Energy Storage – European perspective

Transforming World: Energy Storage has arrived

In our Transforming World Energy Storage Primer, we highlight that energy storage (ES) is set to herald the next major phase in the transition to clean energy, with 50% ES cost reduction by 2025 vs. 2018 a key catalyst. We expect this to trigger new investments and business models and disrupt the fossil economy longer term. In this collaborative report, we show some implications for European sectors due to the rise of ES.

Energy storage implications for Europe

Europe is at the forefront of renewable energy but is behind the US on energy storage for now, judging from size of projects. Nevertheless, ES in Europe has huge potential, especially as renewable share is expected to rise significantly driven by policy. Europe's older renewables coming off fixed tariff periods could also benefit by adding ES. EU companies involved in renewables and new energy electrical equipment are well placed to benefit from ES longer term while those exposed to legacy fossil fuel face headwinds.

Europe is pro-green but may also need help from gas

Northern Europe faces 3-4 months of harsh winter when demand rises but solar (and sometimes even wind) does not work while reliable older fossil and nuclear capacity is being slowly shut down driven by policy. Europe will embrace renewables and ES, but needs new gas plants in certain situations (e.g. Germany) more than others (S. Europe).

Industrials: mixed picture for fossil vs. new energy

EU industrials have mixed exposure to ES. Some companies, such as wind OEMs (SGRE, Vestas) and electrical equipment suppliers (Siemens, ABB, Nexans, Prysmian) ought to benefit from ES. But those more exposed to legacy fossil may face headwinds (e.g. Wartsila). EU industrials typically have diversified exposures, however.

Utilities: enhancing renewables and system balancing

EU Utilities focussed on renewables (such as Iberdrola, Enel, RWE, SSE) are likely to embrace ES as a way to enhance returns. ES will also have an increasing role in electricity system balancing/frequency response (RWE, EdF, Centrica), and there are opportunities for commercial energy management/backup services (Engie, Centrica).

Oil&gas: ES is part of "Big Oil to Big Energy" narrative

For EU Oil&Gas, ES is part of the "Big Oil to Big Energy" narrative. Majors are looking at ES, e.g. Shell acquired Germany's leading ES player Sonnen and Total owns battery tech company Saft. Gas still has a role to play in Europe, so ES may not disrupt EU gas for 10-15 years but in some cases, gas demand from power could decline (e.g. S. Europe).

Mining/Chemical: battery materials well placed

Disruption to coal mining is well understood by investors, with coal assets trading at very low multiples. Battery materials such as Nickel (e.g. Norilsk Nickel) could benefit due to demand from EVs and ES. In Chemicals, Umicore is well placed in battery materials.

Global
Thematic Investing

Pinaki Das >>
Equity Strategist
MLI (UK)
+44 20 7996 2453
pinaki.das@baml.com

Haim Israel >>
Equity Strategist
Merrill Lynch (Israel)
haim.israel@baml.com

Alexander Virgo >>
Research Analyst
MLI (UK)
alexander.virgo@baml.com

David Barker >>
Research Analyst
MLI (UK)
david.w.barker@baml.com

Fraser McLaren >>
Research Analyst
MLI (UK)
fraser.mclaren@baml.com

Christopher Kuplent >>
Research Analyst
MLI (UK)
christopher.kuplent@baml.com

Cedar Ekblom, CFA >>
Research Analyst
MLI (UK)
cedar.ekblom@baml.com

Peter Bisztyga >>
Research Analyst
MLI (UK)
peter.bisztyga@baml.com

Benjamin Heelan >>
Research Analyst
MLI (UK)
benjamin.heelan@baml.com

George Featherstone, CFA >>
Research Analyst
MLI (UK)
george.featherstone@baml.com

Jean-Baptiste Rolland >>
Research Analyst
MLI (UK)
jb.rolland@baml.com

Refer to important disclosures on page 24 to 27. Analyst Certification on page 18. Price Objective Basis/Risk on page 11.
12023251

Timestamp: 23 July 2019 02:15AM EDT

Industrials: Enabling carbon free flexible load

Power outages can be very costly for industrial companies

For many large-scale commercial and industrial companies, any outage or voltage event could be very damaging to operations. Companies that operate sensitive industrial equipment such as robots, drives and critical manufacturing lines can be vulnerable to small imperfections in power quality potentially impacting both production or processing levels in addition to damaging equipment, requiring additional repair or replacement cost.

For grid operators, the global transition towards renewable energy has resulted in a substantial reduction in demand for inflexible fossil fuel base load (mostly natural gas/coal), replaced with variable renewable base load. As a result orders for larger gas turbines have diminished at the likes of **Siemens** and **GE.** However, the demands for grid reliability remain as critical as ever and grid operators are committed to 100% uptime. Therefore, to meet this need for flexible energy, power companies have two main options. 1) They can use **battery storage** to store energy generated from renewable sources and release it during periods of downtime, and 2) they can opt to **deploy flexible fossil fuels** to fill in the gaps.

Siemens, ABB provide storage equipment, SGRE/Vestas develop renewables

In many cases, gaps in generation from renewables are currently filled by flexible sources such as diesel/gas engines manufactured by companies like **Rolls Royce** and **Wartsila**. However, the growing efficiency and cost effectiveness of battery storage in addition to greater pressures to decarbonise the entire network has made fully fossil fuel free base/flexible generation more viable. Whilst this could put pressure on Rolls Royce and Wartsila's turbine/engine businesses it directly provides growth opportunities for electrification providers such as **Siemens, ABB** and **Schneider** which produce a range of components used in the battery storage supply chain. By increasing the viability of renewable base load it also supports demand for wind turbine manufacturers such as **Siemens Gamesa** and **Vestas** and wind farm umbilical cable manufacturers such as **Prysmian** and **Nexans**.

The energy storage equipment market is currently very fragmented and highly competitive with a number of major players in the market including Fluence (Siemens/AES JV), Tesla, Nidec ASI, RES, Powin Energy, LG CNS, Greensmith (Wartsila), NEC Energy Solutions, NextEra Energy Resources, GE Energy Storage and Doosan Gridtech. For **Siemens** and **ABB**, energy storage has yet to develop into a meaningful share of earnings, but in both cases their energy storage businesses are growing at superior levels to the rest of the group.

Siemens: Fluence JV market leader in energy storage

In 2018, Siemens joined forces with AES to create Fluence, an energy storage and technology JV that combines Siemens' Siestorage energy storage platform with AES Advancion. The combined company is the market leader in energy storage globally. Fluence provides containerised storage systems for applications ranging from 500KW to above 100MW and manufactures components such as controls, invertors, power convertors and offers services for customers. Fluence is deployed or awarded on 1,125 in total MW on 95 storage projects in 20 countries and is currently creating the world's largest lithium ion storage facility in Southern California with 100MW in capacity.

Exhibit 1: Fluence technology platforms

	SieStorage	Advancion	Advancion CI
Minimum size	3 MW	5 MW	500 kW
Maximum size	100+ MW	100+ MW	5 MW
Transformer	External	External	Internal
Enclosure material	Metal Custom	Metal ISO	Metal ISO
Duration	30 minutes – 2 hours	2-4 hours	1-4 hours
Applications	All; CP, fast response FR, islanding	FR, capacity peaking, T&D deferral, ECC	All; fast response industrial

Source: Fluence company presentation

Exhibit 2: Fluence offers a cost effective and reliable customer solution

Fluence battery storage currently has <1% of total share of the global market

	STATIC UPS UNIT	DIESEL-ROTATORY UPS	FLUENCE
Max duration	5 – 30 minutes	Several days	Up to 2 hours
Typical use case	Voltage issues	Voltage + outages	Voltage + outages
World market share	95%	5%	<1%
Voltage level	Low voltage	LV & MV	Medium voltage
Max efficiency	97.6%	96.6%	98.1%
Environmental hurdle	Low	Medium/high	Low
Energy Cost Control stacking	No	No	Yes
Power quality at fault	VFI Class 1-3	VI	VI class 3
CAPEX for 2 MW system	€ 500,000	€ 750,000	€ 800,000
Annual Maintenance	Low	High	Low
Add'l electricity costs per yr.	€10K higher than ES	€50K higher than ES	10-30% less w/ ECC

Source: Fluence company presentation Note: UPS = Uninterruptable power supply

Siemens (Buy) driving portfolio optimisation with inexpensive valuation

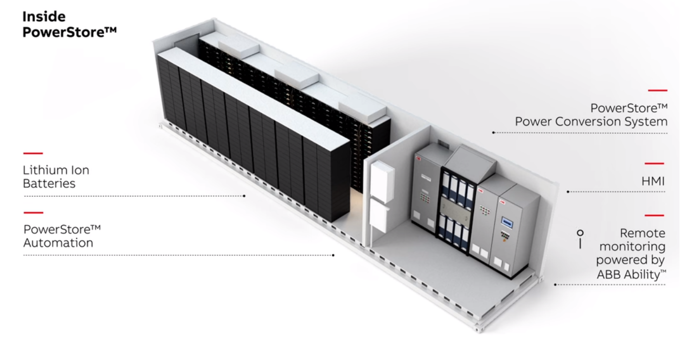
We think Siemens' prospects are much more driven by internal restructuring than macro drivers, both in terms of cost cutting and portfolio optimisation. The recent CMD provided much more substance to support Vision 2020+ margin and growth ambitions than the market thought would be forthcoming, on top of the surprise announcement of the Gas & Power spin, which should trigger the unlocking of value in Digital Industries and Smart Infrastructure.

ABB: Turnkey storage solutions supplement renewable grid

ABB offers a range of turnkey energy storage systems for medium and high voltage grids, enabling storage of renewable generation peaks to be used during demand peaks. Whilst a large component of this business is in Power Grids (the being sold to Hitachi), ABB is still keeping a 20% ownership stake in the business. Furthermore, components used in the energy storage turnkey solutions such as control systems and switchgear produced by the electrification business. ABB produces battery energy storage solutions (BESS) ranging from 100KW to 50MW for applications ranging from utility scale to micro-grid level. It produces components ranging from power convertors, control systems, protection equipment, transformers and switchgear used in power conversion and storage systems. As of 2017, ABB had a worldwide energy storage solution installed base of 210MW (104MW in the US).

One example of ABB's energy storage solutions is ABB PowerStore, a microgrid solution designed to ensure power availability and grid stability for grid and off-grid systems. The package is a containerised 'plug-and-play' microgrid solution with a standardised specification for installations including remote villages as well as industry and utilities, enabling customers to reduce reliance on fossil fuel flexible generation.

Exhibit 3: ABB PowerStore microgrid storage system



Source: ABB Company presentation

Exhibit 4: Example of scope of ABB products in Energy Storage: BESS Project for Solar site in Chitose Hokkaido, Japan (17MW).

Need:

- 28 MW PV grid integration
- Ramp Rate control 1%/min - Voltage support - Capacity firming

Project details :

- Li-ion batteries
- Installed in 2016

ABB Scope:

- (4) x 4 MW + (1) x 1 MW Outdoor PCS
- PCS inverters, DC contactors, AC circuit breakers
- MV-LV Coupling transformer
- MV Switchgear
- Local controller integrating PCS, Switchgear and MBMS
- Local HMI

Source: ABB Company presentation

ABB (Buy) is one of the most comprehensive self-help stories in sector

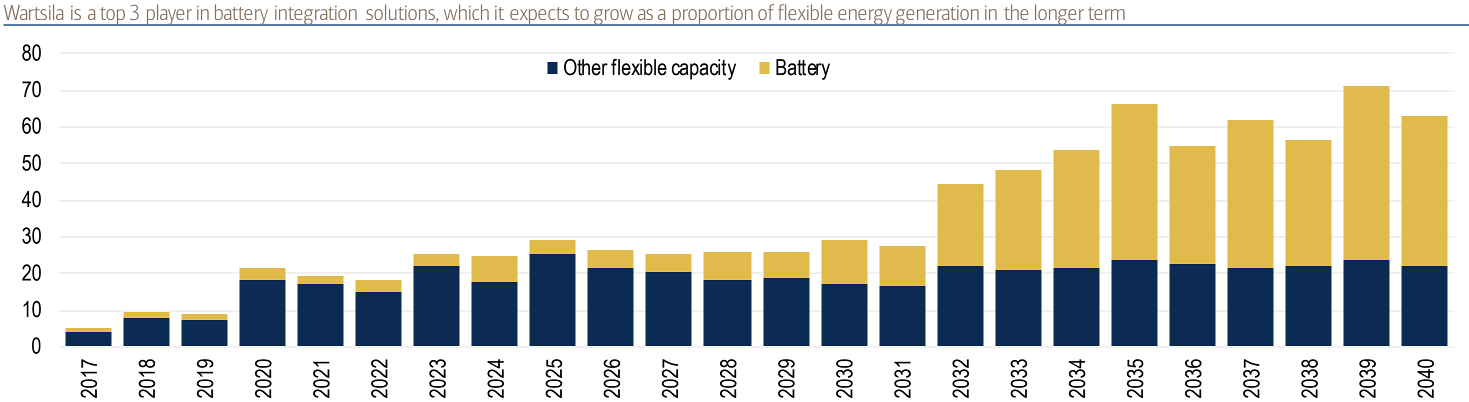
ABB is a global leader in key automation segments (motors, drives, robots and control) for process, hybrid and discrete industries. ABB has c.40% of sales exposed to later cycle capex markets such as O&G, marine, pulp/paper, metals/mining and. The recent Power Grids divestment focuses ABB to core competencies in electrification and automation. The expected cost-savings are significant and the BoD has made clear its intentions to return these to shareholders, despite the recent CEO change.

