

Impact Study

Tennessee, US Data Center

2024



Google's Data Center Impact in Tennessee

Google's data center in Tennessee is helping to rapidly grow the digital economy. It is what you rely on to pull up a map to a new restaurant, attend online classes, or access your healthcare records.

Google's digital infrastructure investments in Tennessee drive local economic development through job creation, promote environmental stewardship through carbon-free energy production, and foster thriving communities.

Since 2018, Google has invested more than [\\$2.1B in Tennessee's digital infrastructure](#). This Impact Study provides a summary of key economic, environmental, and social metrics that Google's digital infrastructure investments have had on Tennessee in recent years.

Economic

Google's investments in digital infrastructure in Tennessee support jobs in construction, engineering, and the service industry. Google's data center contribution to labor income in Tennessee is equal to supporting **~2,590 households in the state each year**.

~\$263M

Annual contribution to Tennessee's GDP¹ (2021-2023)

~2,235

Annual jobs supported (2021-2023)

Environmental

As part of Google's commitment to operate all of its data centers using carbon-free energy by 2030, Google signed a contract with Tennessee Valley Authority to **source 308 MW of clean energy to both Google's Alabama and Tennessee data centers**.

65% (2023) | 63% (2022)

Percentage of electricity matched with carbon-free energy^{2,3} supply at every hour of every day at Google's data center in Tennessee

Social

Google's community investments include support to Austin Peay State University's summer coding camps which helped to empower 480+ students, **generating a ~\$1.30 social benefit for every Google-invested dollar** and fostering a more digitally skilled future workforce in Tennessee.

~\$943K

Invested in Tennessee communities surrounding Google's data center in 2022 and 2023

This report provides a summary of Google's data center impact. The overall impact of all Google operations is significantly larger, encompassing contributions beyond data centers, including economic benefits from its platforms, products, and services used across various sectors.

Notes: 1. GDP stands for gross domestic product. 2. Google defines [carbon-free energy](#) (CFE) as any type of electricity generation that doesn't directly emit carbon dioxide, including (but not limited to) solar, wind, geothermal, hydropower, and nuclear. Sustainable biomass and carbon capture and storage (CCS) are special cases considered on a case-by-case basis, but are often also considered carbon free energy sources. 3. Google's CFE is influenced by various factors, such as overall electricity usage, purchases of carbon-free energy, technological advancements, and changes in the broader energy landscape.

Economic Impact: 2021-2023¹



~\$263M

Annual Contribution
to Local GDP

Includes ~\$146M direct, ~\$48M indirect, and ~\$69M induced



~2,235

Annual
Jobs Supported²

Includes ~335 direct jobs, ~1,295 indirect, and ~605 induced



~\$169M

Annual
Labor Income

Includes ~\$30M direct, ~\$100M indirect, and ~\$38M induced

Google's contribution to Tennessee's GDP increased by ~55% between 2021 and 2023, compared to the state's overall GDP growth of ~9% during the same period.

Google's data center contribution to direct, indirect, and induced labor income in Tennessee is equal to supporting ~2,590 households in the state each year.

Top GDP Contributions



Professional, scientific, and technical services³

(12% of Total GDP Contribution from Google's investments in Tennessee)



Construction
(12%)



Other (various sectors such as administrative and support services and health care)
(76%)

Spotlight: Carbon-Free Energy

Google's investments in clean energy in Tennessee have created...



~\$864K

Annual
Contribution to
Local GDP



Jobs

Annually
Supported for
Construction and
Maintenance



~\$296K

Annual Labor
Income

Direct: includes Google employees and contractors (incl. their payroll and benefits) and annual spend on Google's suppliers

Indirect: includes Google's suppliers' employees and contractors, the suppliers' payroll and benefits due to Google orders, and suppliers spend

Induced: includes impact generated by the household spending of Google's employees and their suppliers in their local economies

Notes: 1. GDP and labor income rounded to the nearest one-million; Jobs and household numbers rounded to the nearest multiple of five. 2. Google's support to jobs includes construction, engineering, networking, renewable energy jobs, security, and services, among others. 3. Includes computer systems, data processing, software services, and other computer-related facility management support, etc.

Environmental Impact: 2022 & 2023^{1,2}

65% (2023) vs. 53% (2023 Regional Grid)

63% (2022) vs. 52% (2022 Regional Grid)

24/7 Carbon-Free Energy (CFE)

Google has matched 100% of its global annual electricity consumption with renewable energy purchases, and has further committed to operating at 24/7 CFE by 2030. This means matching electricity demand with CFE supply every hour of every day.

1.10 (2023)

1.11 (2022)

vs. 1.58 (industry average)

Avg. Power Usage Effectiveness

Compared to the industry average, Google's Tennessee data center is achieving an 83% reduction in overhead power usage. For every watt of power used to run servers and network equipment, only 0.10 watts are used to run supporting infrastructure like cooling and lighting.

Spotlight: Carbon Free Energy

To help advance Google's 24/7 CFE commitment, Google signed a deal in 2019 with the Tennessee Valley Authority (TVA) bringing 308 MW of clean energy to both Google's Alabama and Tennessee data centers in the coming years. One of the biggest solar farms will be located in Yum Yum, Tennessee.

In addition to carbon-free energy, the solar farm development is expected to generate additional economic benefits as TVA partners will hire hundreds of engineers, electricians, and construction workers within the region.

