
THE DEVIL'S ADVOCATE REPORT

December 28, 2022

ChargePoint Holdings, Inc.

(SELL)

Price:	\$8.25	Ticker:	CHPT
52-Week Range:	\$8.07-\$20.99	Dividend:	Zero
Shares Outstanding:	342 million	Yield:	Zero
Market Capitalization:	\$2.8 billion		

Data as of December 27, 2022



*Exclusive Marketers of
The Devil's Advocate Report*

PCS Research Services
100 Wall Street, 20th Floor
New York, NY 10005
research@pcsresearchservices.com
(212) 233-0100
www.pcsresearchservices.com



Research Team

	Murray Stahl		Steven Bregman	
Rich Begun	Thérèse Byars	Ryan Casey	James Davolos	Peter Doyle
Matthew Houk	Utako Kojima	Eric Sites	Fredrik Tjernstrom	Steven Tuen

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Investment Thesis

ChargePoint Holdings, with an \$3 billion market capitalization, is a rapidly growing company focusing on the buildout of the electric vehicle (EV) charging network infrastructure. Improving sales of EVs, partly driven by substantial government incentives, has resulted in strong demand for charging services, and the company's business model has, therefore, tended to favor revenue growth over profits. While that perhaps is understandable, the large and accelerating cash burn rates have now become a problem for ChargePoint.

With \$397 million in cash on hand and a burn rate of \$283 million in the past year (and accelerating), ChargePoint is on track for insolvency within approximately one year, unless it can raise additional capital. That said, given its revenue growth, the nascent state of the EV market and ample incentives from both the US and EU governments, ChargePoint most likely can raise new capital, although it might be expensive. More concerning is the deterioration in profitability measures, which shows no obvious path to profitability.

ChargePoint's free cash flow has been negative throughout its existence and it is currently on a run-rate exceeding a \$350 million annualized loss¹. For the past four fiscal years, its free cash flow as a percentage of revenue has ranged from -112% in FY2020 to an estimated -96% in FY2023², which seems to indicate that there are essentially no economies of scale, since revenues have risen 230%³. Rather, it seems, the more chargers that are installed and the more subscriptions that are sold, the greater the losses.

ChargePoint's gross margin declined slightly, from 22.5% in FY2021 to 22.2% in FY2022 but has narrowed more rapidly in the first three quarters of the current fiscal year, to just less than 17.0%. Even more concerning are the operating expenses, which have accounted for more than 100% of revenues in the past three fiscal years, as well as year-to-date. If there is a silver lining to be found, it is that the operating margin improved from -132% in FY2022 to -84% year to date, and -66% in the most recent quarter. That said, on a dollar-basis, the operating losses are greater than ever, and accelerating.

Despite taking on \$300 million of convertible debt in April 2022, by the end of October, ChargePoint's cash balance was essentially back to where it was at the end of the last fiscal year (January 31, 2022). Consequently, the debt issuance bought ChargePoint approximately one year of operations at current burn rates. Additional debt might be more difficult to raise, as well as dangerous from a leverage aspect. At prevailing interest rates, another \$300 million debt offering could result in total interest expenses that approach half of the annualized *gross* profit.

¹ Based on the last quarter annualized

² Represents the first three quarters of FY2023

³ Using Wall Street consensus estimates for the (current) final quarter of FY2023

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Instead, ChargePoint could attempt to raise new equity, but whether the valuation will remain close to 10x revenues, as it currently stands, appears highly uncertain, given the escalating losses. Even if the company is able to raise new equity or debt capital, the current market environment, in which investors seem to prefer profits over profitless revenue growth, is a distinct change from the prior capital-raising period of just a year ago. New stakeholders could prefer that ChargePoint focus more on profitability and deemphasize growth-at-all-cost. Sensible as that might be, the company's stock market valuation would probably not be sustained if its expansion were to moderate meaningfully.

The optimistic investment thesis hinges upon the rapid transition from internal combustion engines (ICE), which use gas stations to refuel, to EVs, some of which will use ChargePoint's network. While some market observers had estimated a rapid transition, such as the forecast that EVs will account for more than half of all new car sales in the U.K. by 2026, recent trends have not confirmed such forecasts. Rather, battery costs have increased in the last year, for the first time in over a decade, as commodity input prices have spiked, partly as a result of the increasing demand from EV manufacturers. Lithium, for example, is 15x more expensive than two years ago. Also, the rising cost of electricity has eradicated most of the comparative cost advantage of driving EVs.

Then there is the fact that EVs are generally circa \$20,000 more expensive than ICE vehicles, despite generous incentives. There are other practical considerations as well. Although homeowners might be more open to owning EVs, since they can charge them at home, apartment building dwellers might find it much more difficult to charge these vehicles. The relative inconvenience that it takes perhaps half an hour to charge an EV to 80% of its full capacity, versus the three minutes it might take to fill up a tank of gas, is also a factor. Finally, while range anxiety is one of the main concerns of would-be EV buyers, the auto companies are not focused on making larger batteries. Rather, they seem to prefer to reduce the size of the batteries, to keep the costs down. Whether that will impair EV sales remains to be seen. Still, the path to mass market adoption within the next decade is not obvious.

Since ChargePoint's Subscription revenues have declined greatly as a proportion of total revenues, it appears that the EV chargers have low utilization rates. ChargePoint is building relatively simple charging stations, in competition with dozens of similar competitors. The company barely makes a positive gross margin on these sales, but charging station companies in general appear to be too focused on offering the chargers essentially at cost to obtain market share. Since that has resulted in accelerating losses and a burn rate of 73% of revenues over the past 11 quarters, the viability of the business model must be questioned.

Ultimately, a company with accelerating losses that is focused on revenue growth at all cost, and with largely a non-differentiable product, will either run out of capital, dramatically reduce its growth rates to preserve capital, or dilute existing shareholders by issuing copious amounts of new equity to fund the losses. These appear to be the likely outcomes for ChargePoint, since no path to profitability is evident. Consequently, shares of ChargePoint are recommended for sale and short sale.

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Company Overview

ChargePoint Inc. is mainly focused on building a network of charging stations for electric vehicles. The company was founded in 2007 as Coulomb Technologies by Richard Lowenthal, Dave Baxter, Harjinder Bhade and Praveen Mandal —a group of entrepreneurs who had experience in technology and design from various global companies. None of the four co-founders is still with the company, and two of them have joined competitors. Mr. Bhade has been employed at Blink Charging for the past year and a half, as Chief Technology Officer, while Mr. Mandal worked at Volta Charging for the past three years, also as Chief Technology Officer.

In 2017, ChargePoint acquired 9,800 electric vehicle charging spots from General Electric. Prior to that, the company managed 34,900 charging stations across Mexico, Australia, Canada, and the United States. Then, over the next five years, the number of charge spots have quadrupled to around 200,000, partly driven by acquisitions. ChargePoint came public through a special-purpose acquisition company (SPAC) reverse merger in February 2021.