Wartsila: Greensmith acquisition adds storage exposure

Wartsila has historically been a producer of gas engines and small turbines in its energy business. However, with structural pressure on the use of fossil fuel gas engines in developed markets, the most dynamic growth opportunities are now concentrated in emerging markets. To offset some of this structural pressure in 2017 Wartsila acquired Greensmith, one of the market leaders in battery storage. (In 2016, Greensmith's revenue was USD 32 million with over 40 employees and the deal was valued at USD170m). Greensmith provides a full range of capabilities – from full turn-key solutions to design and integration services and a fifth generation software package (GEMS) that today supports multiple energy and power applications. Whilst we expect emerging market opportunities to underpin growth in gas engines in the near-term, the long term growth prognosis at Wartsila Energy is underpinned by renewable sources and storage solutions in our view.

Chart 1: Estimated annual gross capacity additions of 'flexible' energy sources (battery/other flexible capacity) (GW) 2017-2040

Wartsila is a top 3 player in battery integration solutions, which it expects to grow as a proportion of flexible energy generation in the longer term



Source: Wartsila CMD 2018, Bloomberg NEF 2017

Case studies: Wartsila's flexible power solutions in Arizona and Australia At Wartsila's last CMD management showcased two of its flagship flexible energy installations at two solar power plants at Tucson Electric Power in Arizona and AGL Energy Limited in Australia – illustrating the use case for 'hybrid' (renewable and flexible gas/battery) setups. At Tucson, Wartsila offers flexible capacity to fill in downtime at the solar plant with up to 200MW in flexible capacity and a 10MW/2.4MWh energy storage system (provided by Greensmith in 2016) which are both capable of filling in the variable production of solar and wind. At AGL Energy in Australia, Wartsila is creating the first utility-scale reciprocating engine power plant in the national Australian Market, where it is installing a 211MW flexible plant to smooth out renewable generation.

Wartsila (U/P): Downside risks to consensus despite thematic exposure
We think Wartsila is an attractive long term asset, given a large aftermarket business and exposures to marine environmental technologies and gas infrastructure. However with the recovery in marine and scrubber demand well understood by the market we believe the stock trades at too high a premium relative to the sector.

Rolls Royce: Diesel turbines offer flexible power solutions

Rolls-Royce is predominantly an aerospace propulsion company, but c.25% of sales come from its Power Systems business. Within this business it owns MTU, a leading manufacturer of large diesel engines and propulsion and drive systems for marine applications, heavy land, rail and defence vehicles, and the oil and gas industry. It also owns MTU Onsite Energy, which offers standardised and tailor-made diesel gensets for emergency, base load and peak load power generation.

Prysmian/Nexans: Indirect exposure to renewables spending

Although Prysmian/Nexans are not directly involved in the energy storage supply chain, the high-voltage umbilical cables business is driven by growth in offshore wind farms, connecting the farms to the rest of the grid. In addition, Prysmian/Nexans manufacture high-voltage grid interconnections, another enabler of the grid flexibility required for an effective renewable grid in Europe. Grid interconnections will play a key role in reaching the EU target for carbon-neutrality by 2050 as renewables penetration increases. Consequently, the EU targets 10% electricity interconnection by 2020, rising to 15% by 2030. HVDC projects are big ticket and when executed to plan deliver above average margins relative to commoditised cables.

SGRE/Vestas: Storage supports wind investment case

Both **Vestas** and **Siemens Gamesa** are likely to benefit indirectly from the growing viability of energy storage as it makes wind more attractive as a majority base-load source of energy by filling in gaps during generation down time. **Siemens Gamesa** itself has some technological exposure to storage with its Electric Thermal Energy Storage (ETES) technology, enabling flexible energy storage for a number of applications, including renewable energy generation, and is scalable to several GWh (first 1GWh commercial pilot scheduled for launch in 2020).

The efficacy of storage for wind energy will likely increase further when combined with solar to create hybrid energy solutions, whereby surplus energy from solar generated during the day can be combined with that of wind, which is typically stronger at night, to limit the downside of renewables as an intermittent source of energy. Both companies are currently exploring hybrid solutions.

Utilities

Challenges and opportunities

Utilities and generators are likely to be important adopters of large scale energy storage units that can complement renewables, create new stand-alone investment opportunities for system balancing, and augment the product range of those offering energy management services. The transition to clean energy has already had a significant detrimental impact on fossil fuelled generators in Europe and the advent of cost effective, large scale battery technology could increase the viability of renewables, further pushing down traditional margins. Overall, generators focussed on renewables are best placed, in our view (***RWE, Orsted, SSE, Enel, Iberdrola***).

Enhancing renewables

Adding storage capacity to renewables has the potential to significantly enhance returns through the ability to detach energy generation from energy delivery. Without storage, an intermittent generator could be forced to sell at low prices resulting from market conditions such as period of low demand or high supply on a windy/sunny day. Storage allows operators to reschedule sales to when power is more valuable – this can enhance the profitability of existing plants, form part of the base case for new projects, or be an important factor in the economics of repowering projects that are reaching the end of their subsidy entitlement periods.

Iberdrola has recently announced plans to install the UK's largest renewable battery at its existing Whitelee wind farm in Scotland – in addition to maximising achieved prices, the battery will protect subsidies at times when there are transmission system constraints.

System balancing and services

The growth of renewables means that electricity networks are increasingly populated by intermittent generation, making system stability an increasing challenge. Batteries are particularly suitable for the task given their immediate response and lower energy costs than fossil-fuelled peaking plants. Although such new competition for system services could put further pressure on thermal plants which traditionally filled this role, many generators are considering investment in stand –alone batteries rather than new conventional plant (***RWE, Drax***), often using existing generation sites. ***Enel*** has already commissioned a 22MW balancing facility in Germany.

Companies aiming to leverage relationships with end-users to sell value-added energy management services could also utilise energy storage technology to provide load smoothing and provide back-up supply (***Engie, Centrica***).

The US offers additional angles

Energy storage is growing even faster in the US, with ***RWE, Enel, Iberdrola and Orsted*** among the European renewables generators with exposure. In some states, storage capacity is being funded by regulators, increasing potential for rate base growth for network owners such as ***National Grid***.

Oil&Gas

Implications for oil & gas sector: From Big Oil to Big Energy

Given demand growth for gas and even more so electricity is widely expected to outpace and outlast oil, we have long argued 'Big Oil' has started to move towards 'Big Energy' business models encompassing more activities in gas but increasingly also (low-carbon) electricity. We believe pioneers in this shift (such as Total and RDS) already target increasing retail exposure as Big Oil leverages its existing brand recognition and customer touchpoints Downstream. Any expansion will be centred around Big Oil's commodity trading desks and hence increase the sales of (low-carbon) energy and thus reduce its carbon footprint defined as the emission intensity of its products.

Storage+renewables may yet present threat to gas demand from powergen

Given the intermittency of most renewable electricity (wind / solar), today's security of electricity supply is often ensured via fossil-fuelled peak load power producers (most flexibly and widely used are gas-fired power plants). Gas-fired power generation is also often still a preferred alternative to coal-fired power generation given a switch from coal to gas halves the carbon footprint of the produced electricity. Both factors above hence pose a real threat to growth expectations for gas demand (and hence long-term investment prospects for gas / LNG developments in the oil & gas industry) from continuing electrification around the world (and in particular in emerging markets) depending on the pace of improvements in the economics of energy storage enhancing growth and penetration prospects of renewable electricity.

Mining

We see two key long-term implications for Metals and Mining from growth in Energy Storage.

- Coal as a percentage of the "energy mix" can decline over time in favour of "green" / renewal energy.
- Battery chemistry is "evolving" yet we see strong positive demand trends for battery raw materials. Battery materials such as nickel, cobalt and lithium can benefit due to demand from EVs and ES.

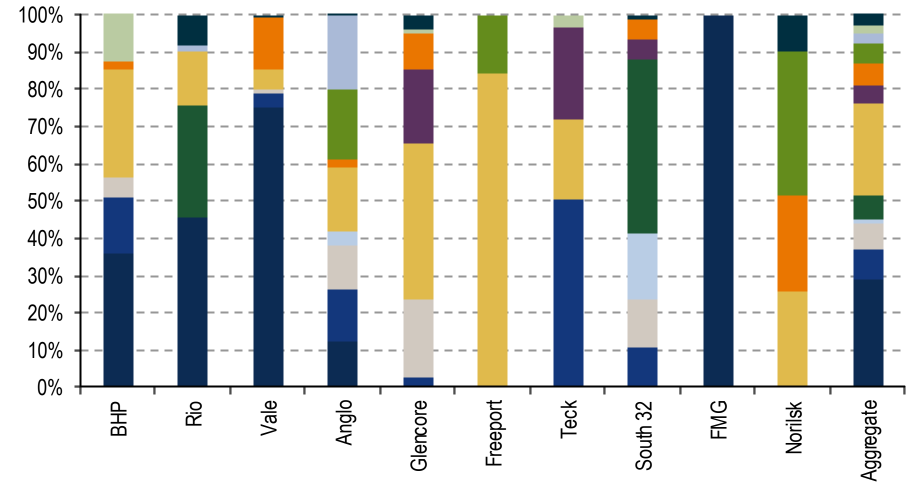
Does coal has a future in "Big Miner" portfolios?

One of the key takeaways from our recent Global Metals, Mining and Steel conference was that thermal coal is "out of style" for investors. Coal stocks tend to trade at a discount to mining peers with some management teams making an active decision to reduce or fully divest coal assets in portfolios. We flag the example of Rio Tinto which has fully exited its coal portfolio. Other large miners (BHP, Anglo, S32) have already partially sold coal assets or are in the process of exiting the commodity.

Being bearish coal is consensual. The counter argument is however that capital is not being "formed" in coal this could potentially suggest tighter markets and higher-for-longer prices.

We present revenue by commodity for key big miners globally. Rio Tinto stands out as a miner with no thermal coal exposure. Glencore has the largest exposure to coal and sees this commodity as core within its portfolio. Glencore argues that coal has a meaningful place in the "energy mix", particularly in emerging markets, for the foreseeable future.

Chart 2: Revenue by commodity, 2018A



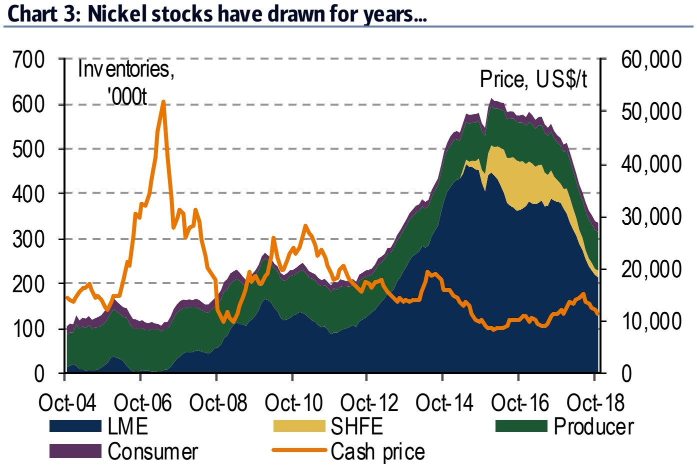
Source: BofA Merrill Lynch Global Research estimates, Company reports.

