

Thailand Utilities - EV

Material cost hikes are not rueful “Russian roulette”

- Material cost for NMC 822 battery is over 60% of total battery cost; c30% of total cost.
- The price spikes in nickel and lithium due to the ongoing Russia-Ukraine war should negatively impact the earnings of battery and EV producers and marketers.
- EA and NEX remain attractive investment choices, in our view.

Russia-Ukraine war triggers price spikes of global materials and metals

As the Russia-Ukraine war continues, the global nickel price has jumped by over 2x from USD15,000/t to USD35,000-40,000/t, and the price of lithium carbonate in China skyrocketed to RMB493,500/t on 14 Mar-22, up 74% YTD. According to the EIA, the cost of materials for the nickel-manganese-cobalt (NMC) 822 battery accounts for over 60% of the total battery cost, in which cobalt, lithium, nickel and graphite are the most expensive materials, accounting for c30% of the total cost. With the battery cost normally accounting for almost 50% of the cost of an EV and the costs of materials being around two-thirds of the total battery cost, the recent lithium and nickel price spikes should negatively impact the earnings of battery and EV producers and marketers like EA and NEX.

Up to 6-9% lower selling prices and 10 ppt lower net margins

As nickel and lithium are the two key raw materials used for the production of the NMC 822 battery by EA for its e-buses and e-trucks, we have analysed the potential earnings downsides from the higher costs of nickel and lithium. We found that our assumptions of 166% and 366% increases in the prices of nickel and lithium, respectively, would result in 6-9% drops in the selling prices of EA's three e-bus models, and the net profit margins would decline from 22.9% to 13.6% for a minibus (7-metre length e-bus), from 28.6% to 17.5% for a standard e-bus (10m), and from 34.3% to 21.3% for a large e-bus (12m).

Potential 14% (EA) and 29% (NEX) downsides to 2022 EPS and net profit forecasts

Based on our EV sales volume assumptions for EA and NEX, our respective net profit forecasts in 2022-23, and our margin change assumptions under 166% and 366% price increases for nickel and lithium, we estimate that, all else being equal, EA could see its 2022E net profit drop by 14% to THB9.1b and EPS could drop to THB2.45, while 2023E net profit could drop by 10% to THB12.1b and EPS could drop to THB3.26. NEX could see its 2022E net profit drop by 29% to THB755m and EPS could drop to THB0.45, while 2023E net profit could drop by 19% to THB1.4b and EPS could drop to THB0.85.

Upsides from sales volumes over downsides from material price spikes

Despite the potential EPS downsides from the price spikes in nickel and lithium due to the ongoing Russia-Ukraine war, we believe EA and NEX remain attractive investment choices in the Thai equity market as 1) their EPS growth, even with the impact of the material price hikes, should remain strong; and 2) their valuations should remain attractive for the next three years, in our view, with high earnings growth visibility on the back of potentially large orders of e-buses and e-trucks in Thailand, thanks to their “first-mover” advantages.



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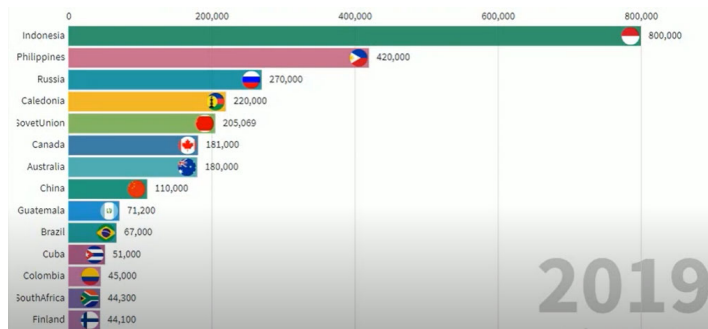
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Material cost hikes are not rueful “Russian roulette”

Following Russia’s invasion of Ukraine, the prices of many commodities, including a number of metals, shot up by over 2x over investors and consumers’ fears of rising supply risks as Russia ranked as the world’s third largest producer of nickel in 2021, according to the US Energy Information Administration (EIA).

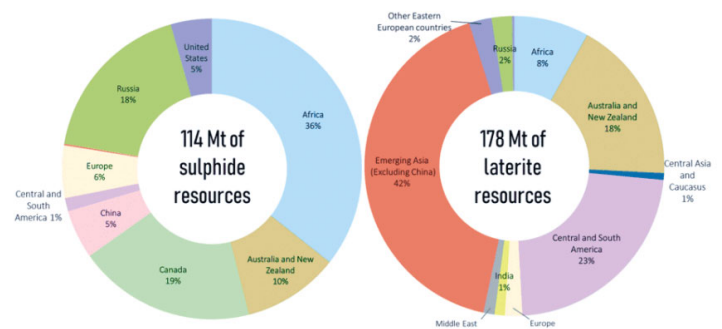
In 2021, according to Global Data, global nickel production recovered by 6.8% y-y to 2.42mt, supported by Indonesia (+16.3% y-y to 800kt), the Philippines (+5.1% y-y to 420kt), and Brazil (+24% y-y to 67kt) after falling by 4.2% y-y in 2020 due to the Covid-19 lockdowns and restrictions.

Exhibit 1: Russia is the world’s third largest producer of nickel



Source: Global Data

Exhibit 2: Global nickel reserves, breakdown by country



Source: [Energy Industry Review](#)

Russia is the world’s third largest producer of nickel with an 11% market share as of 2021. Russia saw lower nickel production in 2021 at -13.8% y-y, as did South Africa (-15.8% y-y), due to restrictions arising from poor weather conditions.

The world’s top five producers – Indonesia (30% market share in 2021), the Philippines (18%), Russia (11%), Caledonia (8.5%), and former countries of the Soviet Union, including Ukraine (8.5%), together accounted for 76% of the global nickel supply in 2021. Global Data projects that global nickel production will grow at a CAGR of 3% to reach 2.73mt in 2025, led by Indonesia, Russia, Canada and the Philippines, with combined production to rise from 1.61mt in 2021 to 1.82mt in 2025.

