battery supply-demand model, after previously using an EV-only framework. On a combined EV+ESS basis, the ex-China battery demand-to-supply ratio bottoms at 104%/32% in 2027E (before/after adjusting for potential Chinese exports), down from 110%/33% in 2026E, before recovering to 131%/40% in 2030E (Exhibit 1). Given the projected deterioration in the demand-to-supply ratio towards 2027E, we remain selective and focused on relative value in the battery space, and would need confirmation from capacity closures and stronger EV penetration before turning more constructive. This caution holds even as our base-case battery demand trajectory already runs above forecasts from third-party consultancies such as Wood Mackenzie (Exhibit 2-Exhibit 3). On a global basis, we estimate the battery demand-to-supply ratio could bottom in 2029E - two years later than the ex-China trough in 2027E - mainly due to our China battery team seeing China ESS utilization trending lower as supply catches up with normalizing demand (Exhibit 4).

US battery market to remain in surplus in the medium term. Although the Section 45X manufacturing tax credits compress domestic delivered cost curves relative to Chinese imports, and robust ESS demand outpaces local supply throughout our forecast window, oversupply risks persist (Exhibit 5-Exhibit 6). We expect US manufacturers to continue to face margin compression as the domestic demand-to-supply ratio grinds down toward 70% in 2028E, prior to a modest recovery into 2030E (Exhibit 7).

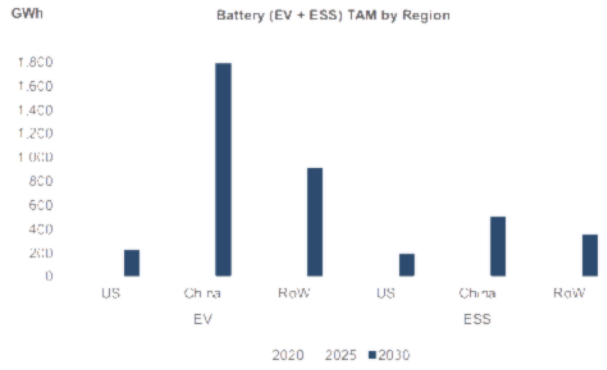
In Europe, Korean cell makers show selective stabilization. Unlike the US, Europe lacks equivalent production policy support, leaving its domestic producers to compete more directly against Chinese imports on delivered cost (Exhibit 9). That said, we observe early signs of market share stabilization among Korean battery manufacturers, driven by OEM diversification strategies and the commercial adoption of new form factors (such as 4680 cylindrical cells). However, this traction remains largely confined to higher-end OEMs and has yet to translate into a broad-based market share recovery across Korean cell makers.

Exhibit 1: Our battery supply-demand model (on EV+ESS basis) points to a 2027E trough in ex-China demand-to-supply ratio



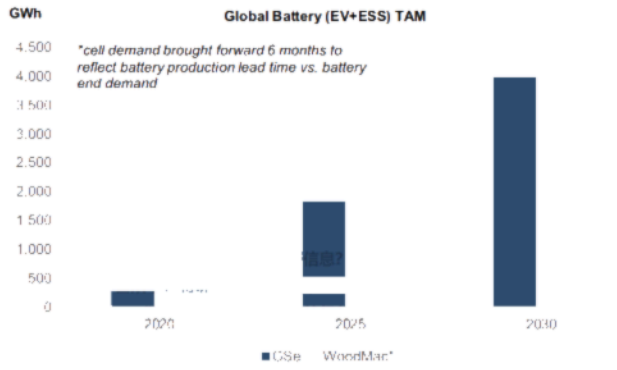
Source: Company data, Goldman Sachs Global Investment Research

Exhibit 2: Our base-case battery demand trajectory assumes robust growth across both the EV and ESS segments...



