Korea: Batteries

Incorporating US demand downgrades and reciprocal tariff impact

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Delaying US BEV ownership cost parity to 2028E, on lower oil and higher tariff. We had expected that by 2026E, BEVs could reach ownership cost parity to gasoline-fuelled cars without subsidies in the US, given the falling global battery prices. However, we now assess such cost parity could be delayed to 2028E, as our macro team has reduced oil forecast cumulatively by US$14/bbl over the past month, and the new US tariffs could raise the local battery cost by US$11-14/kWh according to our estimates.

Lowering 2025E-30E global EV battery demand by 2-3%. We reflect our Auto team's forecast reductions in US auto sales and US BEV mix assumptions in this battery supply/demand update. This revision brings our US battery demand base case to be more in line with our previous bear case scenario for the US market, leading to moderately slower ex-China supply-demand rebalancing than we previously expected.

Lower earnings, refresh scenarios; prefer LGC/SDI. While the increasing US tariffs on imports from China could lead to a reduction in China battery flows in the US and potentially boost market share of ex-China players, we lower earnings estimates for Korean battery names as we believe the lower EV battery TAM and margins will more than offset market share gains and higher US ESS battery earnings. Our refreshed stress test suggests further downside risk to consensus earnings and potentially further pressure on share prices, though fundamentally we believe the bear case TAM is already largely priced into shares of Samsung SDI and LG Chem.

Remain Sell rated on Posco FM/Ecopro BM on valuations and stretched balance sheets. We also lower earnings estimates for Korean cathode names. Our stress test suggests that in a scenario of bear case TAM, the earnings risks in 2026 are higher for cathode companies relative to cell companies, while our DCF-derived long-term valuation framework suggests Sell-rated Posco Future M and Ecopro BM are still pricing in closer to our hyper adoption EV scenario. Meanwhile, cathode companies' (ex-LGC) balance sheets appear stretched even in our base case scenario, while EBITDA to interest coverage falls towards avg. 1.4x in our 2026 bear case demand scenario.

Incorporating US demand downgrades and reciprocal tariff impact

Delaying US BEV ownership cost parity to 2028E, on lower oil and higher tariffs. Under the assumption of US$80/bbl oil, we previously expected that by 2026E, BEVs could reach ownership cost parity to gasoline-fuelled cars without subsidies in the US, given the falling global battery prices. However, we now expect such cost parity to be delayed to 2028E, as two key variables have shifted (Exhibit 1). First, due to slower growth outlook, tariff escalation and somewhat higher OPEC+ supply, our macro team have cut their oil forecast cumulatively by US$14/bbl over the past month, now expecting 2025/26 Brent oil average price at US$66/58/bbl. Second, the US tariffs announced over the past 12 months could raise the local battery cost by US$11-14/kWh according to our estimates, primarily driven by tariffs imposed on imports from China and Korea (Exhibit 2).

Exhibit 1: Assuming US$60/bbl Brent, BEVs could reach ownership cost parity to gasoline-fuelled cars without subsidies in the US by 2028E

		After owning it for X years, a BEV purchased in a given year is more economical than an ICE*						Battery prices****	
	US IRA	No IRA credits		Producer credits**		Producer & consumer credits***		US	Global
	Oil price (/bbl)	US$60	US$80	US$60	US$80	US$60	US$80	US$/kWh	US$/kWh
Year purchased	2023	*Owning a BEV purchased in these years is more expensive than owning an ICE*		*Owning a BEV is more expensive than owning an ICE*		1y	1y	160	149
	2024E					1y	1y	122	111
	2025E			6y	4y	1y	1y	111	90
	2026E		8y	4y	2y	1y	1y	101	82
	2027E		5y	2y	1y	1y	1y	94	76
	2028E	7y	4y	1y	1y	1y	1y	89	72
	2029E	5y	4y	1y	1y	1y	1y	83	68
	2030E	4y	3y	1y	1y	1y	1y	78	64
Previous (before the impact of tariff change)									
Year purchased	2023				*No change vs. new*	*No change vs. new*		160	149
	2024E							122	111
	2025E			6y				100	90
	2026E		7y	4y				91	82
	2027E	7y	4y	1y				83	76
	2028E	5y	3y	1y				78	72
	2029E	4y	2y	1y				72	68
	2030E	4y	1y	1y				67	64

** Example: assuming no IRA credits and US$60/bbl Brent - after owning a BEV for 7 years, the total cost of ownership of the BEV purchased in 2028E is lower than that of an ICE purchased in the same year and owned for the same duration.*

*** Assume US IRA's 45X (US$45/kWh tax credits) is passed onto consumers.*

**** Assume US IRA's 45X (US$45/kWh tax credits) & 30D (US$7,500/vehicle tax credits) are both passed onto consumers.*

***** This calculation is based on US battery prices, which is at a premium to global battery prices due to higher local cost components and import tariffs (incorporating the 10% part of the reciprocal tariffs due to the 90 day pause).*