Nickel products: two major forms depending on purity. The Global nickel mining business has mostly been executed in two major categories of nickel:

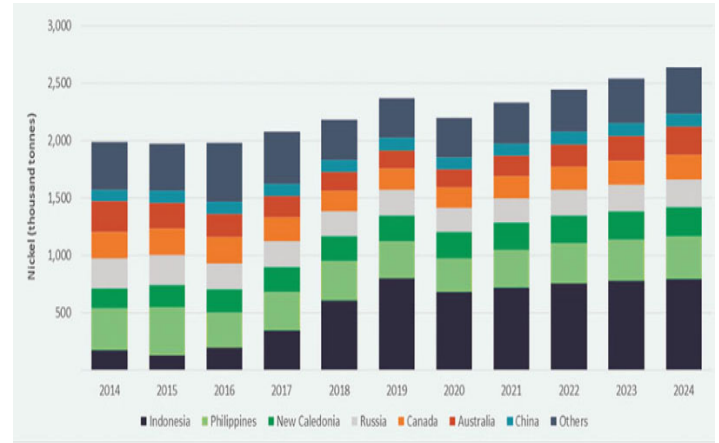
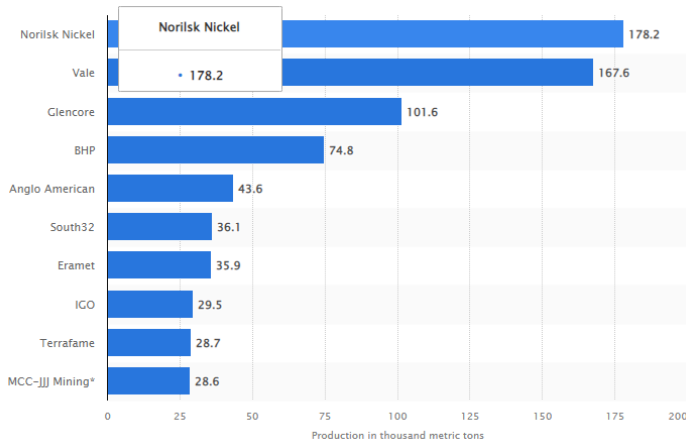
Class 1 nickel (sulphides): This class 1 nickel has a nickel content greater than or equal to 99.98% and generally comes from sulphide deposits with a high level of purity and a high production cost. A number of forms including powder, briquettes, cathodes or even granules are all in this class 1 category. Class 1 nickel is mostly used to produce nickel sulphates for various batteries, including EV lithium-ion batteries. Around 55% of the global nickel production is in the form of class 1 nickel, according to the Nickel Institute.

Class 2 nickel (alloys and ferronickel): Class 2 nickel is produced from laterite deposits, with a low purity level and is mainly used in the stainless-steel industry. The stainless-steel industry uses both class 1 and class 2 (lower purity) nickel, and is the main driver of nickel demand.

Russia still ranks among the top four producers of nickel. With its large reserves, Russia is well positioned as one of the world's top producers of nickel. In 2020, Russian mining company Norilsk Nickel, also known as Nornickel, was the world's largest nickel producer, with a production volume of some 178,200 tonnes of nickel. Brazil's Vale was the second largest nickel producer in 2020, with a production volume of 167,600 tonnes.

Exhibit 3: Global nickel producer in 2020

Exhibit 4: Global nickel production (ktpa)



Source: [Statista](https://www.statista.com)

Source: [Energy Industry Review](https://www.energyindustryreview.com)

Indonesia emerging as the world's dominant nickel producer. Full with class 2 nickel, Indonesia has set a target to develop the infrastructure for the high-pressure acid leaching (HPAL) process required to convert class 2 nickel into class 1 nickel. While class 1 nickel, produced from sulphide deposits, is simpler and more cost effective than class 2, it is technically plausible via the HPAL process to produce a sulphide mixture, a raw material for the production of nickel sulphate (a form of class 1 nickel). Indonesia has launched several HPAL plant projects, and two HPAL plants are already operational in the Philippines.

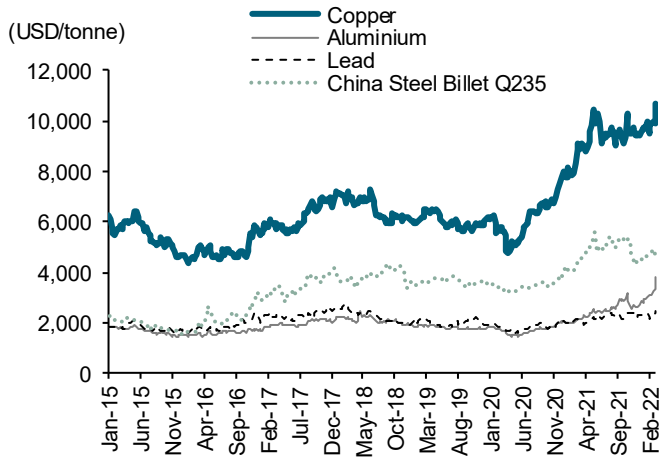
China, the largest nickel consumer in the world, depends to a large extent on Indonesia and the Philippines for its nickel supply to produce the batteries used for EVs.

US lacks nickel supplies but sources them from Canada. With its low nickel production but rising demand for EVs, the US is susceptible to the price and supply fluctuations of class 1 nickel for its EV production. However, the country seems to be able to depend on the proximity of its Canadian neighbour, which has rich sulphide reserves.

Nickel price spike on Russia-Ukraine war

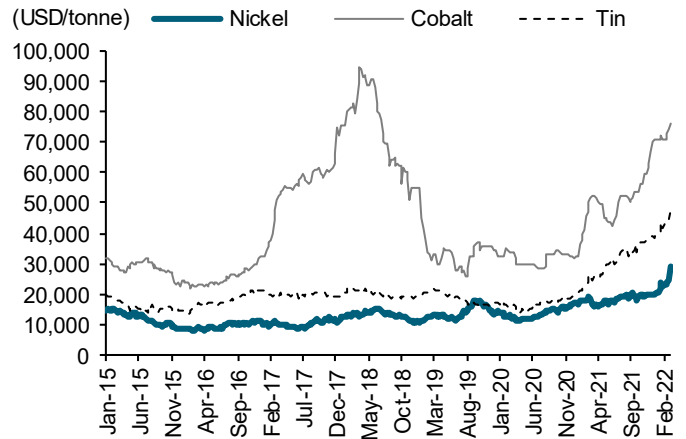
As the Russia-Ukraine war continues, the global nickel supply risk increases substantially, resulting in a higher price of nickel from USD15,000/t to over 2x to USD35,000-40,000/t. In addition, the price of lithium carbonate in China skyrocketed to RMB493,500/t on 14 Mar-22, up 74% YTD.