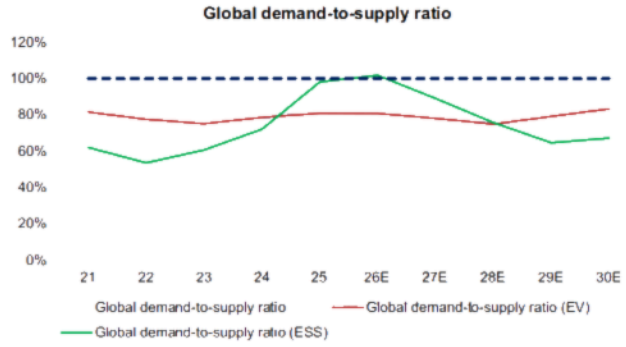
Source: Goldman Sachs Global Investment Research

Exhibit 3: ...which already runs above forecasts from third-party consultancies



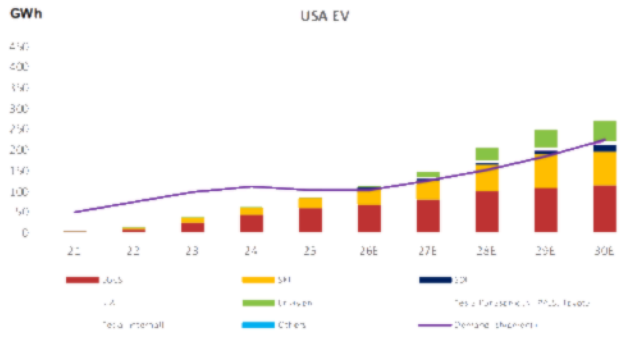
Source: Goldman Sachs Global Investment Research, Wood Mackenzie

Exhibit 4: Global battery demand-to-supply ratio could bottom in 2029E - two years later than ex-China



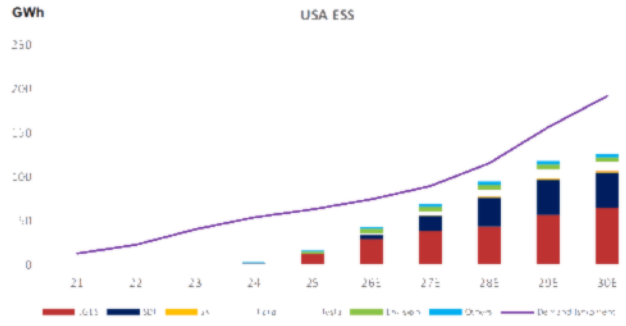
Source: Company data, Goldman Sachs Global Investment Research

Exhibit 5: The US domestic EV battery market is oversupplied over 2026E-30E



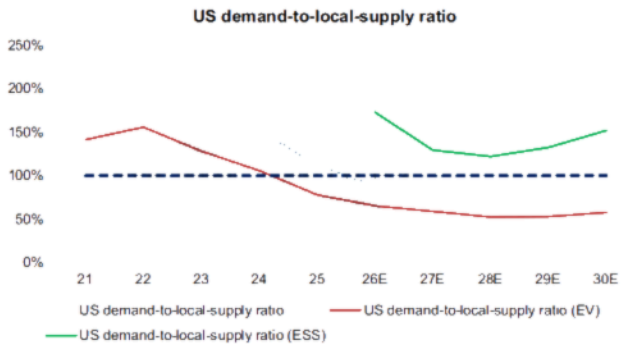
Source: Company data, Goldman Sachs Global Investment Research

Exhibit 6: US ESS demand stays ahead of domestic capacity through 2030E



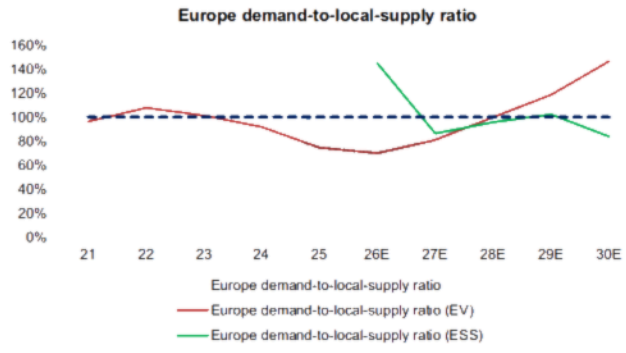
Source: Company data, Goldman Sachs Global Investment Research