Battery raw materials demand growth supported

Battery chemistry is "evolving" yet we see strong positive demand trends for battery raw materials. Battery materials can benefit due to demand from EVs and ES. In particular we see very supportive supply/demand trends for nickel.

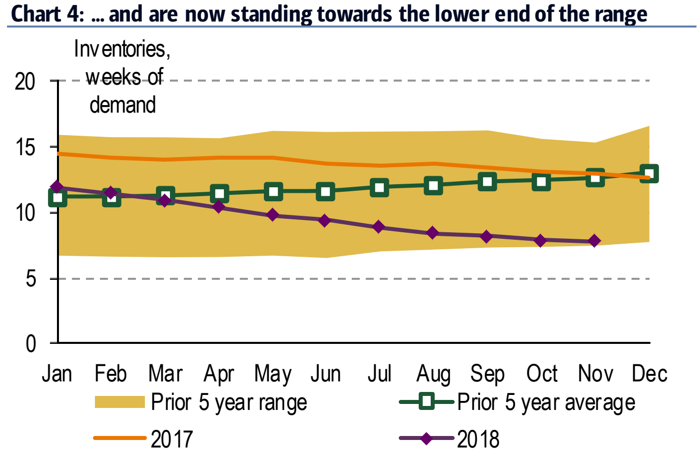
We present the trend of nickel inventories which shows a strong trend of destocking. We think destocking is a result of expected demand increases from electric vehicle (EV) battery manufacturers. Key producers of nickel, and other EV materials are: Norilsk Nickel, Eramet, Glencore.

Chart 3: Nickel stocks have drawn for years...



Source: CRU, , Bloomberg. BofA Merrill Lynch Global Research

Chart 4: ... and are now standing towards the lower end of the range



Source: CRU, Woodmac, Bloomberg. BofA Merrill Lynch Global Research

Chemicals

Umicore – global leader in cathode materials well placed for energy storage

Umicore is a global leader of cathode materials providing Rechargeable Battery Materials for both the electric vehicles (EVs) and energy storage systems (ESS). One in five Li-ion batteries ever produced for portable electronics contains Umicore materials.

In Europe, Umicore is by far the largest producer although BASF and Johnson Matthey have announced new capacities. Umicore offers nickel manganese cobalt oxide (NMC) cathodes which it sells to North Korean battery producers (LG Chem, Samsung SDI, SK Innovation) as well as to Chinese manufacturers.

The company is widely regarded as one of the few premium producers and has strong expertise in scaling up its operations, which we view as key competitive advantages. We expect Umicore to reach 100kt of capacities in the course of 2020-21. In our view, the shares trade on an undemanding multiple of 9.4x NTM EV/EBITDA and we have a Buy recommendation.

Table 1: Companies mentioned in this report

Company Name	BofAML Ticker	Bloomberg Ticker	q-r-q	Rating	Analyst
EU Utilities					
Drax Group Ltd	DRXGF	DRX LN	B-1-7	BUY	McLaren, Fraser
EDF	ECIFF	EDF FP	B-1-8	BUY	Bisztyga, Peter
Enel	ESOCF	ENEL IM	B-1-7	BUY	Wyburd, Harry
National Grid	NGGTF	NG/ LN	B-1-7	BUY	McLaren, Fraser
National Grid	NGG	NGG US	B-1-7	BUY	McLaren, Fraser
Orsted	DOGEF	ORSTED DC	A-1-7	BUY	Bisztyga, Peter
RWE	RWNFF	RWE GR	B-1-7	BUY	Bisztyga, Peter
SSE	SSEZF	SSE LN	B-1-8	BUY	McLaren, Fraser
SSE	SSEZY	SSEZY US	B-1-8	BUY	McLaren, Fraser
National Grid	NGGTF	NG/ LN	B-1-7	BUY	McLaren, Fraser
National Grid	NGG	NGG US	B-1-7	BUY	McLaren, Fraser
Orsted	DOGEF	ORSTED DC	A-1-7	BUY	Bisztyga, Peter
Iberdrola	IBDSF	IBE SM	A-2-7	NEUTRAL	Wyburd, Harry
Centrica	CPYYF	CNA LN	B-2-8	NEUTRAL	McLaren, Fraser
Centrica	CPYYY	CPYYY US	B-2-8	NEUTRAL	McLaren, Fraser
EU Industrials					
ABB Ltd.	ABLZF	ABBN SW	A-1-7	BUY	Virgo, Alexander
Nexans	NXPRF	NEX FP	B-1-7	BUY	Barker, David
Prysmian	PRYMF	PRY IM	B-1-7	BUY	Barker, David
Siemens	SMAWF	SIE GR	A-1-7	BUY	Virgo, Alexander
Siemens Gamesa	GCTAF	SGRE SM	B-1-8	BUY	Virgo, Alexander
Schneider	SBGSF	SU FP	A-2-7	NEUTRAL	Virgo, Alexander
Vestas	VWSYF	VWS DC	B-2-8	NEUTRAL	Virgo, Alexander
Rolls Royce	RYCEF	RR/ LN	B-3-7	UNDERPERFORM	Heelan, Benjamin
Wartsila OYJ	WRTBF	WRT1V FH	B-3-7	UNDERPERFORM	Virgo, Alexander
EU Oil&Gas					
Royal Dutch Shell A	RDSA	RDS/A US	B-1-7	BUY	Kuplent, Christopher
Total	TTFNF	FP FP	A-1-7	BUY	Kuplent, Christopher
EU Mining					
Eramet	ERMAF	ERA FP	C-1-7	BUY	Fairclough, Jason
Norilsk Nickel	NILSY	MNOD LI	C-1-7	BUY	Fedotov, Anton
Glencore Plc	GLCNF	GLEN LN	B-1-7	BUY	Fairclough, Jason
Glencore Plc	XGLNF	GLN SJ	C-1-7	BUY	Fairclough, Jason
EU Chemicals					
Umicore	UMICF	UMI BB	B-1-7	BUY	Rolland, Jean-Baptiste

Source: BofA Merrill Lynch Global Research

Company	BofAML Ticker	Local price
ABB	ABB	18.99
ABB Ltd.	ABLZF	18.59
Centrica	CPYYF	88.28
Centrica	CPYYY	4.52
Drax Group Ltd	DRXGF	279.8
EDF	ECIFF	11
Enel	ESOCF	6.273
Eramet	ERMAF	54.46
Glencore Plc	GLCNF	272.3
Glencore Plc	XGLNF	47.2
Iberdrola	IBDSF	8.516
National Grid	NGG	51.91
National Grid	NGGTF	833.5
Nexans	NXPRF	30.35
Norilsk Nickel	NILSY	23.33
Norilsk Nickel	XNRLF	14652
Orsted	DOGEF	634.4
Prysmian	PRYMF	18.8
Rolls Royce	RYCEF	866.8
Rolls Royce	RYCEY	10.9
Royal Dutch Shell A	RDSA	63.9
Royal Dutch Shell A	RYDAF	2555.5
Royal Dutch Shell B	RDSB	64.34
Royal Dutch Shell B	RYDBF	2565.5
RWE	RWEOY	27.2
RWE	RWNFF	24.15
Schneider	SBGSF	76.5
Siemens	SIEGY	55.84
Siemens	SMAWF	99.49
Siemens Gamesa	GCTAF	15.245
SSE	SSEZF	1155
SSE	SSEZY	14.565
Total	TOT	54.41
Total	TTFNF	48.195
Umicore	UMICF	26.57
Vestas	VWSYF	586.4
Wartsila OYJ	WRTBF	11.5

Source: BofA Merrill Lynch Global Research

Price objective basis & risk

ABB Ltd. (ABLZF / ABB)

Our price objective of CHF25 (US$25.25 for the ADR) is based on applying a c30% premium to our 2020E target sector EV/EBITA multiple of 11x. We think this is fair given strong earnings potential from execution on its cost saving programmes, good cash flow generation, higher than average returns (ROIC) a strong balance sheet and scope for cost-savings from the Power Grids sale. Our target sector multiple of 11x is at the low end of the long run average through cycle multiple of 10-12x reflecting higher risk free rates and weaker global lead indicators at this point in the economic cycle.

Downside risks: Poor project execution, slowdown in industrial investment, project deferrals in emerging markets, higher than anticipated separation costs for Power Grids business.

Centrica (CPYYF / CPYYY)

Our price objective of 130p/US$6.79 is based on our sum-of-parts, which uses a range of valuation tools such as DCFs and multiples for the various divisions as appropriate - for example, we use a discount rate of 10% for upstream, 7.5% for retail supply and an 11x 2020E earnings multiple for Home Services. This would put the shares on a 2019E P/E of c14x using company guidance, and reflects a c6% yield in the event that the dividend is cut by 33% to 8p/share.

Downside risks to our price objective are further political intervention in the energy supply markets, sustained competitive pressure, softer wholesale gas/electricity prices, and the re-emergence of LNG trading downside. Upside risks to our price objective are higher wholesale gas/power prices (assuming pass through to consumers is possible), faster than expected growth in the Connected Home/Distributed Energy divisions, or higher achieved prices for planned disposals such as the British Energy stake.

Drax Group Ltd (DRXGF)

Our price objective for Drax is 420p, based on a life of plant DCF with a 7% discount rate. We assume that two coal units close by 2025, and the biomass units in 2027, when current subsidies end. Despite low/ negative dark spreads, we include rising coal unit income from system support services and balancing market participation. Much of Drax's biomass income is fixed, but there is some residual exposure to commodities and power prices. We assume that the retail business continues to grow, but do not include development of any of the OCGT project or repowering. Upside risks to our price objective are rising gas prices, lower biomass fuel prices, a tighter UK generation supply/demand balance and higher capacity market prices. Downside risks are adverse movements in commodities/spreads, operational risk associated with the biomass units, and difficult trading conditions for I&C supply.

EDF (ECIFF)

We set our EDF PO at €14.7 based on a sum-of-the-parts valuation. This is based on DCF valuations of the operating divisions using a €52/MWh long-term power price assumption in France and WACCs ranging from 3.4% for the French regulated networks to 6.1% for international activities (increased versus previous assumption to reflect higher beta assumption). We value provisions, dedicated assets and other financial liabilities at book value. Downside risks to our price objective are: weakness in French/UK power prices, serviceability issues with the French nuclear fleet, cost overruns/delays with new nuclear projects, and unfavourable tariff interventions by the French government. Upside risks to our price objective are cost/capex efficiencies above our expectations, further recovery in carbon prices, or a restructuring by the French government.

Enel (ESOCF)

Our €6.3 PO is based on a sum-of-the-parts valuation. Our assumptions are 1) our one year forward estimated EV/EBITDA multiples corresponding to listed peers for integrated activities in Italy (7.5x), Iberia (8.7x), Latin America (6.5x), and Rest of World (6.0x), 2) RAV premium (10%) corresponding to listed Italian regulated peers for Italian distribution activities and 3) market values for minorities.

Downside risks to our PO are a significant deterioration in financial performance in one of Enel's subsidiaries, a highly significant decline in gas and power prices, sharp declines in energy demand in any of Enel's geographies, political intervention in retail supply markets, and adverse FX moves.

Eramet (ERMAF)

We set our SOTP-based price objective at EUR103. This is based on 1x our updated 2019E multiple derived SOTP, in line with the group's historical trading multiple. Our multiples are based on peer metals and mining companies with an adjustment to reflect our view on Eramet's capacity to deliver on cost savings. Nickel 3x 2019E EBITDA, Manganese 5x 2019E EBITDA, Alloys 0.6x 2019E Sales, Mineral sands 5x EBITDA, Corporate costs 5x 2019E EBITDA. We adjust the attributable value by the company's ownership stake.