Exhibit 5: Commodities prices: Copper, Aluminium, Lead, Steel



Source: Bloomberg

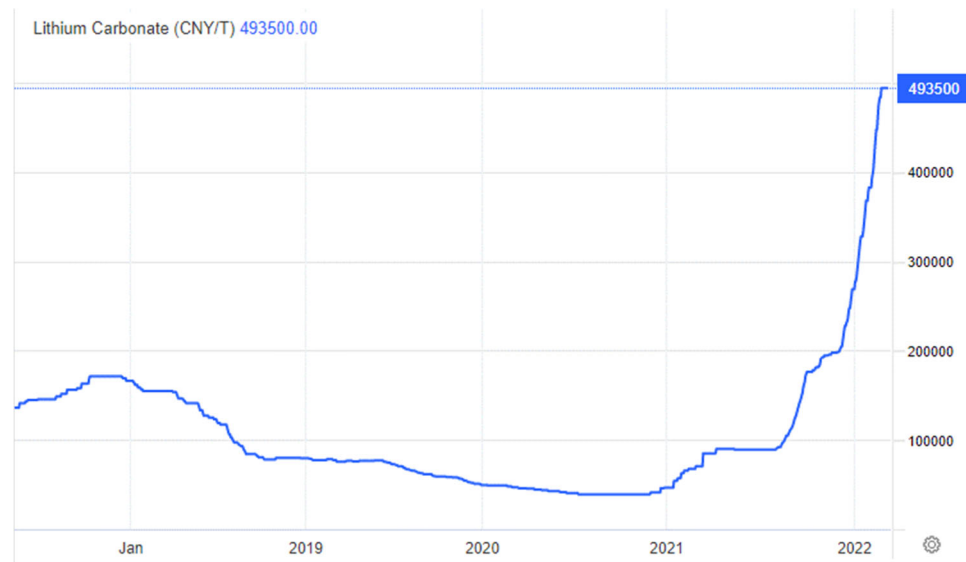
Exhibit 6: Commodities prices: Nickel, Cobalt, Tin



Source: Bloomberg

Amid the high global demand and projections of scarcity, sales of EVs powered by lithium batteries are soaring amid the transition to greener energy. According to Adamas Intelligence, a record 25,921 tonnes of lithium carbonate-equivalent batteries were deployed to roads in Dec-21, up 68% y-y and 31% m-m, as the new EV sales in China rose by 157% y-y to 3.2m units in 2021 and are expected to surpass 5m in 2022.

Exhibit 7: Price of lithium carbonate in China

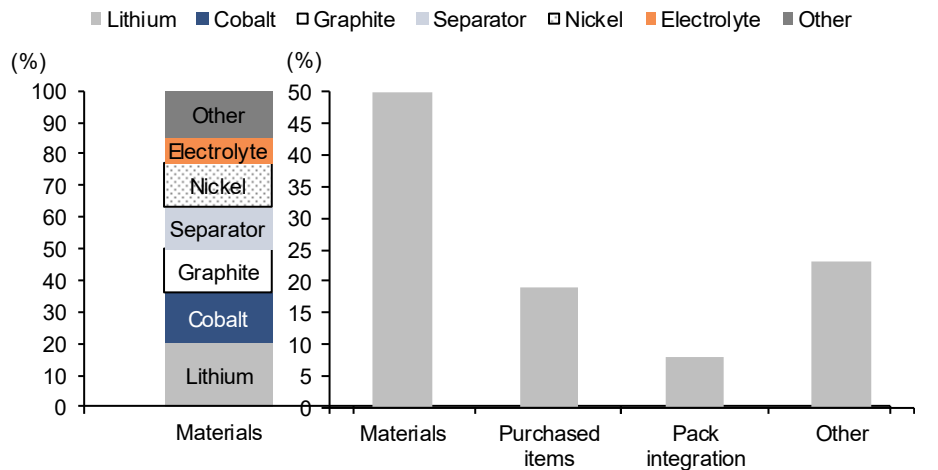


Source: [Trading Economics](https://www.tradingeconomics.com)

Potential impact on profitability for EVs

According to the EIA, the cost of materials for the NMC 822 battery accounts for over 60% of the total battery cost, in which cobalt, lithium, nickel and graphite are the most expensive materials, accounting for c30% of the total cost. Improvements in the production process, chemistry improvements, and pack engineering advances should lower the battery price, but the battery cost, which accounts for almost 50% of the EV cost, is highly exposed to the metal price risks as the cost of materials account¹ for around two-thirds of the total cost.

Exhibit 8: Cost structure of NMC 822 lithium-ion battery



Source: EA

As nickel and lithium are the two key raw materials used for the production of the NMC 822 battery by EA for its e-buses and e-trucks, we have analysed the potential earnings downsides from the higher costs of nickel and lithium based on following assumptions:

- Selling prices of THB3.5m for a small minibus (S), THB5m for a standard medium e-bus (M), and THB7m for a large e-bus (L), and a net profit per EV of THB0.8m for S, THB1.0m for M, and THB1.2m for L;
- Price changes by 166% or USD20,000/tonne for nickel and by 366% or USD63,492/tonne for lithium, based on the recent market price of lithium carbonate in China in Jan to Mar-22;
- NMC 822 battery sizes of 250kWh for S, 300kWh for M, and 350kWh for L.

Exhibit 9: Key assumptions for NMC 822 battery margin sensitivity to the changes in nickel and lithium prices

	Selling price (THB m)	Battery size (kWh)	EV length (meter)	Nickel (USD/tonne)	Lithium (USD/tonne)	Nickel (USD/EV)	Lithium (USD/EV)	Nickel (THB m/EV)	Lithium (THB m/EV)	Total (THB m/EV)	% increase (%)
Minibus	3.5	250	7	20,000	63,492	3,200	6,604	0.11	0.22	0.32	0.09
Standard	5.0	300	10	20,000	63,492	3,840	7,925	0.13	0.26	0.39	0.08
Large	7.0	350	12	20,000	63,492	4,480	9,245	0.15	0.31	0.45	0.06

Sources: EA; FSSIA estimates

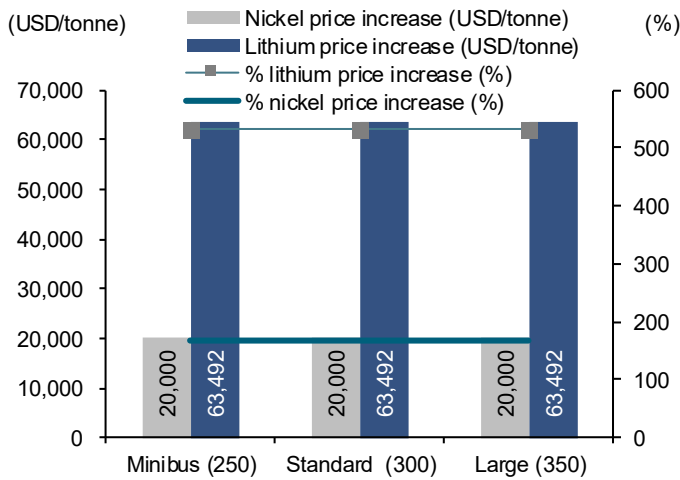
Exhibit 10: Sensitivity analysis of potential net profits from EVs to the changes in nickel and lithium prices