Exhibit 7: We expect US manufacturers to continue to face margin compression as the domestic demand-to-supply ratio grinds down toward 70% in 2028E



Source: Company data, Goldman Sachs Global Investment Research

Exhibit 8: European producers face severe competitive pressure from Chinese imports, though demand-to-local-supply ratio before Chinese export adjustments is resilient



Source: Company data, Goldman Sachs Global Investment Research

Exhibit 9: Unlike the US, Europe lacks equivalent production policy support

EU Industrial Accelerator Act (IAA): key provisions and current status

Topic	What the Commission proposal says	Legal timing	Status/what to watch
Legislative status of the IAA	Proposal COM(2026) 100 published 4 Mar 2026. Ordinary legislative procedure: Parliament and Council must both agree	Parliament committee draft report published 11 Sep 2026; plenary vote expected Dec 2026; Council position pending	Final text and dates can still change
EV requirements, phase 1	Vehicle assembled in the EU: >=70% of non-battery components (ex-works value) of Union origin, **battery with >=3 main specific components, including cells**, of Union origin.	From 6 months after entry into force.	n/a
EV requirements, phase 2	**Battery with >=5 main specific components** of Union origin, **including cells, cathode active material** and BMS; >=50% of e-powertrain and >=50% of main electronic systems of Union origin.	From 3 years after entry into force.	n/a
Fleet-level compliance	On the OEM's request, all its EVs are deemed compliant for 12 months if the **compliant EVs it assembled in the previous calendar year equal >=85%** of its EU registrations that year.	n/a	Carmakers ask for 70%.
Origin definition	Union non-preferential rules of origin apply; content from FTA and customs-union partners treated as Union origin (22 parties incl. UK, Japan, Korea, Canada and Australia); Commission can exclude a country by delegated act.	n/a	Parliament draft report: EU27-only at first by default, with a country added only if it passes seven tests covering market access, security, labour, climate and carbon pricing, and human rights.; The Commission lets FTA partners (i.e. Korea, Japan) count as EU by **default and can** remove them.
Storage (BESS)	Year 1: BESS of Union origin, systems above 1MWh with Union-origin BMS. Year 3: plus Union-origin **cells** and one more main component. Covers procurement, auctions and support schemes. Auction share subject to non-price criteria incl. Union origin raised to >=40% of volume or 8GW a year (from 30% / 6GW).	1 and 3 years after entry into force	n/a
FDI conditions	Prior approval for **investments above EUR100m** (>=30% stake or greenfield) in **batteries**, EVs, solar PV and critical raw materials **by investors from a non-FTA country holding >40% of global capacity**: at least 4 of 6 conditions (49% ownership cap, EU joint venture, IP licensing, EU R&D, EU workforce share, EU-sourced inputs); national penalties plus turnover-based fines.	To be confirmed.	China is the only country above 40% in all four sectors (law-firm analysis).

Source: European Commission, ACEA, Mobility Global, Transport & Environment, Agence Europe, Korea MOTIE, Goldman Sachs Global Investment Research

Earnings, TP changes, and refreshed risk reward analysis

We revise our Korean cell and cathode makers' 2026E/2027E/2028E earnings by an average of +5%/-10%/-10% mainly reflecting: (1) slower EV battery margin recovery and lower EV shipments reflecting lower TAM in US and continued high competition in Europe from China battery makers, (2) 2Q detailed financials and for LGES prelim 3Q results, (3) weaker USD against KRW forecast; and (4) chemical margin assumptions for LG Chem. Correspondingly, our 12m price targets for cell and cathode makers change by an average of -7% and -9%, respectively. For Samsung SDI we also reflected faster narrowing of smaller battery losses in 2H26 driven by stronger growth in BBU (battery back-up unit) business, and also mark-to-market values of Samsung SDI's listed and unlisted subsidiary holdings in our SOTP. There is no change in our valuation methodology or target valuation multiples. For L&F, weaker earnings impact from currency is partially offset by higher LFP shipments/market share given recent order win from SK On, and we also fine tune our margin assumptions.

