

2023 AT&T Gigaton Goal Progress Update

March 2024

Progress Summary

AT&T has long understood that connectivity and our other services can enable our customers to reduce greenhouse gas (GHG) emissions to mitigate climate change. In 2021, we announced the AT&T Gigaton Goal to enable customers to reduce a gigaton (1 billion metric tons) of GHG emissions by 2035, through the use of AT&T connectivity and other services. One gigaton of emissions is roughly equivalent to more than 1.6 million cross country flights.

We measure our progress against this goal by calculating the cumulative impact of emissions reduction starting in 2018, when we first calculated our emissions reduction enablement, until the end of 2035. Progress against this goal is reported annually. At the end of 2023, we calculated cumulative emissions reductions of 188.3 million metric tons of CO₂e, achieving almost 19% of our goal. We are still at the beginning of our journey and expect our progress to accelerate with the development of new technologies and continued uptake of existing solutions.

	2018	2019	2020	2021	2022	2023
Annual Enabled Emissions Reduction (million metric tons)	17.1	24 ¹	31.3	37.9	38.9	39.1
Cumulative Enabled Emissions Reduction (million metric tons)	17.1	41.1	72.4	110.3	149.2	188.3

¹ Note: Per our [10x Methodology](#), we calculate avoided emissions every 2 years, so we used the average of 2018 and 2020 for 2019 avoided emissions

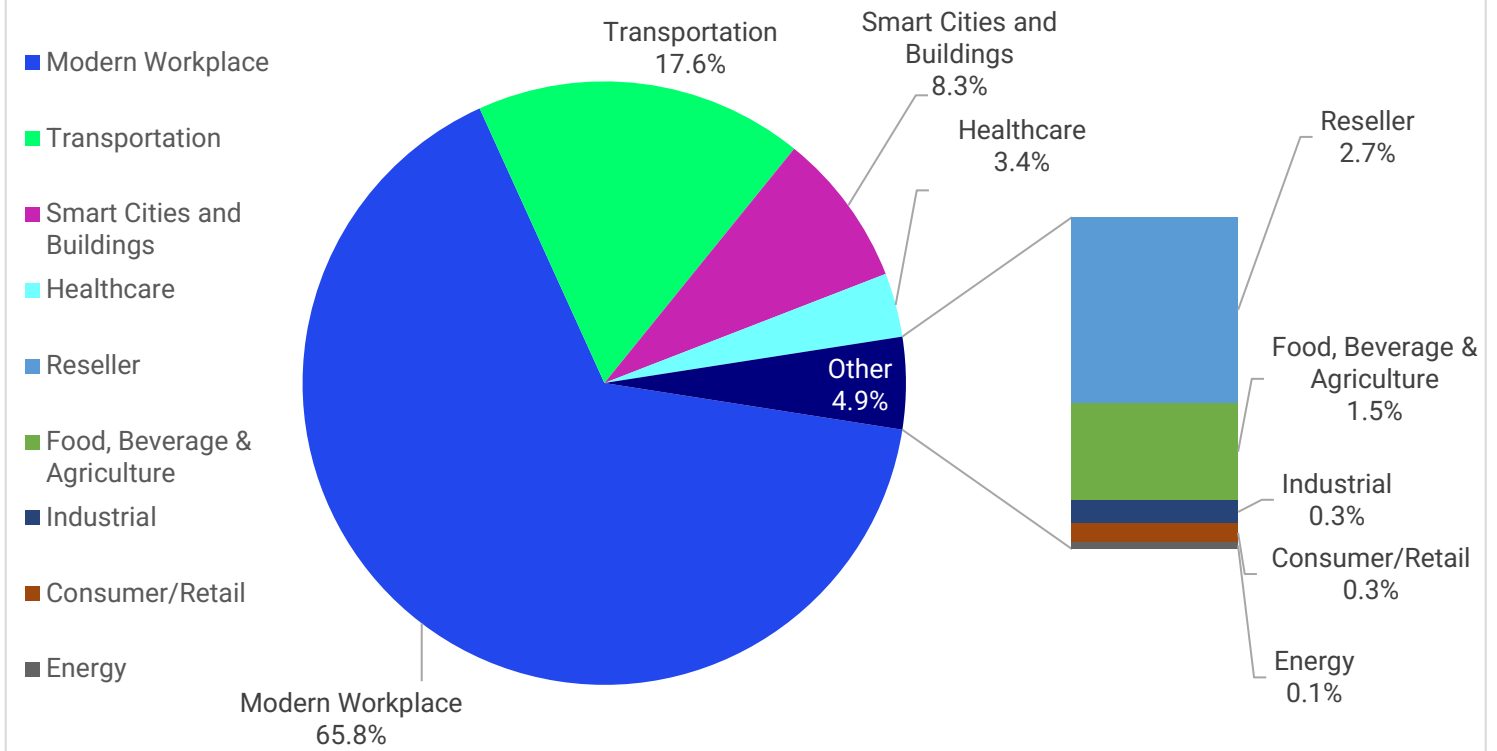
By the numbers – High-level summary of impact areas

