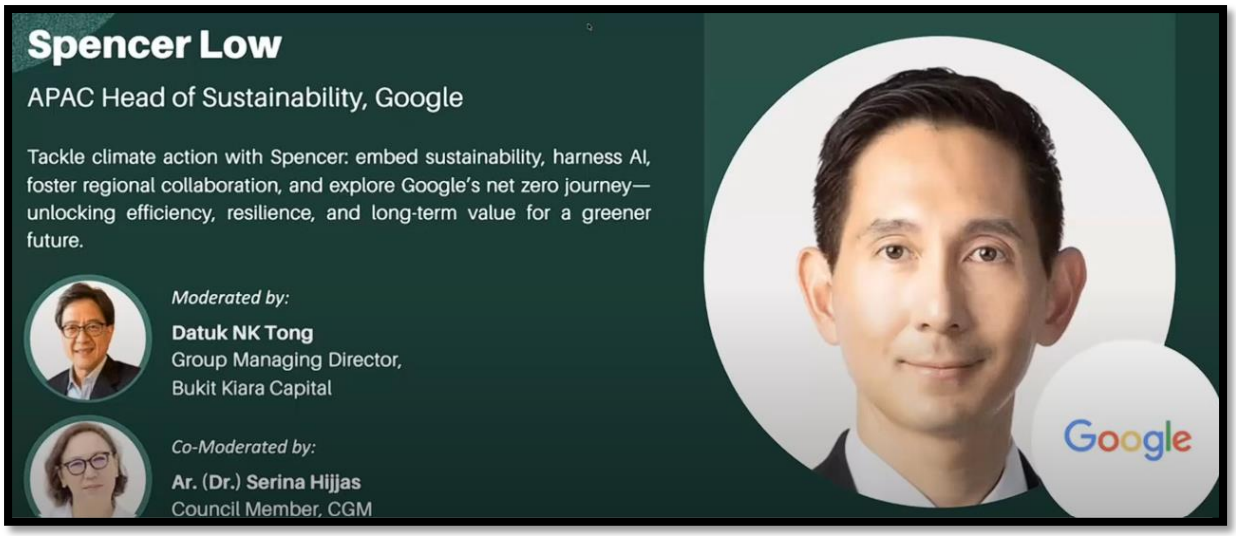
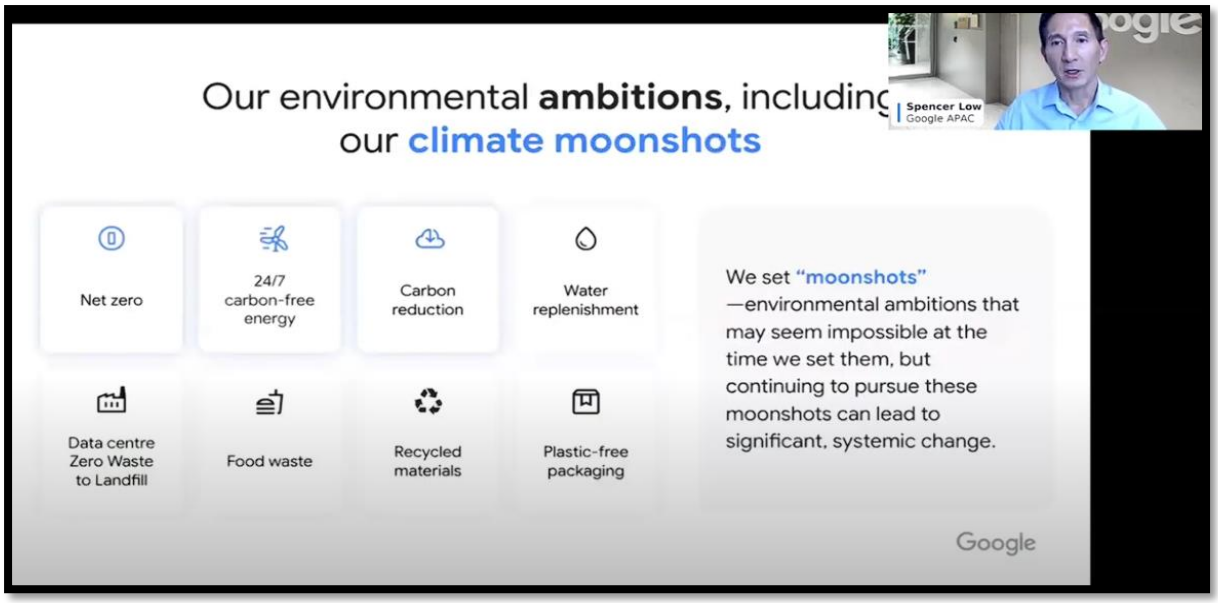