Downside risks: The share price could decline below our price objective if the global

demand for commodities slows further, leading to lower metal prices which would drive lower earnings. The group's manufacturing businesses do have gearing to European manufacturing. If growth slows, the profitability of these businesses could be negatively impacted. China winter shutdowns which could impact steel production.
Upside risk: The group's manufacturing businesses do have gearing to European manufacturing. If growth increases, the profitability of these businesses could be positively impacted.

Glencore (GLCNF / XGLNF)
Our price objective of GBp380 (ZAR72.07) is c.1x our DCF and multiple derived SOTP. Through the cycle large-cap diversified miners have traded between 0.7-1.3x NPV (DCF, WACC: c.10%, terminal growth rate: 2%). Shares of more financially and operationally leveraged vehicles, such as Glencore, do tend to trade at premiums to NPV during periods of positive outlook for miners. We also consider potential for NPV upgrades for Glencore as "higher for longer" commodity prices in key products e.g. copper, zinc, coal can have a material impact on GLEN's cash flow expectations.

Upside/downside risks to our price objective are commodity prices being stronger/weaker than our forecasts, trading profits being better/worse than our estimates, better/worse than modelled cost savings at industrial assets, positive/negative operational surprises at the group's industrial assets, a rise/decline in the market value of the group's listed assets.

Iberdrola (IBDSF)
Our price objective for Iberdrola is EUR8.85 per share based on a SOTP valuation. Our WACC ranges from 5.2% for regulated Networks to 7.7% for Generation & Supply and to 5.3% for Renewables.

The downside risks to our PO are: volatility in hydro/wind load factors and FX, execution risks on generation/wind projects under development, news flow on asset rotation and/or potential acquisitions, potential regulatory changes (mainly in Spain, UK, Brazil), changes to US incentives to renewables.

National Grid (NGGTF / NGG)
Our price objective of 1030p (US$65.19/ADR) is based on our sum-of-parts methodology which uses various metrics appropriate to the group's divisions including regulated asset values, DCF, and earnings multiples, We include an average 23% premium to residual UK regulatory asset values (ex Gas D at agreed transaction values) to capture RAV growth and outperformance potential. For the US, we use a 18.2x FY2 P/E on underlying earnings and include deferred revenue and work in progress at par. Our PO reflects more prudent UK RAV multiples given recent regulatory developments and transaction multiples.

Downside risks to our price objective are Labour government renationalisation policies, and an adverse change in the regulatory or political environment that results in lower than expected revenues or growth potential. Higher debt costs or difficulty accessing capital could also impact on actual returns and growth potential. Currency exposure to the US dollar is mitigated by dollar denominated debt and swaps.

Upside risks are achieving premium returns vs regulatory allowances and consequently higher dividend growth.

Nexans (NXPRF)
Our price objective is EUR35. To derive, we apply a 20% discount to our 2020E sector target EV/EBITA multiple of 11x, which we think is justified given concerns over the restructuring story and is a marginal discount to its most comparable peer Prysmian. Our target sector multiple of 11x is at the mid point of the sector through cycle multiple

range of 10-12x, reflecting higher risk free rates and weaker global lead indicators at this point in the economic cycle.

We value Nexans more closely to Prysmian, given the heavy effect of restructuring within our valuation calculation which has a punitive impact. We see a discount as justified given the group's weak track record, high earnings volatility, poor cash flow generation, below average ROIC and lumpy nature of the high-voltage projects business.

Upside risks: (i) stronger than expected execution of the cost savings programme, (ii) a recovery in pricing and (iii) disposal of non-performing assets

Downside risks: Further execution and production problems leading to contract risks and weaker overall demand and ongoing pricing pressure

Norilsk Nickel (NILSY / XNRLF)
Our price objective of US$26.0 per GDR (RUB16,640) is the average of P/E, EV/EBITDA and dividend valuation:
- we use 7.5x-7.0x 2019-20E P/E and 6.0x-5.5x 2019-20E EV/EBITDA, in line with Norilsk Nickel's historical multiples
- we use 9% target dividend yield, which is 2p.p. lower that Norilsk Nickel's historical 11%. We think that currently investors may require a dividend yield lower than historical due to Norilsk Nickel's exposure to the electric vehicle penetration growth in long term. We apply our target dividend yield to 2018-2020E dividend discounted using 13.3% cost of equity

We believe that the combined valuation approach captures both the earnings growth in 2018E and the value of the dividend stream relative to Norilsk's global peers.

The downside risks are: negative changes in metal prices due to economic events, speculator involvement or deterioration in fundamental demand, Russian political and regulatory risk, institutional fund flows out of Russia, international sanctions, further escalation of the conflict among the key shareholders of the company and operational and project execution risk.

Upside risks are: higher-than-expected metals prices, improvement in corporate governance, repeal of international sanctions against Russia resulting in better investor sentiment, lifting of US sanctions against Rusal (Norilsk Nickel's significant shareholder), resolution of the shareholder conflict via a mediator between Vladimir Potanin and Oleg Deripaska.

Orsted A/S (DOGEF)
Our DKK680/sh PO for Orsted is based on an SOTP valuation that values Orsted's existing and future wind development projects using a DCF methodology. We use a 3.8% WACC assumption, and assume 150bps IRR value creation on offshore wind in our discrete forecasting period to 2048. Upside risks to our price objective are lower bond yields, stronger GBP, higher inflation and lower costs/capex trends. Additional upside risks are new projects being won at high implied returns and sale of existing projects at high valuations. Downside risks to our price objective are higher bond yields, weaker GBP, lower inflation and higher costs/capex trends. Additional downside risks are increased competition at offshore wind auctions (which could impact the company's ability to create value from new investments), changes in regulation for existing assets and lower prices / delays in asset sales.

Prysmian (PRYMF)
Our price objective of EUR23 is based on applying a discount of c10% to our 2020E sector target EV/EBITA multiple of 11x. Our target sector multiple of 11x is at the mid point of the sector through cycle multiple range of 10-12x, reflecting higher risk free

rates and weaker global lead indicators at this point in the economic cycle.

We believe a discount is justified given Prysmian's products are more commoditized than the rest of the sector and execution in high-voltage projects is risky.

Upside risks to our PO are: Stronger volumes, accretive capital allocation and price increases.

Downside risks to our PO are: (i) weakening demand, (ii) ongoing price pressure and (iii) additional unforeseen charges.

Rolls Royce (RYCEF / RYCEY)

To derive our 835p price objective (US$10.43/ADR), we use 2020 & 2021 FCF estimates, and apply a 14x multiple to the underlying operational FCF, unhedged. This is below the peers' 2008-17 average FCF multiple of 17x, which we believe is fair given lack of structural growth story. We then add back the NPV of the V2500 royalty payment, and deduct headwinds for future charges. This yields a PO of 835p.

Upside risks: 1) strengthening of the USD vs. Sterling, 2) on-time ramp-up of the TrentXWB and 3) better-than-expected passenger traffic in 2019, leading to higher aftermarket growth, 4) a steep recovery of the oil price.

Downside risks: 1) an exogenous event (such as 9/11) that causes a reduction in flying. 2) Issues with the Trent XWB engines, 3) accelerated parking of WB airplanes with RR engines, 4) continued decline in oil price, 5) large M&A transaction.

Royal Dutch Shell B (RYDBF / RDSB)

Our price objective of 2660p/share (US$67/ADR) is based on our sum-of-the-parts valuation breaking RDS up into its constituents (upstream, downstream and others). We value these separately from our bottom-up cash flow model via a DCF valuation based on differentiated discount rates (7.7% for Upstream, 9.6% for Downstream, 8.3% Group and others). Our divisional DCF valuations are usually based on zero-growth perpetuity assumptions beyond 2020 - except for RDS's and legacy BG E&P assets: Here we run a "depletion DCF" and disregard both the income and capex attributable to future prospects.

Risks to our forecasts and valuation are: Changes in oil & gas prices, political / regulatory risks as well as significant exploration success or lack thereof. Other risks are exposure to swings in the global economy that could impact oil and gas prices as well as refining margins, currency moves for the US dollar, general risks of changes in taxes and tariffs and rising capex costs.

Royal Dutch Shell PLC Shs A (RYDAF / RDSA)

Our price objective of 2660p/share (US$67/ADR) is based on our sum-of-the-parts valuation breaking RDS up into its constituents (upstream, downstream and others). We value these separately from our bottom-up cash flow model via a DCF valuation based on differentiated discount rates (7.7% for Upstream, 9.6% for Downstream, 8.3% Group and others). Our divisional DCF valuations are usually based on zero-growth perpetuity assumptions beyond 2020 - except for RDS's and legacy BG E&P assets: Here we run a "depletion DCF" and disregard both the income and capex attributable to future prospects.

Risks to our forecasts and valuation are: Changes in oil & gas prices, political / regulatory risks as well as significant exploration success or lack thereof. Other risks are exposure to swings in the global economy that could impact oil and gas prices as well as refining margins, currency moves for the US dollar, general risks of changes in taxes and tariffs and rising capex costs.

RWE (RWNFF / RWEOY)
We set our €31.5 (US$35.66) price objective for RWE based on a pro forma NAV valuation. The methodology is: 1) Generation DCF model based on German power prices rising from c€47/MWh in 2020 to c€52/MWh by 2025 driven by rising spreads and higher CO2 prices and an 6.7% WACC, 2) DCF models for the renewables assets RWE is acquiring and, 3) pro forma liabilities following the asset swap with E.On. Our generation valuation has no terminal value, while our renewables valuation uses a continuing value formula with 100bps EV-IC spread in perpetuity on capex pipeline. Our SOTP reflects a €1.1bn increased NPV of lignite mining provisions as a result of early coal exit.

Risks to our PO are volatility in the value of RWE's future 16.7% stake in E.On, volatility in future power prices, coal prices and CO2 prices, adverse policies relating to coal phase out, anti-trust obstacles to the E.On asset swap, and growing competition in renewables.

Schneider (SBGSF)
Our EUR85 price objective is based on applying a c10% premium to our 2020E sector target EV/EBITA multiple of 11x. We think this premium is appropriate, given solid margins, relatively defensive earnings, and a strong management team. Our target sector multiple of 11x is the middle of the sector through cycle multiple range of 10-12x, reflecting higher risk free rates and weaker global lead indicators at this point in the economic cycle.

Upside risks to our price objective relate mainly to stronger industrial and construction demand and better-than-expected restructuring execution.

Downside risks are weaker-than-expected construction activity and further expansion through large, expensive M&A.

Siemens (SMAWF / SIEGY)
Our PO of EUR140 (US$79.27 for the ADR) is derived from a Sum of the Parts analysis in light of the proposed spin off of Gas & Power (to complete Sep '20). We apply a 15x EV/EBITA multiple to Digital Industries (DI), 11x to Smart Infrastructure (SI) and 9x to Gas & Power (GP). These multiples reflect market leadership (DI), margin improvement potential (SI) and scope for earnings recovery (GP). We also apply 10x to Mobility, reflecting industry leading margins and backlog visibility

We apply the target sector multiple (11x) to capitalise restructuring costs, central eliminations and severance costs.

Downside risks to our price objective are (i) weakening demand in the automation and Energy divisions, (ii) GP carve out/spin off execution issues, and (iii) lack of capital discipline.

Siemens Gamesa (GCTAF)
Our price objective of EUR18 is based on applying a c.5% premium to our 2020E target sector EV/EBITA multiple of 11x. We think this is fair given SGRE's higher than average EPS growth, better growth visibility due to structural growing offshore and service businesses.

Our target sector multiple of 11x is in the middle of the sector through cycle multiple range of 10-12x, reflecting higher risk free rates but improving global lead indicators at this point in the economic cycle.

Downside risks to our PO are weak demand leading to price/margin pressure, execution issues in developing new products or delivering orders, merger execution risks, and weak synergies post merger.

SSE (SSEZF / SSEZY)
Our price objective is 1400p (US$17.72 /ADR) based on a sum-of-the-parts methodology - this is calculated using medium term fundamentals and metrics appropriate to each division, including DCF analysis (discount rates c8% but vary by division), relevant peer group multiples, and an average c24% premium to RAB for the networks. We include a 20% probability that additional value can be unlocked via sell-downs, consistent with company strategy, and for this we use recent transaction multiples.

