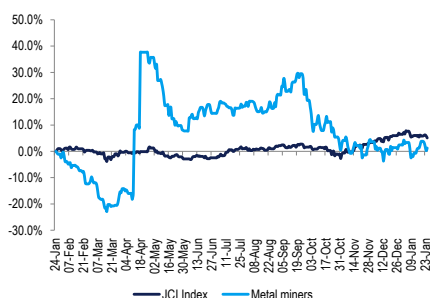


Sector Index Performance

	3M	6M	12M
Absolute	-6.3%	-14.2%	1.3%
Relative to JCI	-11.3%	-17.5%	-3.8%



Summary Valuation Metrics

P/E (x)	2023F	2024F	2025F
ADMR IJ	10.6	9.2	9.4
ANTM IJ	10.6	9.5	8.3
HRUM IJ	8.2	9.3	8.7
INCO IJ	11.0	20.4	36.4
MBMA IJ	217.0	23.1	14.0
MDKA IJ	N/A	30.8	28.2
NCKL IJ	9.4	6.8	6.0

EV/EBITDA (x)	2023F	2024F	2025F
ADMR IJ	8.1	8.2	7.5
ANTM IJ	6.4	5.9	5.0
HRUM IJ	3.1	4.8	6.3
INCO IJ	4.2	7.9	9.8
MBMA IJ	39.3	9.8	7.1
MDKA IJ	18.6	8.5	7.8
NCKL IJ	6.7	4.3	3.4

Div. Yield	2023F	2024F	2025F
ADMR IJ	N/A	N/A	N/A
ANTM IJ	5.1%	4.7%	5.3%
HRUM IJ	N/A	N/A	N/A
INCO IJ	N/A	N/A	N/A
MBMA IJ	N/A	N/A	N/A
MDKA IJ	N/A	N/A	N/A
NCKL IJ	N/A	3.2%	4.4%

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Deciphering battery innovation risks to Indonesian nickel

- Advancement in battery technology (i.e. LFP, LMFP, Na-Ion) continued to pose risks on the viability of nickel-based batteries for EVs.
- U.S and European automakers that had been previously sceptical with LFP batteries have either announced or built LFP-based EVs (Fig. 5).
- We expect NMC-batteries to remain relevant in the next 10 years but shall subject to technological advancement in non-nickel-based battery.

Wider adoption of LFP-batteries are expected to continue

Since 2019, LFP (lithium-ferum-phosphate) cathode has started gaining higher market-share in China EV-market (c.67% in FY23, Fig. 1) owing to the technological breakthrough of cell-to-pack (CTP) from CATL and BYD's blade-battery technology, both of which are able to increase LFP-batteries' energy-density with enhanced safety features. By having technological and first-mover advantage over other players, CATL and BYD combined currently held c.65-70% of China EV-battery installations in Dec-23 (Fig. 2). Furthermore, more technological features such as CATL's 0-80% fast-charging in 30 minutes have been introduced and has since reduce the necessity of using high energy-density batteries – which NMC (nickel manganese cobalt) has advantage over LFP, particularly in China, which has the most developed charging-infrastructure worldwide (Fig. 3). The LFP technology itself has started to gain higher adoption in ex-China market, with U.S and European automakers has either announced their commitment or has started manufacturing EVs using LFP-batteries (Fig. 5).

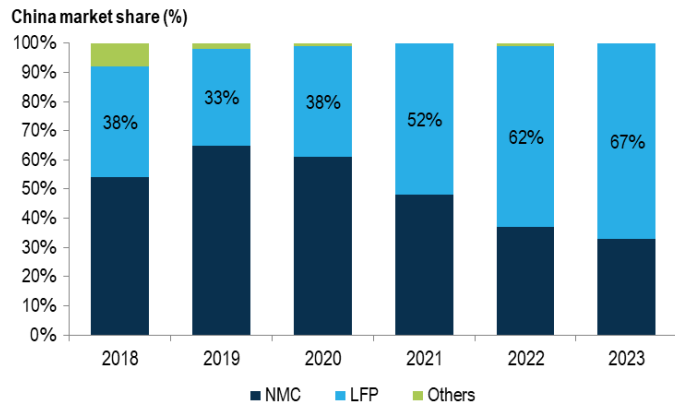
Innovation beyond LFP batteries: LMFP to Na-Ion batteries

LMFP (adding manganese to LFP) batteries were not necessarily new technology, however its development were facing difficulties amid government of China's preference for higher energy-density batteries (i.e. NMC) – this was prior to the innovation in LFP batteries in 2020. However, starting FY23, battery-manufacturers have started to entertain the idea of installing LMFP cathode into batteries which can generate up to c.230 Wh/kg energy-density (Fig. 4), much higher vs. typical LFP (c.170 Wh/kg) and is only 15-20% lower than NMC811. If successful, this would further narrow the energy-density gap between L(M)FP and NMC. Aside from LMFP, advancement of solid-state batteries (SSB) and sodium-ion (Na-Ion) batteries pose a benefit and risk to nickel, respectively, as the success of SSB may lead to higher nickel-demand while rapid adoption of Na-Ion batteries would reduce nickel and lithium demand.

