

Impact Study

Oklahoma, US Data Center

2024



Google's Data Center Impact in Oklahoma

Google's data center in Oklahoma 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 Oklahoma drive local economic development through job creation, promote environmental stewardship through carbon-free energy production, and foster thriving communities.

Since 2007, Google has invested more than [\\$4.8B in Oklahoma'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 Oklahoma in recent years.

Economic

Google's investments in digital infrastructure in Oklahoma support jobs in construction, engineering, and the service industry. Google's data center contribution to labor income in Oklahoma is equal to supporting [~6,430 households in the state each year](#).

~\$613M

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

~5,885

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 EDF Renewables to [bring 201 MW of clean energy from a wind project](#) in Woodward and Ellis counties to power Google's Oklahoma data center.

87% (2023) | 87% (2022)

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

Social

Google's community investments include support to the Thunder Foundation which [helped Black high school and college students in the Tulsa area develop skillsets valued by local employers](#), fostering a diverse future workforce and more equitable economic growth in Oklahoma.

~\$1.1M

Invested in Oklahoma 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



~\$613M

Annual Contribution
to Local GDP

*Includes ~\$304M direct, ~\$176M
indirect, and ~\$133M induced*



~5,885

Annual
Jobs Supported²

*Includes ~975 direct jobs, ~3,520
indirect, and ~1,390 induced*



~\$384M

Annual
Labor Income

*Includes ~\$77M direct, ~\$237M
indirect, and ~\$70M induced*

Google's contribution to Oklahoma's GDP increased by ~48% between 2021 and 2023, compared to the state's overall GDP growth of ~8% during the same period.

Google's data center contribution to direct, indirect, and induced labor income in Oklahoma is equal to supporting ~6,430 households in the state each year.

Top GDP Contributions³



Professional, scientific, and technical services⁴

**(18% of Total GDP Contribution
from Google's investments in
Oklahoma)**



Construction
(14%)



Utilities
(10%)

Spotlight: Carbon-Free Energy

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



~\$54M

Annual
Contribution to
Local GDP



~190

Annual Jobs
Supported



~\$16M

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. Top GDP contributions detail the three largest contribution areas and are not meant to total to 100%. 4. Includes computer systems, data processing, software services, and other computer-related facility management support, etc.

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

87% (2023) vs. 47% (2023 Regional Grid)

87% (2022) vs. 47% (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)

1.10 (2022)

vs. 1.58 (industry average)

Avg. Power Usage Effectiveness

Compared to the industry average, Google's Oklahoma 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 advance Google's 24/7 CFE commitment, Google had over 680 MW worth of operational clean energy contracts in Oklahoma at the end of 2023. Part of this 680 MW includes a Power Purchase Agreement Google signed with EDF Renewables for 201 MW of power from its Great Western Wind Project in Woodward and Ellis counties.

This project houses 81 wind turbines, which can generate power equivalent to avoiding CO₂ emissions from 125,000 vehicles driven for a year.

"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

815.1M Gal. (2023)

689.7M Gal. (2022)

Water Consumption

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

Sustainability Spotlight

The Mayes County data center holds many of Google's next-generation Tensor Processing Units (TPUs). Designed for machine learning, these TPUs reduce energy consumption by operating up to 5x more efficiently than off-the-shelf processors. In addition, Google can shift background updates, like processing YouTube uploads, to when energy is available on the grid by using a carbon-intelligent computing platform.

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



~\$1.1M

Given to communities
in 2022 and 2023

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



21

Organizations supported
in 2022 and 2023

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



48,000

Pounds of nutritious
food given

*Based on food bank donation
support³*

Google invested ~\$1.1M in Oklahoma communities, including:

Food Security

In 2022, Google gave \$100K to enable the Food Bank of Eastern Oklahoma to deliver nutritious food to underinvested community members.

- The funding helped to deliver 480,000 pounds of nutritious food to Oklahomans across 24 counties over the course of 12 months.
- A large portion of food delivered was to low-income families, at-risk students, seniors, military veterans, and ethnic minorities in underinvested areas – about 41% of which live in rural communities.

Empowering Students

From 2020-2023, Google provided \$400K to the Thunder Foundation.

- One program Google supported was Thunder Fellows, which works with Black high school and college students in the Tulsa area to develop skillsets valued by local employers.
- Google's grant specifically supported Thunder Fellows' data & analytics curriculum, which allowed students to engage in immersive field lessons with businesses and higher education institutions, as well as provided technology equipment and transportation to help Black students access careers in technology.



"Food insecurity continues to impact over half a million Oklahomans each year. With Google's contribution, we can make a significant and immediate difference in the lives of families and individuals in need. We are full of gratitude for Google's support. They're a valuable partner in our mission to fight hunger and provide for our community."

- Calvin Moore, President and CEO of the Food Bank of Eastern Oklahoma

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. Based on investments to the Food Bank of Eastern Oklahoma.

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 Oklahoma.

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 Oklahoma articulates Google's impact across these three domains. As Google considers its future strategy in Oklahoma, 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 Oklahoma. 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 Oklahoma 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. 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.