Downside risks to our price objective are a permanent deterioration of generation and supply profitability, inability to execute new business objectives, political change/intervention/renationalisation, withdrawal of renewable subsidies, and an adverse change in the UK regulatory environment. Upside risks include a supportive commodity macro and successful execution of additional investment opportunities such as offshore wind.

Total (TTFNF / TOT)
Our PO of EUR51/share (ADR US$59) is based on our bottom-up cash flow model and resultant sum-of-the-parts valuation. Our SOTP valuation uses DCF valuation for Total's sub-divisions based on differentiated discount rates: 8.6% for Refining and Marketing & Services, as well as 8.3% for Corporate (assuming a zero perpetuity growth rate for all). Our divisional DCF valuations are usually based on perpetuity assumptions beyond 2020 - except for Total's E&P assets: Here we run a "depletion DCF" (at a 7.1% discount rate) and disregard both the income and capex attributable to future prospects (effectively assuming these are value neutral).

Risks (upward and downward) to our PO are sharp moves in refining margins, oil and gas prices as well as the USD. Other risks are unanticipated government intervention and regulation, expropriation risk, project execution/oil spill/environmental risk, bankruptcy risk, litigation risk, M&A risk and the general risk of increased taxes and tariffs. In addition, our PO is subject to significant exploration success or lack thereof, general risks of changes in taxes and tariffs as well as fluctuating capex costs.

Umicore (UMICF)
We have a PO of €40 based on a 13x target '20E EV/EBITDA multiple (including pensions). We cross check with an SOTP and a DCF. For our SOTP, we assume 2019E EBITDA multiples of 13.6x for Catalysis, 35.6x for Energy and Surface Technologies (EV/EBIT to growth 18-20 of 1x) and 6.7x for Recycling. These multiples are broadly in line with peers in each of the businesses. For our DCF, we assume 3.1% terminal growth (0% for Catalysis and Recycling and 4.5% for Energy and Surface Technologies), 11.5% terminal NOPAT margin and 8% WACC.

Upside risks to our price objective are: better-than-expected results in EST driven by stronger pricing in in Rechargeable Battery Materials (RBM) or stronger pricing Nickel and Cobalt. Market share gains by Umicore against autocatalysts peers JMAT and BASF. Downside risks are: weaker pricing in platinum and base metal prices, a weaker outlook for automotive production and materially lower demand for portable electronics and/or electrified vehicles and/or lower outlook for global auto production.

Vestas (VWSYF)
Our price objective of DKK640 is derived by applying our 2020E target sector EV/EBITA multiple of 11x. We think this is fair given Vestas's lower than average EBIT growth partially offset by better growth visibility. Our target sector multiple of 11x is at the mid point of the sector through cycle multiple range of 10-12x, reflecting higher risk free

rates and weaker global lead indicators at this point in the economic cycle.

Downside risks to our PO are weak demand leading to price/margin pressure, execution issues in developing new products or delivering orders, competition from Chinese manufacturers, political uncertainties.

Wartsila OYJ (WRTBF)

Our price objective for Wartsila of EUR10 is based on applying a 20% our 2020E sector target EV/EBITA multiple of 11x. We think this is fair given the declining revenue visibility and lower than sector average organic growth 2019/20E.

Upside risks: Rebound in gas and offshore ship contracting, a faster acceptance of marine environment products (SOx scrubbers and BWT treatment systems), successful capital allocation, rebound in EM distributed power investments or renewed M&A speculation.

Downside risks: further slowdown in power generation orders, delays in the implementation of environmental regulations, higher competition in medium speed engines and emerging competition in power and environmental products where Wartsila holds dominant positions

Analyst Certification

We, Pinaki Das, Alexander Virgo, Anton Fedotov, Benjamin Heelan, Christopher Kuplent, David Barker, Fraser McLaren, Harry Wyburd, Jason Fairclough, Jean-Baptiste Rolland and Peter Bisztyga, hereby certify that the views each of us has expressed in this research report accurately reflect each of our respective personal views about the subject securities and issuers. We also certify that no part of our respective compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

Special Disclosures

BofA Merrill Lynch is currently acting as financial adviser to Glencore PLC in connection with its proposed acquisition of a 75% stake in Chevron South Africa Propriety Limited and the entire issued share capital of Chevron Botswana Propriety Limited, which was announced on 6th October 2017.

BofA Merrill Lynch is currently acting as Financial Advisor to Royal Dutch Shell PLC in connection with its proposed divestment of the Danish Underground Consortium (DUC) to Norwegian Energy Company ASA (Noreco), which was announced on 17 October 2018.

BofA Merrill Lynch is currently acting as financial advisor to RWE AG in connection with its proposed disposal of 50.04% stake in Innogy Grid Holding to Macquarie Infrastructure and Real Assets which was announced on 30 April 2019.

BofA Merrill Lynch is currently acting as adviser to Schneider Electric SE in connection with its proposed partnership with Temasek to acquire Larsen & Toubro Ltd's Electrical & Automation business, which was announced on 1 May 2018.

BofA Merrill Lynch is currently acting as Financial Advisor to RWE AG in connection with its proposed sale of its 76.8% stake in Innogy SE to E.ON SE as per their ad-hoc disclosure of 11 March 2018

EMEA - Aerospace, Defence & Satellite Services Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	Airbus	EADSF	AIR FP	Benjamin Heelan
	Dassault Aviation	DUAVF	AM FP	Romain Gourvil
	Leonardo Finmeccanica	FINMF	LDO IM	Romain Gourvil
	Meggitt	MEGGF	MGGT LN	Benjamin Heelan
	Rheinmetall AG	RNMBF	RHM GR	Romain Gourvil
	SAAB AB	SAABF	SAABB SS	Romain Gourvil
	Safran SA	SAFRF	SAF FP	Benjamin Heelan
	Thales	THLEF	HO FP	Romain Gourvil
	ViaSat	VSAT	VSAT US	Benjamin Heelan
NEUTRAL				
	BAE SYSTEMS	BAESF	BA/ LN	Benjamin Heelan
	BAE SYSTEMS	BAESY	BAESY US	Benjamin Heelan
	Cobham	CBHMF	COB LN	Benjamin Heelan
	MTU Aero Engines	MTUAF	MTX GR	Romain Gourvil
	QinetiQ	QNTQF	QQ/ LN	Benjamin Heelan
UNDERPERFORM				
	Eutelsat	EUTLF	ETL FP	Benjamin Heelan
	Intelsat SA	I	I US	Benjamin Heelan
	Rolls Royce	RYCEF	RR/ LN	Benjamin Heelan
	Rolls Royce	RYCEY	RYCEY US	Benjamin Heelan
	Senior Plc	SNIRF	SNR LN	Benjamin Heelan
	SES	SGBAF	SESG FP	Benjamin Heelan
	Ultra Electronics	UEHPF	ULE LN	Benjamin Heelan
RSTR				
	Inmarsat	IMASF	ISAT LN	Benjamin Heelan

EMEA - Chemicals Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	Arkema	ARKAF	AKE FP	Jean-Baptiste Rolland
	Arkema	ARKAY	ARKAY US	Jean-Baptiste Rolland
	Johnson Matthey	JMPLF	JMAT LN	Jean-Baptiste Rolland
	Johnson Matthey	JMPLY	JMPLY US	Jean-Baptiste Rolland
	Umicore	UMICF	UMI BB	Jean-Baptiste Rolland
NEUTRAL				
	Covestro	CVVTF	1COV GR	Jean-Baptiste Rolland
	Covestro	COVTY	COVTY US	Jean-Baptiste Rolland
	Givaudan	GVDBF	GIVN SW	Jean-Baptiste Rolland
	Symrise	SYIEF	SY1 GR	Jean-Baptiste Rolland

EMEA - Engineering & Capital Goods Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	ABB	ABB	ABB US	Alex ander Virgo
	ABB Ltd.	ABLZF	ABBN SW	Alex ander Virgo
	Alfa Lav al	ALFVF	ALFA SS	Alex ander Virgo
	Assa Abloy	ASAZF	ASSAB SS	Alex ander Virgo
	Fluidra SA	FLUIF	FDR SM	George Featherstone, CFA
	Hex agon AB	HXGBF	HEXAB SS	Alex ander Virgo
	KION Group AG	KNNGF	KGX GR	Alex ander Virgo
	Melrose plc	XLHVF	MRO LN	Alex ander Virgo
	Metso	MXCYY	MXCYY US	Alex ander Virgo
	Metso	MXTOF	METSO FH	Alex ander Virgo
	Nex ans	NXPRF	NEX FP	Dav id Barker
	Pry smian	PRYMF	PRY IM	Dav id Barker
	Rotork Plc	RTOXF	ROR LN	Alex ander Virgo
	Sandv ik	SDVKF	SAND SS	Alex ander Virgo
	Sandv ik	SDVKY	SDVKY US	Alex ander Virgo
	Siemens	SMAWF	SIE GR	Alex ander Virgo
	Siemens	SIEGY	SIEGY US	Alex ander Virgo
	Siemens Gamesa	GCTAF	SGRE SM	Alex ander Virgo
	Spirax -Sarco	SPXSF	SPX LN	Alex ander Virgo
	Vesuv ius	CKSNF	VSVS LN	Dav id Barker
	Weir Group	WEIGF	WEIR LN	Alex ander Virgo
NEUTRAL				
	Alstom	AOMFF	ALO FP	Alex ander Virgo
	Electrolux	ELUXY	ELUXY US	Alex ander Virgo
	Electrolux	ELUXF	ELUXB SS	Alex ander Virgo
	GEA	GEAGF	G1A GR	Alex ander Virgo
	IMI	IMIAF	IMI LN	Alex ander Virgo
	Legrand	LGRVF	LR FP	Alex ander Virgo
	Morgan Adv anced Materials	MCRUF	MGAM LN	Dav id Barker
	Outotec	OUKPF	OTE1V FH	Alex ander Virgo
	Rex el	RXLSF	RXL FP	Alex ander Virgo
	Schneider	SBGSF	SU FP	Alex ander Virgo
	Signify	SFFYF	LIGHT NA	Alex ander Virgo
	Vestas	VWSYF	VWS DC	Alex ander Virgo
UNDERPERFORM				
	Atlas Copco	ATLKF	ATCOA SS	Alex ander Virgo
	Body cote PLC	BYPLF	BOY LN	Dav id Barker
	DUERR AG	DUERF	DUE GR	Alex ander Virgo
	Epiroc AB	XJSHF	EPIA SS	Alex ander Virgo
	Jungheinrich Pref	JGHAF	JUN3 GR	Alex ander Virgo
	Knorr-Bremse AG	KNBHF	KBX GR	Alex ander Virgo
	Knorr-Bremse AG	KNRRY	KNRRY US	Alex ander Virgo
	Kone OYJ	KNYJF	KNEBV FH	Alex ander Virgo
	SGL Group	SGLFF	SGL GR	Dav id Barker
	SKF	SKFRY	SKFRY US	Alex ander Virgo
	SKF	SKUFF	SKFB SS	Alex ander Virgo
	Smiths Group	SMGKF	SMIN LN	Alex ander Virgo
	Smiths Group	SMGZY	SMGZY US	Alex ander Virgo
	Spectris	SEPJF	SXS LN	Dav id Barker
	Wartsila OYJ	WRTBF	WRT1V FH	Alex ander Virgo

