COMPANY UPDATE

Automotive · US

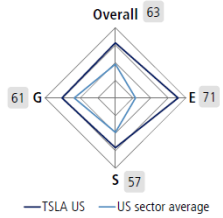
Tesla (TSLA.O/TSLA US)

Price as of Sep 30: US265

Record-high 3Q22 deliveries; Tesla AI Day 2

Trading data			
Mkt cap (US$bn)			831.2
Outstanding shares (mn)			3,133
Institutional ownership (%)			45.5
3M avg. daily trading (mn)			76.6
52-week trading range (US$)			206.9-414.5
Performance	**3M**	**6M**	**12M**
Absolute (%)	12.1	(18.3)	6.7
Relative (%)	17.6	0.4	23.8

ESG score card



Source: Refinitiv, KGI securities

Event

Tesla (US) held Tesla AI Day 2 event and reported 3Q22 deliveries of 343,830 units, up 35% QoQ and 42% YoY. The company's 3Q22 earnings call is scheduled for October 19.

Impact

Tesla AI Day 2 focus – Tesla Bot Optimus + FSD + ExaPod (Dojo Supercomputer). Tesla presented the latest prototype of its humanoid robot Optimus and shared hardware details. Designed for mass production, low cost, and high reliability, Optimus is scheduled to hit the market in 3-5 years at a cost of less than US$20k. Besides Optimus, Tesla revealed a full Dojo cabinet design and guides a few cabinets combined will create ExaPod, which will achieve over 1 exaFLOP of computing power at a reduced footprint and cost. The firm plans to build the first ExaPod, with a goal of seven in Palo Alto, CA in 1Q23, which would more than double its auto labeling capacity. Full Self Driving (FSD) and Autopilot improvements were also revealed at the event, and the firm has scheduled wide release of FSD beta at end-2022.

Record-high 3Q22 deliveries, but 4% below consensus, with surge of cars in transit. Tesla's EV production grew 42% QoQ and 54% YoY to 365,923 units in 3Q22, versus EV deliveries of 343,830 units, up 35% QoQ and 42% YoY. 3Q22 deliveries fell short of our estimate and consensus by around 4%. Management notes the wider gap between production and deliveries of 22,093 units was due to a more even regional mix of vehicle builds each week in 3Q22, which led to an increase in cars in transit at end-3Q22. In view of freight capacity and cost considerations, Tesla will no longer pursue a quarter-end sales push strategy for all markets. As a result, we believe a 5-10% gap between production and deliveries could become the norm going forward.

Positive outlook intact. Our market observations leads us to believe the 3Q22 delivery shortfall was not a demand issue. The German-made Model Y became available for order in Taiwan in September, with a wait time of more than three months. We are positive on the firm's global capacity growth to address unmet demand. Gigafactory Shanghai, post 30% capacity upgrade in 3Q22, can now produce 22k EV per week, while Gigafactory Berlin recently exceeded the 2,000 units per week production threshold. This suggests Tesla's EV production run rate is now 37k units per week, supporting 4Q22 production of over 420k units. However, considering logistics and cars in transit, we slightly revise down our 4Q22 and 2022 delivery estimates to a respective 404k and 1.31mn units, up 31% and 40% YoY. We maintain 2021-24F EPS CAGR at 43%, on a shipment CAGR of 39%.

Key financials

	Dec-20A	Dec-21A	Dec-22F	Dec-23F	Dec-24F
Revenue (US$mn)	31,536	53,823	84,468	125,186	153,390
Gross profit (US$mn)	6,630	13,606	22,585	34,399	43,049
Operating profit (US$mn)	1,994	6,523	14,471	23,007	29,230
EBITDA (US$mn)	4,316	9,434	18,267	27,595	29,240
Net profit (US$mn)	2,424	7,654	14,285	20,385	24,907
EPS (US$)	0.75	2.71	4.12	5.88	7.19
Revenue growth (%)	28.3	70.7	56.9	48.2	22.5
EPS growth (%)	5,437.4	263.4	52.0	42.8	22.2
Gross margin (%)	21.0	25.3	26.7	27.5	28.1
Operating margin (%)	6.3	12.1	17.1	18.4	19.1
EBITDA margin (%)	13.7	17.5	21.6	22.0	19.1
Net debt to equity (%)	Net cash	Net cash	Net cash	Net cash	Net cash
Return on average equity (%)	4.3	20.0	27.8	28.4	26.0