Source: Company data, EIA, Goldman Sachs Global Investment Research

Exhibit 2: The US tariffs announced over the past 12 months could raise the local battery cost by US$11-14/kWh according to our estimates

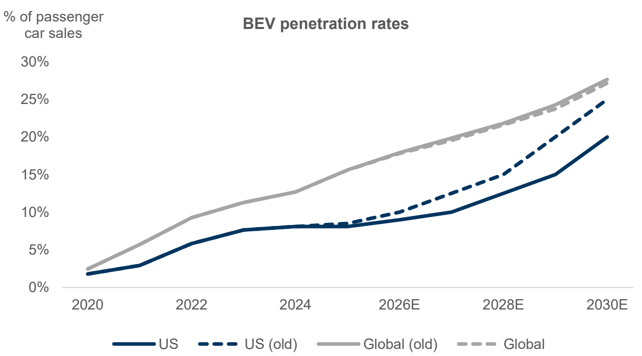
	2025E global battery costs		Import origin	Previous tariff	New tariffs (over past 12 months)		Tariff change (annouced)	Tariff change (with 90 day pause)
	US$/kWh A	% of pack costs	Assumed	B	Announced* C	With 90 day pause D	US$/kWh (C-B) x A	US$/kWh (D-B) x A
Cathode	17.4	19%	Korea	0%	25%	10%	4.4	1.7
Anode	5.6	6%	China	25%	170%	170%	8.1	8.1
Current collector	7.1	8%	Korea	0%	0%	0%	0.0	0.0
Electrolyte (LiPF6)	3.2	4%	China	3%	23%	23%	0.6	0.6
Separator	4.9	5%	Europe	4%	24%	14%	1.0	0.5
Other costs	52.3	58%	US domestic					
Total costs (pack)	**90.5**	**100%**					**14.1**	**11.0**

* Announced reciprocal tariffs before the 90 day pause.

Source: USITC, Goldman Sachs Global Investment Research

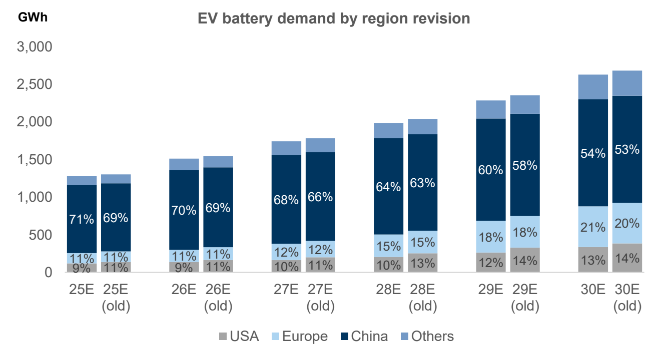
Lowering 2025E-30E global EV battery demand by 2-3%. Our Auto team cut their US auto sales forecast (to 15.4/15.25 mn units in 2025E/26E from 16.25/16.35 prior), as well as their US BEV mix assumptions (to 8%/20% for 2025E/30E from 8.5%/25%), in order to reflect the impact of slower demand outlook and the increase in tariffs (Exhibit 3). Accordingly, we revise down global EV battery demand by 2-3% for 2025E-30E (Exhibit 4). This revision brings our US battery demand base case to be more in line with our previous bear case scenario for the US market, leading to moderately slower ex-China supply-demand rebalancing than we expected in early March (Exhibit 5-Exhibit 6).

Exhibit 3: Our Auto team have lowered their US BEV mix assumptions
New (Apr 2025) vs. Old (Jan 2025)



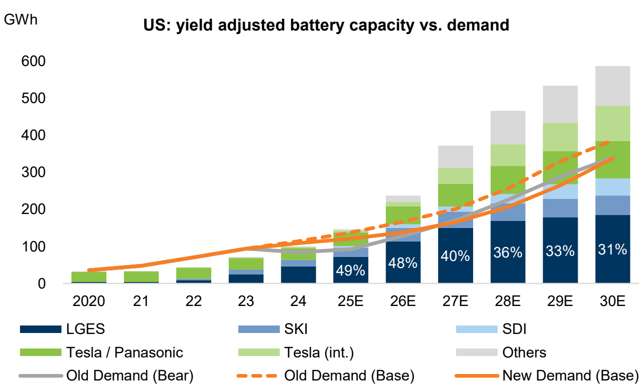
Source: Goldman Sachs Global Investment Research

Exhibit 4: We revise down global EV battery demand by 2-3% for 2025E-30E
New (Apr 2025) vs. Old (Jan 2025)