EMEA - Metals & Mining, Steel, Paper Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	AMG	AMVMF	AMG NA	Cedar Ekblom, CFA
	Anglo American	AAUKF	AAL LN	Jason Fairclough
	Anglo Pacific Group Plc	AGPIF	APF LN	Jason Fairclough
	Antofagasta	ANFGF	ANTO LN	Jason Fairclough
	ArcelorMittal	AMSYF	MT NA	Cedar Ekblom, CFA
	ArcelorMittal	MT	MT US	Cedar Ekblom, CFA
	Centamin Plc	CELTF	CEY LN	Jason Fairclough
	Centamin Plc	YCEE	CEE CN	Jason Fairclough
	DS Smith	DITHF	SMDS LN	Alexander Berglund
	Eramet	ERMAF	ERA FP	Jason Fairclough
	Ferrexpo plc	FEEXF	FXPO LN	Jason Fairclough
	Fresnillo plc	FNLPF	FRES LN	Jason Fairclough
	Gem Diamonds	GMDMF	GEMD LN	Kevin Kerdoudi
	Glencore	GLCNF	GLEN LN	Jason Fairclough
	Glencore	XGLNF	GLN SJ	Jason Fairclough
	Hochschild Mining plc	HCHDF	HOC LN	Jason Fairclough
	Imerys	IMYSF	NK FP	Kevin Kerdoudi
	Lucara Diamond Corporation	XDVAF	LUC SS	Kevin Kerdoudi
	Lucara Diamond Corporation	YLUC	LUC CN	Kevin Kerdoudi
	Mondi Limited	MODLF	MND SJ	Alexander Berglund
	Mondi Plc	MONDF	MNDI LN	Alexander Berglund
	Mondi Plc	XDPMF	MNP SJ	Alexander Berglund
	Norsk Hydro	NHYDY	NHYDY US	Cedar Ekblom, CFA
	Norsk Hydro	NHYKF	NHY NO	Cedar Ekblom, CFA
	Petra Diamonds	PDMDF	PDL LN	Kevin Kerdoudi
	Sappi Limited	SPPJF	SAP SJ	Alexander Berglund
	Sappi Limited	SPPJY	SPPJY US	Alexander Berglund
	SIG Combibloc Group	XKSDF	SIGN SW	Alexander Berglund
	Smurfit Kappa	SMFTF	SKG ID	Alexander Berglund
	Smurfit Kappa	SMFLF	SKG LN	Alexander Berglund
	SSAB	SSAAF	SSABA SS	Cedar Ekblom, CFA
	Thyssenkrupp	TYEKF	TKA GR	Cedar Ekblom, CFA
	UPM	UPMKF	UPM FH	Alexander Berglund
	UPM	UPMKY	UPMKY US	Alexander Berglund
	Voestalpine	VLPNF	VOE AV	Cedar Ekblom, CFA
NEUTRAL				
	BHP Group Plc	BHPBF	BHP LN	Jason Fairclough
	BHP Group Plc	BBL	BBL US	Jason Fairclough
	Petropavlovsk	PPLKF	POG LN	Jason Fairclough
	Salzgitter	SZGPF	SZG GR	Cedar Ekblom, CFA
UNDERPERFORM				
	Acerinox	ANIOF	ACX SM	Cedar Ekblom, CFA
	Aperam	XASPF	APAM NA	Cedar Ekblom, CFA
	Aurubis	AIAGF	NDA GR	Olivia Du
	Boliden	BDNNF	BOL SS	Olivia Du
	Nyrstar	NYRSF	NYR BB	Olivia Du
	Outokumpu	OUTFF	OUT1V FH	Cedar Ekblom, CFA
	Rio Tinto Plc	RIO	RIO US	Jason Fairclough
	Rio Tinto Plc	RTPPF	RIO LN	Jason Fairclough
	SCA	SVCBF	SCAB SS	Alexander Berglund
	SCA	SVCBY	SVCBY US	Alexander Berglund
	Stora Enso	SEOJF	STERV FH	Alexander Berglund
	Stora Enso	SEOAY	SEOAY US	Alexander Berglund
RSTR				
	GIMA TT	XWQLF	GIMA IM	Alexander Berglund

EMEA - Oil & Gas Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	Aker Solutions	AKRTF	AKSO NO	Vlad Sergiev skii
	Eni	E	E US	Christopher Kuplent
	Eni	EIPAF	ENI IM	Christopher Kuplent
	Lundin Petroleum	LNDNF	LUPE SS	Christopher Kuplent
	Neste	NTOIF	NESTE FH	Alex ander Jones
	OMV	OMVJF	OMV AV	Christopher Kuplent
	OMV	OMVKY	OMVKY US	Christopher Kuplent
	Repsol	REPYY	REPYY US	Christopher Kuplent
	Repsol	REPYF	REP SM	Christopher Kuplent
	Roy al Dutch Shell B	RDSB	RDS/B US	Christopher Kuplent
	Roy al Dutch Shell B	RYDBF	RDSB LN	Christopher Kuplent
	Roy al Dutch Shell PLC Shs A	RDSA	RDS/A US	Christopher Kuplent
	Roy al Dutch Shell PLC Shs A	RYDAF	RDSA LN	Christopher Kuplent
	Saras S.p.A.	SAAFF	SRS IM	Alex ander Jones
	Total	TTFNF	FP FP	Christopher Kuplent
	Total	TOT	TOT US	Christopher Kuplent
	Vallourec	VLOUF	VK FP	Vlad Sergiev skii
	Wood Group	WDGJF	WG/ LN	Vlad Sergiev skii
NEUTRAL				
	Equinor ASA	STOHF	EQNR NO	Christopher Kuplent
	Equinor ASA	EQNR	EQNR US	Christopher Kuplent
	Saipem	SAPMF	SPM IM	Vlad Sergiev skii
UNDERPERFORM				
	Aker BP	DETNF	AKERBP NO	Christopher Kuplent
	BP plc	BP	BP US	Christopher Kuplent
	BP plc	BPAQF	BP/ LN	Christopher Kuplent
	Galp Energia	GLPEF	GALP PL	Christopher Kuplent
	Hunting	HNTIF	HTG LN	Vlad Sergiev skii
	SBM Offshore	SBFFF	SBMO NA	Vlad Sergiev skii
	Subsea 7 SA	ACGYF	SUBC NO	Vlad Sergiev skii
	TechnipFMC	FTI	FTI US	Vlad Sergiev skii
	TechnipFMC	XTISF	FTI FP	Vlad Sergiev skii

EMEA - Utilities Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	Drax Group Ltd	DRXGF	DRX LN	Fraser McLaren
	EDF	ECIFF	EDF FP	Peter Bisztyga
	Enel	ESOCF	ENEL IM	Harry Wyburd
	Engie	ENGQF	ENGI FP	Peter Bisztyga
	Fortum	FOJCF	FORTUM FH	Peter Bisztyga
	National Grid	NGGTF	NG/ LN	Fraser McLaren
	National Grid	NGG	NGG US	Fraser McLaren
	Orsted A/S	DOGEF	ORSTED DC	Peter Bisztyga
	Red Electrica	RDEIF	REE SM	Harry Wyburd
	RWE	RWNFF	RWE GR	Peter Bisztyga
	RWE	RWEOY	RWEOY US	Peter Bisztyga
	SSE	SSEZF	SSE LN	Fraser McLaren
	SSE	SSEZY	SSEZY US	Fraser McLaren
	Terna	TERRF	TRN IM	Harry Wyburd
NEUTRAL				
	Centrica	CPYYF	CNA LN	Fraser McLaren
	Centrica	CPYYY	CPYYY US	Fraser McLaren
	Endesa	ELEZF	ELE SM	Harry Wyburd
	Iberdrola	IBDSF	IBE SM	Harry Wyburd
	Italgas	XXYZF	IG IM	Harry Wyburd
	Naturgy	GASNF	NTGY SM	Harry Wyburd
	Uniper	XUIKF	UN01 GR	Peter Bisztyga
	Veolia	VEOEF	VIE FP	Fraser McLaren
	Veolia	VEOEY	VEOEY US	Fraser McLaren
UNDERPERFORM				
	E.ON	ENAKF	EOAN GR	Peter Bisztyga
	E.ON	EONGY	EONGY US	Peter Bisztyga
	Enagas	ENGGF	ENG SM	Harry Wyburd
	Pennon	PEGRF	PNN LN	Fraser McLaren
	Severn Trent	SVTRF	SVT LN	Fraser McLaren
	Snam	SNMRF	SRG IM	Harry Wyburd
	Suez	SZEVF	SEV FP	Fraser McLaren
	United Utilities	UUGWF	UU/ LN	Fraser McLaren
RSTR				
	innogy	XISAF	IGY GR	Peter Bisztyga
RVW				
	EDP	EDPFY	EDPFY US	Harry Wyburd
	EDP	ELCPF	EDP PL	Harry Wyburd

EEMEA - Materials Coverage Cluster

Investment rating	Company	BofA Merrill Lynch ticker	Bloomberg symbol	Analyst
BUY				
	African Rainbow Minerals	AFBOF	ARI SJ	Cedar Ekblom, CFA
	ArcelorMittal South Africa	ARCXF	ACL SJ	Cedar Ekblom, CFA
	En+ Group	XWEUF	ENPL LI	Anton Fedotov
	Ex x aro Resources	EXXAF	EXX SJ	Cedar Ekblom, CFA
	Harmony	HGMCF	HAR SJ	Patrick Mann, CFA
	Harmony	HMY	HMY US	Patrick Mann, CFA
	Kazatomprom	XWREF	KAP LI	Anton Fedotov
	Kazatomprom	XCWGF	KAP KZ	Anton Fedotov
	MMK	XGMJF	MMK LI	Anton Fedotov
	MMK	MGKPF	MAGN RM	Anton Fedotov
	Norilsk Nickel	NILSY	MNOD LI	Anton Fedotov
	Norilsk Nickel	XNRLF	GMKN RM	Anton Fedotov
	Roy al Bafokeng Platinum	XRVBF	RBP SJ	Patrick Mann, CFA
	Rusal	RUALF	486 HK	Anton Fedotov
	Rusal	RUAL	RUAL RM	Anton Fedotov
	Sibany e-Stillwater	SBGLF	SGL SJ	Patrick Mann, CFA
	Sibany e-Stillwater	SBGL	SBGL US	Patrick Mann, CFA
NEUTRAL				
	Anglo Platinum	AGPPF	AMS SJ	Patrick Mann, CFA
	Erdemir	ERELF	EREGL TI	Anton Fedotov
	Impala Platinum	IMPUF	IMP SJ	Patrick Mann, CFA
	Impala Platinum	IMPUY	IMPUY US	Patrick Mann, CFA
	NLMK	XKOVF	NLMK LI	Anton Fedotov
	NLMK	XNVLF	NLMK RM	Anton Fedotov
	Poly metal International Plc	XPMYF	POLY LN	Anton Fedotov
	Sev erStal	SVJTY	SVST LI	Anton Fedotov
	Sev erStal	JSCCF	CHMF RM	Anton Fedotov
UNDERPERFORM				
	ALROSA	ARRLF	ALRS RM	Anton Fedotov
	AngloGold Ashanti	AULGF	ANG SJ	Patrick Mann, CFA
	AngloGold Ashanti	AU	AU US	Patrick Mann, CFA
	Ev raz	EVRZF	EVR LN	Anton Fedotov
	Gold Fields	GFI	GFI US	Patrick Mann, CFA
	Gold Fields	GFIOF	GFI SJ	Patrick Mann, CFA
	KAZ Minerals Plc	KZMYF	KAZ LN	Jason Fairclough
	KGHM Polska Miedz	KGHPF	KGH PW	Anton Fedotov
	Kumba Iron Ore	KUMBF	KIO SJ	Cedar Ekblom, CFA
	Northam Platinum	NMPNF	NHM SJ	Patrick Mann, CFA

Disclosures

Important Disclosures

Equity Investment Rating Distribution: Aerospace/Defense Electronics Group (as of 30 Jun 2019)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	28	62.22%	Buy	18	64.29%
Hold	9	20.00%	Hold	6	66.67%
Sell	8	17.78%	Sell	5	62.50%

Equity Investment Rating Distribution: Alternative Energy Group (as of 30 Jun 2019)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	5	62.50%	Buy	4	80.00%
Hold	2	25.00%	Hold	2	100.00%
Sell	1	12.50%	Sell	1	100.00%

Equity Investment Rating Distribution: Chemicals Group (as of 30 Jun 2019)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	38	48.72%	Buy	20	52.63%
Hold	16	20.51%	Hold	10	62.50%
Sell	24	30.77%	Sell	12	50.00%

Equity Investment Rating Distribution: Electrical Equipment Group (as of 30 Jun 2019)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	16	66.67%	Buy	10	62.50%
Hold	5	20.83%	Hold	3	60.00%
Sell	3	12.50%	Sell	1	33.33%

Equity Investment Rating Distribution: Energy Group (as of 30 Jun 2019)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	100	57.14%	Buy	76	76.00%
Hold	35	20.00%	Hold	21	60.00%
Sell	40	22.86%	Sell	24	60.00%