Our refreshed scenario analysis indicates more favorable risk-reward for LG Chem and LGES relative to peers (Exhibit 16). For LG Chem and LGES our bull (ESS)/bull (EV+ESS) cases suggest positive variance to current share price of +79%/+133% and +34%/+74% respectively, assuming higher long-term shipments, market share and margins.

Exhibit 10: Earnings estimates changes table

		GS EBITDA forecasts			GS EBITDA revisions			GS vs consensus		
	Curr	2026E	2027E	2028E	2026E	2027E	2028E	2026E	2027E	2028E
Korea battery cell					**5%**	**(10%)**	**(10%)**	**(3%)**	**(6%)**	**6%**
LG Chem	W bn	7,965	10,686	14,873	8%	(12%)	(12%)	5%	7%	29%
LG Energy Solution	W bn	5,330	7,443	10,861	(2%)	(13%)	(13%)	(6%)	(12%)	3%
Samsung SDI Co.	W bn	2,727	3,928	5,240	12%	(16%)	(17%)	(4%)	(3%)	2%
SK Innovation	W bn	12,664	7,404	7,554	0%	0%	0%	(5%)	(16%)	(8%)
Korea Cathode					**(2%)**	**(6%)**	**(7%)**	**11%**	**(12%)**	**(1%)**
Posco Future M	W bn	330	442	666	(8%)	(11%)	(7%)	3%	(13%)	12%
Ecopro BM	W bn	241	314	432	1%	(10%)	(13%)	25%	(4%)	1%
L&F	W bn	271	270	341	0%	3%	(1%)	6%	(18%)	(16%)

Source: Bloomberg, Goldman Sachs Global Investment Research

Exhibit 11: TP Changes Table

	Rating		TP	Share price	12 month TP			
	Old	New	Curr	13-Oct	Old	New	% Chg	Upside/ downside
Korea battery cell							**(7%)**	**21%**
LG Chem	Buy	**Buy**	KRW	262,000	480,000	**430,000**	(10%)	64%
LG Energy Solution	Buy	**Buy**	KRW	410,000	520,000	**480,000**	(8%)	17%
Samsung SDI Co.	Neutral	**Neutral**	KRW	560,000	695,000	**630,000**	(9%)	13%
SK Innovation	Neutral	**Neutral**	KRW	156,800	140,000	**140,000**	0%	(11%)
Korea Cathode							**(9%)**	**(9%)**
L&F	Neutral	**Neutral**	KRW	109,300	139,000	**135,000**	(3%)	24%
Posco Future M	Sell	**Sell**	KRW	177,200	130,000	**115,000**	(12%)	(35%)
Ecopro BM	Sell	**Sell**	KRW	113,200	108,427	**95,000**	(12%)	(16%)

Priced as of 13 Oct 2026 close.

Source: Goldman Sachs Global Investment Research, Refinitiv Eikon, Datastream

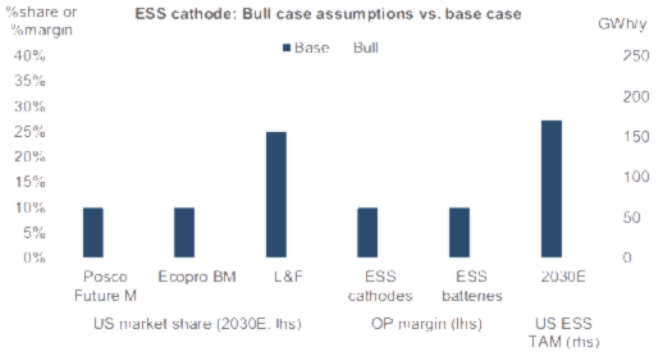
Exhibit 12: Our 12m TPs suggest that the implied 2028E EV/EBITDA would be trading below historical mid-cycle average