Source: Company data, KGI Research estimates

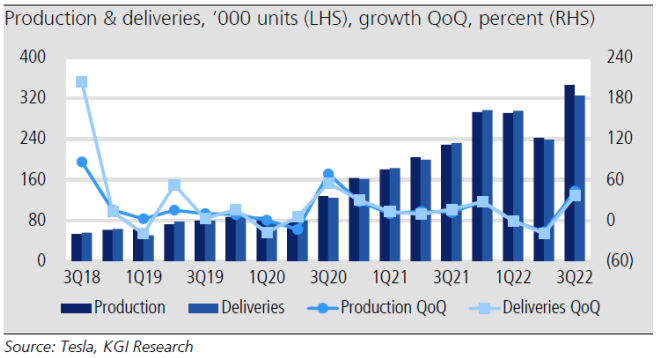
Tesla AI Day 2 takeaways

Tesla Bot Optimus unveiled, with delivery target of 3-5 years. Tesla presented the latest prototype of its humanoid robot Optimus and shared hardware details. Leveraging design discipline and manufacturing experience from electric vehicles and energy products, Tesla developed Optimus for mass production, low cost, and high reliability. Using Tesla SOC for its brain and the same computer vision neural network for Autopilot, Optimus is designed with simplified and integrated components and subsystems for manufacturing efficiency and power consumption minimization. For example, Tesla uses six types of actuators (three rotary and three linear) for the design of 28 unique structural actuators to support 200 degrees of movement freedom in its body, of which six support 11 degrees of movement freedom in its hands. Tesla plans to first test Optimus in Tesla factories and aims to make it available for sale within five years at a cost of less than US$20,000.

Worldwide release of FSD Beta at end-2022, subject to regulatory and testing. Tesla shared Full Self Driving (FSD) and Autopilot improvements at AI Day 2, noting the number of FSD Beta customers has increased from 2,000 a year ago to 160k. Via an updated automated 3D labeling system and simulator, Tesla has reduced 5.0mn hours of manual labeling to 12 hours per cluster for 10k trips, as well as synthetically creating images and simulating the environment a thousand times faster than in the traditional way. The firm expanded its training infrastructure by 40-50% to three in-house supercomputers, powered by 14k NVidia GPUs, caching 30PB worth of distributed videos.

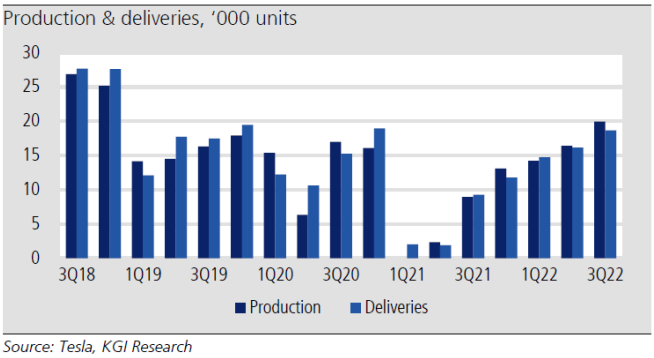
ExaPod, a Dojo supercomputer cluster, was revealed, with the first to be completed in 1Q23. Tesla revealed a full Dojo cabinet design and guides a few cabinets combined will create an ExaPod, which will have over 1 exaFLOP of computing power. Each Dojo cabinet will house two system trays that each hold six Dojo training tiles with extremely dense integration of high power, mechanical, and thermal design. The firm claims each Dojo tile could replace six GPU boxes with cost less than that of one GPU box, suggesting a significant improvement in footprint and cost. The firm plans to build the first ExaPod, with seven targeted in Palo Alto, CA in 1Q23, which would more than double its auto labeling capacity. Tesla envisions building a single unified and scalable Dojo accelerator for AI training, and does not rule out providing computing services to third parties in the future.