Equity Investment Rating Distribution: Engineering & Construction Group (as of 30 Jun 2019)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	10	58.82%	Buy	4	40.00%
Hold	3	17.65%	Hold	1	33.33%
Sell	4	23.53%	Sell	2	50.00%

Equity Investment Rating Distribution: Industrials/Multi-Industry Group (as of 30 Jun 2019)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	40	57.97%	Buy	18	45.00%
Hold	13	18.84%	Hold	8	61.54%
Sell	16	23.19%	Sell	9	56.25%

Equity Investment Rating Distribution: Machinery/Diversified Manufacturing Group (as of 30 Jun 2019)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	23	36.51%	Buy	12	52.17%
Hold	17	26.98%	Hold	11	64.71%
Sell	23	36.51%	Sell	10	43.48%

Equity Investment Rating Distribution: Non-Ferrous Metals/Mining & Minerals Group (as of 30 Jun 2019)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	62	56.36%	Buy	25	40.32%
Hold	20	18.18%	Hold	12	60.00%
Sell	28	25.45%	Sell	13	46.43%

Equity Investment Rating Distribution: Utilities Group (as of 30 Jun 2019)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	61	44.20%	Buy	47	77.05%
Hold	42	30.43%	Hold	30	71.43%
Sell	35	25.36%	Sell	27	77.14%

Equity Investment Rating Distribution: Global Group (as of 30 Jun 2019)

Coverage Universe	Count	Percent	Inv. Banking Relationships*	Count	Percent
Buy	1516	51.23%	Buy	942	62.14%
Hold	687	23.22%	Hold	431	62.74%
Sell	756	25.55%	Sell	380	50.26%

* Issuers that were investment banking clients of BofA Merrill Lynch or one of its affiliates within the past 12 months. For purposes of this Investment Rating Distribution, the coverage universe includes only stocks. A stock rated Neutral is included as a Hold, and a stock rated Underperform is included as a Sell.

FUNDAMENTAL EQUITY OPINION KEY: Opinions include a Volatility Risk Rating, an Investment Rating and an Income Rating. *VOLATILITY RISK RATINGS*, indicators of potential price fluctuation, are: A - Low, B - Medium and C - High. *INVESTMENT RATINGS* reflect the analyst's assessment of a stock's: (i) absolute total return potential and (ii) attractiveness for investment relative to other stocks within its *Coverage Cluster* (defined below). There are three investment ratings: 1 - Buy stocks are expected to have a total return of at least 10% and are the most attractive stocks in the coverage cluster; 2 - Neutral stocks are expected to remain flat or increase in value and are less attractive than Buy rated stocks and 3 - Underperform stocks are the least attractive stocks in a coverage cluster. Analysts assign investment ratings considering, among other things, the 0-12 month total return expectation for a stock and the firm's guidelines for ratings dispersions (shown in the table below). The current price objective for a stock should be referenced to better understand the total return expectation at any given time. The price objective reflects the analyst's view of the potential price appreciation (depreciation).

Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster*
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

* Ratings dispersions may vary from time to time where BofA Merrill Lynch Research believes it better reflects the investment prospects of stocks in a Coverage Cluster.

***INCOME RATINGS*, indicators of potential cash dividends, are: 7 - same/higher (dividend considered to be secure), 8 - same/lower (dividend not considered to be secure) and 9 - pays no cash dividend.** *Coverage Cluster* is comprised of stocks covered by a single analyst or two or more analysts sharing a common industry, sector, region or other classification(s). A stock's coverage cluster is included in the most recent BofA Merrill Lynch report referencing the stock.

Price charts for the securities referenced in this research report are available at https://pricecharts.baml.com, or call 1-800-MERRILL to have them mailed.
BofAS or one of its affiliates acts as a market maker for the equity securities recommended in the report: ABB, National Grid, Royal Dutch Shell A, Royal Dutch Shell B, Total.
BofAS or an affiliate was a manager of a public offering of securities of this issuer within the last 12 months: EDF, Schneider, Total SA.
The issuer is or was, within the last 12 months, an investment banking client of BofAS and/or one or more of its affiliates: ABB Ltd., Centrica plc, Drax Group Ltd, EDF, Enel SpA, Glencore Plc, Iberdrola, National Grid, Norilsk Nickel, Orsted, Rolls Royce, Royal Dtch Shell, RWE, Schneider, Siemens, Siemens Gamesa, SSE, Total SA.
BofAS or an affiliate has received compensation from the issuer for non-investment banking services or products within the past 12 months: ABB Ltd., Centrica plc, Drax Group Ltd, EDF, Enel SpA, Eramet, Glencore Plc, Iberdrola, National Grid, Norilsk Nickel, Prysmian, Rolls Royce, Royal Dtch Shell, RWE, Schneider, Siemens, Siemens Gamesa, SSE, Total SA, Vestas.
The issuer is or was, within the last 12 months, a non-securities business client of BofAS and/or one or more of its affiliates: ABB Ltd., Centrica plc, Drax Group Ltd, EDF, Enel SpA, Eramet, Glencore Plc, Iberdrola, National Grid, Norilsk Nickel, Prysmian, Rolls Royce, Royal Dtch Shell, RWE, Schneider, Siemens, Siemens Gamesa, SSE, Total SA, Vestas.

In the US, retail sales and/or distribution of this report may be made only in states where these securities are exempt from registration or have been qualified for sale: Centrica plc, Drax Group Ltd, EDF, Enel SpA, Eramet, Glencore Plc, Iberdrola, Nexans, Norilsk Nickel, Orsted, Prysmian, Rolls Royce, RWE, Schneider, Siemens, Siemens Gamesa, SSE, Umicore, Vestas, Wartsila OYJ.
BofAS or an affiliate has received compensation for investment banking services from this issuer within the past 12 months: Drax Group Ltd, EDF, Enel SpA, Glencore Plc, Iberdrola, National Grid, Orsted, Rolls Royce, Royal Dtch Shell, RWE, Schneider, Siemens, Siemens Gamesa, SSE, Total SA.
BofAS or an affiliate expects to receive or intends to seek compensation for investment banking services from this issuer or an affiliate of the issuer within the next three months: ABB Ltd., Centrica plc, Drax Group Ltd, EDF, Enel SpA, Glencore Plc, Iberdrola, National Grid, Norilsk Nickel, Rolls Royce, Royal Dtch Shell, RWE, Schneider, Siemens, Siemens Gamesa, SSE, Total SA.
BofAS together with its affiliates beneficially owns one percent or more of the common stock of this issuer. If this report was issued on or after the 9th day of the month, it reflects the ownership position on the last day of the previous month. Reports issued before the 9th day of a month reflect the ownership position at the end of the second month preceding the date of the report: Glencore Plc, National Grid, Royal Dtch Shell, Total SA.
BofAS or one of its affiliates is willing to sell to, or buy from, clients the common equity of the issuer on a principal basis: ABB, Centrica, National Grid, Rolls Royce, Royal Dutch Shell A, Royal Dutch Shell B, RWE, Siemens, SSE, Total.
The issuer is or was, within the last 12 months, a securities business client (non-investment banking) of BofAS and/or one or more of its affiliates: ABB Ltd., Centrica plc, Drax Group Ltd, EDF, Enel SpA, Glencore Plc, Iberdrola, National Grid, Rolls Royce, Royal Dtch Shell, RWE, Schneider, Siemens, Siemens Gamesa, SSE, Total SA.
Due to the nature of strategic analysis, the issuers or securities recommended or discussed in this report are not continuously followed. Accordingly, investors must regard this report as providing stand-alone analysis and should not expect continuing analysis or additional reports relating to such issuers and/or securities.
BofA Merrill Lynch Research Personnel (including the analyst(s) responsible for this report) receive compensation based upon, among other factors, the overall profitability of Bank of America Corporation, including profits derived from investment banking. The analyst(s) responsible for this report may also receive compensation based upon, among other factors, the overall profitability of the Bank's sales and trading businesses relating to the class of securities or financial instruments for which such analyst is responsible.

Other Important Disclosures

From time to time research analysts conduct site visits of covered issuers. BofA Merrill Lynch policies prohibit research analysts from accepting payment or reimbursement for travel expenses from the issuer for such visits.
Prices are indicative and for information purposes only. Except as otherwise stated in the report, for the purpose of any recommendation in relation to: (i) an equity security, the price referenced is the publicly traded price of the security as of close of business on the day prior to the date of the report or, if the report is published during intraday trading, the price referenced is indicative of the traded price as of the date and time of the report; or (ii) a debt security (including equity preferred and CDS), prices are indicative as of the date and time of the report and are from various sources including Bank of America Merrill Lynch trading desks.
The date and time of completion of the production of any recommendation in this report shall be the date and time of dissemination of this report as recorded in the report timestamp.