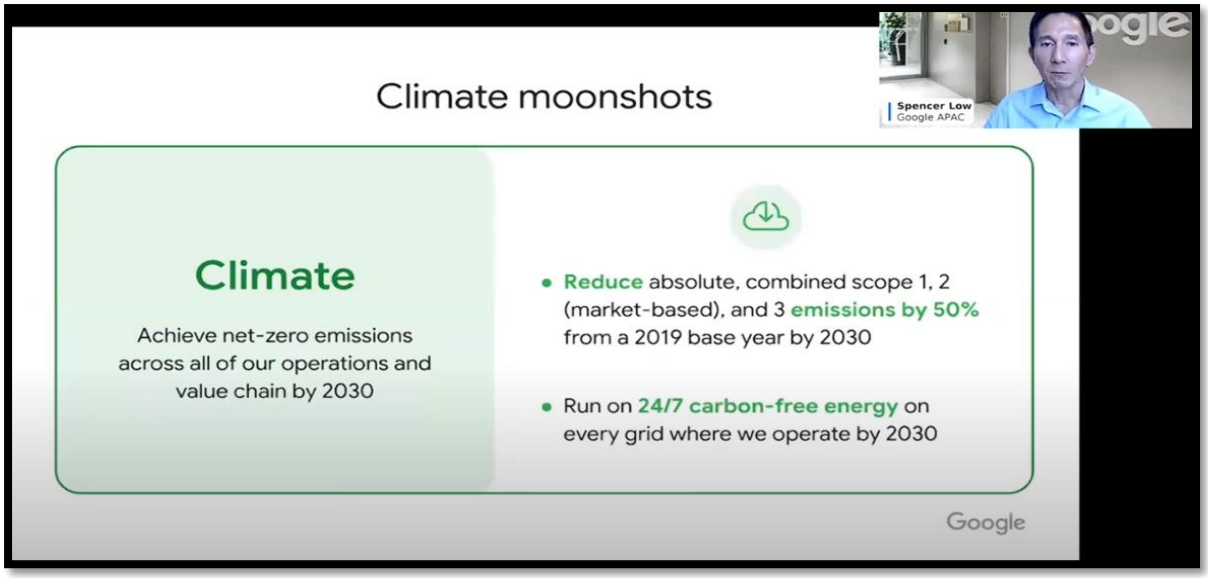
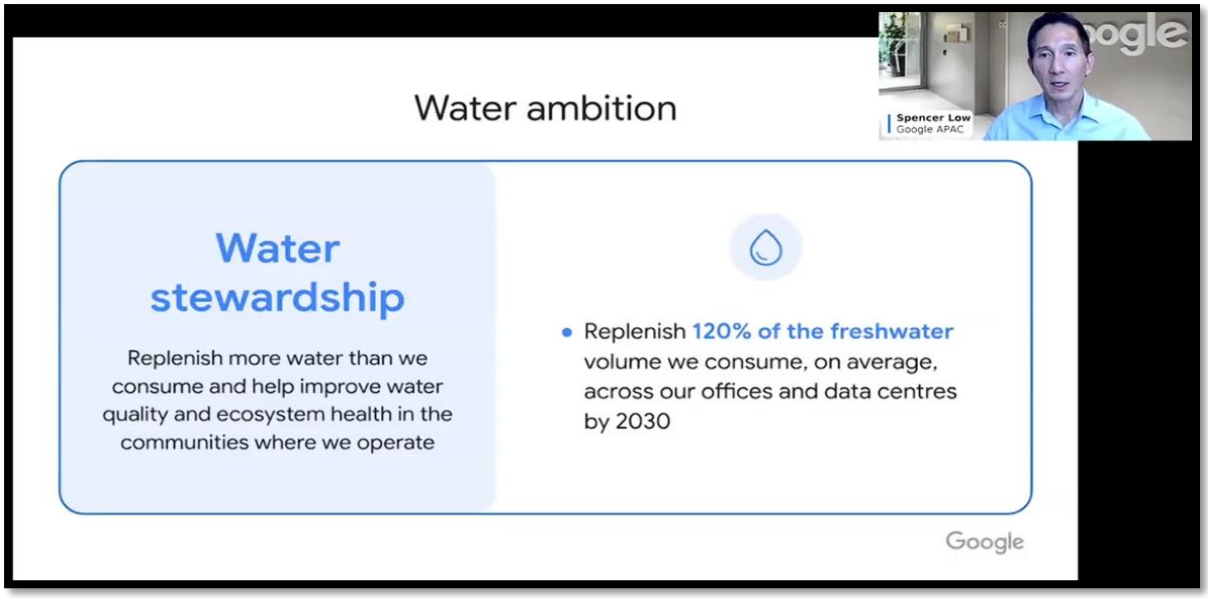