Figure 1: Models 3 & Y combined production & deliveries



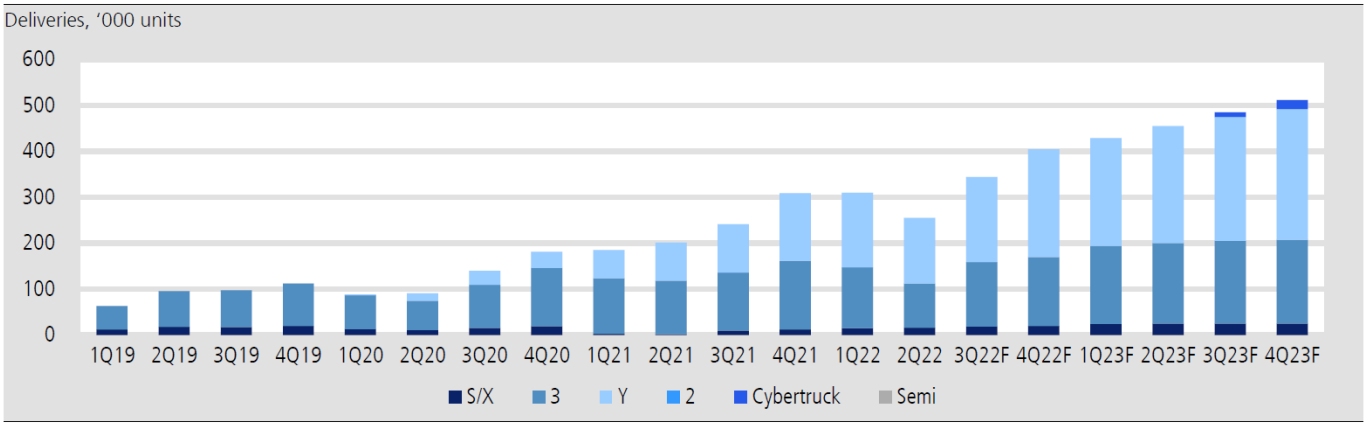
Source: Tesla, KGI Research

Figure 2: Models S & X combined production & deliveries



Source: Tesla, KGI Research

Figure 3: Model Y will serve as major growth driver over next two years



Source: Tesla; KGI Research

Figure 4: Peer comparison – Valuations

Company	Ticker	Market cap	Share price	EPS (LCY)			PE (x)			P/S (x)			EV/EBITDA (x)			ROE (%)			Total return (%)		
		(US$mn)	(LCY)	2021	2022F	2023F	2021	2022F	2023F	2021	2022F	2023F	2021	2022F	2023F	2021	2022F	2023F	3mo.	6mo.	1yr.
Tesla Inc*	TSLA.O	831,153	265.3	2.71	4.12	5.88	97.8	64.4	45.1	26.4	15.4	9.8	111.5	57.6	38.1	20.0	27.8	28.4	16.7	(26.6)	2.6
EV startup																					
Rivian Automot-A	RIVN.N	30,152	32.9	(22.98)	(6.89)	(5.62)	N.M.	N.M.	N.M.	548.2	16.4	4.7	N.M.	N.M.	N.M.	(40.1)	(39.8)	(53.6)	28.0	(29.1)	(67.2)
Lucid Group Inc	LCID.N	23,369	14.0	(2.93)	(1.17)	(1.07)	N.M.	N.M.	N.M.	862.0	30.8	8.3	N.M.	N.M.	N.M.	(101.5)	(49.5)	(81.8)	(17.8)	(43.2)	(43.2)
Nio Inc - Adr	NIO.N	26,343	15.8	(6.72)	(4.33)	(1.71)	N.M.	N.M.	N.M.	0.7	0.5	0.3	N.A.	N.M.	N.M.	(11.5)	(27.4)	(11.3)	(26.2)	(28.1)	(55.4)
Li Auto Inc -Adr	LI.N	24,060	23.0	(0.17)	(0.74)	1.55	N.M.	N.M.	14.8	0.9	0.5	0.2	N.M.	N.M.	43.4	(0.9)	(2.2)	3.7	(39.0)	(15.7)	(12.5)
Xpeng Inc-Adr	XPEV.N	10,299	12.0	(0.46)	(7.85)	(4.95)	N.M.	N.M.	N.M.	3.2	0.3	0.2	N.A.	N.M.	N.M.	(12.7)	(21.2)	(15.0)	(60.5)	(59.1)	(66.3)
Nikola Corp	NKLA.O	1,526	3.5	(1.73)	(1.22)	(1.06)	N.M.	N.M.	N.M.	N.A.	13.8	2.4	N.M.	N.M.	N.M.	(82.5)	(303.4)	(105.3)	(25.4)	(64.9)	(66.9)
Canoo Inc	GOEV.O	513	1.9	(1.52)	(1.92)	(1.38)	N.M.	N.M.	N.M.	N.A.	10.9	1.3	N.M.	N.M.	N.M.	(76.3)	N.A.	N.A.	(0.3)	(65.5)	(73.9)
OEM																					
Toyota Motor	7203.T	211,725	1,876.0	205.23	214.79	237.43	9.1	8.7	7.9	1.0	0.9	0.8	10.8	12.2	10.9	11.2	11.0	11.1	(9.2)	(14.9)	(3.4)