	12m TP			TP-implied EV/EBITDA multiple^		Historical valuations			12m TP (Prior)		
	DCF-based*	EV/EBITDA multiple-based	Blended	2027E	2028E	+1SD	midcycle	-1SD	DCF-based*	EV/EBITDA multiple-based	Blended
LG Energy Solution	500,000	450,000	480,000	26.9x	17.3x	24.9x	19.3x	13.8x	500,000	540,000	520,000
Posco Future M	100,000	130,000	115,000	35.0x	23.2x	45.1x	32.9x	20.7x	110,000	150,000	130,000
Ecopro BM	90,000	100,000	95,000	34.9x	25.4x	51.1x	34.3x	17.4x	110,000	110,000	110,000
L&F	110,000	160,000	135,000	24.5x	19.4x	35.9x	25.2x	14.6x	118,000	160,000	139,000

*PFM based on SOTP. ^ex-JV (i.e. with GM/Honda/Stellantis/Kia) EBITDA for LGES.

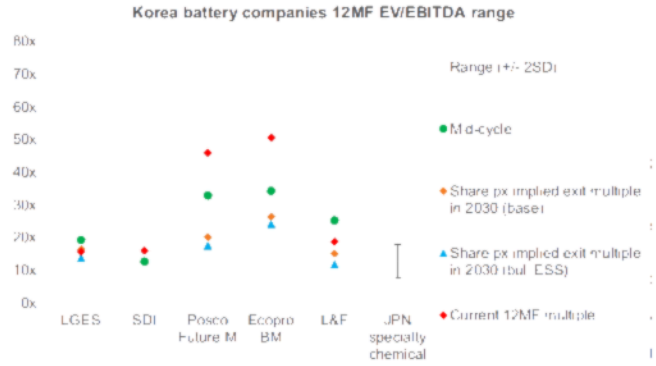
Source: Goldman Sachs Global Investment Research, Datastream

Exhibit 13: Market share, margin and TAM assumptions of our base and bull ESS cases



Source: Goldman Sachs Global Investment Research

Exhibit 14: Even under our bull case scenario assumptions for ESS, the implied 2030 exit multiples for Posco Future M and Ecopro BM remain well above the typical range of Japanese specialty chemical makers



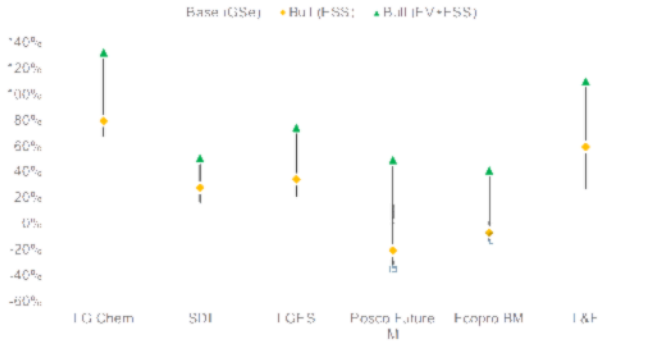
Source: Goldman Sachs Global Investment Research

Exhibit 15: In the early 2026 rally, the multiples of pure Korean battery supply chain companies have once again returned to previous highs, following the trends of US re-industrialization-exposed companies in Korea