Spencer Low
APAC Head of Sustainability, Google
Tackle climate action with Spencer: embed sustainability, harness AI, foster regional collaboration, and explore Google's net zero journey—unlocking efficiency, resilience, and long-term value for a greener future.
Moderated by:
Datuk NK Tong
Group Managing Director,
Bukit Kiara Capital
Co-Moderated by:
Ar. (Dr.) Serina Hijjas
Council Member, CGM
Google


Google: Sustainability in the age of AI
Spencer Low | September 29, 2025
Spencer Low
Google APAC


Google's sustainability strategy
Spencer Low
Google APAC
Our operations
Driving sustainability across our operations by advancing energy and accelerating resource efficiency
Energy
• Energy for our data centres
• Energy for our supply chain
Resource efficiency
• Water stewardship
• Waste reduction
• Nature on our campuses
• Consumer hardware devices
Our products
Empowering people with information to mitigate and adapt to climate change—focusing on sectors like energy and transportation where Google's unique capabilities can have a meaningful impact
New AI research solutions
AI for extreme weather events and disaster response
Protecting the planet with our AI products
Information and innovation
We're helping to lead the transformation to a more sustainable future by making information accessible and driving innovation forward
Google

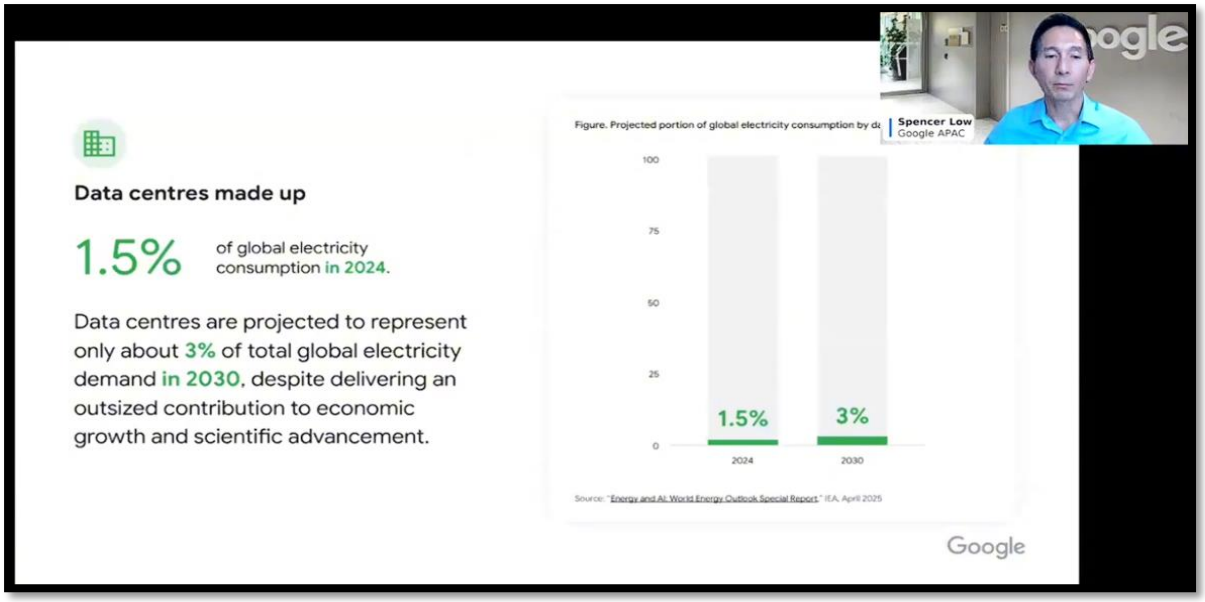

Our environmental ambitions, including our climate moonshots
Spencer Low
Google APAC
Net zero
24/7 carbon-free energy
Carbon reduction
Water replenishment
Data centre Zero Waste to Landfill
Food waste
Recycled materials
Plastic-free packaging
We set "moonshots" —environmental ambitions that may seem impossible at the time we set them, but continuing to pursue these moonshots can lead to significant, systemic change.
Google


Climate moonshots
Spencer Low
Google APAC
Climate
Achieve net-zero emissions across all of our operations and value chain by 2030
Reduce absolute, combined scope 1, 2 (market-based), and 3 emissions by 50% from a 2019 base year by 2030
Run on 24/7 carbon-free energy on every grid where we operate by 2030
Google


Water ambition
Spencer Low
Google APAC
Water stewardship