We have identified nine key Impact Areas where AT&T connectivity can play a fundamental role in reducing emissions. Here is a summary of their relative impact in 2023:

Impact Area	Carbon avoided (tCO ₂ e) (rounded)	Percentage of total
Modern Workplace	25,680,824	65.8%
Transportation	6,885,769	17.6%
Healthcare	1,340,896	3.4%
Smart Cities and Buildings	3,228,529	8.3%
Industrial	129,630	0.3%
Energy	39,502	0.1%
Consumer/Retail	110,214	0.3%
Food, Beverage & Agriculture	566,534	1.5%
Reseller ²	1,074,023	2.7%
Total	39,055,919	100%

² Eight impact areas were originally identified in the [2018 Progress Report](#). Since then, the impact area 'Reseller' has been added to the list.

AT&T Enabled Carbon Reductions 39.1 million metric tons CO2e



Overview of abatement factors by impact area

We've identified a collection of activities for each impact area and worked with Carbon Trust to develop an abatement factor that represents the average emissions reduction that can be possible when using an AT&T-enabled solution. Below is a summary of those activities, their abatement factors and the relative impact of each activity.

Modern Workplace

Activity	Item units	Abatement factor (kg CO ₂ e/unit/year)
Telecommuting - Remote working	Residential internet connections	1,308.16
Videoconferencing - Desk-based	Videoconferencing seats	5,600.00
Office @ Hand	Videoconferencing seats	5,600.00
Flexware	Number of connections	486.80
Video Optimizer	Number of users	0.01

Transportation

Activity	Item units	Abatement factor (kg CO ₂ e/unit/year)
Fleet Management	Connected vehicles	593.62
Fleet Management (Traxen)	Connected vehicles	12,269.70
EV Charging	Connected charging stations	3,860.29
Smart Pallets	Number of composite pallets	71.60
Carsharing	Number of cars	40,358.29

Healthcare

Activity	Item units	Abatement factor (kg CO ₂ e/unit/year)
Remote Patient Monitoring ³	Connected remote monitoring devices	404.89

Smart Cities and Buildings

Activity	Abatement factor (kg CO ₂ e/unit/year)
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³ In 2023, the remote patient monitoring case study has been adjusted to reflect a more conservative estimate of the avoided proportion of hospital trips and days spent in a hospital bed for those with chronic health conditions and using remote monitoring devices, based on secondary data from academic research papers. This has acted to decrease the abatement factor for this solution compared to previous years.

Efficient Building Equipment Funding	Number of sites	156,104.18
Energy Building Management System - EBMS	Connected building management systems	11,306.73
Smart parking	Parking service connections	269.43
Street lighting	Streetlights	20.40
Advanced Water Metering Infrastructure	Number of houses	0.52
Efficient cooling towers	Number of units	1,553.85

Industrial

Activity	Item units	Abatement factor (kg CO ₂ e/unit/year)
Concrete Management (GCP)	Cubic meters of concrete	5.89

Consumer/Retail

Activity	Item units	Abatement factor (kg CO ₂ e/unit/year)
Smart Landscape Irrigation	Number of sites	901.84

Food, Beverage, and Agriculture

Activity	Item units	Abatement factor (kg CO ₂ e/unit/year)
Food Waste to Energy	Number of sites	84,408.30
Durable Ag Sensors	Number of connections	11,534.59

Energy

Activity	Item units	Abatement factor (kg CO ₂ e/unit/year)
Residential Smart Meters	Connected residential smart meters	139.61
Oil and Gas Pipeline Monitoring	Number of rectifiers	56.07
Solar PV Optimization	Number of systems	4.13

Reseller

Activity	Item units	Abatement factor (kg CO ₂ e/unit/year)
Reseller	Number of connections	693.10

Methodology Summary

In this section, we will define the type of data collected and the research used to calculate the carbon abatement factor for each activity.

Emission factors from the following sources are used throughout the calculations to develop the carbon abatement factors:

- [eGrid 2022](#)
- [DESNZ 2023⁴](#)
- [EPA](#)
- [IEA 2023](#)
- [ICE 2019](#)

Detailed in the table below are the references and assumptions used specifically for each activity.