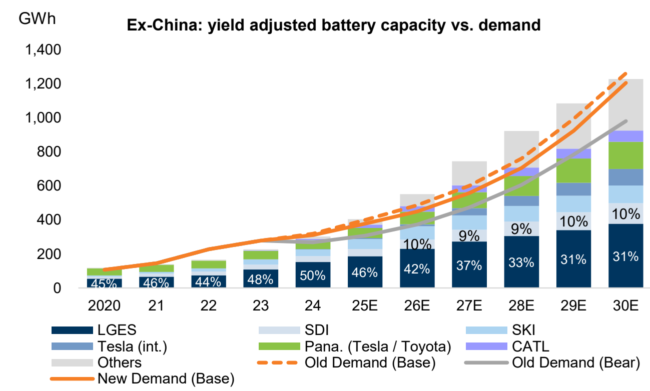
Source: Goldman Sachs Global Investment Research

Exhibit 5: This revision brings our US battery demand base case to be more in line with our previous bear case scenario for the US market...



Source: Company data, Goldman Sachs Global Investment Research

Exhibit 6: ...leading to moderately slower ex-China supply-demand rebalancing than we previously expected

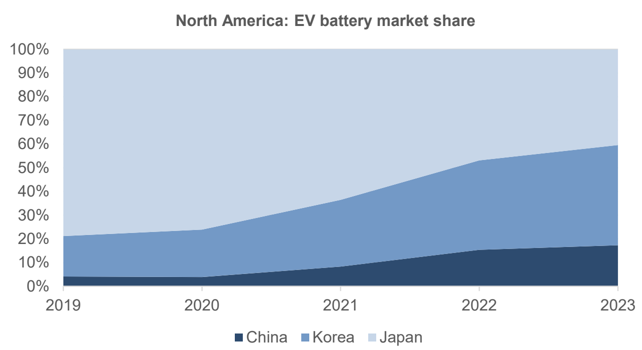


Source: Company data, Goldman Sachs Global Investment Research

Downward earnings revisions for Korean cell makers, moderately mitigated by US ESS market share gains. As per SNE, the 2023 market share of Chinese EV battery exports was 17.3% in North America (Exhibit 7). The increasing US tariffs on imports from China could lead to a reduction in such battery flows, potentially boosting the market share of ex-China players in the US EV battery market. That said, we lower earnings estimates for Korean cell makers (details in the following sections), given 1) we have already assumed limited market share of Chinese EV battery exports in the longer term, with the outlook of local capacity ramping up and leading to a well-supplied market (Exhibit 5), and 2) our US EV battery TAM forecast reduction this time outweighs the volume support from potential Chinese EV battery export reductions (Exhibit 8).

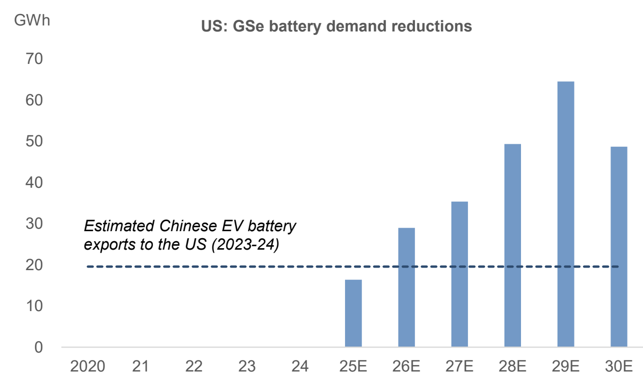
Nevertheless, the negative earnings impact from lower EV battery TAM could be partially offset by the increase in ESS battery earnings, in our view. As Chinese ESS batteries (LFP) exports to US are also affected by the increased tariffs, we expect Korean companies like LGES to aggressively move towards capturing ESS market share through LFP offerings, and accordingly we raise our market share forecast for the Korean producers within the ESS battery TAM. (Exhibit 9).

Exhibit 7: The market share of Chinese EV battery exports has been rising in North America



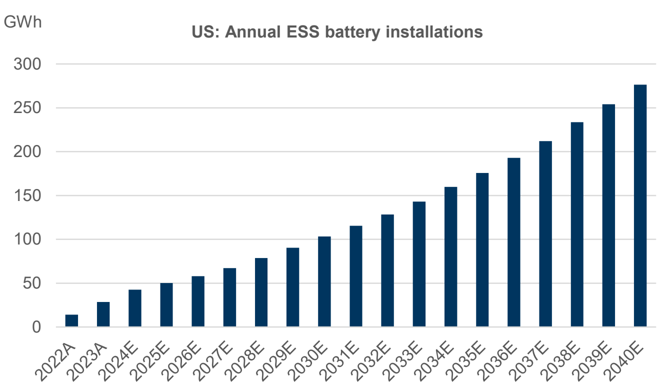
Source: SNE

Exhibit 8: Our US EV battery TAM forecast reduction this time outweighs the volume support from potential Chinese battery export reductions