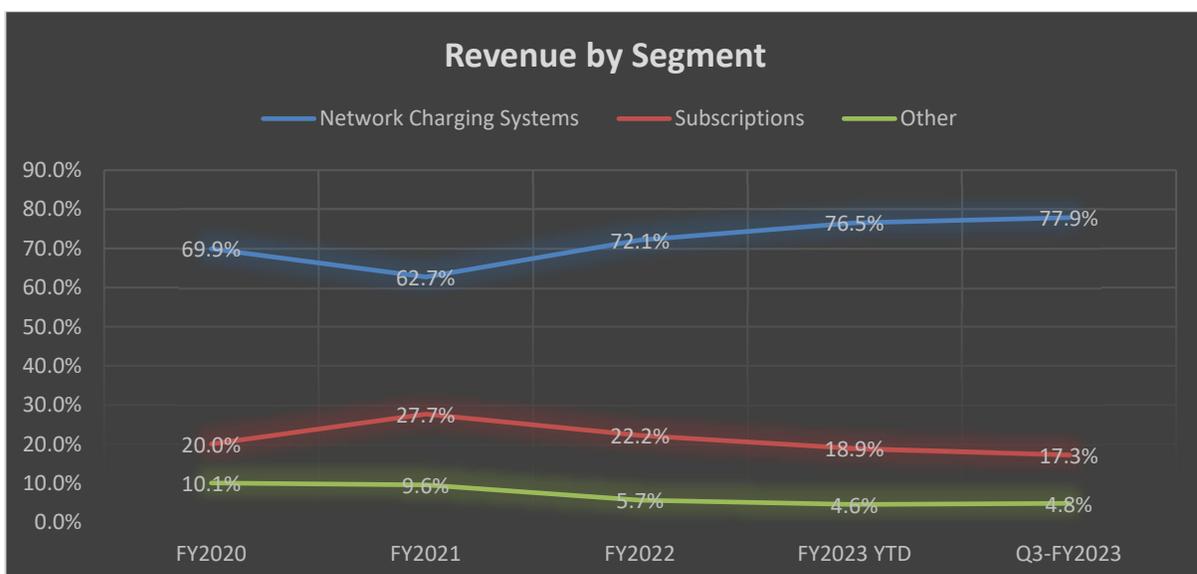
ChargePoint generates revenue from equipment sales (the charge points) in the US and Europe for all segments: commercial (retail, workplace, parking, recreation, education and highway fast charge), fleet (delivery, logistics, motor pool, transit and shared mobility) and residential (homes, apartments and condominiums). ChargePoint offers hardware for Level 2 AC and Level 3 DC charging, and does not sell these solutions without a Cloud Services subscription, which enable consumers to locate, reserve, authenticate and transact at EV charging sessions.

It also offers the cloud-based subscription services that allow operators of the units to charge the customers/clients/employees who use the charging devices. The company also provides an open platform that integrates with system hardware from ChargePoint as well as other manufacturers, connecting systems that provides real-time information about charging sessions. This enables commercial and fleet customers to manage charging in their parking lots and depots. In total, ChargePoint's roaming integrations enable EV drivers to access more than 300,000 additional charge ports in North America and Europe through ChargePoint's mobile and in-dash applications.

The company also generates revenues from selling an extended parts and labor warranty subscription, a service known as Assure. Assure includes proactive monitoring, expert advice and reporting services. Overall, the geographical breakdown of ChargePoint's revenues is as follows: North America accounts for approximately – 85% of revenues year to date, while 15% has been derived from Europe.

The vast majority of the company's revenues, 78% in the most recent quarter, is derived from selling network charging systems. These tend to have low gross margins, around 10-12% year to date. Most of the rest, or 17% in the most recent quarter, comes from subscription revenue:

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The subscription revenues generate considerably wider gross margins—around 38%, or three times the gross margins of the hardware business. That said, that segment obviously relies on the hardware business to expand, in a relationship similar to that of razors and razor blades.

ChargePoint estimates that the US will need 1.2 million public, 28 million private and over 100 million in-home charging stations by 2030, assuming 50% of the new vehicles are EVs. Consequently, the addressable market is potentially enormous. Yet, ChargePoint has not been able to turn profitable since its beginning in 2007. Rather, as of October 31, 2022, it had an accumulated deficit of \$1.08 billion, which is a substantial amount even when spread over 15 years. Yet, the trend is accelerating since, as of one year earlier, the accumulated deficit was just \$752 million. Therefore, while the market could develop in line with the company's projections, it is highly uncertain whether ChargePoint will still be a going concern by the year 2030.

A concerning development is that the more profitable subscription revenues have declined, as a percentage of overall sales. These accounted for 27.7% in FY2021 (ended Jan. 31, 2021) but only 17.3% in the most recent quarter. This indicates that the company is selling charge points faster than it can find users of those charge points. In fact, charge point revenues have increased more than 4x over this period while subscription revenues have just doubled. Thus, incremental charge points seem to have considerably lower utilization by subscribers.

In total, Subscriptions generated a gross profit of just \$8.3 million in the most recent quarter, while Equipment accounted for \$11.8 million⁴. Against this, operating expenses were \$102.7

⁴ 'Other revenue' generated a further \$2.6 million in gross profit

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million, which resulted in an operating loss of \$83.3 million in the third quarter alone. These losses have expanded greatly for the past two years. In FY2021, the operating loss was 'only' \$121 million, but the year-to-date losses are already \$263 million, as of the third quarter, and the run-rate, based on the most recently reported quarter, indicates \$333 million of annualized operating losses—a level that approximates ChargePoint's current cash on hand.

The EV Market

By calendar year 2021, most major manufacturers of passenger cars, trucks of all sizes, buses and industrial vehicles have committed to electrification, and governments have made it clear from both policy and funding perspectives that the future of transportation is electric.

It has been estimated that passenger EV sales will increase from 2.7% of new vehicles sold in 2019 to 43.2% in 2030 in the United States and Europe⁵. Additional factors propelling this shift to electrification include existing and proposed bans on the sale of ICE vehicles. The BNEF Report projects that the cumulative EV charging infrastructure investment in North America and Europe is expected to be approximately \$121 billion by 2030 and increase to approximately \$307 billion by 2040, which would be a 9.8% CAGR in the latter period.

Problematic Profit Margin and Cost of Capital Trends

ChargePoint continues to generate rapid revenue growth from selling EV charging stations, but is doing so at barely positive gross margins. While revenues expanded 93% y-o-y to \$125 million in the most recent quarter, gross profit increased just 41% to \$23 million. Against this, the company's operating expenses were \$106 million, which resulted in an \$83 million operating loss. Consequently, the run-rate operating loss is \$333 million. Not all of that is cash losses, since the company spends approximately \$100 million per year in share-based compensation.

The table below is from the most recent 10-Q:

⁵ According to the Bloomberg New Energy Finance Electric Vehicle Outlook (the BNEF Report)

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ChargePoint Holdings, Inc.
PRELIMINARY CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS
(In thousands, except per share amounts; unaudited)

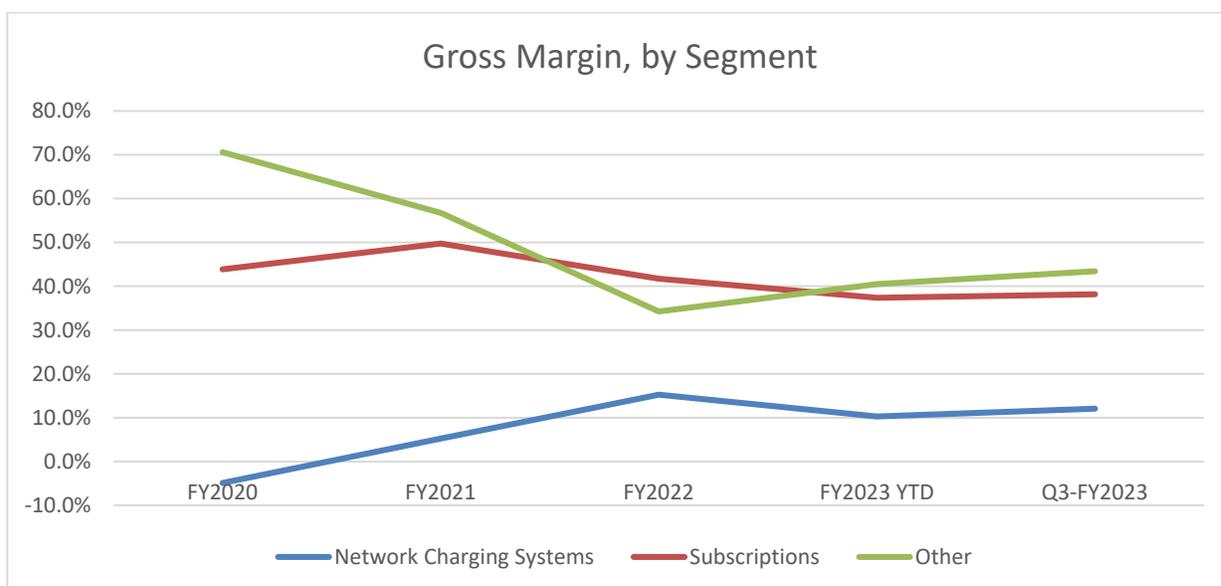
	Three Months Ended		Nine Months Ended	
	October 31		October 31	
	2022	2021	2022	2021
Revenue				
Networked charging systems	\$ 97,592	\$ 47,511	\$ 241,291	\$ 115,185
Subscriptions	21,670	13,397	59,561	36,303
Other	6,079	4,126	14,415	10,177
Total revenue	<u>125,341</u>	<u>65,034</u>	<u>315,267</u>	<u>161,665</u>
Cost of revenue				
Networked charging systems	85,821	38,720	216,439	97,846
Subscriptions	13,400	7,637	37,305	21,107
Other	3,439	2,621	8,581	6,662
Total cost of revenue	<u>102,660</u>	<u>48,978</u>	<u>262,325</u>	<u>125,615</u>
Gross profit	<u>22,681</u>	<u>16,056</u>	<u>52,942</u>	<u>36,050</u>
Operating expenses				
Research and development	48,132	36,751	148,237	102,535
Sales and marketing	35,382	24,361	101,842	62,258
General and administrative	22,445	20,268	66,339	57,467
Total operating expenses	<u>105,959</u>	<u>81,380</u>	<u>316,418</u>	<u>222,260</u>
Loss from operations	<u>(83,278)</u>	<u>(65,324)</u>	<u>(263,476)</u>	<u>(186,210)</u>