Source: Refinitiv Eikon

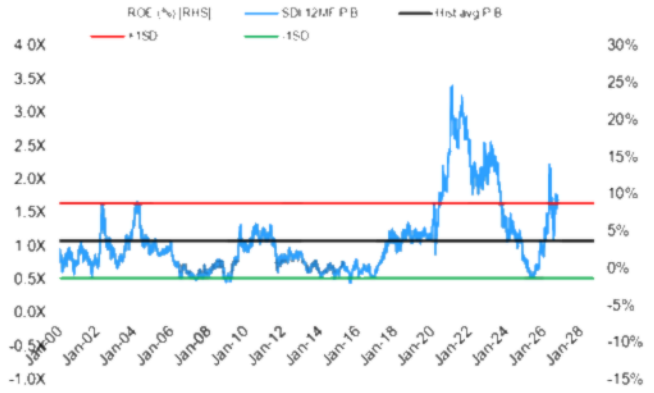
Exhibit 16: Our long term scenario analysis indicates more favorable risk reward for LG Chem and LGES
Base/Bull(ESS)/Bull(EV+SS) valuation scenarios relative to the last closing price



Priced as of 13 Oct 2026 close. Bull (ESS) assumes higher long term ESS shipments/market share/margins, Bull (EV + ESS) assumes Bull (ESS) along with higher long term EV shipments/market share/margins.

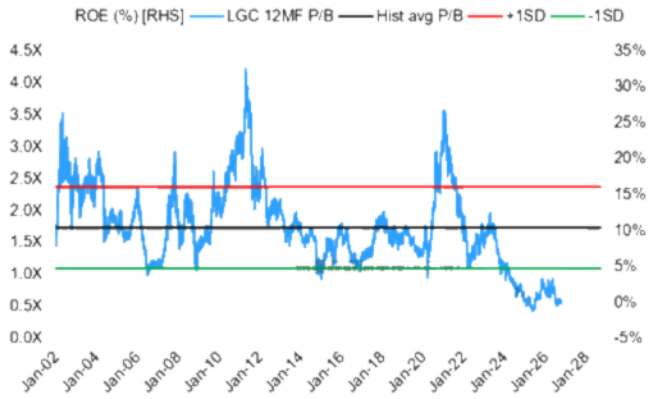
Source: Goldman Sachs Global Investment Research

Exhibit 17: Samsung SDI 12M Fwd P/B vs ROE trend



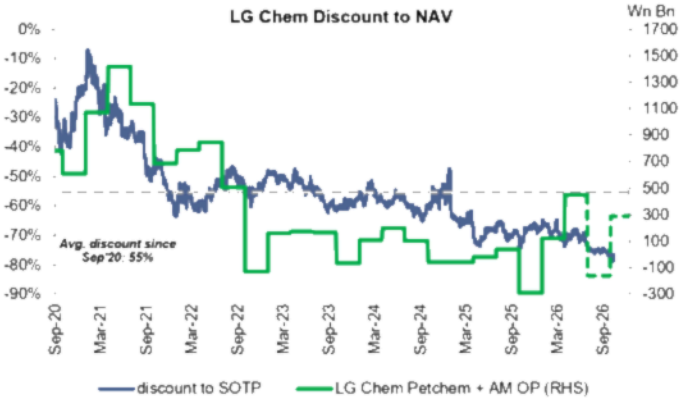
Source: Refinitiv Eikon

Exhibit 18: LG Chem's P/B multiples are now below 1SD; meanwhile we expect ROE to recover to 10% in 2028E



Source: Refinitiv Eikon, Goldman Sachs Global Investment Research

Exhibit 19: LG Chem's discount to NAV has now narrowed to 79%



Source: Company data, Goldman Sachs Global Investment Research

Price Target Risks and Methodology - LG Chem

We are Buy rated on LGC with a 2027E/28E SOTP-based 12m TP of W430,000 (Battery: Based on LGES TP; Petchem/AM/Life Science/Others: 6.5x/12x/14x/5.5x 27E/28E EBITDA multiple).