Byd Co Ltd-H	1211.HK	91,370	194.4	1.06	3.29	5.26	183.4	59.2	37.0	3.4	1.9	1.4	35.0	23.7	17.9	4.7	9.4	13.5	(38.1)	(13.6)	(20.0)
Volkswagen Ag	VOWG_p.DE	74,444	126.4	29.61	34.33	33.50	4.3	3.7	3.8	0.3	0.3	0.3	7.8	5.5	5.5	11.2	11.7	10.4	(0.8)	(15.6)	(31.3)
Mercedes-Benz Gr	MBGn.DE	54,981	52.4	21.50	11.53	11.31	2.4	4.5	4.6	0.4	0.4	0.4	7.4	7.4	6.8	16.3	17.3	14.5	(4.8)	(10.9)	(12.7)
General Motors C	GM.N	46,789	32.1	6.78	6.81	6.24	4.7	4.7	5.1	0.4	0.3	0.3	6.5	11.3	10.5	17.2	16.1	12.1	(0.1)	(25.1)	(39.5)
Ford Motor Co	F.N	45,027	11.2	4.49	2.05	1.91	2.5	5.5	5.8	0.3	0.3	0.3	9.9	11.0	10.3	45.1	13.9	14.3	(0.1)	(31.6)	(18.8)
Bmw Ag	BMWG.DE	45,264	70.0	18.77	21.59	14.02	3.7	3.2	5.0	0.4	0.3	0.3	6.9	6.4	6.3	18.2	17.0	10.9	(5.1)	(4.6)	(10.1)
Honda Motor Co	7267.T	39,309	3,137.0	411.09	443.62	504.28	7.6	7.1	6.2	0.4	0.3	0.3	7.3	7.4	6.8	7.6	7.0	7.5	(1.8)	(9.4)	(5.8)
Stellantis Nv	STLA.N	37,808	11.8	4.64	5.12	4.64	2.6	2.3	2.6	0.3	0.2	0.2	1.6	1.3	1.3	32.2	24.1	19.2	(4.5)	(21.7)	(32.8)
Hyundai Motor	005380.KS	29,822	176,500	18,992	32,623	31,597	9.3	5.4	5.6	0.4	0.3	0.3	11.8	9.1	9.3	7.2	10.6	9.2	(1.9)	(0.3)	(6.5)

** KGI estimates*

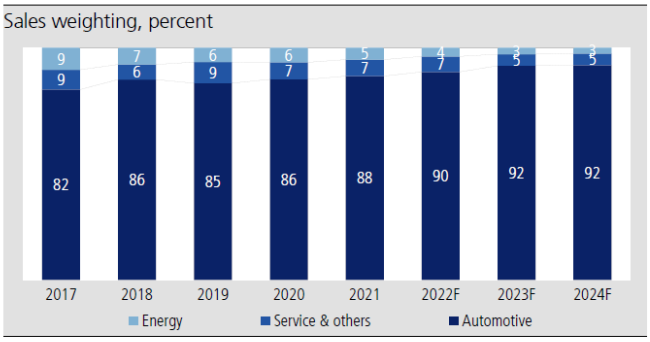
Source: Bloomberg; Refinitiv; KGI Research

Figure 5: Company profile

Established in 2003, Tesla was once a dedicated electric vehicle maker before entering the solar business when the company acquired SolarCity (US) in November 2016. As of 2021, Tesla was the largest EV vendor worldwide with sales of 936.2k units, representing 15% of EV market share. Headquartered in Austin, Texas, Tesla opened its first Gigafactory in Fremont, California in 2010, and has been starting its global expansion footprint since 2019. Gigafactory Shanghai commenced first deliveries in January 2020, while two more factories in Berlin and Texas are scheduled for first deliveries in 1H22.