	Estimated net profit before price spikes (THB m/EV)	Estimated net profit after price spikes (THB m/EV)	Estimated net profit before price spikes (%)	Estimated net profit after price spikes (%)	----- Net profit decrease -----	
					(THB m/EV)	(THB m/1,000 EV)
Minibus	0.8	0.48	22.86	13.61	(0.32)	(324)
Standard	1.0	0.61	28.57	17.48	(0.39)	(388)
Large	1.2	0.75	34.29	21.34	(0.45)	(453)

Sources: EA; FSSIA estimates

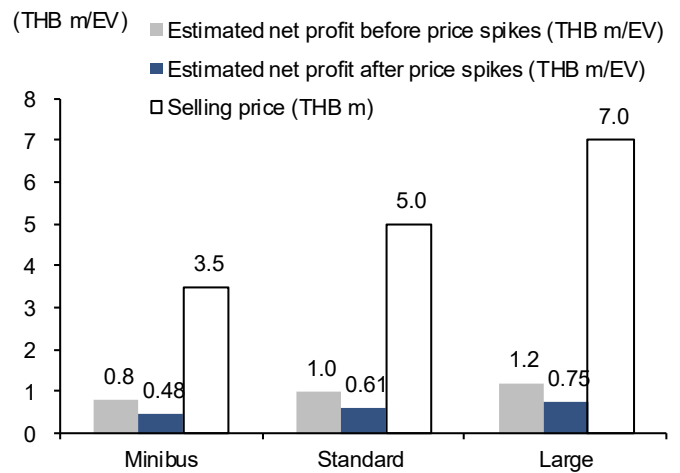
Margin impacts: We found that the 166% and 366% increases in the prices of nickel and lithium, respectively, would result in 6-9% drops in the selling prices of EA's three e-buses. The net profit margins would also decline from 22.9% to 13.6% for S, from 28.6% to 17.5% for M, and from 34.3% to 21.3% for L.

Exhibit 11: Assumptions for changes in nickel and lithium prices



Source: FSSIA estimates

Exhibit 12: Net profit sensitivity for EVs to the changes in prices of nickel and lithium



Source: FSSIA estimates

EPS and net profit forecast impacts. Based on our EV sales volume assumptions for EA and NEX, our respective net profit forecasts in 2022-23, and our margin change assumptions under 166% and 366% price increases for nickel and lithium, we estimate that, all else being equal:

EA: would see an impact from the price increases in nickel and lithium on both battery and EV sales

2022: Potentially lower net profit by 14% to THB9.1b and EPS down to THB2.45;

2023: Potential net profit decrease by 10% to THB12.1b and EPS down to THB3.26.

NEX: the impact from the price hikes of nickel and lithium on NEX should be smaller than EA in absolute terms but larger in percentage terms, as NEX's estimated net profit and EPS are much smaller than EA's

2022: Potential net profit drop by 29% to THB755m and EPS down to THB0.45;

2023: Potential net profit drop by 19% to THB1.4b and EPS down to THB0.85.

Exhibit 13: Sensitivity analysis of EV sales volumes and net profit forecasts in 2022-23 for EA and NEX

	E-bus and e-truck sales volume		Net profit forecasts before changes in costs		Net profit forecasts after changes in costs		% change in net profit	
	2022E	2023E	2022E	2023E	2022E	2023E	2022E	2023E
EA	3,900	3,600	10,650	13,543	9,136	12,146	(14.2)	(10.3)
NEX	3,200	3,500	1,066	1,755	755	1,416	(29.1)	(19.4)

Source: FSSIA estimates

Exhibit 14: Estimated changes in EPS and P/E for EA and NEX in relation to the changes in prices of nickel and lithium

	----- Before material price increases -----		----- After material price increases -----		----- % change -----	
	2022E	2023E	2022E	2023E	2022E	2023E
Share prices as of 14 March 2022						
EA	85.5					
NEX	16.3					
No of shares						
EA	3,730	3,730	3,730	3,730		
NEX	1,674	1,674	1,674	1,674		
EPS						
EA	2.86	3.63	2.45	3.26	(14.2)	(10.3)
NEX	0.64	1.05	0.45	0.85	(29.1)	(19.4)
P/E						
EA	29.9	23.5	34.9	26.3		
NEX	25.6	15.5	36.1	19.3		

Source: FSSIA estimates

Upsides overshadow potential downsides from material price hikes

Despite the potential EPS downsides from the price spikes in nickel and lithium due to the ongoing Russia-Ukraine war, we believe EA and NEX remain attractive investment choices in the Thai equity market as 1) their EPS growth, even with the impact of the material price hikes, should remain strong; and 2) their valuations should remain attractive for the next three years, in our view, with high earnings growth visibility on the back of potentially large orders of e-buses and e-trucks in Thailand, thanks to their “first-mover” advantages.

Exhibit 15: Peer comparisons

Company	BBG code	Rec	Share Price	Target price	Upside	Market Cap	3Y EPS CAGR	----- PE -----		----- ROE -----		----- PBV -----		EV / EBITDA	
								22E	23E	22E	23E	22E	23E	22E	23E
			(LCY)	(LCY)	(%)	(USD m)	(%)	(x)	(x)	(%)	(%)	(x)	(x)	(x)	(x)
THAILAND															
Energy Absolute	EA TB	BUY	85.5	122	43	9,547	35.7	29.9	23.5	28.7	28.8	7.7	6.1	23.0	17.8
BANPU	BANPU TB	BUY	11.2	16.9	51	2,269	(40.4)	6.3	9.8	14.3	9.4	0.8	0.9	5.9	7.3
Banpu Power	BPP TB	BUY	16.2	20	23	1,478	29.1	9.1	8.8	11.5	11.2	1.0	1.0	34.8	26.0
Nex point	NEX TB	BUY	16.3	26	60	817	nm	25.6	15.5	30.6	36.2	6.6	4.9	1,698.9	89.7
Global Power Syn	GPSC TB	BUY	68.5	90	31	5,782	20.4	27.2	18.0	6.5	9.4	1.7	1.7	17.7	14.5
Thailand avg						19,893	20.3	24.7	18.9	19.4	19.9	4.6	3.8	89.2	19.2
US															
Tesla Inc	TSLA US		766.37	NA	NA	792,049	51.5	72.5	55.5	27.2	29.0	19.4	13.9	41.6	30.5
Nio Inc - ADR	NIO US		14.10	NA	NA	23,533	n/a	n/a	62.3	(8.3)	6.1	6.0	5.4	1,161.5	22.4
Nikola Corp	NKLA US		6.87	NA	NA	2,868	(25.7)	n/a	n/a	(88.5)	(77.7)	4.9	3.4	n/a	n/a
Workhorse	WKHS US		3.04	NA	NA	461	(72.2)	n/a	n/a	(46.8)	(25.3)	3.3	3.2	n/a	n/a
US avg						818,911	51.7	70.1	55.4	25.7	27.9	19.0	13.6	73.6	30.1
Alternative energy under coverage						19,893	20.3	24.7	18.9	19.4	19.9	4.6	3.8	89.2	19.2
Average (all)						838,804	51.4	69.1	54.6	25.6	27.8	18.6	13.4	74.0	29.8