"Our long-standing data center efficiency efforts are important because our data centers represent the vast majority of our direct electricity use. Google's [global] data center consumption was more than 24 TWh in 2023 which translates to approximately 7-10% of global data center electricity consumption."

- 2023 & 2024 Google Environmental Reports

288.6M Gal. (2023)

248.7M Gal. (2022)

Water Consumption

Google strives to protect water quality and ecosystem health in the communities where it operates, including Tennessee.³

Sustainability Spotlight

As part of Google's Data Center Community Grants, Google is supporting the Southeastern Grasslands' 100-acre project to turn a fallow soybean into a prairie supporting over 200 native plant species. Rebuilding this habitat has allowed rare and declining animals to return to the land, including bobcats, bald eagles, and the Monarch butterfly.

Notes: 1. For more information on the environmental statistics, refer to the 2023 & 2024 Google Environmental Reports. 2. As applicable, the water consumption represents total water consumption across all data centers in the state; CFE and PUE are averages across data centers. 3. Google seeks to replenish 120% of the freshwater it consumes, on average, across its offices and data centers by 2030.

Social Impact: 2022 & 2023¹



~\$943K

Given to communities
in 2022 and 2023

*Surrounding Google's data center
in Tennessee in addition to other
Google.Org programs²*



28

Organizations supported
in 2022 and 2023

*Focused on education, workforce,
and community development,
among other areas*



~\$1.30

Social benefit per
Google-invested dollar³

*Based on STEM educational
program⁴*

Google invested ~\$943K in Tennessee communities, including:

STEM⁵ Programming

Since 2019, Google has provided \$650K to Austin Peay State University (APSU), earning Google the title of APSU philanthropist of the year. This included:

- Support toward APSU's subsidized summer coding camps for over 480 middle and high school students, generating the social benefit referenced above.
- Funding for other APSU initiatives including the Southeastern Grasslands Institute, STEM workshops for rural teachers, and art experiences to help foster creativity.

"Austin Peay State University is truly thankful for Google's generous investment in the Southeastern Grasslands Institute and so many of our programs. Google is a wonderful partner not just to APSU but to the entire Montgomery County community."

- Michael Licari, APSU President

Supporting Veterans

From 2021-2023, Google provided over \$32K to help Operation Stand Down provide transitional housing and aftercare for veterans.

- Google's support including helping to provide 11 Veteran families with one-time rent assistance.
- As a program, Operation Stand Down assisted 346 veterans in 2023 with maintaining their homes, either through support with rent, electricity, water, or gas.
- As Penny Anderson, Operation Stand Down Tennessee, put it, *"The investment of Google in the Clarksville community empowered Operation Stand Down TN to prevent and relieve homelessness for Veterans and their families."*

Notes: 1. When applicable, numbers were rounded to the nearest thousand. 2. The amounts listed are in addition to other Google programs, like Grow with Google, Google.Org's Impact Challenge, and other initiatives. 3. This calculation is directional and represents Google's step toward understanding social value associated with its community investments. 4. Calculation based on Austin Peay State University coding program. 5. STEM stands for science, technology, engineering, and mathematics.

The Google Differentiator

Google recognizes that its data center operations and value chain can be engines of economic, environmental, and social progress. Google aims for its investments to catalyze positive spillover effects within Tennessee.

Google thinks about its investments holistically.

Google recognizes that it can catalyze greater impact when it looks at its economic, environmental, and social efforts collectively, which is why Google's 2024 Impact Study in Tennessee articulates Google's impact across these three domains. As Google considers its future strategy in Tennessee, it will continue to look for opportunities to keep digital infrastructure secure and sustainable while driving local economic development, fostering thriving communities, and spurring environmental stewardship.

Google seeks to harness AI to drive innovation and accelerate climate action.

Google continues to invest in state-of-the-art infrastructure to support its artificial intelligence (AI) efforts and rapidly grow the digital economy in Tennessee. However, Google recognizes that these benefits also come with increased energy usage and emissions and might have unintended consequences if not properly managed. As part of its AI for Sustainability strategy, Google is taking steps to use AI to accelerate climate progress and through its AI Opportunity Agenda, Google is providing recommendations for governments to amplify the positive impacts of AI for the broadest possible range of people.

Google seeks to engage directly with community members to advance and measure impact.

Google continues to work closely with community members in Tennessee to understand its impact and refine its strategy. This report represents a step toward measuring impact as Google moves from measuring inputs to measuring impact and value. This includes Google's approximation of a "social return on investment", intended to estimate the social value created per Google-invested dollar based on educational empowerment and future job opportunities. Google will continue to find ways to be more transparent and articulate its impact to local communities across all dimensions.

Thank you!

To the many community members and Googlers who strive to make Google's ambitious economic, environmental, and social goals a reality.

For additional information or any questions please reach out to:



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DISCLAIMER: This Impact Study was prepared by Deloitte Consulting LLP ("Deloitte") for Google LLC ("Google") during Fall 2024. The purpose of the study is to assess the economic, environmental, and social impacts of Google's data centers modeled from the years of 2021-2023. The modeling, analysis, and results shown as part of the impact are based on information provided directly by Google LLC, publicly available information, and third-party information. Any revisions to those data will affect the assessments shown as part of the study. To calculate economic impacts, this study used an input-output model developed by IMPLAN. In preparing this study, Deloitte has, without independent verification, relied on the accuracy of information made available by Google.