NMC to remain relevant in the next 10 years, but downside risks linger

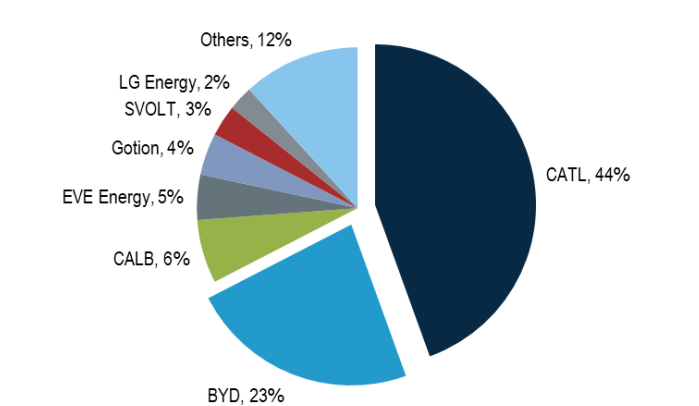
As nickel-demand for EVs set to grow by c.15% CAGR until FY30F and amid geopolitical tension between U.S, China, and potentially Europe – following the implementation of U.S IRA ([report](#)), we think LFP and NMC will co-exist and serve their own respective market segments. Higher dependency on China (LFP, anode material (i.e. graphite), and Na-Ion), could lead to relatively resilient demand for nickel, in our view, as U.S is set to reduce dependency on China along with U.S preference for NMC due to its higher range. Nonetheless, technological development pose the biggest upside and downside risks to nickel, which we have to continue monitoring. We maintain our Neutral sector rating on soft nickel prices and continue to like MDKA ([report](#)) and ADMR ([report](#)) as top picks.

Fig. 1: NMC vs LFP batteries market-share in China



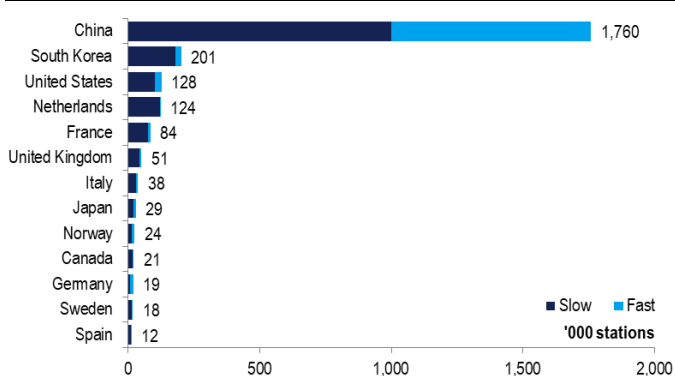
Source: Bloomberg, CABIA, Indo Premier

Fig. 2: China EV-battery installations market-share (%)



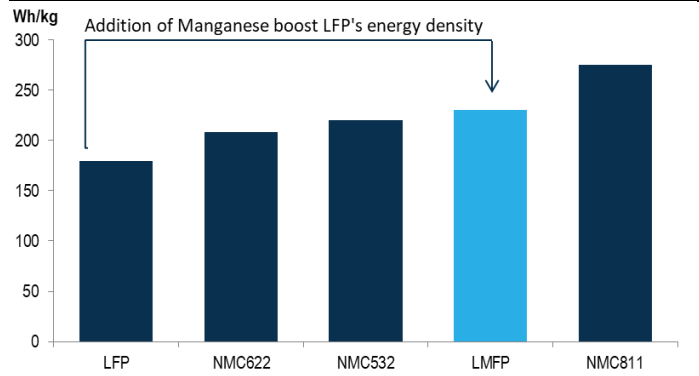
Source: Bloomberg, CABIA, Indo Premier

Fig. 3: China charging infrastructure



Source: Bloomberg, Statista, Indo Premier

Fig. 4: Energy density between each battery chemistries



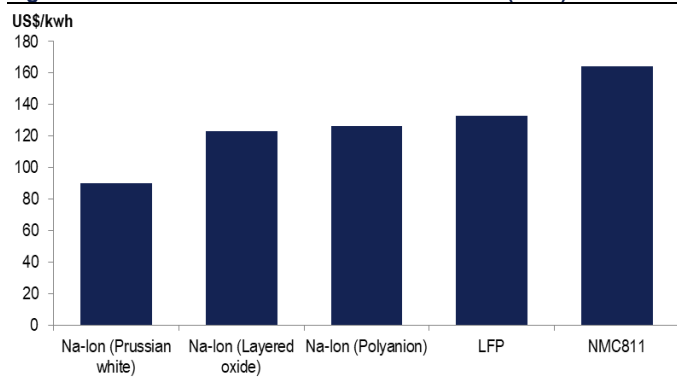
Source: Bloomberg Intelligence, EYP Analysis, Indo Premier