Source: SNE, Goldman Sachs Global Investment Research

Exhibit 9: We expect Korean companies like LGES to aggressively move towards capturing ESS market share through LFP offerings



Source: Company data, Goldman Sachs Global Investment Research

Refreshed scenarios suggest more downside risk to consensus earnings; prefer LGC/SDI. We lower earnings estimates for Korean battery names, reflecting lower battery TAM and margins. We see 6%/4% downside risks to 2025/26 consensus EBITDA. We also refresh our stress test which gauges the potential earnings, valuations and balance sheet impacts on Korean battery names from the Bear case 1 (global battery demand in line with our Auto team's Bear case EV penetration path) and the Bear case 2 (slower TAM as per Bear case 1 and no capture of IRA tax credits, Exhibit 10). While this stress test suggests downside risk to consensus earnings and potentially further pressure on share prices, fundamentally we believe the bear case TAM is already largely priced into shares of Samsung SDI and LG Chem - based on the implied 2026E

EV/EBITDA in the bear case relative to their respective historical averages (Exhibit 10), as well as our DCF-derived long-term valuation framework (Exhibit 11). Hence, we prefer attractive risk-reward battery names LG Chem (Buy) and SDI (Buy) over LGES (Neutral) and SKI (Sell).

Exhibit 10: Cell companies: stress testing earnings, valuations and financial leverage for longer than expected EV demand downturn

Korea Cell Companies Stress Test

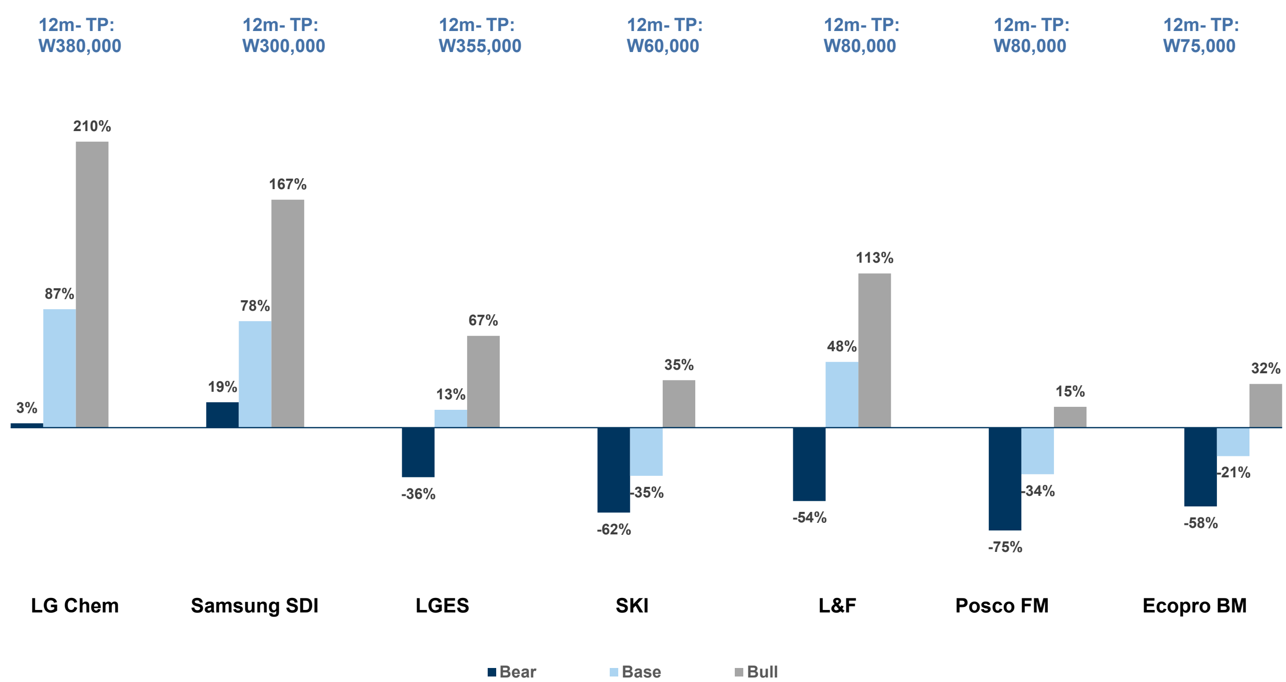
2026E	EBITDA vs Base case		EBITDA vs BBG		Implied EV/EBITDA				
	Bear 1	Bear 2	Bear 1	Bear 2	Base	Bear 1	Bear 2	3yr Avg.	5yr Avg.
LG Energy Solution	-16%	-52%	-26%	-57%	14.2x	16.8x	29.7x	20.6x	20.6x
SK Innovation	-12%	-14%	1%	-2%	8.4x	9.4x	9.8x	6.8x	8.9x
Samsung SDI	-22%	-28%	-34%	-39%	7.0x	9.2x	9.9x	10.0x	12.8x
LG Chem	-11%	-35%	-16%	-39%	5.5x	6.0x	8.5x	6.3x	7.6x

