AT&T 10x Case Study:

ChargePoint uses AT&T connectivity to help businesses scale access to electric vehicle (EV) charging stations and reduce greenhouse gas emissions

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AT&T believes technology plays a critical role in reducing carbon emissions. So, we're using the power of our network to create a better, more environmentally sustainable world. We've set a goal to enable carbon savings for our customers 10x the footprint of our operations by the end of 2025.

To meet this, we're working to make our operations more efficient across the company. We're also working with our customers and technology partners to implement and scale carbon-saving solutions. This case study discusses and quantifies the carbon benefits of using AT&T technology to boost efficiency. This is one study in a series we're sharing as we progress toward our 10x goal.

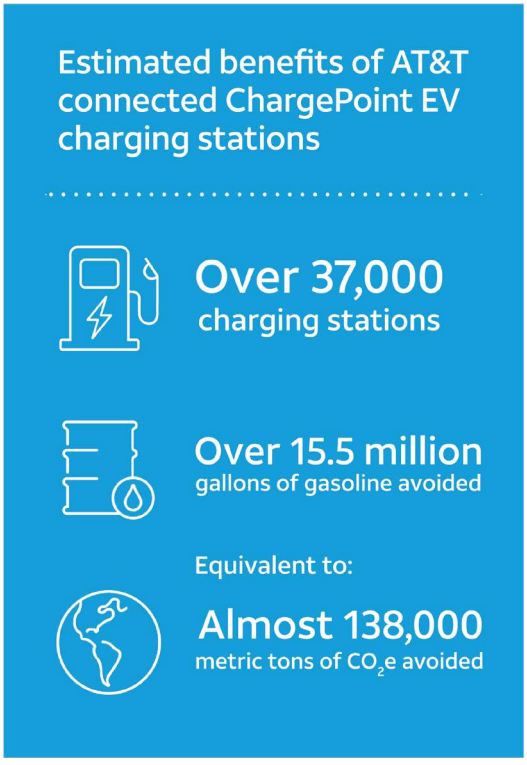
Learn about our goals, our progress, and see more case studies like this at att.com/10x.

Summary

There are many reasons for a business to consider installing electric vehicle (EV) charging stations: gaining customers, attracting talent, retaining employees, and supporting the transition to a low-carbon economy. Since 2007, ChargePoint has been helping businesses do just that by creating an integrated, smart EV charging network to help get people and goods moving on electric power.

Recognizing that an integrated experience is critical, whether you're an EV driver or a business operating the charging stations, ChargePoint has worked with AT&T to use dependable and highly secure Internet of Things (IoT) connectivity at many of their charging stations, providing useful and timely information to station operators and EV drivers alike.

By providing EV charging, a business becomes a part of the fueling network of the future, helping to reduce greenhouse gas (GHG) emissions in the emissions-intensive transportation sector. As of March 2020, ChargePoint used AT&T connectivity at around **37,000** stations, enabling their customers to avoid the use of over **15.5** million gallons of gasoline, which is equivalent to almost **138,000** metric tons of CO_2e avoided.[1,2]



Background: Electric vehicles and EV charging help drive a sustainable future

The shift to EV transportion can play an important role in transitioning to a low-carbon economy. Because electric vehicles are fueled by electricity rather than fossil fuels, EVs typically produce fewer lifecycle emissions compared to conventional vehicles. As more renewable energy such as wind and solar power is added to the electricity grid, EVs will run on a higher percentage of renewable energy, making it cleaner than in years prior. The bottom line is that driving an EV is good for the environment.[3]

81%
Increase in U.S. EV sales from 2017 to 2018[4]

And while EV sales are still a small fraction of car sales in the U.S., EV sales in 2018 were up **81%** over the previous year.[4] And as more automakers join the EV market, the wider range of options at different price points suggest that the electrification of car transportation will not only continue, but accelerate over the next few years. Finally, the advent of autonomous vehicles over the next couple of decades is expected to further accelerate electrification, helping rapidly decarbonize the transportation sector.[5]

Companies are also feeling the pressure to include EV charging as part of their sustainability efforts:

- **Employees** – More and more employees expect their workplace to be socially and environmentally conscious. In fact, 92.1% of millennials believe working for an environmentally and socially responsible company is important,[6] and EV charging is a clear and visible commitment to sustainability.
- **Customers** – Having a brand that is associated with sustainability can boost reputation and sales with customers. Research reveals that a third of consumers are now buying from brands based on their social and environmental impact.[7]
- **Investors** – As investors like BlackRock[8] raise the pressure on businesses to adopt practices to reduce risks of climate change, a commitment to providing EV charging stations provides an opportunity for companies to take meaningful action to address climate change. In fact, at the end of 2018, there were 68 stock exchanges that had environmental listing requirements.[9]

The Challenge: Finding the right EV charging solution that will scale with your business needs

Driving an electric vehicle is different compared to a traditional gas car. Whether you're a station operator or an EV driver, a networked solution is important to the EV experience.