Source: ChargePoint FQ3'23 earnings release

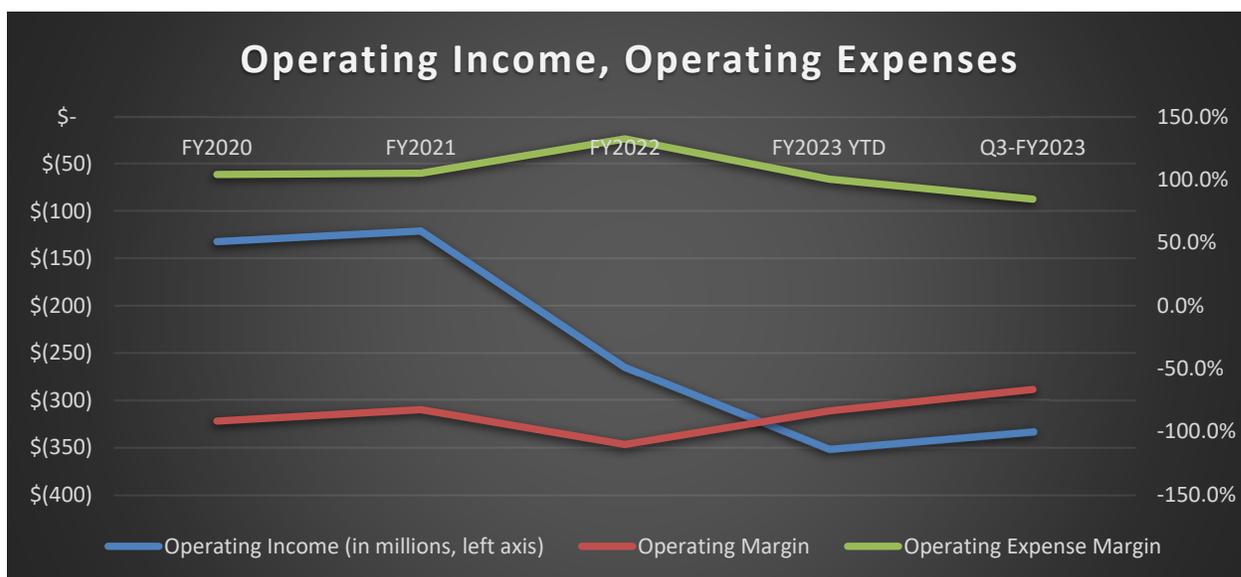
As the bottom row of the table indicates, the losses are escalating on a dollar basis. The gross profit only expanded by \$6.6 million y-o-y in the most recent quarter, while operating expenses surged \$24.6 million. This appears to be a significant problem with the ChargePoint business model.

While revenues increased 245% between the third quarter of FY2021 and the third quarter of FY2023, ChargePoint's gross margin did not improve meaningfully. In fact, the Subscriptions and Other segments' gross margins deteriorated while Network Charging Systems went from slightly negative to slightly positive:

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In total, the gross margin was just 16.8% in the first three quarters of FY2023 and 18.1% most recent quarter. However, as the chart below indicates, the operating expenses alone have exceeded 100% of revenues in each of FY2020, FY2021, FY2022 as well as YTD in FY2023:



(First three quarters and most recent quarter of FY2023 annualized for Operating Income)

While there was a slight improvement in the most recent quarter—operating expenses accounted for just 85% of revenues—the annualized operating losses remained at more than \$300 million. R&D expenses alone has accounted for 47% of the revenues generated YTD. This could be compared to 48% of revenues in FY2020 and 51% in FY2021, which indicates almost no improvement, despite the 245% increase in revenues since FY2020. Therefore, it

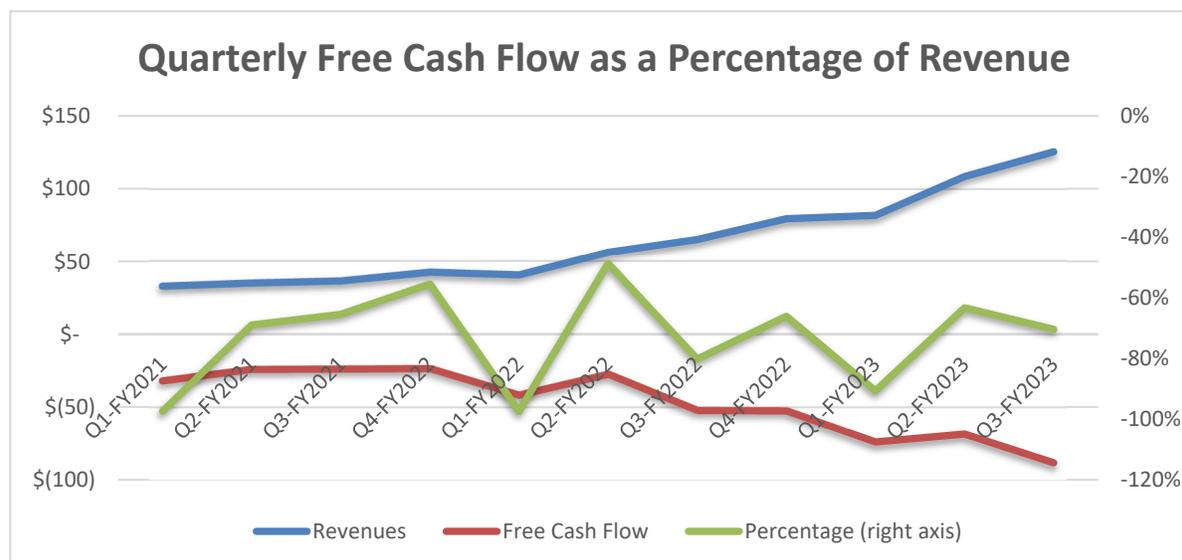
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is difficult to see a path to profitability for the company. Adding more debt, which it might have to, would further exacerbate the situation.

On a non-GAAP basis, the company's earnings are higher because of the use of stock-based compensation. ChargePoint paid out approximately \$26 million in the most recent quarter, for an annualized pace of around \$104 million, or close to a 3% annualized dilution to shareholders.

The company forecasts revenues of \$475 million to \$485 million for FY2023. If that were to materialize, that means that quarterly revenues would expand \$40 million sequentially, to \$165 million, for 108% y-o-y growth in the fourth quarter. Whether that is actually positive for the company depends on the composition of such revenues. If the growth is mainly derived from charging station sales, the losses would likely continue to escalate, since these are barely profitable on a gross margin basis.