Replenish more water than we consume and help improve water quality and ecosystem health in the communities where we operate
Replenish 120% of the freshwater volume we consume, on average, across our offices and data centres by 2030
Google


Waste ambitions
Spencer Low
Google APAC
Circular economy
Maximize the reuse of finite resources across our operations, products, and supply chains
Achieve Zero Waste to Landfill for our global data centre operations
Divert all food waste from landfill by 2025
Use recycled or renewable material in at least 50% of plastic used across our consumer hardware product portfolio by 2025
Make product packaging 100% plastic-free by 2025
Google


Spencer Low
Google APAC
As the digital economy expands, so does our collective need for electricity.
The rise in global energy consumption is driven by:
Industrial production
Electrification of industries
Increasing cooling needs amid record-breaking temperatures
Data centres
And more...
Figure. Increase in electricity demand by sector in the Base Case, 2024-2030
Industry excl. heavy industry
Electric transport
Appliances
Space cooling
Data centres
Space and water heating
Heavy industry
Other
500
1 000
1 500
TWh
IEA. CC BY 4.0.
Source: "Energy and AI: World Energy Outlook Special Report," IEA, April 2025
Google


Spencer Low
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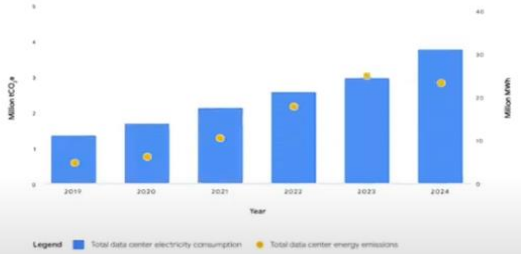
Data centres made up
1.5%
of global electricity consumption in 2024.
Data centres are projected to represent only about 3% of total global electricity demand in 2030, despite delivering an outsized contribution to economic growth and scientific advancement.
Figure. Projected portion of global electricity consumption by da
100
75
50
25
0
1.5%
3%
2024
2030
Source: "Energy and AI: World Energy Outlook Special Report," IEA, April 2025
Google

Emissions from data centre energy

12%

In 2024, we reduced our data centre energy emissions by **12%** compared to 2023.

Figure. Trajectory of data centre electricity consumption and data centre energy emissions



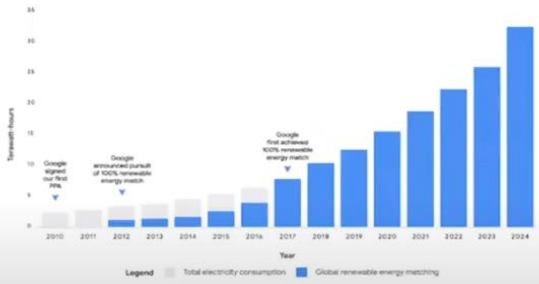
Google

Renewable energy

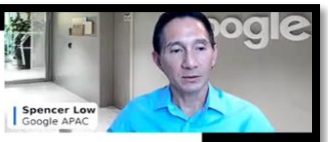
100% match

We've maintained a **100%** renewable energy match on a global basis every year since 2017.