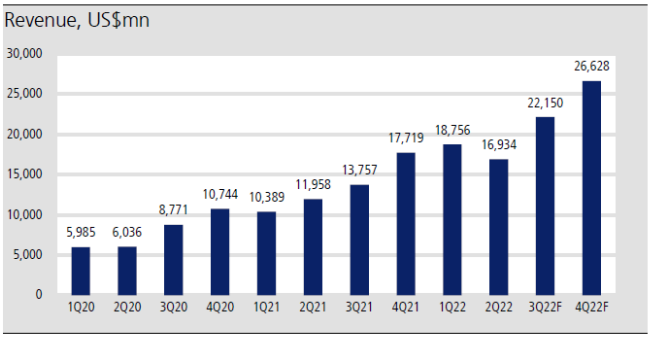
Source: Company data; KGI Research

Figure 6: Revenue mix



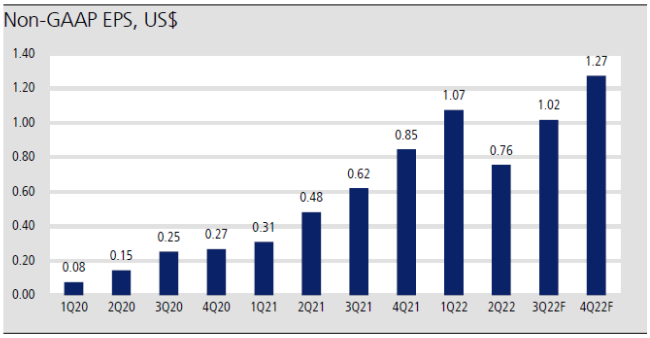
Source: Company data; KGI Research

Figure 7: Revenue



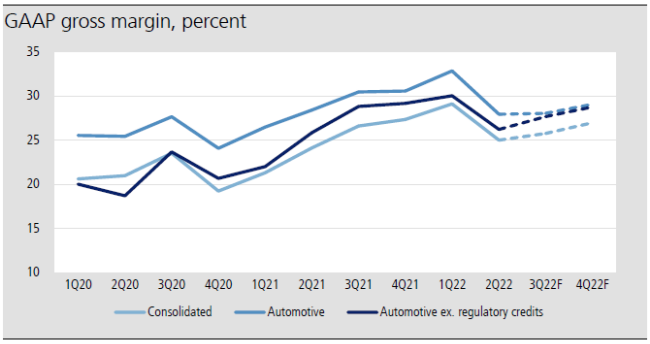
Source: Company data; KGI Research

Figure 8: Non-GAAP EPS



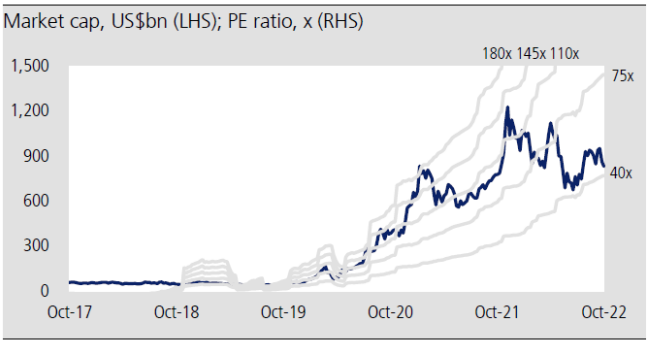
Source: Company data; KGI Research

Figure 9: GAAP gross margin



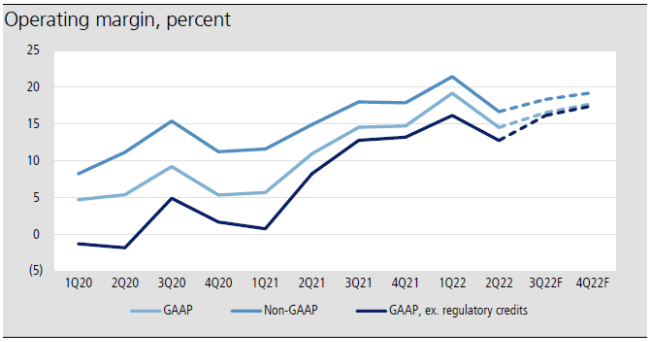