While a boost to equipment sales should, in theory, lead to higher subscription revenues in the quarters ahead, the subscription segment never seems to catch up with the growth of charging stations. Rather, as discussed earlier, the revenues derived from the Subscription segment have declined from 28% of the total in FY2021 to 19% YTD. Therefore, ChargePoint will likely continue to lose \$80-\$90 million per quarter at current levels of revenue and most likely even more if revenues continue to increase. The chart below shows the inverse relationship between free cash flow and revenue for the past 11 quarters:



(Free cash flow in millions)

As the chart indicates, the quarterly free cash flow losses have accelerated in dollar terms but has remained relatively stable as a percentage of revenue. That said, when free cash flow averages a negative 73% of revenue over 11 consecutive quarters with no improvement in

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the trend despite a revenue increase of almost 300%, the company's business model must be called into question.

The \$300 million of convertible debt raised in April has an interest rate of 3.5% if the company pays in cash, or 5.0% if it pays 'in kind' (that is, pays interest through the issuance of additional notes). When that financing was announced, the shares traded at more than \$20, or twice of the current level. Given that, and the fact that the company's burn rate has increased greatly since April, coupled with the 4.0% increase in the Federal Funds rate since that time, another \$300 million debt issuance at the current time might cost the company 6%-7%.

Assuming that ChargePoint were to issue such debt, it then would have \$600 million of total debt, with an average interest rate of around 5%, or \$30 million per year of interest expenses. To put that into perspective, that would amount to around 42% of annualized gross profit⁶, which would further cloud the path to profitability.

Therefore, perhaps the company would prefer to issue equity to stave off insolvency. Since the company might need to raise \$500 million-\$1.0 billion⁷ or more, the total dilution would amount to around 15%-30%, which suggests that such an offering might have to be completed at a substantial discount to the prevailing share price. Yet, even \$500 million might only sustain ChargePoint for another twelve months, given its deteriorating burn rate.

Potential Product Obsolescence

At this early stage of a buildout of a national EV charging grid, the purchaser of ChargePoint's equipment is taking a risk that these units could become obsolete within just a few years. Since the long charging times of EVs is one of the main factors holding back potential buyers, the industry will probably attempt to develop charging technologies that charging within a time span that more closely resembles the experience of visiting a gas station. That is, a complete 100% recharge within just a few minutes. While there are enormous technological hurdles to get there, it is doubtful that EVs will be able to penetrate the mainstream market as long as both the price premium over ICE vehicles is as high and charge times are as long as they are.

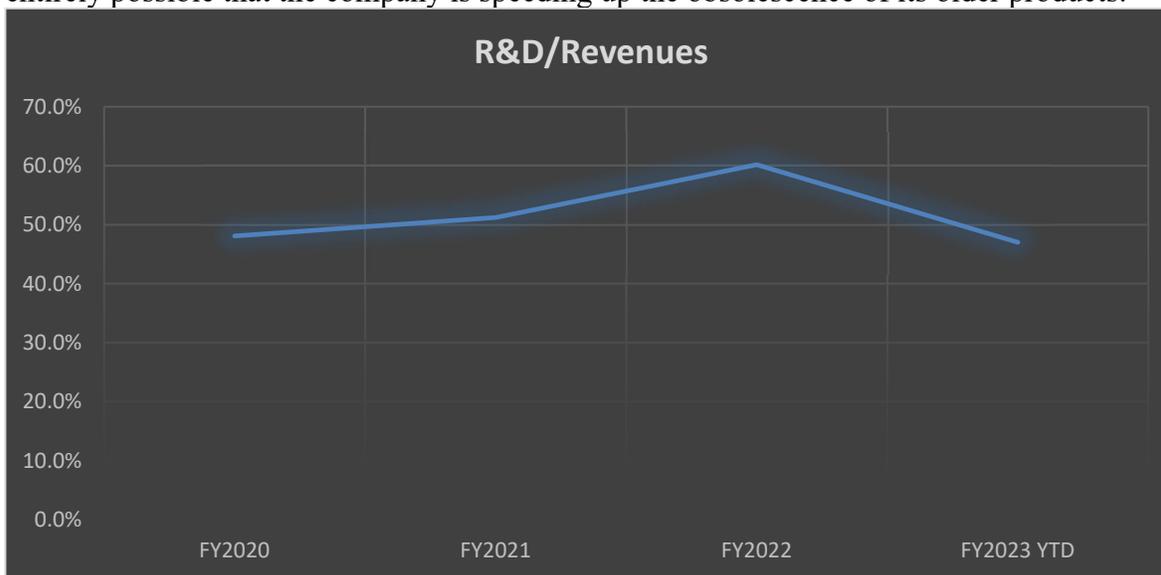
Hence, the EV ecosystem, perhaps with extra support from the governments, will probably focus intensely, over the next decade, on the development of breakthrough EV charging technologies. If so, ChargePoint's network of today might become entirely obsolete. While the company does not own or operate the vast majority of its charge points, its subscription model would likely falter if all of the existing charge points are replaced/upgraded with new equipment, perhaps from a number of different vendors, over the next decade.

⁶ Based on the annualized gross income generated in the first three quarters of FY2023

⁷ The company has filed a Shelf Offering of equity and debt capital up to \$1.0 billion

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Since ChargePoint spends around half of its revenues on Research & Development, it is entirely possible that the company is speeding up the obsolescence of its older products:



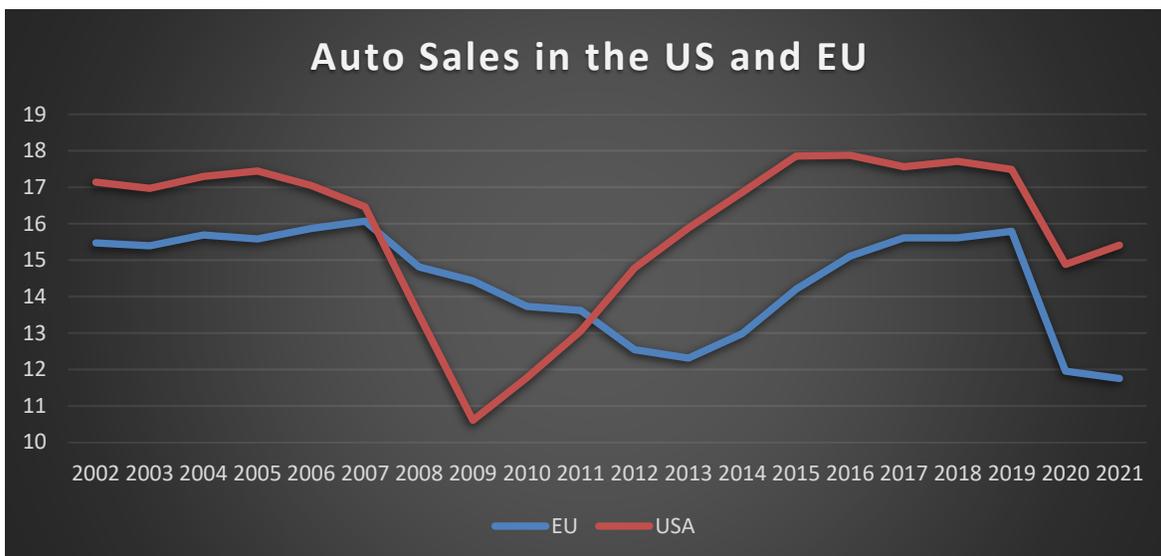
While it is impossible to predict the pace of development, if EVs are to represent the majority of new car sales within just 4-7 years, which is the forecast for most Western economies, it seems unlikely that the average EV driver at that time would be content to wait up to an hour to recharge their vehicles battery only up to 80%, when the corresponding ICE experience is so much more convenient.

Therefore, and most importantly, in understanding the possible trajectories of ChargePoint's ability to develop any scale economies and positive operating margins, rapid innovation is required in this area, and that ensures continued elevated R&D spending for ChargePoint, short product lifecycles, as well as a meaningful obsolescence risk for the buyers of the charge points.