2026E	Net debt/ Equity			Net debt/EBITDA			EBITDA/Interest expense		
	Base	Bear 1	Bear 2	Base	Bear 1	Bear 2	Base	Bear 1	Bear 2
LG Energy Solution	69%	72%	101%	1.9x	2.3x	5.2x	13.3x	11.2x	6.4x
SK Innovation	127%	127%	128%	4.4x	4.9x	5.1x	3.1x	2.7x	2.6x
Samsung SDI	48%	52%	53%	2.9x	3.9x	4.3x	8.1x	6.3x	5.9x
LG Chem	63%	61%	75%	2.0x	2.1x	3.5x	10.7x	9.6x	6.9x

Bear case 1 assumes slower EV demand growth (in line with Bear case EV penetration path in GS Powertrain model). Bear case 2 assumes in addition to slower TAM (per Bear case 1) no capture of the IRA tax credits.

Source: Goldman Sachs Global Investment Research, Bloomberg

Exhibit 11: Our long-term DCF based scenario analysis also suggests more favorable risk-reward for LG Chem and Samsung SDI
Bear/base/bull valuation scenarios, % difference vs Apr 9, 2025 close



Priced as of 09 Apr 2025 close. Bull case assumes higher long term shipments (hyper EV adoption) and margins, bear case assumes lower shipments (bear case global EV penetration) and margins.

Source: Goldman Sachs Global Investment Research

Remain Sell rated on Posco FM/Ecopro BM on valuation and stretched balance sheets. We lower earnings estimates for Korean cathode names, reflecting lower battery TAM and margins. We see 20%/10% downside risks to 2025/26 consensus EBITDA. Our stress test suggests that in a scenario of bear case TAM, the earnings risks in 2026 are higher for cathode companies relative to cell companies (Exhibit 12), while our DCF-derived long-term valuation framework suggests Sell-rated Posco Future M and Ecopro BM are still pricing in closer to our hyper adoption EV scenario (Exhibit 11). Meanwhile, cathode companies' (ex-LGC) balance sheets appear stretched even in our base-case scenario, while EBITDA to interest coverage falls towards avg. 1.4x in our 2026 bear case demand scenario.

Exhibit 12: Cathode companies: Stress testing earnings, valuations and financial leverage for longer than expected EV demand downturn

Korea Cathode Companies Stress Test												
2026E	EBITDA vs Base case	EBITDA vs BBG	Implied EV/EBITDA				Net debt/ Equity		Net debt/EBITDA		EBITDA/Interest expense	
	Bear	Bear	Base	Bear	3yr Avg.	5yr Avg.	Base	Bear	Base	Bear	Base	Bear
Posco Future M*	-28%	-27%	29.8x	45.1x	36.5x	35.5x	224%	370%	12.3x	20.7x	1.9x	1.4x
Ecopro BM*	-30%	-40%	34.8x	49.7x	34.6x	31.9x	184%	189%	8.4x	11.8x	2.4x	1.7x
L&F	-25%	-33%	20.2x	26.2x	24.0x	28.3x	355%	360%	10.2x	12.9x	1.7x	1.2x
LG Chem	-11%	-16%	5.5x	6.0x	6.3x	7.6x	63%	61%	2.0x	2.1x	10.7x	9.6x

Bear case assumes slower EV demand growth (in line with Bear case EV penetration path in GS Powertrain model). *Adjusted net debt and interest expense used for PFM and ECP to account for hybrid bonds.

Source: Goldman Sachs Global Investment Research, Bloomberg

Earnings & TP changes

Overall, we lower our 2025E/26E/27E EBITDA by averages of 2%/7%/6% and 0%/15%/8% (Exhibit 13) for our covered cell and cathode companies respectively on slightly lower near-term utilization, while we have raised LGES ESS market share which partially offset our US-centric cuts in EV utilization. Correspondingly, we cut our cell and cathode companies' 12m TPs by averages of 8% and 9% respectively (Exhibit 14).

Exhibit 13: Earnings estimates changes table

		GS EBITDA forecasts			GS EBITDA revisions			GS vs consensus		
	Curr	2025E	2026E	2027E	2025E	2026E	2027E	2025E	2026E	2027E
Korea battery cell					**(2%)**	**(7%)**	**(6%)**	**(6%)**	**(4%)**	**(2%)**
LG Chem	W bn	7,784	10,819	15,122	0%	(8%)	(7%)	(4%)	(6%)	3%
LG Energy Solution	W bn	4,977	7,554	10,937	(0%)	(10%)	(9%)	(8%)	(10%)	(4%)
Samsung SDI Co.	W bn	2,382	3,580	4,954	(0%)	(7%)	(5%)	(13%)	(15%)	(18%)
SK Innovation	W bn	5,099	7,371	8,521	(8%)	(2%)	(1%)	2%	14%	9%
Korea Cathode					**0%**	**(15%)**	**(8%)**	**(20%)**	**(10%)**	**4%**
Posco Future M	W bn	255	476	735	0%	(6%)	(4%)	(24%)	(5%)	(3%)
Ecopro BM	W bn	200	348	624	0%	(12%)	(15%)	(15%)	(14%)	(3%)
L&F	W bn	(11)	191	380	NM	(26%)	(5%)	NM	(10%)	18%