Source: Company data; KGI Research

Figure 10: 12M forward PE band



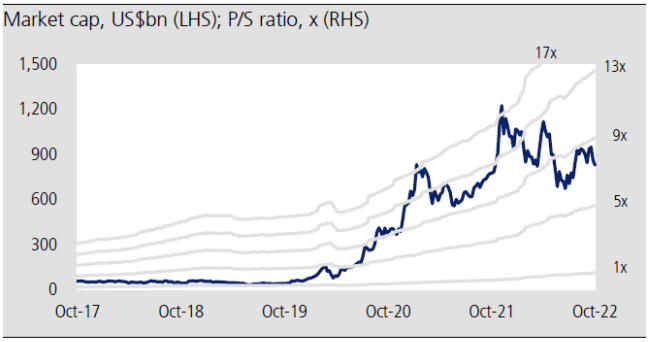
Source: Bloomberg; KGI Research

Figure 11: Operating margin



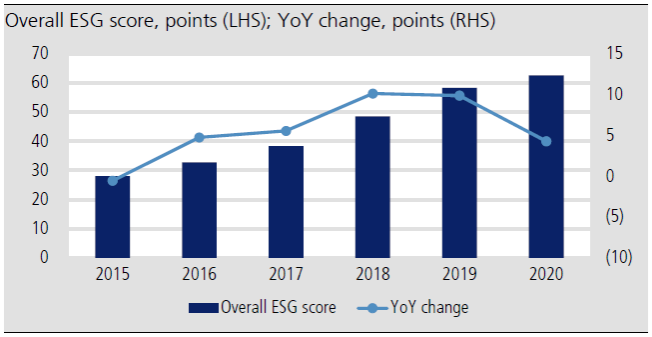
Source: Company data; KGI Research

Figure 12: 12M forward P/S band



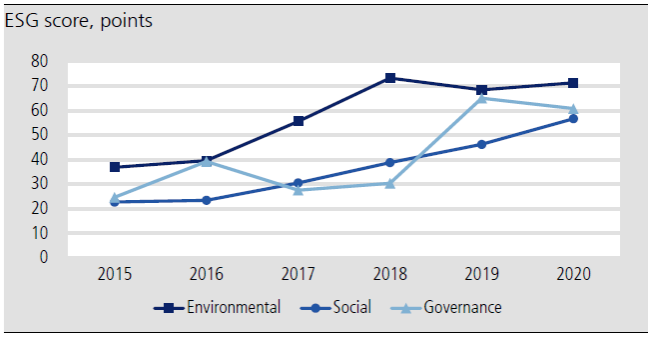
Source: Bloomberg; KGI Research

Figure 13: Overall ESG score



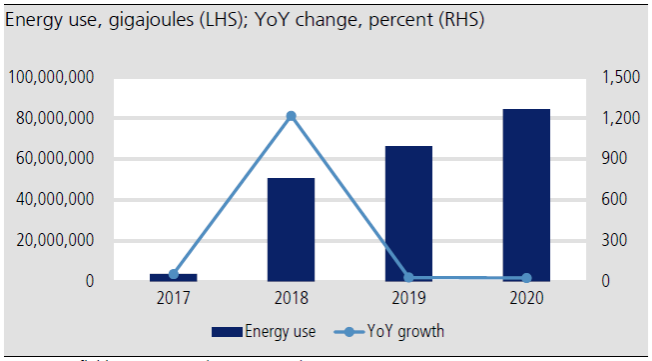
Source: Refinitiv; KGI Research; Company data