A standalone, non-networked charger is not connected to a network, so there's no way for drivers to know if their EV was unplugged or stopped charging for some reason. That means drivers could return to their EVs and find their car did not charge sufficiently for whatever reason, creating a bad driver experience.

Networked or "smart" charging solutions are connected to a network so they can offer advanced features and get updates remotely. The benefits of networked charging make it a better choice than non-networked charging for businesses and EV drivers alike.

AT&T Workplace Charging

AT&T uses ChargePoint EV charging solutions at some of its facilities, with plans to expand its workplace charging footprint. Currently, AT&T utilizes ChargePoint's smart features that include the ability to: control who can charge and when; set pricing; allow drivers to get into a virtual line to charge, making the solution easy to manage.

The Solution: ChargePoint uses AT&T IoT to enable networked EV charging, making EV management easy

ChargePoint recognizes the need to help businesses meet the demand for charging stations so they are working with innovative companies like AT&T to accelerate the future of electrified transportation and further reducing greenhouse gas emissions worldwide. From the very beginning, ChargePoint realized that everything needs to be built on the network in order to provide scale, quality and service.

"Since its inception in 2007, ChargePoint's mission has been to make the transition to electric mobility as easy as possible, providing high quality charging experiences at every touchpoint. With more than 37,000 places to charge on AT&T's network alone, their technology enables the continued rollout of smart charging that benefits businesses, fleets and drivers alike."

- Colleen Jansen, Chief Marketing Officer, ChargePoint

By integrating highly secure and dependable IoT connectivity into their charging stations, ChargePoint can provide the fundamental services needed to make charging stations work. In particular, the remote control and monitoring enabled by AT&T IoT adresses several important needs:

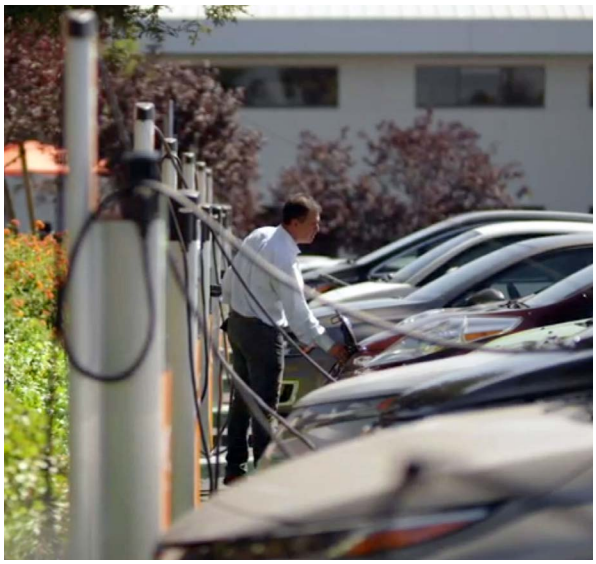
- Allows remote software configuration changes
- Provides monthly reports and detailed quarterly reports of the station's performance metrics
- Enables proactive dispatch of station repair technicians when required
- Processes financial transactions
- Monitors station efficiency 24X7 to improve queue management

These smart capabilities are part of the reason that ChargePoint is leading the transition to an electric vehicle future. In particular, ChargePoint:

