

How much CO₂e?

Use the CO₂e data to explore ways of reducing the impact of how you communicate.

Be ready to present your findings either as a slide show or a poster.

✦ AI Overview

The carbon footprint (*CO₂e*) of digital communication varies significantly based on the platform, data size, and, for emails, whether they have attachments or large chains. Generally, instant messages have a lower carbon footprint than emails, though they all contribute to data center emissions.

Email (*CO₂e*)

- **Average Email:** ~0.3g to 4g of *CO₂e*.
- **Simple/Short Email:** ~0.3g to 0.4g of *CO₂e*.
- **Email with Attachment/Images:** Up to 50g of *CO₂e*.
- **Total Annual Impact:** An average office worker produces about 135 kg of *CO₂e* per year just by sending emails.
- **Tips:** Reduce file sizes, avoid "Reply All," and delete old emails to reduce storage.

What is the carbon footprint for sending an emoji in response to an email in Outlook?

 Estimated Carbon Footprint of an Emoji Reaction

Sending an emoji reaction is essentially sending a tiny metadata packet, much smaller than a regular email.

Action	Estimated CO ₂ Emissions
Emoji reaction (e.g., 🙌)	~0.1 – 0.5 g CO ₂ e

For context:

- This is equivalent to **a few seconds of LED light bulb usage**.
- Reactions are much more efficient than replies like "Thanks" or "Got it" (which can be ~4 g CO₂e or more).

What is difference in the carbon footprint of a google search with and without the Gemini summary?

 Comparison: Google Search vs Gemini Summary

Action	Estimated CO ₂ Emissions per Query
Standard Google Search	~0.2 – 0.8 g CO ₂ e
AI Summary (Gemini/SGE)	~3 – 10 g CO ₂ e

Teams Messages (CO_2e)

- While specific, widely accepted, independent figures for a single Teams message are less common, they are considered significantly more sustainable than emails, particularly when replacing long email threads.
- Teams chat is designed for rapid, short interactions, often consuming less energy than sending a formal email.
- **Video Calls:** A one-hour, six-participant HD meeting produces ~0.05kg (50g) of CO_2e . Turning off cameras can reduce this by 96%.

WhatsApp Messages (CO_2e)

- **Single Message:** Approximately 0.05g to 0.2g of CO_2e , making it one of the most carbon-efficient communication methods.
- **Media:** Sending videos, GIFs, or photos increases this, while simple text or emojis have a much lower footprint.
- **WhatsApp Group:** An active group chat can consume about 2.35kg of CO_2e per week.

Comparison Summary

Communication Type	Estimated CO_2e per Instance	Key Factors
WhatsApp Message	~0.05g - 0.2g	Highly efficient
Short Email	~0.3g - 4g	Standard, no attachment
Email w/ Attachment	~50g	High impact
Teams Message	Low (similar to SMS)	Sustainable for quick chat

Key Takeaway: To minimize your carbon footprint, prefer short instant messages (Teams/WhatsApp) over emails, keep email threads brief, and remove attachments whenever possible.

◆ AI Overview

A single, standard query to ChatGPT is estimated to produce **between 2 and 5 grams of CO_2e** (carbon dioxide equivalent). While this amount is small on an individual basis, it is significantly higher than a standard Google search (approx. 0.2–0.5g CO_2e). 

Here is a breakdown of the environmental impact of a ChatGPT interaction:

Key Metrics

- **Per Query:** A commonly cited figure for a ChatGPT query is **4.32 grams of CO_2** .
- **Comparison:** One query can produce 10 to 20 times more carbon than a single Google search.
- **Context:** 15-20 queries are roughly equivalent to the carbon emissions of watching one hour of video streaming.
- **Water Usage:** Beyond carbon, a 20-50 question conversation with ChatGPT can consume roughly 500ml of water for cooling the data centers. 

◆ AI Overview

While there is no publicly available, exact CO_2e (carbon dioxide equivalent) figure for a single "Thank you Alexa" command, it is part of the broader energy usage of voice-activated AI, which is generally very low per interaction.

Here is the breakdown of the environmental impact based on the available information:

- **Extremely Low Energy Usage:** An Echo device consumes about 2 to 4 Watts while active. A "thank you" interaction lasts only a few seconds, involving a voice command processing (voice-to-text) and a quick cloud response, which is a very small fraction of a Watt-hour.
- **Data Center Impact:** The main energy cost comes from the cloud data processing required to understand and respond to your voice.
- **Comparison:** A simple voice command, like "Thank you," uses significantly less energy than, for example, streaming a high-definition video. It is likely in the realm of a fraction of a gram of CO_2e , similar to sending a very short text-based email or a simple search query. 