Recipients who are not institutional investors or market professionals should seek the advice of their independent financial advisor before considering information in this report in connection with any investment decision, or for a necessary explanation of its contents.
Officers of BofAS or one or more of its affiliates (other than research analysts) may have a financial interest in securities of the issuer(s) or in related investments.
BofA Merrill Lynch Global Research policies relating to conflicts of interest are described at https://rsch.baml.com/coi
"BofA Merrill Lynch" includes BofA Securities, Inc. ("BofAS"), Merrill Lynch, Pierce, Fenner & Smith Incorporated ("MLPF&S") and its affiliates. Investors should contact their BofA Merrill Lynch representative or Merrill Lynch Global Wealth Management financial advisor if they have questions concerning this report or concerning the appropriateness of any investment idea described herein for such investor. "BofA Merrill Lynch" and "Merrill Lynch" are each global brands for BofA Merrill Lynch Global Research.
Information relating to Non-US affiliates of BofA Merrill Lynch and Distribution of Affiliate Research Reports:
BofAS and/or MLPF&S or may in the future distribute, information of the following non-US affiliates in the US (short name: legal name, regulator): Merrill Lynch (South Africa): Merrill Lynch South Africa (Pty) Ltd., regulated by The Financial Service Board; MLI (UK): Merrill Lynch International, regulated by the Financial Conduct Authority (FCA) and the Prudential Regulation Authority (PRA); BofASE (France): BofA Securities Europe SA is authorized by the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and regulated by the ACPR and the Autorité des Marchés Financiers (AMF); BAMLI DAC (Milan): Bank of America Merrill Lynch International DAC, Milan Branch, regulated by the Bank of Italy, the European Central Bank (ECB) and the Central Bank of Ireland (CBI); Merrill Lynch (Australia): Merrill Lynch Equities (Australia) Limited, regulated by the Australian Securities and Investments Commission; Merrill Lynch (Hong Kong): Merrill Lynch (Asia Pacific) Limited, regulated by the Hong Kong Securities and Futures Commission (HKSFC); Merrill Lynch (Singapore): Merrill Lynch (Singapore) Pte Ltd, regulated by the Monetary Authority of Singapore (MAS); Merrill Lynch (Canada): Merrill Lynch Canada Inc, regulated by the Investment Industry Regulatory Organization of Canada; Merrill Lynch (Mexico): Merrill Lynch Mexico, SA de CV, Casa de Bolsa, regulated by the Comisión Nacional Bancaria y de Valores; Merrill Lynch (Argentina): Merrill Lynch Argentina SA, regulated by Comisión Nacional de Valores; Merrill Lynch (Japan): Merrill Lynch Japan Securities Co., Ltd., regulated by the Financial Services Agency; Merrill Lynch (Seoul): Merrill Lynch International, LLC Seoul Branch, regulated by the Financial Supervisory Service; Merrill Lynch (Taiwan): Merrill Lynch Securities (Taiwan) Ltd., regulated by the Securities and Futures Bureau; DSP Merrill Lynch (India): DSP Merrill Lynch Limited, regulated by the Securities and Exchange Board of India; Merrill Lynch (Indonesia): PT Merrill Lynch Sekuritas Indonesia, regulated by Otoritas Jasa Keuangan (OJK); Merrill Lynch (Israel): Merrill Lynch Israel Limited, regulated by Israel Securities Authority; Merrill Lynch (Russia): OOO Merrill Lynch Securities, Moscow, regulated by the Central Bank of the Russian Federation; Merrill Lynch (DIFC): Merrill Lynch International (DIFC Branch), regulated by the Dubai Financial Services Authority (DFSA); Merrill Lynch (Spain): Merrill Lynch Capital Markets Espana, S.A.S.V., regulated by Comisión Nacional del Mercado De Valores; Merrill Lynch (Brazil): Bank of America Merrill Lynch Banco Multiplo S.A., regulated by Comissão de Valores Mobiliários; Merrill Lynch KSA Company: Merrill Lynch Kingdom of Saudi Arabia Company, regulated by the Capital Market Authority.
This information: has been approved for publication and is distributed in the United Kingdom (UK) to professional clients and eligible counterparties (as each is defined in the rules of the FCA and the PRA) by MLI (UK), which is authorized by the PRA and regulated by the FCA and the PRA - details about the extent of our regulation by the FCA and PRA are available from us on request; has been approved for publication and is distributed in the European Economic Area (EEA) by BofASE (France), which is authorized by the ACPR and regulated by the ACPR and the AMF; has been considered and distributed in Japan by Merrill Lynch (Japan), a registered securities dealer under the Financial Instruments and Exchange Act in Japan, or its permitted affiliates; is issued and distributed in Hong Kong by Merrill Lynch (Hong Kong) which is regulated by HKSFC; is issued and distributed in Taiwan by Merrill Lynch (Taiwan); is issued and distributed in India by DSP Merrill Lynch (India); and is issued and distributed in Singapore to institutional investors and/or accredited investors (each as defined under the Financial Advisers Regulations) by Merrill Lynch (Singapore) (Company Registration No 198602883D). Merrill Lynch (Singapore) is regulated by MAS. Bank of America N.A., Australian Branch (ARBN 064 874 531), AFS License 412901 (BANA Australia) and Merrill Lynch Equities (Australia) Limited (ABN 65 006 276 795), AFS License 235132 (MLEA) distribute this information in Australia only to 'Wholesale' clients as defined by s.761G of the Corporations Act 2001. With the exception of BANA Australia, neither MLEA nor any of its affiliates involved in preparing this information is an Authorised Deposit-Taking Institution under the Banking Act 1959 nor regulated by the Australian Prudential Regulation Authority. No approval is required for publication or distribution of this information in Brazil and its local distribution is by Merrill Lynch (Brazil) in accordance with applicable regulations. Merrill Lynch (DIFC) is authorized and regulated by the DFSA. Information prepared and issued by Merrill Lynch (DIFC) is done so in accordance with the requirements of the DFSA conduct of business rules. Bank of America Merrill Lynch International DAC, Frankfurt Branch (BAMLI DAC (Frankfurt)) distributes this information in Germany and is regulated by BaFin, the ECB and the CBI. BofA Merrill Lynch entities, including BAMLI DAC and BofASE (France), may outsource/delegate the marketing and/or provision of certain research services or aspects of research services to other branches or members of the BofA Merrill Lynch group. You may be contacted by a different BofA Merrill Lynch entity acting for and on behalf of your service provider where permitted by applicable law. This does not change your service provider. Please use this link http://www.bankofamerica.com/emaildisclaimer for further information.
This information has been prepared and issued by BofAS and/or one or more of its non-US affiliates. The author(s) of this information may not be licensed to carry on regulated activities in your jurisdiction and, if not licensed, do not hold themselves out as being able to do so. BofAS and/or MLPF&S is the distributor of this information in the US and accepts full responsibility for information distributed to BofAS and/or MLPF&S clients in the US by its non-US affiliates. Any US person receiving this information and wishing to effect any transaction in any security discussed herein should do so through BofAS and/or MLPF&S and not such foreign affiliates. Hong Kong recipients of this information should contact Merrill Lynch (Asia Pacific) Limited in respect of any matters relating to dealing in securities or provision of specific advice on securities or any other matters arising from, or in connection with, this information. Singapore recipients of this information should contact Merrill Lynch (Singapore) Pte Ltd in respect of any matters arising from, or in connection with, this information.

General Investment Related Disclosures:

Taiwan Readers: Neither the information nor any opinion expressed herein constitutes an offer or a solicitation of an offer to transact in any securities or other financial instrument. No part of this report may be used or reproduced or quoted in any manner whatsoever in Taiwan by the press or any other person without the express written consent of BofA Merrill Lynch.

This document provides general information only, and has been prepared for, and is intended for general distribution to, BofA Merrill Lynch clients. Neither the information nor any opinion expressed constitutes an offer or an invitation to make an offer, to buy or sell any securities or other financial instrument or any derivative related to such securities or instruments (e.g., options, futures, warrants, and contracts for differences). This document is not intended to provide personal investment advice and it does not take into account the specific investment objectives, financial situation and the particular needs of, and is not directed to, any specific person(s). This document and its content do not constitute, and should not be considered to constitute, investment advice for purposes of ERISA, the US tax code, the Investment Advisers Act or otherwise. Investors should seek financial advice regarding the appropriateness of investing in financial instruments and implementing investment strategies discussed or recommended in this document and should understand that statements regarding future prospects may not be realized. Any decision to purchase or subscribe for securities in any offering must be based solely on existing public information on such security or the information in the prospectus or other offering document issued in connection with such offering, and not on this document.

Securities and other financial instruments referred to herein, or recommended, offered or sold by BofA Merrill Lynch, are not insured by the Federal Deposit Insurance Corporation and are not deposits or other obligations of any insured depository institution (including, Bank of America, N.A.). Investments in general and, derivatives, in particular, involve numerous risks, including, among others, market risk, counterparty default risk and liquidity risk. No security, financial instrument or derivative is suitable for all investors. In some cases, securities and other financial instruments may be difficult to value or sell and reliable information about the value or risks related to the security or financial instrument may be difficult to obtain. Investors should note that income from such securities and other financial instruments, if any, may fluctuate and that price or value of such securities and instruments may rise or fall and, in some cases, investors may lose their entire principal investment. Past performance is not necessarily a guide to future performance. Levels and basis for taxation may change.

This report may contain a short-term trading idea or recommendation, which highlights a specific near-term catalyst or event impacting the issuer or the market that is anticipated to have a short-term price impact on the equity securities of the issuer. Short-term trading ideas and recommendations are different from and do not affect a stock's fundamental equity rating, which reflects both a longer term total return expectation and attractiveness for investment relative to other stocks within its Coverage Cluster. Short-term trading ideas and recommendations may be more or less positive than a stock's fundamental equity rating.

BofA Merrill Lynch is aware that the implementation of the ideas expressed in this report may depend upon an investor's ability to "short" securities or other financial instruments and that such action may be limited by regulations prohibiting or restricting "shortselling" in many jurisdictions. Investors are urged to seek advice regarding the applicability of such regulations prior to executing any short idea contained in this report.

Foreign currency rates of exchange may adversely affect the value, price or income of any security or financial instrument mentioned herein. Investors in such securities and instruments, including ADRs, effectively assume currency risk.

UK Readers: The protections provided by the U.K. regulatory regime, including the Financial Services Scheme, do not apply in general to business coordinated by BofA Merrill Lynch entities located outside of the United Kingdom.

BofAS or one of its affiliates is a regular issuer of traded financial instruments linked to securities that may have been recommended in this report. BofAS or one of its affiliates may, at any time, hold a trading position (long or short) in the securities and financial instruments discussed in this report.

BofA Merrill Lynch, through business units other than BofA Merrill Lynch Global Research, may have issued and may in the future issue trading ideas or recommendations that are inconsistent with, and reach different conclusions from, the information presented herein. Such ideas or recommendations may reflect different time frames, assumptions, views and analytical methods of the persons who prepared them, and BofA Merrill Lynch is under no obligation to ensure that such other trading ideas or recommendations are brought to the attention of any recipient of this information.

In the event that the recipient received this information pursuant to a contract between the recipient and BofAS for the provision of research services for a separate fee, and in connection therewith BofAS may be deemed to be acting as an investment adviser, such status relates, if at all, solely to the person with whom BofAS has contracted directly and does not extend beyond the delivery of this report (unless otherwise agreed specifically in writing by BofAS If such recipient uses the services of BofAS in connection with the sale or purchase of a security referred to herein, BofAS may act as principal for its own account or as agent for another person. BofAS is and continues to act solely as a broker-dealer in connection with the execution of any transactions, including transactions in any securities referred to herein.

Copyright and General Information:

Materials prepared by BofA Merrill Lynch Global Research personnel are based on public information. Facts and views presented in this material have not been reviewed by, and may not reflect information known to, professionals in other business areas of BofA Merrill Lynch, including investment banking personnel. BofA Merrill Lynch has established information barriers between BofA Merrill Lynch Global Research and certain business groups. As a result, BofA Merrill Lynch does not disclose certain client relationships with, or compensation received from, such issuers.

To the extent this material discusses any legal proceeding or issues, it has not been prepared as nor is it intended to express any legal conclusion, opinion or advice. Investors should consult their own legal advisers as to issues of law relating to the subject matter of this material. BofA Merrill Lynch Global Research personnel's knowledge of legal proceedings in which any BofA Merrill Lynch entity and/or its directors, officers and employees may be plaintiffs, defendants, co-defendants or co-plaintiffs with or involving issuers mentioned in this material is based on public information. Facts and views presented in this material that relate to any such proceedings have not been reviewed by, discussed with, and may not reflect information known to, professionals in other business areas of BofA Merrill Lynch in connection with the legal proceedings or matters relevant to such proceedings.

This information has been prepared independently of any issuer of securities mentioned herein and not in connection with any proposed offering of securities or as agent of any issuer of any securities. None of BofAS any of its affiliates or their research analysts has any authority whatsoever to make any representation or warranty on behalf of the issuer(s). BofA Merrill Lynch Global Research policy prohibits research personnel from disclosing a recommendation, investment rating, or investment thesis for review by an issuer prior to the publication of a research report containing such rating, recommendation or investment thesis.

Any information relating to the tax status of financial instruments discussed herein is not intended to provide tax advice or to be used by anyone to provide tax advice. Investors are urged to seek tax advice based on their particular circumstances from an independent tax professional.

The information herein (other than disclosure information relating to BofA Merrill Lynch and its affiliates) was obtained from various sources and we do not guarantee its accuracy. This information may contain links to third-party websites. BofA Merrill Lynch is not responsible for the content of any third-party website or any linked content contained in a third-party website. Content contained on such third-party websites is not part of this information and is not incorporated by reference. The inclusion of a link does not imply any endorsement by or any affiliation with BofA Merrill Lynch. Access to any third-party website is at your own risk, and you should always review the terms and privacy policies at third-party websites before submitting any personal information to them. BofA Merrill Lynch is not responsible for such terms and privacy policies and expressly disclaims any liability for them.

All opinions, projections and estimates constitute the judgment of the author as of the date of publication and are subject to change without notice. Prices also are subject to change without notice. BofA Merrill Lynch is under no obligation to update this information and BofA Merrill Lynch's ability to publish information on the subject issuer(s) in the future is subject to applicable quiet periods. You should therefore assume that BofA Merrill Lynch will not update any fact, circumstance or opinion contained herein.

Subject to the quiet period applicable under laws of the various jurisdictions in which we distribute research reports and other legal and BofA Merrill Lynch policy-related restrictions on the publication of research reports, fundamental equity reports are produced on a regular basis as necessary to keep the investment recommendation current.

Certain outstanding reports or investment opinions relating to securities, financial instruments and/or issuers may no longer be current. Always refer to the most recent research report relating to an issuer prior to making an investment decision.

In some cases, an issuer may be classified as Restricted or may be Under Review or Extended Review. In each case, investors should consider any investment opinion relating to such issuer (or its security and/or financial instruments) to be suspended or withdrawn and should not rely on the analyses and investment opinion(s) pertaining to such issuer (or its securities and/or financial instruments) nor should the analyses or opinion(s) be considered a solicitation of any kind. Sales persons and financial advisors affiliated with BofAS or any of its affiliates may not solicit purchases of securities or financial instruments that are Restricted or Under Review and may only solicit securities under Extended Review in accordance with firm policies.

Neither BofA Merrill Lynch nor any officer or employee of BofA Merrill Lynch accepts any liability whatsoever for any direct, indirect or consequential damages or losses arising from any use of this information.