Modern Workplace

Activity	References and assumptions
Telecommuting - Remote working	<p>Percentage of people sometimes working remotely and percentage of remote-capable employees: Global Indicator: Hybrid Work - Gallup</p> <p>Total employed in the US: Labor Statistics Employed 2023 and Labor Force Statistics 2023</p> <p>Distance commuted: Bureau of Transportation, Omnistats</p> <p>Forms of commuting and vehicle occupancy: Bureau of Transportation Statistics, Principal Means of Transportation to Work (Table 1-41) 2022</p> <p>BEIS 2023 emission factors for motor cycle, regular taxi, public transport (average); EPA and BEIS 2023 emission factor for typical passenger car (with adjustment for EVs based on IEA 2022 projections)</p> <p>Through time, remote working has become increasingly prevalent in society such that a situation where an employee physically commutes to their place of work is no longer representative of market average behavior. However,</p>

⁴ This dataset was previously referred to as “BEIS” – in reference to the UK Government’s Department for Business, Energy and Industrial Strategy. In 2023, BEIS was split into different government departments, with DESNZ (Department Energy Security and Net Zero) taking its place in the role of publishing this annual dataset.

	<p>to maintain consistency, AT&T’s Gigaton Goal methodology measures the impact of enabling technology against a fixed Business As Usual (BAU) baseline. As such, the comparison in this case study measures the enablement impact of working from home compared to travelling to the workplace, which was deemed BAU when the impact of remote working was first measured.</p> <p>Whilst currently adhering to the existing Gigaton Goal methodology, AT&T also recognizes that avoided emissions guidance has been evolving and during 2024 will be reviewing how the methodology may need to adapt to align with best practice on accounting for shifting BAU baseline scenarios.</p>
<p>Videoconferencing - Desk-based</p>	<p><u>Internal case study</u>: An annual figure of ‘typical equivalent travel distance to physical meetings if these had taken place instead of video calls. This was calculated from data collected by a videoconferencing provider and based on the use of a managed videoconferencing service over a year. The case study considered the number of people involved in the videoconferences and their locations. It also assumed that 4% of the travel distance was by car, and 96% was by air.</p> <p>Meeting avoidance factor of 32%: Cisco research quoted by BT (no longer published online)</p> <p>BEIS 2023 emission factors for long-haul air travel and car travel (with adjustment for EVs based on IEA 2022 projections)</p> <p>Data on enterprises conducting online meetings shows that videoconferencing is the market average in many countries. However, to maintain consistency, AT&T’s Gigaton Goal methodology measures the impact of enabling technology against a fixed Business As Usual (BAU) baseline. As such, the comparison in this case study measures the enablement impact of desk-based videoconferencing compared to travelling to in-person meetings, which was deemed BAU when the impact of videoconferencing was first measured.</p> <p>Whilst currently adhering to the existing Gigaton Goal methodology, AT&T also recognizes that avoided emissions guidance has been evolving and during 2024 will be reviewing how the methodology may need to adapt to align with best practice on accounting for shifting BAU baseline scenarios.</p>
<p>Office@Hand</p>	<p>Uses same methodology and same abatement factor as Videoconferencing. Videoconferencing and Office@Hand were previously reported together; they are now reported separately but still use the same abatement factor and methodology.</p>
<p>FlexWare</p>	<p>AT&T case study: AT&T FlexWareSM puts common network functions on one device, reducing space, electricity usage, and emissions</p>

Video Optimizer	AT&T case study: AT&T Video Optimizer helps developers improve viewers' mobile app and video experience while lowering energy usage and emissions
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Transportation

Activity	References and assumptions
Fleet Management	<p>Energy Savings Trust: A Guide to Telematics – typical fuel savings of between 5% and 15%. A figure of 10% fuel saving was used in the calculations.</p> <p>EPA: Greenhouse Gases Equivalencies Calculator – emission factor for gasoline</p> <p>Bureau of Travel Statistics: Light Duty Vehicle, fuel consumption and travel – average fuel consumed per vehicle per year (with adjustment for EVs based on IEA 2022 projections)</p>
Fleet Management (Traxen)	<p>AT&T case study uses average fuel savings rate of 9%, which is based on internal Traxen case study presented in Traxen FEI Test Results.</p> <p>BEIS 2023 emission factors for Diesel (average biofuel blend) + WTT</p>
EV Charging	AT&T case study: ChargePoint uses AT&T connectivity to help businesses scale access to electric vehicle (EV) charging stations and reduce greenhouse gas emissions
Smart Pallets	AT&T case study: Unlocking the Potential of Connected, Reusable Pallets
Car Sharing	<p>Greenhouse Gas Emission Impacts of Carsharing in North America – tCO₂e saved per year per household</p> <p>Calculations assume one household is equivalent to one member of a car sharing platform, and an average of 70 members per car.</p>