Figure 14: ESG score by category



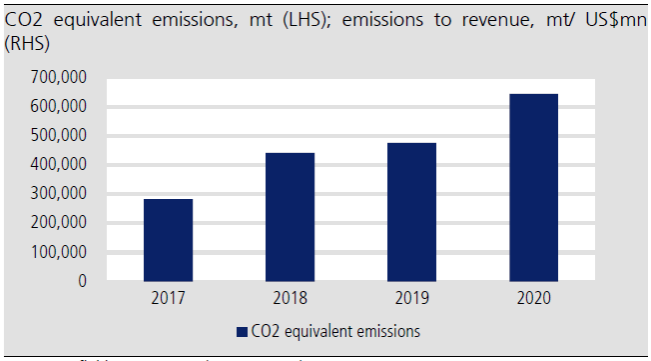
Source: Refinitiv; KGI Research; Company data

Figure 15: Energy use



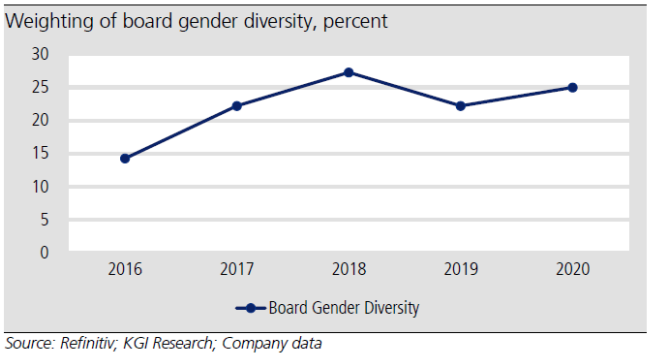
Source: Refinitiv; KGI Research; Company data

Figure 16: CO2 equivalent emissions



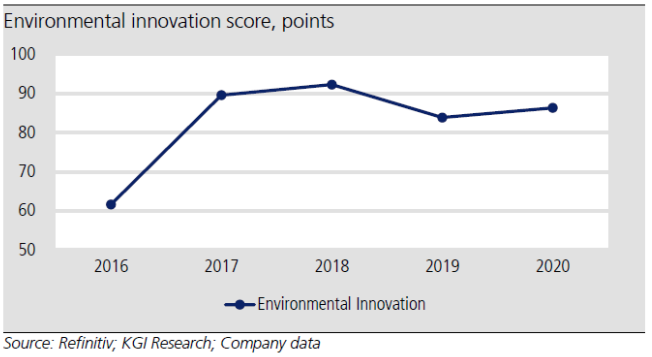
Source: Refinitiv; KGI Research; Company data

Figure 17: Board gender diversity



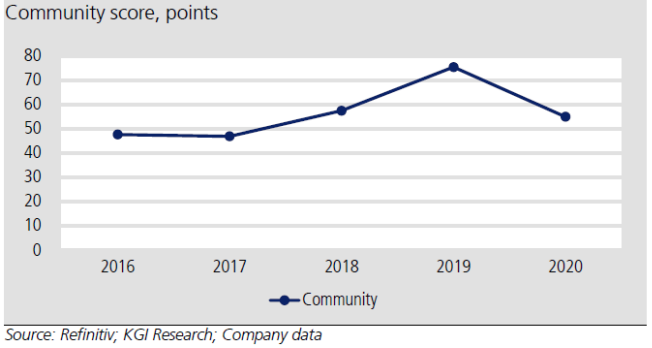
Source: Refinitiv; KGI Research; Company data

Figure 18: Environmental innovation



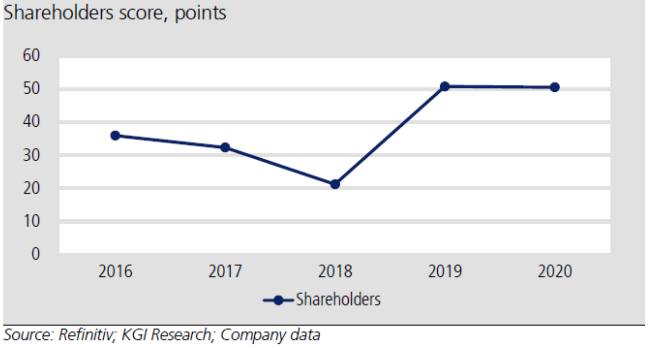
Source: Refinitiv; KGI Research; Company data