Share price as of 14 March 2022

Sources: Bloomberg, FSSIA estimates

Corporate Governance report of Thai listed companies 2020

EXCELLENT LEVEL										
AAV	ADVANC	AF	AIRA	AKP	AKR	ALT	AMA	AMATA	AMATAV	ANAN
AOT	AP	ARIP	ARROW	ASP	BAFS	BANPU	BAY	BCP	BCPG	BDMS
BEC	BEM	BGRIM	BIZ	BKI	BLA	BOL	BPP	BRR	BTS	BWG
CENTEL	CFRESH	CHEWA	CHO	CIMBT	CK	CKP	CM	CNT	COL	COMAN
COTTO	CPALL	CPF	CPI	CPN	CSS	DELTA	DEMCO	DRT	DTAC	DTC
DV8	EA	EASTW	ECF	ECL	EGCO	EPG	ETE	FNS	FPI	FPT
FSMART	GBX	GC	GCAP	GEL	GFPT	GGC	GPSC	GRAMMY	GUNKUL	HANA
HARN	HMPRO	ICC	ICHI	III	ILINK	INTUCH	IRPC	IVL	JKN	JSP
JWD	K	KBANK	KCE	KKP	KSL	KTB	KTC	LANNA	LH	LHFG
LIT	LPN	MAKRO	MALEE	MBK	MBKET	MC	MCOT	METCO	MFEC	MINT
MONO	MOONG	MSC	MTC	NCH	NCL	NEP	NKI	NOBLE	NSI	NVD
NYT	OISHI	ORI	OTO	PAP	PCSGH	PDJ	PG	PHOL	PLANB	PLANET
PLAT	PORT	PPS	PR9	PREB	PRG	PRM	PSH	PSL	PTG	PTT
PTTEP	PTTGC	PYLON	Q-CON	QH	QTC	RATCH	RS	S	S & J	SAAM
SABINA	SAMART	SAMTEL	SAT	SC	SCB	SCC	SCCC	SCG	SCN	SDC
SEAFCO	SEAOIL	SE-ED	SELIC	SENA	SIRI	SIS	SITHAI	SMK	SMPC	SNC
SONIC	SORKON	SPALI	SPI	SPRC	SPVI	SSSC	SST	STA	SUSCO	SUTHA
SVI	SYMC	SYNTEC	TACC	TASCO	TCAP	TFMAMA	THANA	THANI	THCOM	THG
THIP	THRE	THREL	TIP	TIPCO	TISCO	TK	TKT	TTB	TMILL	TNDT
TNL	TOA	TOP	TPBI	TQM	TRC	TSC	TSR	TSTE	TSTH	TTA
TTCL	TTW	TU	TVD	TVI	TVO	TWPC	U	UAC	UBIS	UV
VGI	VIH	WACOAL	WAVE	WHA	WHAUP	WICE	WINNER	TRUE		
VERY GOOD LEVEL										
2S	ABM	ACE	ACG	ADB	AEC	AEONTS	AGE	AH	AHC	AIT
ALLA	AMANAHA	AMARIN	APCO	APCS	APURE	AQUA	ASAP	ASEFA	ASIA	ASIAN
ASIMAR	ASK	ASN	ATP30	AUCT	AWC	AYUD	B	BA	BAM	BBL
BFIT	BGC	BJC	BJCHI	BROOK	BTW	CBG	CEN	CGH	CHARAN	CHAYO
CHG	CHOTI	CHOW	CI	CIG	CMC	COLOR	COM7	CPL	CRC	CRD
CSC	CSP	CWT	DCC	DCON	DDD	DOD	DOHOME	EASON	EE	ERW
ESTAR	FE	FLOYD	FN	FORTH	FSS	FTE	FVC	GENCO	GJS	GL
GLAND	GLOBAL	GLOCON	GPI	GULF	GYT	HPT	HTC	ICN	IFS	ILM
IMH	INET	INSURE	IRC	IRCP	IT	ITD	ITEL	J	JAS	JCK
JCKH	JMART	JMT	KBS	KCAR	KGI	KIAT	KOOL	KTIS	KWC	KWM
L&E	LALIN	LDC	LHK	LOXLEY	LPH	LRH	LST	M	MACO	MAJOR
MBAX	MEGA	META	MFC	MGT	MILL	MITSIB	MK	MODERN	MTI	MVP
NETBAY	NEX	NINE	NTV	NWR	OCC	OGC	OSP	PATO	PB	PDG
PDI	PICO	PIMO	PJW	PL	PM	PPP	PRIN	PRINC	PSTC	PT
QLT	RICHY	RML	RPC	RWI	RWI	S11	SALEE	SAMCO	SANKO	SAPPE
SAWAD	SCI	SCP	SE	SEG	SFP	SGF	SHR	SIAM	SINGER	SKE
SKR	SKY	SMIT	SMT	SNP	SPA	SPC	SPCG	SR	SRICHA	SSC
SSF	STANLY	STI	STPI	SUC	SUN	SYNEX	T	TAE	TAKUNI	TBSP
TCC	TCMC	TEAM	TEAMG	TFG	TIGER	TITLE	TKN	TKS	TM	TMC
TMD	TMI	TMT	TNITY	TNP	TNR	TOG	TPA	TPAC	TPCORP	TPOLY
TPS	TRITN	TRT	TRU	TSE	TVT	TWP	UEC	UMI	UOBKH	UP
UPF	UPOIC	UT	UTP	UWC	VL	VNT	VPO	WIJK	WP	XO
YUASA	ZEN	ZIGA	ZMICO							
GOOD LEVEL										
7UP	A	ABICO	AJ	ALL	ALUCON	AMC	APP	ARIN	AS	AU
B52	BC	BCH	BEAUTY	BGT	BH	BIG	BKD	BLAND	BM	BR
BROCK	BSBM	BSM	BTNC	CAZ	CCP	CGD	CITY	CMAN	CMO	CMR
CPT	CPW	CRANE	CSR	D	EKH	EP	ESSO	FMT	GIFT	GREEN
GSC	GTB	HTECH	HUMAN	IHL	INOX	INSET	IP	JTS	JUBILE	KASET
KCM	KKC	KUMWEL	KUN	KWG	KYE	LEE	MATCH	MATI	M-CHAI	MCS
MDX	MJD	MM	MORE	NC	NDR	NER	NFC	NNCL	NPK	NUSA
OCEAN	PAF	PF	PK	PLE	PMTA	POST	PPM	PRAKIT	PRECHA	PRIME
PROUD	PTL	RBF	RCI	RJH	ROJNA	RP	RPH	RSP	SF	SFLEX
SGP	SISB	SKN	SLP	SMART	SOLAR	SPG	SQ	SSP	STARK	STC
SUPER	SVOA	TC	TCCC	THMUI	TIW	TNH	TOPP	TPCH	TPIPP	TPLAS
TTI	TYCN	UKEM	UMS	VCOM	VRANDA	WIN	WORK	WPH		
Description	Score Range									
Excellent	90-100									
Very Good	80-89									
Good	70-79									