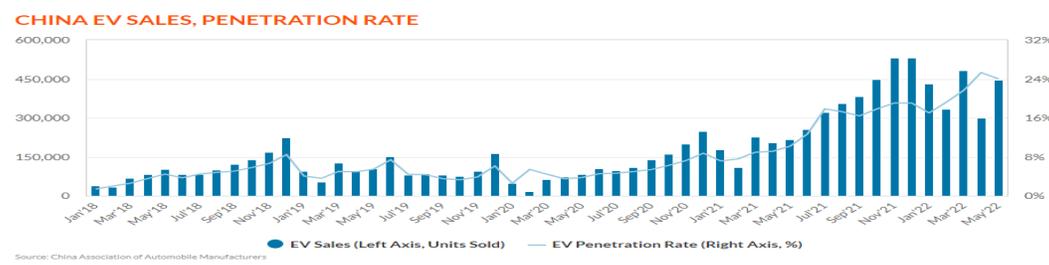
EVs Impacted by High Electricity Prices

There are many scenarios that could cause the actual EV adoption rate to deviate greatly from the consensus trajectory. On the supply side, it would require absolutely enormous amounts of commodities to produce EV batteries at the level that is required to replace ICE vehicles. In the US and EU, 33 million new cars were sold in 2002. Despite the populations increasing 17% and 5% over the past 20 years, the 20-year average is lower, at just 30.3 million new cars sold per year:

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In 2021, which of course was marked by the pandemic, combined auto sales in the US and EU were just 27.2 million units, or around 20% below the 2022 level. The Chinese auto market is almost exactly the same size, at around 27 million units. Although in China, the market has expanded 10-fold since 2002. EV penetration is estimated to be approximately 19% in Europe and 5% in the US. In China, the penetration rate has doubled in the last year:



The rapid increase in penetration rate in China is, of course, a strong contributor to the 15-fold increase in the price of lithium since November 2020. For the US, EU and China to reach a combined 50% EV penetration rate, approximately 27 million EVs would need to be sold in a given year, and that is assuming no overall growth in auto sales, despite the existing levels being depressed relative to historical levels, particularly given the population increase.

Assuming a normalization to perhaps 35 million of combined autos sold in the US and EU by 2030, and assuming a continuation of the growth trend in China, to perhaps 35 million units, then 35 million EVs would have to be sold—just in these three markets—per year. Presently, around 8.5 million EVs combined are sold in these three markets (annualized). Consequently, a quadrupling of EV sales might be required over the next seven years.

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Interestingly, these three markets accounted for the bulk of worldwide auto sales, which have been 64 million to 66 million units per year from 2020-2022, according to Statista⁸. Consequently, in 2021, the US, EU and China accounted for approximately 80% of the world's auto sales, despite having just 27% of the population. Should the rest of the world reach the same level of auto sales per capita, worldwide auto sales would increase approximately 190% to 185 million units⁹. Of course, then, 92.5 million EVs would need to be sold for a 50% penetration rate, which would be a ten-fold increase from current levels.

Because of the price sensitivity of the EV producers, and the relative unaffordability of EVs vis-à-vis ICE vehicles, commodity prices really cannot rise much further without causing another meaningful deterioration in affordability, as EVs would become even more expensive. However, the Institute for Sustainable Futures at the University of Technology Sydney, Australia last year estimated that the mining of cobalt for batteries will need to increase 300%–800%, while lithium production, used for electric cars (not counting its use for battery backup for the electric grid), will need to rise more than 2,000%. Production of elements such as nickel, dysprosium, and tellurium will need to increase 200%–600%.

Therefore, it appears unrealistic to expect prices of these metals to remain stable over the next decade, since a great number of new mines all over the world need to get permits, get funded, built and start producing commodities, which will then get refined at yet-to-be-built refineries of these metals.

On the demand side, there are many reasons that consumers might not be ready to embrace EVs. First, it generally takes 30-60 minutes to charge an EV battery up to 80%. Consumers are accustomed to filling up their gas tanks in 3-5 minutes, and that experience is simply not about to be replicated in the EV realm in the foreseeable future. There is also a significant convenience factor for apartment dwellers, particularly those with only one vehicle, who lack the homeowner's facility of charging an EV at home with a long, overnight, charge time. Even more concerning for would-be EV buyers, the average new EV cost \$65,041 in November 2022, according to Kelley Blue Book, compared to \$48,681 for an average new ICE car—a 34% premium. This affordability deficit could hold back mass-market demand and leave EVs price-competitive only in the high-end market segment.

Reuters recently published the results of an annual survey by *OC&C Strategy Consultants*, which found that 69 percent of prospective auto buyers would, on average, not pay more than \$500 over the price of an ICE vehicle for an EV. It is only currently possible to come anywhere near that thanks to tax-payer funded subsidies, which total around \$10,000 on average in many countries, once emission credits, tax incentives and subsidies are factored in. Such subsidies are meant to be temporary, though, since they would quickly become very

⁸ <https://www.statista.com/statistics/200002/international-car-sales-since-1990/>

⁹ 50 million new car sales in China, US and EU, with 27% of worldwide population, means that worldwide auto sales would reach $50/0.27=185$ million units on a leveled per-capita basis, compared to 64 million units in 2021

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expensive in a national budget context if EVs were to become a large part of the overall auto market. Yet, even including subsidies, the average EV appears to be some \$16,400 more expensive than the ICE alternative, a considerable gap over the \$500 consumers were willing to pay.

According to Statista, the luxury car segment in the US accounted for just 4.5% of the total market in 2021¹⁰, so if EV prices remain competitive only in this price segment, perhaps EV penetration will reach no higher than approximately 5%, unless the affordability improves meaningfully. Rapidly rising interest rates, and auto finance rates, do not help the demand side for either EVs and ICE vehicles at the current time. According to St. Louis Fed, light-weight vehicle sales were at a seasonal adjusted average rate of 14 million in November 2022, down from 18 million 18 months ago:

NOVEMBER

Light-Weight Vehicle Sales: Autos and Light Trucks ("SAAR")



Source: St. Louis Fed

Recently, electricity prices have increased greatly, particularly in Europe, while the price of oil and gasoline have declined by around one-third since mid-June. This affects the relative affordability of EVs. For example, the CEO of Volkswagen's components division recently stated that surging energy prices have hurt EV demand in Europe in recent months, according to Bloomberg. Volkswagen is looking into alternative battery chemistries that may offer less efficiency but lower cost to offset rising prices for nickel and cobalt.

While range-anxiety is a major concern to would-be EV buyers, the car manufacturers are not necessarily trying to alleviate this concern by developing larger batteries. On the contrary, they would like to reduce cost by using smaller batteries, with less range. Volkswagen has stated that it intends to focus on smaller batteries, because "big batteries in small cars are high-cost. An average customer is driving 40 kilometers per day, so why do you need a 500 kilometer range?", according to the company's components division CEO. Thus, the mismatch appears to be that would-be EV-buyers seem to desire a greater range,

¹⁰ <https://www.statista.com/statistics/681399/luxury-vehicles-united-states-premium-vehicle-market-unit-sales/>

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or at least know that sufficient range is available should they need it, whereas the EV manufacturers want to reduce cost by installing smaller batteries, with less range. How this mismatch will impact demand for EVs remains to be seen.

In the UK, EV demand recently fell for first time since the pandemic began, as soaring electricity prices have made EVs increasingly costly to run¹¹. Only 19% of UK car buyers were in the market specifically for an EV in November 2022, according to data from AutoTrader—a decline from 27% in June. According to the same source, demand for EVs has declined 12.6% over the last 12 months. This is partly attributed to declining gasoline prices and spiking energy bills, which increases the cost of running battery powered vehicles relative to ICE vehicles. The UK government has also withdrawn subsidies for electric cars. In June, a £1,500 grant for EV buyers was discontinued and, in November, Jeremy Hunt (Chancellor of the Exchequer) announced that EVs would be subject to a road tax commencing in 2025. Partly as a result of this, inventory levels of EVs have doubled from 10,600 at the start of 2021 to 20,600 in the third quarter of 2022.