Key downside risks: (1) Lower earnings growth from the EV battery business due to slower capacity growth, weaker industry demand or higher raw material inflation, (2) a larger fall in 2027/28 petchem margins, (3) slower growth in advanced materials capacity expansion, especially cathodes, (4) CROCI dilutive M&A.

Price Target Risks and Methodology - LG Energy Solution

We are Buy rated on LGES with a 12m TP of W480,000 derived using a 50%/50% blend of DCF (WACC: 8.4%, TGR: 3.3%) and 2027E/28E EV/EBITDA. We apply a mid-cycle 20x multiple to adjusted (ex-JV share) 2027E/28E EBITDA.

Key downside risks: (1) Lower-than-expected market share; (2) Slower-than-expected ramp-up of new EV/ESS battery plant lines; (3) Lower global EV penetration rate

Price Target Risks and Methodology - Samsung SDI Co.
We are Neutral rated on Samsung SDI with a 2027E/28E SOTP-based 12m TP of W630,000 (xEV Battery: DCF; Small-size Battery/ESS/EM: 11x/14x/8x 27E/28E EBITDA multiple; Listed/unlisted subsidiaries: market/book value).

Key upside/downside risks:

(1) Higher/lower-than-expected global EV penetration rate growth; (2) faster/slower-than-expected EV/ESS shipment and market share growth in battery-related business; (3) higher/lower-than-expected battery business margins, higher/lower-than-expected EM business margins and; (4) weaker/stronger-than-expected KRW:USD.

Price target risks and methodology - SKI
We are Neutral rated on SKI with a 2027E/28E SOTP-based 12m TP of W140,000 (Battery: DCF; SKIET/Refining/Chemicals/Lube/Gas/Power/E&P: 13x/6.5x/6.5x/6.5x/8x/8x/3.5x 27E/28E EBITDA multiple).

Key upside/downside risks: Higher/Lower-than-expected refining/lube margins, higher/lower-than-expected chemical margins, faster/slower-than-expected new battery technology advancement and faster/slower-than-expected growth in global EV sales TAM.

Price target risks and methodology - Posco Future M
We are Sell rated on Posco Future M with a 12m 50%/50% blend of SOTP and 2027E/28E EV/EBITDA of W115,000 (Cathode and Anode on DCF; Steel & PMC Tech: 6.5x 27E EBITDA multiple). We apply 31x 2027E/28E EV/EBITDA multiple based on mid-cycle.

Key upside risks: Faster-than-expected growth in EV penetration growth; stronger-than-expected NCM market share in the global cathode mix; higher-than-expected market share in cathodes and anodes; higher-than-expected cathode and anode margins; a weaker-than-expected KRW:USD.

Price Target Risks and Methodology - Ecopro BM
We are Sell rated on Ecopro BM with a 12m 50%/50% blend of DCF and 2027E/28E EV/EBITDA 12m TP of W95,000. We apply 30x 2027E/28E EV/EBITDA multiple based on mid-cycle.

Key upside risks: Faster-than-expected growth in EV penetration growth; stronger-than-expected NCM market share in the global cathode mix; higher-than-expected market share in cathodes; higher-than-expected cathode margins; a weaker-than-expected KRW:USD.

Price Target Risks and Methodology - L&F
We are Neutral rated on L&F with a 12m TP of W135,000 derived using a 50%/50% blend of DCF and 2027E/28E EV/EBITDA. We apply 25x 2027E/28E EV/EBITDA multiple based on mid-cycle.

Key upside/downside risks: (1) Higher-/lower-than-expected margins from

faster-/slower-than-expected global cathode production ramp-up and/or higher-/lower-than-expected global cathode demand; (2) Sustained lead in N95 cathodes beyond the short-term through signing more long-term contracts or lower market share in N95 if competitors commercialize this product in the short-term; (3) Faster/slower technological innovation and mass production (vs. competitors) of differentiated LFP-based cathode; (4) Stronger-/weaker-than-expected KRW.