Source: Bloomberg, Goldman Sachs Global Investment Research

Exhibit 14: Rating and TP changes table

	Rating		TP	Share price	12 month TP			Upside/
	Old	New	Curr	9-Apr	Old	New	% Chg	downside
Korea battery cell							(8%)	35%
LG Chem	Buy	**Buy**	KRW	203,500	390,000	**380,000**	(3%)	87%
Samsung SDI Co.	Buy	**Buy**	KRW	171,700	333,742	**300,000**	(10%)	75%
LG Energy Solution	Neutral	**Neutral**	KRW	314,000	375,000	**355,000**	(5%)	13%
SK Innovation	Sell	**Sell**	KRW	92,700	70,000	**60,000**	(14%)	(35%)
Korea Cathode							(9%)	(2%)
L&F	Neutral	**Neutral**	KRW	54,000	90,000	**80,000**	(11%)	48%
Ecopro BM	Sell	**Sell**	KRW	94,700	80,000	**75,000**	(6%)	(21%)
Posco Future M	Sell	**Sell**	KRW	121,500	90,000	**80,000**	(11%)	(34%)

Priced as of 9 Apr 2025 close.

Source: Goldman Sachs Global Investment Research, Refinitiv Eikon

Investment Thesis - LG Energy Solution

LGES is the largest battery manufacturer outside China (based on 2024 market share), with leadership in high nickel battery chemistries. We remain positive on LGES' fundamentals given its widening global technology leadership in batteries with upcoming commercial production of new technology battery products such as large size cylindrical 4680 batteries, cell-to-pack LFP batteries (from 2025) and dry electrode process (from 2028). Meanwhile, we see market share growth in the US driven by rapidly expanding capacities where we expect its US market share growth to be margins and returns accretive (GSe 2025E-27E EBITDA CAGR of 48% and 4.9% CROCI expansion during this period). However, the stock is now pricing in our base case market share and core EBITDA margin growth in 2030E at 16.0%/14.1% vs 11.5%/9.1% in 2024E. We now only see balanced risk reward given the variance to current share price in our bear/base/bull case scenarios. We note LGES also has the highest 45X IRA advanced manufacturing production credits (AMPC) exposure where JV partner OEMs have previously sought more sharing of these tax credits. We are Neutral-rated on LGES.

Price Target Risks and Methodology - LG Energy Solution

We are Neutral rated on LGES with a 12-m DCF-based (8.4% WACC, 3.3% TGR) target price of W355,000.

Key upside/downside risks:

(1) Higher/lower-than-expected market share: LGES' market share gain pace may over-/undershoot our estimates against other technology leaders thereby driving upside/downside risks to LGES' long-term margin and market share.

(2) Faster-/slower-than-expected ramp-up of new EV battery plants: Acceleration/delays in new battery plant ramp ups could lead to higher/lower operating leverage leading to upside/downside risk to our operating margin estimates.

(3) Higher/lower global EV penetration rate: Higher/lower oil prices and easier/harder realization of the IRA tax credits could lead to higher/lower than expected EV penetration rates leading to upside/downside risk to our earnings estimates.

Investment Thesis - Samsung SDI

Samsung SDI (SDI) is a battery and electronic materials manufacturer maintaining industry-leading profitability levels in the large-sized battery business while becoming more of a pure-play battery company. We expect Samsung SDI battery margins to be more resilient than that of peers given long-term contracts with premium customers. Meanwhile, SDI is making good progress on technology leadership (alongside LGES) with strong know-how and a diversified new product offering (mass production of prismatic P6 with Ni >90%, cylindrical 46-pi, and solid state batteries). We also see potential for further cell order momentum in the US market as OEMs look for battery suppliers and form factor diversification. Valuation wise, risk-reward still looks attractive. We are Buy rated on the stock.

Price Target Risks and Methodology - Samsung SDI Co.

Valuation methodology: We are Buy rated on Samsung SDI with a 2026E SOTP-based (xEV Battery: DCF-based with 8.4% WACC, 3.3% TGR; Small-size Battery: 8x EV/EBITDA; ESS Battery, 8x EV/EBITDA; Electronic Materials: 6x EV/EBITDA; and market/book value of listed/unlisted subsidiaries respectively) 12m TP of W300,000.