There is also a supply-based price discrepancy in the UK market, since there are only 20% as many new EV models (17) than ICE vehicles being offered in the £30,000 price range. The £20,000 – £30,000 price bracket is the most popular on Auto Trader in the UK. Consequently, in the UK, as well as in the US, it appears the majority of EVs are out of reach for all but the most affluent car buyers. A used EV in the UK still costs circa £10,000 more than an equivalent gasoline or diesel vehicle, while a brand-new model is still over a third (36%) more expensive, an increase from 31% at the start of 2022.

This is a decisive move in the wrong direction, away from a vital price parity point between EVs and ICE vehicles. While the UK is a different market than the US, the relative price premium between EVs and ICE vehicles appear to be almost identical (36% in the UK vs 34% in the US) and, therefore, it is unlikely that US demand for EVs would not be impacted by these trends as well.

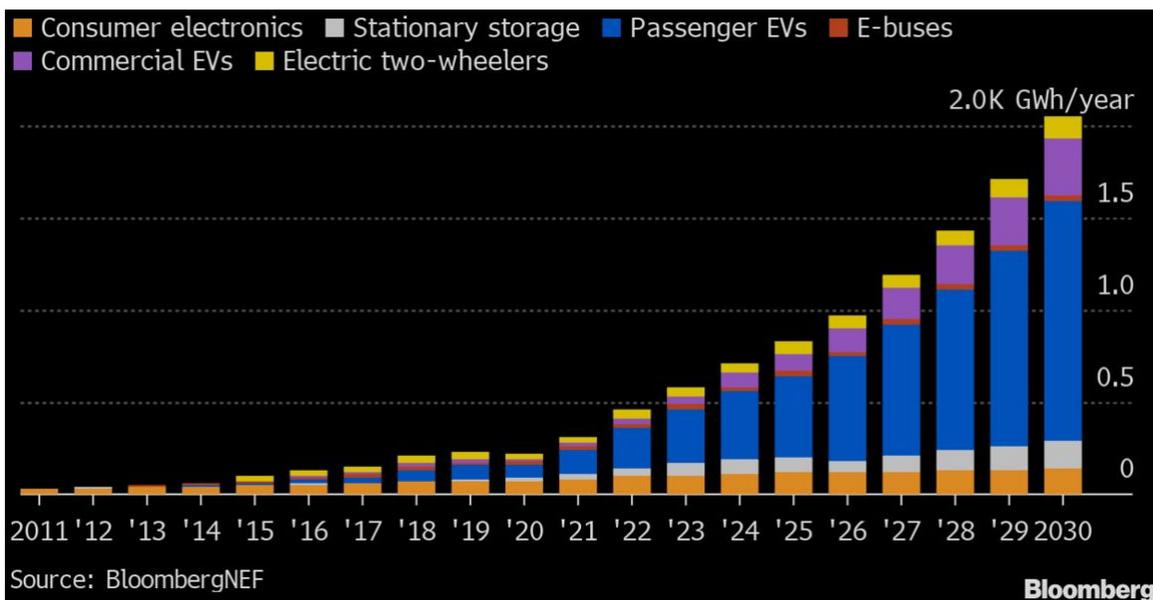
Another data point: multinational automaker Stellantis, which was formed through the merger of France's PSA Group and Italian-American Fiat Chrysler, recently announced that it will be closing an assembly plant in Illinois in February, and laying off hundreds of workers, in large part due to the high cost of making electric vehicles.

In the US, after a decade of declining EV battery prices, these actually increased by 7% this year, according to BloombergNEF. Of course, this could be expected, since the supply of commodities is not rising as fast as the demand, and opening new mines is difficult, in many countries, for environmental reasons. This raises the question of whether, in making the shift to EVs, automakers are losing control of their costs. As mentioned, while EV makers competed to ramp up their offerings, lithium alone spiked 15-fold between November 15,

¹¹ <https://www.msn.com/en-gb/cars/news/electric-car-demand-falls-for-first-time-since-pandemic-as-electricity-prices-soar/ar-AA15cSZY>

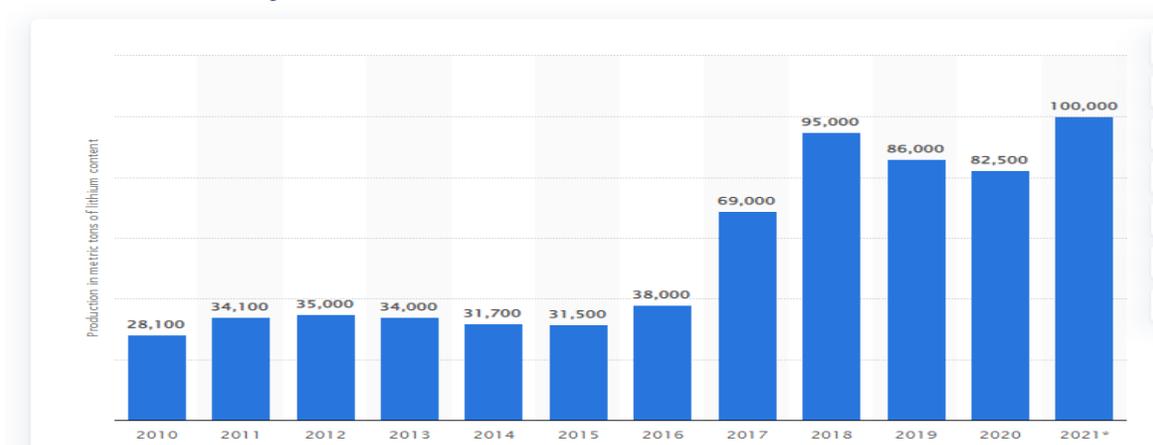
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2020 and November 15, 2022¹². According to Bloomberg, demand for lithium-ion batteries will increase almost 10-fold in the next decade:



However, supply of lithium was essentially flat between 2018 and 2021:

Mine production of lithium worldwide from 2010 to 2021
(in metric tons of lithium content)



By factoring in the ore grades, one can estimate the typical quantity of rock that must be extracted from the earth and processed to yield the pure minerals needed to fabricate a single battery. For example, lithium brine typically contains less than 0.1% lithium, so that entails some 25,000 pounds of brine to get 25 pounds of pure lithium. Cobalt ore grades average

¹² From 39,000 yuan per ton to 600,000. <https://tradingeconomics.com/commodity/lithium>

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about 0.06%, thus 45,000 pounds of ore are required¹³. Nickel ore grades average about 1%, so approximately 6,000 pounds of ore are needed to produce a sufficient amount for one battery. Graphite ore is typically 10%, and so requires around 1,000 pounds of ore to be mined per battery, while copper, at about 0.6% in the ore, requires around 25,000 pounds of ore per battery. In total then, acquiring just these five elements, which account for around 400 pounds of the 1,000-pound EV battery, requires mining about 100,000 pounds of ores, and that does not even include the 400 pounds of steel, aluminum and plastic in the remainder of the car.

Therefore, in the absence of a considerable increase in the global supply of lithium, prices will likely be the mechanism that will balance supply and demand, and with demand expected to quadruple by 2030, lithium prices could spike considerably from current levels, should insufficient supply come to market. Also, even if the supply increases meaningfully, new supply will come from new extraction sources that most likely have higher extraction/refining costs than the current mines.

EV manufacturers are also navigating this summer's climate law that requires them to source a certain percentage of their components from the US or countries with trade agreements in order to qualify for critical tax credits. It takes time and expense to establish these new supply chains, so it is possible that will result in a near-term spike in demand for the available US-based battery materials, which could drive component/commodity costs even higher. What all this likely results in, is an even greater focus on the most expensive EVs, made for the high-end market, where higher costs are more easily passed on to the consumer.