Disclaimer:

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* CGR scoring should be considered with news regarding wrong doing of the company or director or executive of the company such unfair practice on securities trading, fraud, and corruption SEC imposed a civil sanction against insider trading of director and executive; ** delisted

Source: Thai Institute of Directors Association (IOD); FSSIA's compilation

Anti-corruption Progress Indicator 2020

CERTIFIED										
2S	ADVANC	AI	AIE	AIRA	AKP	AMA	AMANAHA	AP	AQUA	ARROW
ASK	ASP	AYUD	B	BAFS	BANPU	BAY	BBL	BCH	BCP	BCPG
BGC	BGRIM	BJCHI	BKI	BLA	BPP	BROOK	BRR	BSBM	BTS	BWG
GEN	CENTEL	CFRESH	CGH	CHEWA	CHOTI	CHOW	CIG	CIMBT	CM	CMC
COL	COM7	CPALL	CPF	CPI	CPN	CSC	DCC	DELTA	DEMCO	DIMET
DRT	DTAC	DTC	EASTW	ECL	EGCO	FE	FNS	FPI	FPT	FSS
FTE	GBX	GC	GCAP	GEL	GFPT	GGC	GJS	GPSC	GSTEEL	GUNKUL
HANA	HARN	HMPRO	HTC	ICC	ICHI	IFS	INET	INSURE	INTUCH	IRPC
ITEL	IVL	K	KASET	KBANK	KBS	KCAR	KCE	KGI	KKP	KSL
KTB	KTC	KWC	L&E	LANNA	LHFG	LHK	LPN	LRH	M	MAKRO
MALEE	MBAX	MBK	MBKET	MC	MCOT	MFC	MFEC	MINT	MONO	MOONG
MPG	MSC	MTC	MTI	NBC	NEP	NINE	NKI	NMG	NNCL	NSI
NWR	OCC	OCEAN	OGC	ORI	PAP	PATO	PB	PCSGH	PDG	PDI
PDJ	PE	PG	PHOL	PL	PLANB	PLANET	PLAT	PM	PPP	PPPM
PPS	PREB	PRG	PRINC	PRM	PSH	PSL	PSTC	PT	PTG	PTT
PTTEP	PTTGC	PYLON	Q-CON	QH	QLT	QTC	RATCH	RML	RWI	S & J
SABINA	SAT	SC	SCB	SCC	SCCC	SCG	SCN	SEAOIL	SE-ED	SELIC
SENA	SGP	SIRI	SITHAI	SMIT	SMK	SMPC	SNC	SNP	SORKON	SPACK
SPC	SPI	SPRC	SRICHA	SSF	SSSC	SST	STA	SUSCO	SVI	SYNTEC
TAE	TAKUNI	TASCO	TBSP	TCAP	TCMC	TFG	TFI	TFMAMA	THANI	THCOM
THIP	THRE	THREL	TIP	TIPCO	TISCO	TKT	TTB	TMD	TMILL	TMT
TNITY	TNL	TNP	TNR	TOG	TOP	TPA	TPCORP	TPP	TRU	TSC
TSTH	TTCL	TU	TVD	TVI	TVO	TWPC	U	UBIS	UEC	UKEM
UOBKH	UWC	VGI	VIH	VNT	WACOAL	WHA	WHAUP	WICE	WIJK	XO
ZEN	TRUE									

DECLARED										
7UP	ABICO	AF	ALT	AMARIN	AMATA	AMATAV	ANAN	APURE	B52	BKD
BM	BROCK	BUI	CHO	CI	COTTO	DDD	EA	EFORL	EP	ERW
ESTAR	ETE	EVER	FSMART	GPI	ILINK	IRC	J	JKN	JMART	JMT
JSP	JTS	KWG	LDC	MAJOR	META	NCL	NOBLE	NOK	PK	PLE
ROJNA	SAAM	SAPPE	SCI	SE	SHANG	SINGER	SKR	SPALI	SSP	STANLY
SUPER	SYNEX	THAI	TKS	TOPP	TRITN	TTA	UPF	UV	WIN	ZIGA

Level	
Certified	This level indicates practical participation with thoroughly examination in relation to the recommended procedures from the audit committee or the SEC's certified auditor, being a certified member of Thailand's Private Sector Collective Action Coalition Against Corruption programme (Thai CAC) or already passed examination to ensure independence from external parties.
Declared	This level indicates determination to participate in the Thailand's Private Sector Collective Action Coalition Against Corruption programme (Thai CAC)

Disclaimer:

The disclosure of the Anti-Corruption Progress Indicators of a listed company on the Stock Exchange of Thailand, which is assessed by Thaipat Institute, is made in order to comply with the policy and sustainable development plan for the listed companies of the Office of the Securities and Exchange Commission. Thaipat Institute made this assessment based on the information received from the listed company, as stipulated in the form for the assessment of Anti-corruption which refers to the Annual Registration Statement (Form 56-1), Annual Report (Form 56-2), or other relevant documents or reports of such listed company. The assessment result is therefore made from the perspective of Thaipat Institute that is a third party. It is not an assessment of operation and is not based on any inside information. Since this assessment is only the assessment result as of the date appearing in the assessment result, it may be changed after that date or when there is any change to the relevant information. Nevertheless, FSS International Investment Advisory Company Limited does not confirm, verify, or certify the accuracy and completeness of the assessment results.