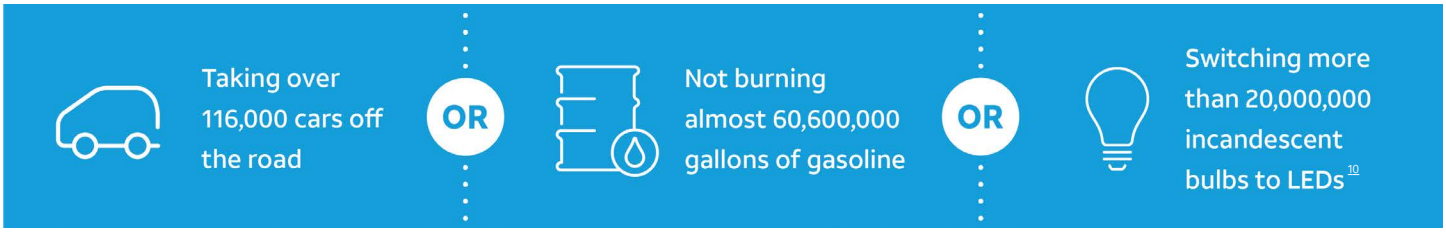
- Provides an integrated EV charging experience for businesses and drivers across every touch point and for every use case.
- Designs, develops and manufactures complete, integrated charging stations and software solutions.
- Delivers a top-rated mobile app and award-winning services and support.

Sustainability Impact: Charging station data via AT&T IoT unlocks potential for expansion

As more companies make sustainability a core piece of their business, tracking and reporting of environmental impacts will grow more important. When more businesses become part of the new fueling network of the future by adding ChargePoint EV charging stations, IoT-enabled reporting will make it possible for an organization to measure and monitor the progress they are making toward their sustainability goals.



If current growth continues and ChargePoint is able to provide **127,000** charging stations that utilize the AT&T IoT network by **2025**, and the average usage of those stations is consistent with the usage they're seeing today (a conservative assumption given the expected increase in EV drivers), AT&T IoT will enable GHG emissions reductions of an estimated **537,000** metric tons of CO_2e in **2025**. This is equivalent to:



Applying the 10x Carbon Impact Methodology

Carbon Trust and BSR collaborated with AT&T in the development of a methodology to measure the carbon benefits of AT&T's technology. The details of the methodology can be found on the AT&T 10x website. The table below summarizes how the 10x methodology was applied to estimate the environmental impacts described in this case study.

Description of the Enabling Technology	AT&T's IoT connectivity enables the remote control and monitoring of ChargePoint's network of EV charging stations. Specifically, this allows for remote software updates and enhancements, provides monthly and quarterly reports of the station's performance metrics, enables proactive dispatch of station repair technicians when required, processes financial transactions, and monitors station efficiency 24X7 to improve queue management. This creates an integrated EV charging experience for businesses and drivers, providing both with useful and timely information and support services, facilitating the overall transition towards more sustainable forms of transport..
Impact Category	This case study focuses on the carbon impact of IoT connected EV charging stations.
Materiality	The implementation of EV charging stations increases the use of electric vehicles and thereby reduces the consumption of fossil fuels and associated emissions.
Attribution of Impacts	The carbon savings detailed in this case study are a result of ChargePoint's charging stations, combined with the use of AT&T's IoT technology, which together overcome barriers to EV charging station installation by enabling the development of technology platforms and new financing programs that help address the costs of installing charging stations. Both AT&T and ChargePoint play a fundamental role in enabling the environmental benefits that are delivered.
Primary Effects	AT&T connected charging stations lead to carbon savings by enabling the use of EV's rather than fossil fuel vehicles.

Secondary Effects	An improvement in the implementation and usability of EV charging stations can increase the proportion of drivers using electric vehicles, reducing emissions derived from vehicle fossil fuel consumption. This increase in demand can subsequently lead to greater investment into efficient electric vehicles and batteries, having knock-on effects for decarbonization in other industries in the long term.
Rebound Effects	In the short term, a large shift from fossil fuel powered to electric vehicles might lead to a greater overall quantity of manufactured cars than would have otherwise been made. This may create a disuse of petrol/diesel vehicles before their end of life and increases emissions in manufacturing and resource use.
Trade-Offs or Negative Effects	This technology does not appear to create other outsized or irreparable environmental or social impacts.
Carbon Burden from the Enabling	The embodied carbon emissions of the sensors and IoT devices, which will be minimal compared with the emissions reductions.
Carbon Abatement Calculation	
Scope	The scope of the case study covers all AT&T enabled ChargePoint charging stations in the US.
Timeframe	The data in this case study covers AT&T enabled charging stations in 2019.
Functional Unit	The functional unit for the avoided GHG emissions is expressed as metric tons of CO_2e per charging station.