Healthcare

Activity	References and assumptions
Remote Patient Monitoring	<p>Average of 1.5 of hospital admissions per year – Focus on: Hospital admissions from care homes</p> <p>Average of 5.9 days per hospital stay – OECD: Length of Hospital Stay</p> <p>Average 125 kg CO₂e per day per hospital stay – Guest post: Calculating the carbon footprint of the NHS in England</p> <p>Average 7.38 km journey to hospital – OECD How's Life In Your Region</p> <p>Percentage reduction in hospital admissions and stays due to remote patient monitoring - Does remote patient monitoring reduce acute care use? A systematic review</p>

	<p>Ratio of length of hospitalization for patients with chronic conditions versus average for all patients - The burden of chronic disorders on hospital admissions prompts the need for new modalities of care: A cross-sectional analysis in a tertiary hospital</p> <p>The savings calculated derive from the reduction in hospital emissions due to reduced hospital stays and reduced need to travel to hospital.</p>
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Smart Cities and Buildings

Activity	References and assumptions
Efficient Building Equipment Funding	AT&T case study: "Efficiency-as-a-Service" Enables AT&T to Reduce Lighting Bills and Emissions
Energy Building Management System - EBMS	AT&T case study: Using the Internet of Things to reduce facility costs and emissions
Smart parking	SFMTA Study: Pilot Project Evaluation - pilot project assessing how effectively a smart parking solution delivered expected benefits, by comparing pilot and control areas. Data on reduced CO ₂ e and reduced vehicle miles travelled used for calculations.
Smart street lighting	Average yearly consumption: ~221 kWh / year base on World Lighting Council Report on Incandescent vs LED lights and US Energy Department Report Assumed carbon reduction: Intel: Smart Street Lights for Brighter Savings and Opportunities
Advanced Water Metering Infrastructure	<u>Internal case study</u> : a pilot project with 502 houses, assessing impact of advanced metering infrastructure (AMI) with AT&T connectivity. The internal case study found that by allowing for increased visibility of the performance of water utilities, improving water safety, reducing water leakages, this AMI reduced water-related waste, emissions and costs.
Efficient cooling towers	Emissions savings per unit: Calculated from EcoLab: Partners for Greater Purpose, Sustainability Report 2019

Industrial

Activity	References and assumptions
Concrete Management (GCP)	<p>Average fuel consumption of truck at Idle of 0.84 gallons per hour fuel (delivery truck unloaded) - Vehicle Idle Reduction Savings Worksheet</p> <p>The following assumptions were used: the average value of cement reduced for a typical Verifi customer is 10 kg per cubic meter of concrete delivered, the average cement composition is 25% Portland cement and 75% pozzolana and fly ash (15-40%), the fuel type of all concrete delivery trucks is assumed to be diesel, the average fuel consumption of a delivery truck is 0.01 liters per drum revolution</p>

Consumer/Retail

Activity	References and assumptions
Smart Landscape Irrigation	AT&T case study: Lowe's Uses HydroPoint and AT&T to Reduce Water Consumption and Carbon Footprint

Food, Beverage, and Agriculture

Activity	References and assumptions
Food Waste to Energy	AT&T case study: Emerson's Grind2Energy integrates AT&T IoT to turn food waste into clean energy
Durable Ag Sensors	AT&T case study: Soiltech uses AT&T Internet of Things connectivity to optimize food from soil to storage, helping increase yield, reduce waste and lower emissions

Energy

Activity	References and assumptions
Residential Smart Meters	Ofgem study: GB-wide smart meter roll out for the domestic sector – electricity savings per meter EIA: average electricity consumption per US household
Oil and Gas Pipeline Monitoring	AT&T case study: OmniMetrix uses AT&T IoT connectivity to help customers monitor oil and gas pipelines, helping reduce inspection time, costs, fuel usage, and emissions
Solar PV Optimization	Internal case study: Solar PV with AT&T's IoT connectivity enabled users to monitor, troubleshoot, and improve the performance of installed solar systems. This visibility was found to decrease emissions by reducing the need for a technician to visit site (reducing travel emissions) and increasing uptime in electricity generation (generating additional renewable electricity that can be introduced into the grid).

Reseller

Activity	References and assumptions
Value Added Reseller	Average abatement of AT&T IoT enabled solutions used as a proxy. Average includes abatement from: Fleet Management, EV Charging, Smart Pallets, Remote Patient Monitoring, Efficient Building Equipment Funding, Energy Building Management System, Smart Parking, Smart Street Lighting, Residential Smart Meters, Durable Ag Sensors, Oil and Gas Pipeline Monitoring, Advanced Water Metering Infrastructure, Solar PV Optimisation, Efficient Cooling Towers, Carsharing, Fleet Management (Traxen).