Note: Companies participating in Thailand's Private Sector Collective Action Coalition Against Corruption programme (Thai CAC) under Thai Institute of Directors (as of June 24, 2019) are categorised into: 1) companies that have declared their intention to join CAC, and; 2) companies certified by CAC.

Source: The Securities and Exchange Commission, Thailand; * FSSIA's compilation

GENERAL DISCLAIMER

ANALYST(S) CERTIFICATION

Suwat Sinsadok, CFA, FRM, ERP FSS International Investment Advisory Securities Co., Ltd

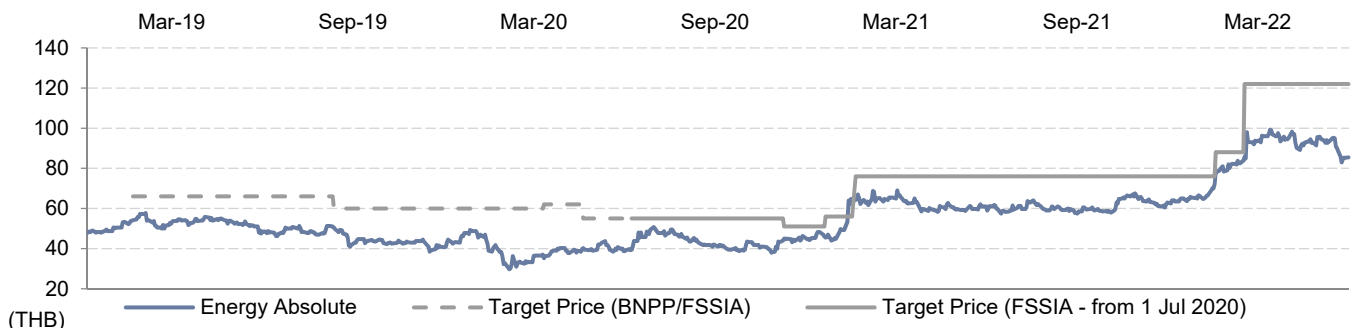
The individual(s) identified above certify(ies) that (i) all views expressed in this report accurately reflect the personal view of the analyst(s) with regard to any and all of the subject securities, companies or issuers mentioned in this report; and (ii) no part of the compensation of the analyst(s) was, is, or will be, directly or indirectly, related to the specific recommendations or views expressed herein.

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History of change in investment rating and/or target price

Energy Absolute (EA TB)



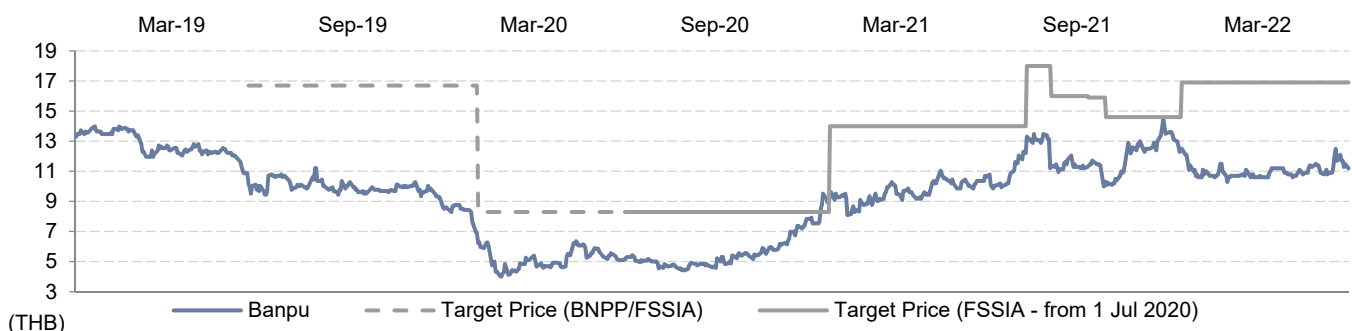
Date	Rating	Target price	Date	Rating	Target price	Date	Rating	Target price
26-Apr-2019	BUY	66.00	20-May-2020	BUY	55.00	08-Jan-2021	BUY	76.00
17-Oct-2019	BUY	60.00	09-Nov-2020	BUY	51.00	18-Nov-2021	BUY	88.00
16-Apr-2020	BUY	62.00	15-Dec-2020	BUY	56.00	13-Dec-2021	BUY	122.00

Suwat Sinsadok, CFA, FRM, ERP started covering this stock from 09-Jul-2020

Price and TP are in local currency

Source: FSSIA estimates

Banpu (BANPU TB)



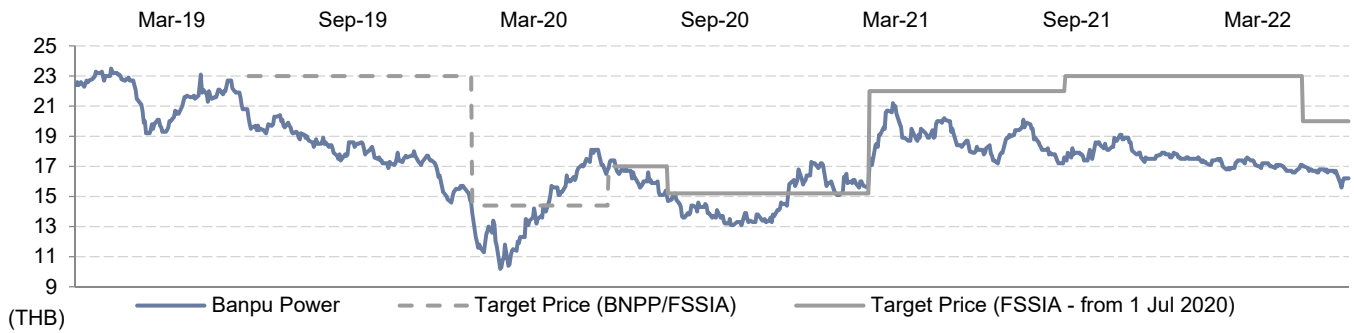
Date	Rating	Target price	Date	Rating	Target price	Date	Rating	Target price
13-Aug-2019	BUY	16.70	10-Jun-2021	BUY	18.00	21-Oct-2021	BUY	16.90
26-Feb-2020	HOLD	8.30	01-Jul-2021	HOLD	16.00	15-Mar-2022	BUY	18.80
09-Oct-2020	BUY	8.30	02-Aug-2021	BUY	15.90			
23-Dec-2020	BUY	14.00	17-Aug-2021	BUY	14.60			

Suwat Sinsadok, CFA, FRM, ERP started covering this stock from 26-Feb-2020

Price and TP are in local currency

Source: FSSIA estimates

Banpu Power (BPP TB)