Methodology	The total electricity dispensed across ChargePoint's AT&T enabled charging stations, the top 3 charged vehicle models, and number of AT&T enabled charging stations was collected for the calendar year 2019. • To calculate the kg CO_2e per charging point from the electricity used by EVs, the kWh dispensed per charging point was multiplied by the eGrid 2018 US average electricity EF. • Average kWh/mile was calculated using specific data for the top 3 vehicle models and information derived from various studies. This factor was then converted into miles/kWh. • Total distance travelled by cars recharged, per charging point was calculated by multiplying the 'kWh dispensed per charging point' by the 'miles per kWh' factor. This distance was subsequently used to calculate the kg CO_2e from the average car (using average car EF) per charging point. • The difference between the two calculated values gives tons of CO_2e savings per charging station.
Key Assumptions	• Assume the top 3 vehicle models are representative for all EVs using ChargePoint's AT&T enabled charging stations. • If the kWh/mile figure provided for each vehicle model did not include charging losses, an average charging loss factor of 23% was assumed. These charging losses account for the energy lost during the AC to DC conversion and energy consumed in surpassing battery resistance to charging.
Exclusions	• Embodied carbon emissions of the IoT connections. • Rebound effects related to an increase in the overall electricity demand and an increase in emissions from EV manufacturing.

Data Sources	• Electricity emission factors (eGrid – https://www.epa.gov/energy/egrid) • Greenhouse Gas Emissions from a Typical Passenger Vehicle – Tailpipe (EPA – https://www.epa.gov/greenvehicles/greenhouse-gas-emissions-typical_passenger-vehicle) • Greenhouse gas reporting: conversion factors 2019 (WTT) (DEFRA – https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2019) • kWh/mile figures for top 3 vehicles (https://www.Ev-database.uk; https://www.insideevs.com; https://www.fueleconomy.gov) • Average charging losses (https://www.fueleconomy.gov/feg/atv-ev.shtml; https://www.researchgate.net/publication/314301528_Measurement_of_power_loss_during_electric_vehicle_charging_and_discharging; https://ev-database.uk/car/1106/Nissan-Leaf) • Top 3 electric vehicles using A&T enables charging stations, kWh dispensed in 2019 from AT&T enabled ChargePoint charging stations, total number of AT&T enabled stations (provided by ChargePoint)
Results	
Carbon Abatement Factor	3,725 kg CO_2e / charging point

Endnotes

1. "Greenhouse Gas Equivalency Calculator," U.S. Environmental Protection Agency, August 16, 2019, https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator (Note, average eGRID electricity factors have been used rather than marginal AVERT electricity factors, this being a more conservative savings estimate).
2. Note that these estimated benefits are from AT&T-connected stations only. ChargePoint uses a variety of other network partners.
3. "Reducing Pollution with Electric Vehicles," U.S. Department of Energy, April 14, 2020, https://www.energy.gov/eere/electricvehicles/reducing-pollution-electric-vehicles
4. "Electric Vehicle Sales: Facts & Figures," Edison Electric Institute, April 2019, https://www.eei.org/issuesandpolicy/electrictransportation/Documents/FINAL_EV_Sales_Update_April2019.pdf
5. "Will Autonomous Vehicles be Electric?" Boston University Institute for Sustainable Energy, April 14, 2020, https://www.bu.edu/ise/2018/08/27/will-autonomous-vehicles-be-electric/
6. Professor Debbie Haski-Leventhal and Julian Concat, "The State of CSR and RME in Business Schools and the Attitudes of their Students," Macquarie University Graduate School of Management, 2016, https://www.unprme.org/resource-docs/MGSMPRMEReport2016.pdf
7. "Report shows a third of consumers prefer sustainable brands," Unilever, May 1, 2017, https://www.unilever.com/news/press-releases/2017/report-shows-a-third-of-consumers-prefer-sustainable-brands.html
8. "A Fundamental Reshaping of Finance," BlackRock, April 14, 2020, https://www.blackrock.com/corporate/investor-relations/larry-fink-ceo-letter
9. "2018 State of Green Business," GreenBiz Group, April 15, 2020, https://bit.ly/2VvxSHY
10. "Greenhouse Gas Equivalency Calculator," U.S. Environmental Protection Agency, August 16, 2019, https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator (Note, average eGRID electricity factors have been used rather than marginal AVERT electricity factors, this being a more conservative savings estimate).