Figure 19: Community



Source: Refinitiv; KGI Research; Company data

Figure 20: Shareholders



Source: Refinitiv; KGI Research; Company data

Item	Definition
Energy use	Total direct and indirect energy consumption in gigajoules. - the total amount of energy that has been consumed within the boundaries of the company's operations - total energy use = total direct energy consumption + indirect energy consumption - purchased energy and produced energy are included in total energy use - for utilities, transmission/ grid loss as part of its business activities is considered as total energy consumed and data does not consider electricity produced to answer energy use (utility company produces to sell) - for utilities, raw materials such as coal, gas or nuclear used in the production of energy are not considered under 'total energy use'
Renewable energy purchased	Total primary renewable energy purchased in gigajoules. - energy consumed by the company from various sources and among the purchased energy, how much energy is renewable in nature (solar, wind, hydro, biomass, geothermal) are in scope - if there is no evidence that renewable energy is produced by the company, then we consider the reported energy figure as renewable energy purchased
Renewable energy use ratio	Renewable energy to total energy used
CO2 equivalent emissions	Direct CO2 and CO2 equivalent emissions in metric tons. - direct emissions from sources that are owned or controlled by the company (scope 1 emissions) - following gases are relevant: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCS), perfluorinated compound (PFCS), sulfur hexafluoride (SF6), nitrogen trifluoride (NF3)
CO2 equivalent emissions to sales	Direct CO2 and CO2 equivalent emissions (metric tons) to sales (NT$mn) - direct emissions from sources that are owned or controlled by the company (scope 1 emissions) - following gases are relevant: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCS), perfluorinated compound (PFCS), sulfur hexafluoride (SF6), nitrogen trifluoride (NF3)
Waste total	Total amount of waste produced in metric tons. - total waste = non-hazardous waste + hazardous waste - only solid waste is taken into consideration, exceptionally if liquid waste is reported in metric tons, then we do the summation to derive total including liquid waste - for sectors like mining, oil & gas, waste generation like tailings, waste rock, coal and fly ash are also considered
Waste recycling ratio	The waste recycling ratio as reported by the company. - waste recycling ratio = waste recycled/total waste*100 - waste to energy or waste incinerated with energy recovery are considered as waste recycled - waste recovered via composting is considered as recycled waste
Water withdrawal total	Total water withdrawal in cubic meters. - the total volume of water withdrawn from any water source that was either withdrawn directly by the reporting organization or through intermediaries such as water utilities - different sources of water like wells, town/utility/municipal water, river water, and surface water are considered
Environmental expenditures	Total amount of environmental expenditures. - all environmental investment & expenditures for environmental protection or to prevent, reduce, control environmental aspects, impacts, and hazards. It also includes disposal, treatment, sanitation, and clean-up expenditures
Turnover of employees	Percentage of employee turnover. - includes employees who left the company for any reason (voluntary or involuntary), such as resignations, retirement, natural departure/death, medical incapacitation, redundancy, layoffs, restructuring, dismissal, retrenchment or end of a fixed-term contract - employees turnover rate = (employees leaving/average number of employees)*100 - where the average number of employees = (employees at the end of the current year + employees at the end of the previous year)/2 - employees at the end of the current fiscal year = employees at the end of the previous fiscal year + new employees - employees leaving
Women managers	Percentage of women managers. - percentage of women managers among total managers of the company - if there is a breakdown by category in percentage, such as top, senior, middle, and junior management, then we consider the percentage of middle women managers - percentage of women managers = number of women managers/total number of managers*100
Women employees	Percentage of women employees. - percentage of women employees to the total number of employees of the company - percentage of women employees = number of women/total number of employees*100
Training hours total	Total training hours performed by all employees. - consider only employee training hours - includes all types of training given to general employees (such as health & safety, environmental, emergency response, skills & career development training) - if the value is given in days, multiply by 8, assuming that 1 day = 8 hours worked
Training hours per employee	Training hours per employee per year

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