Figure. Clean energy purchases compared to total electricity use



Google

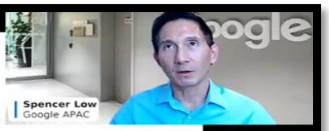


Minco II wind farm in Oklahoma (102 MW for Google).

In addition to generating more clean electricity, the global energy transition is about **aligning supply with demand in real time**—hour by hour, grid by grid.

That's the vision behind **24/7 carbon-free energy**, where every kilowatt-hour of electricity we use is matched with clean power produced on the same grid during the same hour.

Google



Carbon-free energy progress varies by region

We achieved **at least 80% carbon-free energy** on an hourly basis across **nine out of 20 grid regions** with Google-owned and -operated data centres.

Figure. Carbon-free energy map for grid regions with Google-owned and -operated data centres

Google

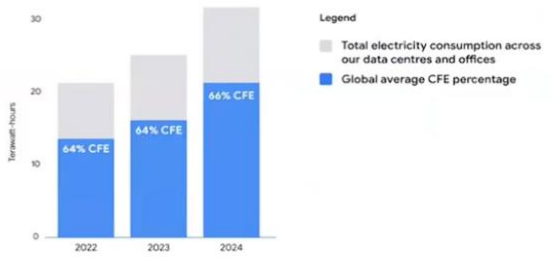
Ambition

Carbon-free energy

We aim to run on 24/7 carbon-free energy on every grid where we operate by 2030.

Progress

In 2024, we increased our global carbon-free energy percentage across our data centres and offices to **66%**