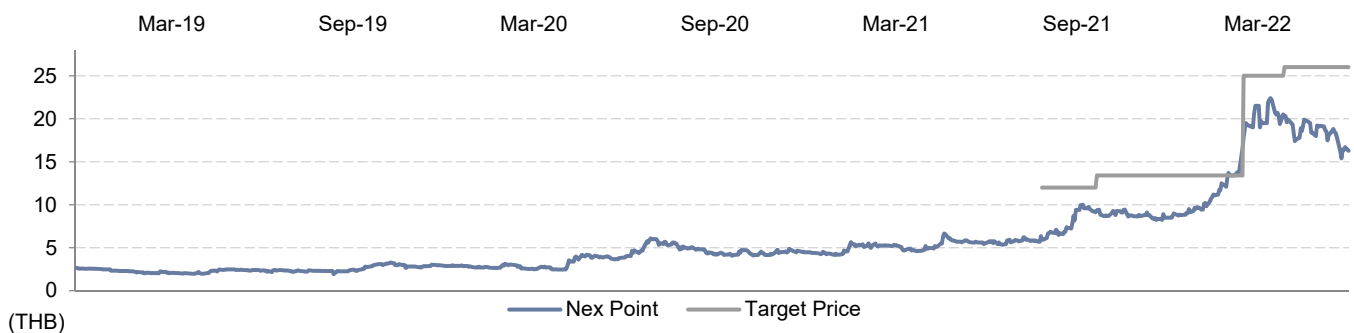
Date	Rating	Target price	Date	Rating	Target price	Date	Rating	Target price
13-Aug-2019	HOLD	23.00	06-Aug-2020	HOLD	15.20	02-Feb-2022	BUY	20.00
21-Feb-2020	HOLD	14.40	26-Jan-2021	BUY	22.00			
17-Jun-2020	HOLD	17.00	13-Jul-2021	BUY	23.00			

Suwat Sinsadok, CFA, FRM, ERP started covering this stock from 17-Jun-2020

Price and TP are in local currency

Source: FSSIA estimates

Nex Point (NEX TB)



Date	Rating	Target price	Date	Rating	Target price	Date	Rating	Target price
23-Jun-2021	BUY	12.00	13-Dec-2021	BUY	25.00	-	-	-
09-Aug-2021	BUY	13.40	17-Jan-2022	BUY	26.00			

Suwat Sinsadok, CFA, FRM, ERP started covering this stock from 23-Jun-2021

Price and TP are in local currency

Source: FSSIA estimates

Global Power Synergy (GPSC TB)



Date	Rating	Target price	Date	Rating	Target price	Date	Rating	Target price
11-Jul-2019	BUY	71.27	14-Jul-2021	BUY	110.00	07-Feb-2022	BUY	90.00
17-Dec-2019	BUY	120.00	15-Jul-2021	BUY	112.00			
08-Apr-2020	BUY	112.00	05-Aug-2021	BUY	100.00			

Suwat Sinsadok, CFA, FRM, ERP started covering this stock from 08-May-2020

Price and TP are in local currency

Source: FSSIA estimates

Company	Ticker	Price	Rating	Valuation & Risks
Energy Absolute	EA TB	THB 85.50	BUY	Downside risks to our SoTP-based TP include: 1) lower-than-expected demand for electricity in Thailand; 2) lower crude prices; and 3) lower-than-expected demand for batteries.
Banpu	BANPU TB	THB 11.20	BUY	We see downside risks to our SoTP-based TP from lower coal prices, higher diesel costs and any unplanned shutdowns of its power plants.
Banpu Power	BPP TB	THB 16.20	BUY	Downside risks to our SOTP valuation are the start-up delays of its new projects and government intervention in the electricity tariff.
Nex Point	NEX TB	THB 16.30	BUY	Downside risks to our SOTP-based TP include: 1) a lower-than-expected bus sales volume; 2) delays in bus deliveries; and 3) risk from regulatory changes.
Global Power Synergy	GPSC TB	THB 68.50	BUY	The downside risks to our SoTP-based TP on GPSC include 1) lower-than-expected demand for electricity in Thailand; 2) a lower crude price; and 3) lower-than-expected demand from industrial users.

Source: FSSIA estimates

Additional Disclosures

Target price history, stock price charts, valuation and risk details, and equity rating histories applicable to each company rated in this report is available in our most recently published reports. You can contact the analyst named on the front of this note or your representative at Finansia Syrus Securities Public Company Limited

FSSIA may incorporate the recommendations and target prices of companies currently covered by FSS Research into equity research reports, denoted by an 'FSS' before the recommendation. FSS Research is part of Finansia Syrus Securities Public Company Limited, which is the parent company of FSSIA.

All share prices are as at market close on 14-Mar-2022 unless otherwise stated.

RECOMMENDATION STRUCTURE

Stock ratings

Stock ratings are based on absolute upside or downside, which we define as $(\text{target price}^* - \text{current price}) / \text{current price}$.

BUY (B). The upside is 10% or more.

HOLD (H). The upside or downside is less than 10%.

REDUCE (R). The downside is 10% or more.

Unless otherwise specified, these recommendations are set with a 12-month horizon. Thus, it is possible that future price volatility may cause a temporary mismatch between upside/downside for a stock based on market price and the formal recommendation.

* In most cases, the target price will equal the analyst's assessment of the current fair value of the stock. However, if the analyst doesn't think the market will reassess the stock over the specified time horizon due to a lack of events or catalysts, then the target price may differ from fair value. In most cases, therefore, our recommendation is an assessment of the mismatch between current market price and our assessment of current fair value.

Industry Recommendations

Overweight. The analyst expects the fundamental conditions of the sector to be positive over the next 12 months.

Neutral. The analyst expects the fundamental conditions of the sector to be maintained over the next 12 months.

Underweight. The analyst expects the fundamental conditions of the sector to be negative over the next 12 months.

Country (Strategy) Recommendations

Overweight (O). Over the next 12 months, the analyst expects the market to score positively on two or more of the criteria used to determine market recommendations: index returns relative to the regional benchmark, index sharpe ratio relative to the regional benchmark and index returns relative to the market cost of equity.

Neutral (N). Over the next 12 months, the analyst expects the market to score positively on one of the criteria used to determine market recommendations: index returns relative to the regional benchmark, index sharpe ratio relative to the regional benchmark and index returns relative to the market cost of equity.

Underweight (U). Over the next 12 months, the analyst does not expect the market to score positively on any of the criteria used to determine market recommendations: index returns relative to the regional benchmark, index sharpe ratio relative to the regional benchmark and index returns relative to the market cost of equity.