Key downside risks: Lower-than-expected global EV penetration rate growth, slower-than-expected shipment and market share growth in battery-related business, lower-than-expected battery business margins, lower EM business margins and a stronger-than-expected KRW:USD.

Investment Thesis - SK Innovation

SK Innovation (SKI) is a refining, petrochemical, and gas & power utility company operating through seven business segments: (1) Refining; (2) Petrochemicals; (3) Lubricant; (4) E&P; (5) Battery (SK On); (6) Battery Materials (SKIET); and Gas & power utility (SKI E&S). Our analysis suggests that the battery cost curve is steepening further as incumbent leaders (i.e., LGES and SDI) are propelling ahead with new battery products launches faster compared to SK On backed by more sizable R&D investments. With a potentially rising gap in cost and technology we base case a more delayed turn in profitability of the battery business (relative to company guidance). Valuation wise, risk-reward looks unfavorable. We are Sell rated on the stock.

Price target risks and methodology - SKI

Valuation methodology: We are Sell rated on SKI with a 2026E SOTP-based (Battery: DCF-based with 8.5% WAAC, 3.3% TGR; Battery Materials: 13.0x EV/EBITDA; Refining/Lube/Petchem: 6.5x EV/EBITDA; Gas & power: 8.0x EV/EBITDA; Upstream E&P/Others: 3.5x EV/EBITDA) 12m TP of W60,000.

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

Investment Thesis - LG Chem

LG Chem is a petrochemical and materials company operating through four key business segments: (1) Petchem; (2) Battery (through its subsidiary, LG Energy Solution); (3) Advanced Materials (includes battery materials); and (4) Life Science. The stock is trading at a 23-year low with a P/B multiple of 0.5x, implying an 85% discount to NAV. We expect 2025 to be the fourth year of a cyclical downturn for chemicals and the second year for ex-China battery and cathode, though LGC has continued to report margin outperformance and a much stronger balance sheet vs both chemical and cathode peers. We believe the stock offers deep value and see a path toward 4%/10% ROE by 2026E/27E for LGC (vs. 0% in 2024E) and FCF (ex-LGES) to turn positive in 2027E driven by: (1) end of ongoing c.3 years of consumer durables destocking (favorable for downstream chemicals demand), (2) return of stronger battery demand in 2026 driven by improving EV economics (as battery prices continue to fall), and (3) revised lower capex guidance for both LGES and ex-LGES businesses. We are Buy-rated on LG Chem.

Price Target Risks and Methodology - LG Chem

Valuation methodology: We are Buy rated on LG Chem with a 2026E SOTP-based (Battery: GSe LGES DCF-based with 8.4% WACC, 3.3% TGR; Petchem: 6.5x EV/EBITDA; Advanced Materials, 12.0x EV/EBITDA; Life Science: 14.0x EV/EBITDA, Others: 5.5x EV/EBITDA) 12m TP of W380,000.

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 2026 petchem margins, (3) slower growth in advanced materials capacity expansion, especially cathodes, (4) CROCI dilutive M&A.

Investment thesis - Posco Future M

Posco FM is the only Korean company with both cathode and anode production capacity. Its main business used to be refractories and furnace maintenance for its steel-making parent company (Posco Holdings) before Posco group started to change its strategic focus to new-generation materials such as battery materials and hydrogen in the late 2010s. After its merger with the cathode making arm of the group (Posco ESM) back in 2018, Posco Future M has been aggressively expanding both anode and cathode capacity, to become a major cathode supplier for LG Energy Solutions, Samsung SDI and GM. Among the Korean cathode peers, Posco FM is the most vertically integrated cathode maker thanks to its parent company's investments in metal sourcing and recycling and expects to establish a complete closed-loop of battery materials from production to recycling by 2030. We also see the company as a unique enabler of the US battery component supply chain onshoring, and see more potential order wins in anodes, but we are Sell rated as valuation appears to be stretched despite solid business fundamentals.

Price target risks and methodology - Posco Future M

Valuation methodology: We are Sell rated on Posco Future M with a 2026E SOTP-based (Cathode: DCF-based with 8.1% WAAC, 3.3% TGR; Anode: DCF-based with 8.1% WAAC, 3.3% TGR; Steel-related Business: 6.5x EV/EBITDA; PMC Tech: 6.5x EV/EBITDA) 12m TP of W80,000.

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.