For example, while Porsche can make an electric vehicle (the Taycan model), which ranges from base prices of \$87,000 to \$190,000 depending on the model, and still earn a profit, it is considerably more difficult to sell EVs profitably at price points that are affordable to the mass market, such as within the \$25,000-\$40,000 range. If EV makers continue to focus on the more profitable, high end of the market, the mass market could become even more under-penetrated on a relative basis. Thus, expecting EVs to account for 50% of new car sales in the US within just seven years seems like a stretch.

Share Dilution

One and a half years ago, after the company assumed its current structure, it had 306.3 million shares outstanding. Most recently, the figure is 341.7 million shares. That is an increase of 35.4 million, or 11.6%, in just over 18 months. Out of the total issuance, 5.7 million shares were issued to acquire a company known as has•to•be gmbh, but the remainder is just from the exercise of grants, options, warrants, as well as raising equity capital. In addition, ChargePoint has another 140.4 million shares in the pipeline, which would represent dilution of 41%:

¹³ Laura Talens Peiró and Gara Villalba Méndez, "Material and Energy Requirement for Rare Earth Production"

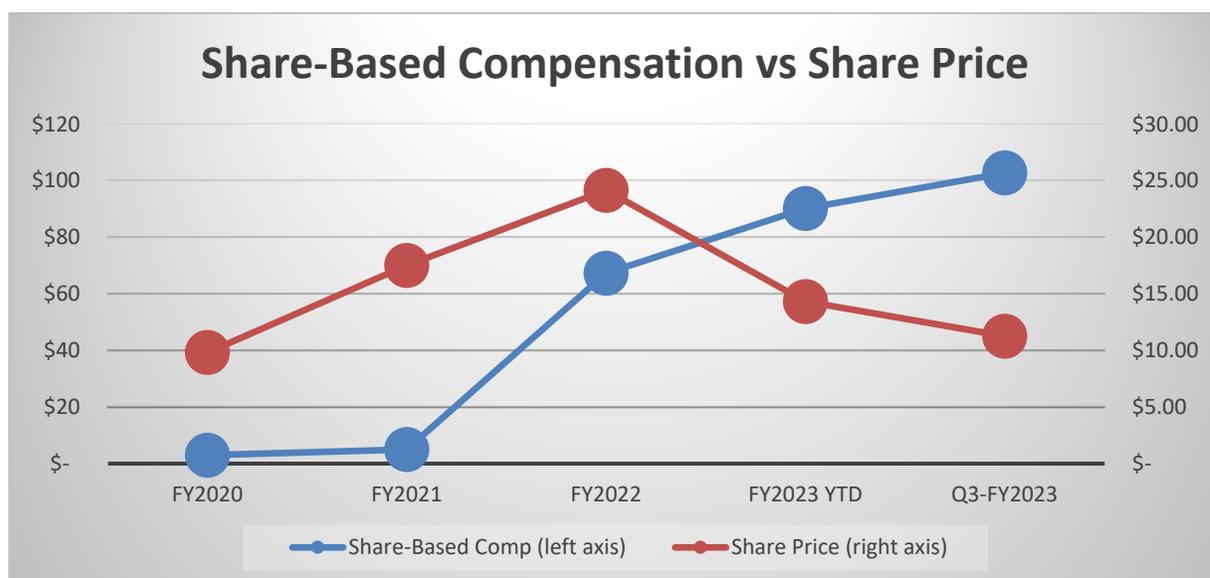
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Shares of Common Stock reserved for future issuance, on an as-if converted basis, were as follows:

	October 31, 2022	January 31, 2022
Stock options issued and outstanding	18,785,716	22,200,869
Restricted stock units outstanding	15,297,013	4,033,418
Common stock warrants outstanding	34,587,257	35,549,024
Shares available for grant under 2021 Equity Incentive Plan	40,060,867	36,370,596
Shares available for grant under 2021 ESPP	10,919,906	8,177,683
Shares available for conversion under 2027 Convertible Notes	20,743,081	—
Total shares of Common Stock reserved	140,393,840	106,331,590

Most of these shares are almost certainly going to be issued, whereas others might not be. For example, the 20.7 million shares reserved for the conversion of the convertible notes would only occur if ChargePoint's share price exceeds \$24.03 (the conversion price) before 2027. If the thesis advanced in this report is correct, that conversion price will not be reached, and the convertible notes will not actually be converted into shares.

Share-based compensation will most likely continue its upward trajectory, though, since the company needs to conserve its liquid capital. It is noteworthy that the amount of share-based compensation has increased by 60% in the past year while the share price has declined more than 40%. That means that the share issuance per quarter has increased by around 180%:



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(Share-based compensation in millions. YTD and Q3-2022 annualized.)

Yet, while the company's cash balances are dwindling, it has taken steps to raise additional capital. On July 1, 2022, ChargePoint filed a Form S-3 which permits it to offer up to \$1.0 billion shares of Common Stock, preferred stock, debt securities, warrants and rights in one or more offerings and in any combination. As part of this, ChargePoint filed a prospectus supplement registering for sale from time to time of up to \$500 million shares of common stock. Because of the company's burn rates and declining cash balances, it is likely that these tools will be used before the end of 2023.

However, what is uncertain is at what interest rates ChargePoint will be able to raise additional debt capital and at which valuation it is able to sell more equity. Given the trajectory of the losses, for investors to consider this an attractive valuation, interest rates will likely be high and, for the stock valuation, considerably lower than the present multiple of 10x revenues.

Valuation

Blink Charging is similar to ChargePoint in that it provides EV charging infrastructure. That company trades at 11x consensus 2022 revenues, with consensus revenue growth of 65% in 2023. Blink's burn rate, that is, negative free cash flow, is around \$100 million per year (run-rate) and the company held just \$57 million in cash on its balance sheet as of September 30th. Thus, Blink's financial situation is perhaps even more precarious than ChargePoint's. If it is unable to raise capital over the next few months, it could become insolvent.

A smaller company, Volta Inc. is in yet an even more dire situation than Blink. With a share price that has declined by more than 95% since February 2021, to just \$0.50, its (consensus) projected losses for the next year are \$0.80 per share. It trades at 1.5x consensus 2023 revenues. With \$16 million in cash, as of September 30, 2022, its quarterly burn rate has averaged approximately \$70 million over the last four quarters. It expanded revenues by 69% y-o-y in the most recent quarter but EBITDA losses deteriorated 40% to \$31 million for the quarter. It seems possible that both Blink and Volta will fail in the near term. That should raise investor's concerns over a similar development for ChargePoint, particularly as it will need to raise additional capital shortly. If so, ChargePoint's current valuation of 10x revenues could decline to a level more similar to Volta's 1.5x revenues, which would trigger an 85% decline in the share price.

If ChargePoint is able to reach a state of maturity – some profitable level of critical mass and scale economy – perhaps it will occupy a similar position in investors' portfolios like Quanta Services, an electric power infrastructure solutions provider (essentially outsourced maintenance and construction workers for various components of the electric grid). That company trades at 21x next year's consensus EPS and an enterprise value of 1.3x 2023

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revenues. Quanta Services is projected to expand its revenues by 30% in 2022 and 7% next year. While ChargePoint's growth rates are higher, its profitability is nonexistent.

Quanta Services has a 3.5% net profit margin and ChargePoint a negative 67.4%, based on the most recent quarter. Consequently, if ChargePoint were ever to reach Quanta's level of profitability, and to trade at Quanta Services revenue multiple, at 1.3x, then it would be worth around \$624 million, based on the consensus revenue forecast of \$480 million for FY2023. With net debt of \$106 million, that indicates an equity value of \$518 million, which equates to a share price of \$1.50.

Alternatively, ChargePoint would have to generate revenues of \$3.08 billion to justify its \$4.0 billion enterprise value, if were to trade at 1.3x revenues. And that assumes no more debt and no additional equity issuance. At an average annual growth rate of 36%, it would take six years to reach such a revenue level. In addition, since losses appear to expand with revenues, it would likely take billions of dollars in capital infusions to reach such a level of revenues, so by the time ChargePoint reaches \$3.08 billion of revenues, perhaps it will have a 1.3x revenue multiple, but if it takes another \$2.0 billion of debt to get there, the equity would only be worth \$1.7 billion (\$4.0 billion total enterprise value, minus the existing \$300 million of debt, minus the future \$2.0 billion in additional debt required to survive another six years), which equates to a share price of \$4.97 six years from now. That assumes no further equity issuance, not even for share-based compensation. Thus, a share price decline of almost 50% would occur.