Fig. 5: Plan from U.S and European Automakers

Automakers	EVs with LFP Batteries	Status Update
Tesla	In production	Tesla's rear-wheel drive model 3s and Ys use LFP batteries supplied by CATL and BYD
GM	Announced	GM plans to equip the next-generation Chevy Bolt EVs with LFP batteries
Ford	In production	Ford has introduced LFP batteries in its entry-level Mustang Mach-E since 2023, to be followed by F-150 Lightning in 2024
Volkswagen	In production	Volkswagen will introduce LFP batteries for its China-built ID.3 in 1Q24. It plans to use LFP batteries for entry-level models globally, including the upcoming ID.2
BMW	Announced	BMW's 6th generation battery technology - developed for its NEUE KLASSE EVs due in 2025 - offers the option of using LFP cathodes for the first time
Mercedes	Announced	Mercedes plans to use LFP batteries in its future entry-level models, including the new CLA compact sedan due in 2025
Stellantis	Announced	Stellantis' all-new Citroen e-C3 due in 2Q24 will use LFP batteries. The automaker has also signed a MoU with CATL for the local supply of LFP batteries to power Stellantis' EV production in Europe
Renault	N/A	N/A
Toyota	In production	Toyota has equipped its China-built bZ3 EV with BYD's LFP batteries since 2023. The automaker's next-generation "Popularization" batteries due in 2026-27 will also use LFP chemistry
Honda	Announced	Honda plans to adopt LFP batteries in 2025
Hyundai/Kia	In production	Kia's new China-built EV5 is using BYD's LFP batteries. Hyundai and Kia target to install LFP batteries in more entry-level and midpriced EVs for global markets from 2025

Source: BloombergNEF, Indo Premier

Fig. 6: Sodium ion batteries vs other chemistries (2022)



Source: Bloomberg, Indo Premier

Fig. 7: BYD Seagull (sodium-ion EV)



Source: China Auto Show, Indo Premier

Fig. 8: Peers comparison table

Ticker	Company	Rating	Target price (Rp/share)	P/E			EV/EBITDA			Dividend yield (%)		
				23F	24F	25F	23F	24F	25F	23F	24F	25F
ADMR IJ	Adaro Minerals Indonesia	Buy	1,650	10.6	9.2	9.4	8.1	8.2	7.5	N/A	N/A	N/A
ANTM IJ	Aneka Tambang	Buy	2,100	10.6	9.5	8.3	6.4	5.9	5.0	5.1%	4.7%	5.3%
HRUM IJ	Harum Energy	Buy	1,750	8.2	9.3	8.7	3.1	4.8	6.3	N/A	N/A	N/A
INCO IJ	Vale Indonesia	Hold	5,560	11.0	20.4	36.4	4.2	7.9	9.8	N/A	N/A	N/A
MBMA IJ	Merdeka Battery Materials	Buy	940	217.0	23.1	14.0	39.3	9.8	7.1	N/A	N/A	N/A
MDKA IJ	Merdeka Copper Gold	Buy	3,500	N/A	30.8	28.2	18.6	8.5	7.8	N/A	N/A	N/A
NCKL IJ	Trimegah Bangun Persada	Buy	1,250	9.4	6.8	6.0	6.7	4.3	3.4	N/A	3.2%	4.4%

Source: Bloomberg, Indo Premier

SECTOR RATINGS

- OVERWEIGHT : An Overweight rating means stocks in the sector have, on a market cap-weighted basis, a positive absolute recommendation
- NEUTRAL : A Neutral rating means stocks in the sector have, on a market cap-weighted basis, a neutral absolute recommendation
- UNDERWEIGHT : An Underweight rating means stocks in the sector have, on a market cap-weighted basis, a negative absolute recommendation

COMPANY RATINGS

- BUY : Expected total return of 10% or more within a 12-month period
- HOLD : Expected total return between -10% and 10% within a 12-month period
- SELL : Expected total return of -10% or worse within a 12-month period

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The views expressed in this research report accurately reflect the analyst's personal views about any and all of the subject securities or issuers; and no part of the research analyst's compensation was, is, or will be, directly or indirectly, related to the specific recommendations or views expressed in the report.

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