Investment Thesis - Ecopro BM

Ecopro BM develops and manufactures high-nickel NC(M)A (Nickel, Cobalt, Manganese, Aluminum) cathode materials. The company has been producing NC(M)A cathode since 2008, to become the 2nd-largest ternary cathode producer in terms of market share (2022 GSe market share: 11.1%) following Sumitomo Metal Mining. Ecopro BM supplies cathodes to the major Korean cell-makers including Samsung SDI and SK On. The company also supplies NC(M)A cathode to power-tool battery makers like Murata, but the revenue contribution from EV cathodes has been rising from 23% (2019) to 50% (2022). Its parent company, Ecopro is making meaningful investments in supply chain vertical integration from lithium refining/ precursor to recycling through its subsidiaries including Ecopro Innovation (lithium refining), Ecopro Materials (precursor) and Ecopro CNG (recycling). We are Sell rated with cash returns to have likely peaked in 2022 (aggressive capacity expansion plans with more limited duration supply contracts while ternary cathode oversupply is expected in the coming decade) and stretched valuation.

Price Target Risks and Methodology - Ecopro BM

Valuation methodology: We are Sell rated on Ecopro BM with a 12-m DCF-based (8.3% WACC, 3.3% TGR) target price of W75,000.

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.

Investment Thesis - L&F

L&F is one of the leading ternary cathode makers globally in terms of market share and has been producing NCM (Nickel, Cobalt, Manganese) based cathode since 2008. The company started to focus on the EV battery cathode business in 2019, commercialized high nickel NCMA (Nickel, Cobalt, Manganese, Aluminum) cathode in 2020 and is now a supplier of cathode to LG Energy Solutions, SK On and Samsung SDI, and most recently, also won a direct cathode supply contract from Tesla. On top of that, according to company guidance, L&F is ahead of its competitors in terms of single-crystal cathode commercialization. L&F mostly relies on OEM customers for metal sourcing (c.70% of its operation). We are Neutral rated on the stock despite high growth customer exposure due to limited vertical integration and a mixed valuation risk-reward.

Price Target Risks and Methodology - L&F

Valuation methodology: We are Neutral rated on L&F with a 12-m DCF-based (8.3% WACC, 3.3% TGR) target price of W80,000.

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

Disclosure Appendix

Reg AC

We, Nikhil Bhandari, Amber Cai and John Tsang, 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.

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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).

For a more detailed description of how we calculate the GS Factor Profile, please contact your GS representative.

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Target price history table(s)

Ecopro BM (247540.KQ)

Date of report	Target price (W)
02-Mar-25	80,000
06-Nov-24	95,000
31-Jul-24	105,000

SK Innovation (096770.KS)

Date of report	Target price (W)
02-Mar-25	70,000
06-Nov-24	75,000
04-Sep-24	70,000

Ecopro BM (247540.KQ)

Date of report	Target price (W)
05-May-24	120,000
25-Mar-24	135,000
03-Aug-23	120,000
12-Jun-23	125,000

SK Innovation (096770.KS)

Date of report	Target price (W)
01-Aug-24	95,000
29-Apr-24	105,000
06-Feb-24	120,000
09-Jan-24	140,000
05-Nov-23	155,000
03-Oct-23	180,000
30-Jul-23	190,000
06-Jun-23	180,000
07-May-23	170,000

Samsung SDI Co. (006400.KS)

Date of report	Target price (W)
02-Mar-25	340,000
06-Nov-24	530,000
04-Sep-24	560,000
30-Jul-24	630,000
25-Mar-24	730,000
30-Jan-24	740,000
09-Jan-24	800,000
26-Oct-23	850,000
03-Oct-23	890,000
12-Jun-23	930,000

LG Chem (051910.KS)

Date of report	Target price (W)
02-Mar-25	390,000
08-Jan-25	470,000
06-Nov-24	480,000
04-Sep-24	500,000
25-Jul-24	560,000
13-Jun-24	650,000
01-May-24	670,000
25-Mar-24	700,000
09-Jan-24	710,000
30-Oct-23	800,000
03-Oct-23	810,000
27-Jul-23	850,000
20-Jul-23	880,000
06-Jun-23	870,000

L&F (066970.KS)

Date of report	Target price (W)
02-Mar-25	90,000
06-Nov-24	130,000
09-May-24	150,000
25-Mar-24	165,000
01-Feb-24	155,000
09-Jan-24	175,000
03-Oct-23	200,000
03-Aug-23	250,000
12-Jun-23	255,000

Posco Future M (003670.KS)

Date of report	Target price (W)
02-Mar-25	90,000
06-Nov-24	140,000
26-Jul-24	160,000
25-Apr-24	180,000
25-Mar-24	210,000
31-Jan-24	190,000
24-Oct-23	220,000
24-Jul-23	240,000
12-Jun-23	220,000

LG Energy Solution (373220.KS)

Date of report	Target price (W)
02-Mar-25	375,000
08-Oct-24	455,000
04-Sep-24	450,000
25-Jul-24	455,000
08-Jul-24	485,000
25-Apr-24	500,000
25-Mar-24	515,000
28-Jan-24	530,000
09-Jan-24	550,000
25-Oct-23	610,000
03-Oct-23	620,000
27-Jul-23	605,000
09-Jul-23	610,000
26-Apr-23	590,000

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