Investment Summary

ChargePoint occupies a role in a rapidly growing industry with strong long-term prospects. There is an enormous amount of investment optimism for EVs, and last year investors bid up shares of these companies with seemingly no regard for valuation. Yet, the faster the company expands, the greater its losses. A recent debt offering of \$300 million only bought it approximately one more year of cash, and the company will likely run out of capital before the end of next year at current burn rates.

That said, cash burn rates have increased with revenues, and with expected sales growth of more than 90%, on average, over the next two quarters, its losses might expand at a similar rate, if history is any guide. Consequently, rapid growth is not the solution to reach profitability, since there are no observable scale economies; the problem appears to be ChargePoint's pricing power, or lack thereof. There are many competitors and essentially no product differentiability. With gross margins of less than 17%, the company is almost giving away its products at cost and, on top of that, has operating expenses that exceed revenue. Thus, it seems the EV charging market is still too focused on installing charging stations without much in the way of actual demand for usage at prices that cover the all-in equipment cost.

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While many market observers believe that it is almost a foregone conclusion that EVs will completely displace ICE vehicles during the next decade, many critical factors make this unlikely. First, while there might be sufficient quantities of metals such as lithium, nickel, cobalt, neodymium and copper in the world to produce the required hundreds of millions of EV batteries (there are approximately 1.32 billion ICE vehicles in the world that might all be replaced), those raw materials will become considerably more expensive to extract as demand explodes. Lithium prices, as but one example, have risen 15-fold in the past two years. New mines have to be opened all over the world at an enormous expense—both monetary and environmental.

Moreover, as a precondition to replacing ICE vehicles, EVs must first improve in many areas, and they need to become more price-competitive with ICE vehicles. However, that will be next to impossible if raw material prices, which account for the vast majority of the cost of an EV, continue to increase. The problem cannot be met with increasing subsidies, since such subsidies cannot scale – they are taxpayer-funded and were intended to assist a developing industry only to the extent of achieving viability or critical mass. Instead, subsidies will probably have to be gradually removed as EV sales increase, in order to avoid a budgetary nightmare, and the EV industry will ultimately have to make up for the lost gasoline taxes, as well.

If ChargePoint can raise enough capital to remain in business for the next several years, it might mature and develop into a company similar to Quanta Services, which assists utilities in electric grid construction and maintenance. That company is still expanding meaningfully but trades at just 1.3x revenues. At such a valuation, even if ChargePoint can expand revenues by 36% per year for the next six years to achieve the same scale, its ending share price might still be less than \$5.00. On the other hand, at already more than 10x run-rate revenues and with operating expenses that exceed revenues, it is difficult to identify a path to profitability. Higher growth rates have resulted in greater losses. Two publicly traded competitors are already near the brink of financial failure, which events might bode poorly for ChargePoint's pending capital raising needs. For those reasons, shares of ChargePoint are recommended for sale and short sale.

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ChargePoint Holdings, Inc.
Condensed Consolidated Balance Sheets
(in thousands, except share and per share data, unaudited)

	October 31, 2022	January 31, 2022
Assets		
Current assets:		
Cash and cash equivalents	\$ 188,273	\$ 315,235
Restricted cash	400	400
Short-term investments	208,887	—
Accounts receivable	123,028	75,939
Inventories	62,449	35,879
Prepaid expenses and other current assets	58,589	36,603
Total current assets	641,626	464,056
Property and equipment, net	38,706	34,593
Intangible assets, net	89,637	107,209
Operating lease right-of-use assets	21,890	25,535
Goodwill	201,742	218,484
Other assets	6,982	6,020
Total assets	\$ 1,000,583	\$ 855,897
Liabilities, Redeemable Convertible Preferred Stock and Stockholders'		
Current liabilities:		
Accounts payable	\$ 44,537	\$ 27,576
Accrued and other current liabilities	111,910	84,328
Deferred revenue	81,912	77,142
Total current liabilities	238,359	189,046
Deferred revenue, noncurrent	93,306	69,666
Debt, noncurrent	294,635	—
Operating lease liabilities	22,309	25,370
Deferred tax liabilities	12,349	17,697
Total liabilities	661,993	308,883
Other long-term liabilities	1,035	7,104
Stockholders' equity (deficit):		
Common stock	34	33
Additional paid-in capital	1,451,711	1,366,855
Accumulated other comprehensive loss	(35,054)	(8,219)
Accumulated deficit	(1,078,101)	(811,655)
Total stockholders' equity	338,590	547,014
Total liabilities and stockholders' equity	\$ 1,000,583	\$ 855,897

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ChargePoint Holdings, Inc.
Condensed Consolidated Statements of Operations
(in thousands, except share and per share data, unaudited)

	Three Months Ended Oct 31		Nine Months Ended Oct 31	
	2022	2021	2022	2021
Revenue				
Networked charging svstems	\$ 97.592	\$ 47.511	\$ 241.291	\$ 115.185
Subscriptions	21.670	13.397	59.561	36.303
Other	6.079	4.126	14.415	10.177
Total revenue	125.341	65.034	315.267	161.665
Cost of revenue				
Networked charging svstems	85.821	38.720	216.439	97.846
Subscriptions	13.400	7.637	37.305	21.107
Other	3.439	2.621	8.581	6.662
Total cost of revenue	102.660	48.978	262.325	125.615
Gross profit	22.681	16.056	52.942	36.050
Operating expenses				
Research and development	48.132	36.751	148.237	102.535
Sales and marketing	35.382	24.361	101.842	62.258
General and administrative	22.445	20.268	66.339	57.467
Total operating expenses	105.959	81.380	316.418	222.260
Loss from operations	(83.278)	(65.324)	(263.476)	(186.210)
Interest income	1.905	25	3.471	72
Interest expense	(2.606)	(3)	(6.467)	(1,502)
Change in fair value	—	—	—	9.237
Change in fair value of common stock	—	(2,429)	(24)	30,911
Change in fair value of contingent	—	—	—	84,420
Transaction costs expensed	—	—	—	(7,031)
Other expense, net	(943)	(2,025)	(2,646)	(2,200)
Net loss before income taxes	(84,977)	(69,756)	(269,147)	(77,303)
Benefit from income taxes	(442)	(314)	(2,696)	(211)
Net loss	\$ (84,480)	\$ (69,442)	\$ (266,446)	\$ (77,092)
Cumulative dividends on redeemable	—	—	—	(4,292)
Deemed dividends attributable to	—	—	—	(51,855)
Deemed dividends attributable to	—	—	—	(110,635)
Net loss attributable to common	\$ (84,480)	\$ (69,442)	\$ (266,446)	\$ (238,874)
Gain attributable to earnout shares	—	—	—	(84,470)
Change in fair value of dilutive	—	—	—	(51,106)
Net loss attributable to common	\$ (84,480)	\$ (69,442)	\$ (266,446)	\$ (374,400)
Weighted average shares outstanding -	339,595,385	325,034,920	337,037,111	286,025,483
Weighted average shares outstanding -	339,595,385	325,034,920	337,037,111	292,575,318
Net loss per share - Basic	\$ (0.25)	\$ (0.21)	\$ (0.79)	\$ (0.84)
Net loss per share - Diluted	\$ (0.25)	\$ (0.21)	\$ (0.79)	\$ (1.28)

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This report was produced by Horizon Kinetics ("HK"). The following persons employed by HK contributed to this report: Murray Stahl, Chairman, Steven Bregman, President, and Peter Doyle, Managing Director. HK is located at 470 Park Avenue South, New York, NY 10016. At the time of this report, there are no planned updates to the recommendations. To the extent HK has provided previous recommendations concerning the same issuer(s) during the preceding 12-month period, such recommendations do not differ from the recommendations contained here.

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