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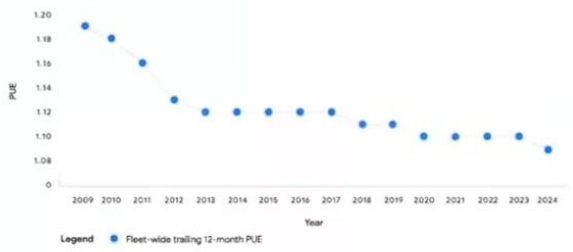
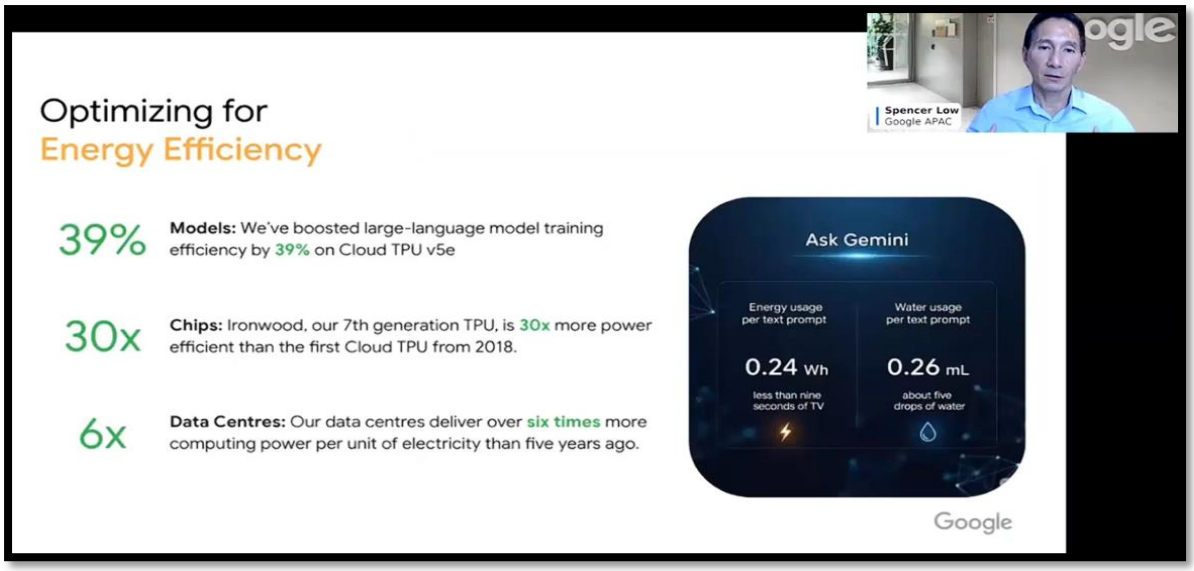
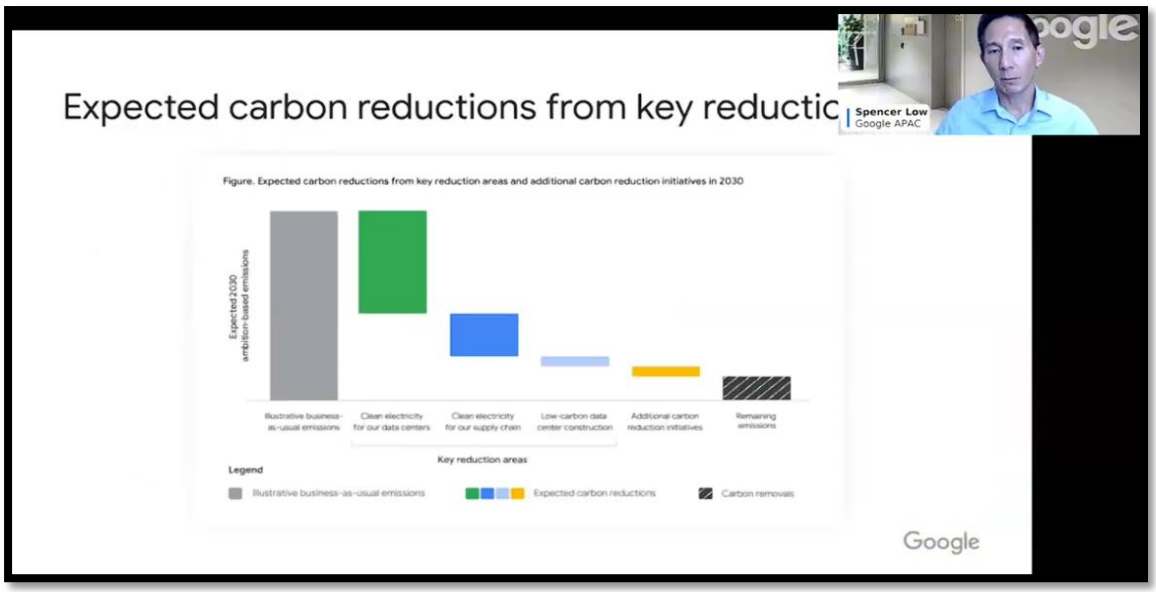
For the first time in years, the average annual power usage effectiveness (PUE) for our global fleet of data centres dropped below 1.10 to **1.09**.

Figure. Energy efficiency (PUE) across Google data centres



Google


Optimizing for
Energy Efficiency
39%
Models: We've boosted large-language model training efficiency by 39% on Cloud TPU v5e
30x
Chips: Ironwood, our 7th generation TPU, is 30x more power efficient than the first Cloud TPU from 2018.
6x
Data Centres: Our data centres deliver over six times more computing power per unit of electricity than five years ago.
Ask Gemini
Energy usage per text prompt
0.24 Wh
less than nine seconds of TV
Water usage per text prompt
0.26 mL
about five drops of water
Google
Spencer Low
Google APAC


Expected carbon reductions from key reductio
Figure. Expected carbon reductions from key reduction areas and additional carbon reduction initiatives in 2030
Expected 2030 ambition-based emissions
Illustrative business-as-usual emissions
Clean electricity for our data centers
Clean electricity for our supply chain
Low-carbon data center construction
Additional carbon reduction initiatives
Remaining emissions
Key reduction areas
Legend
Illustrative business-as-usual emissions
Expected carbon reductions
Carbon removals
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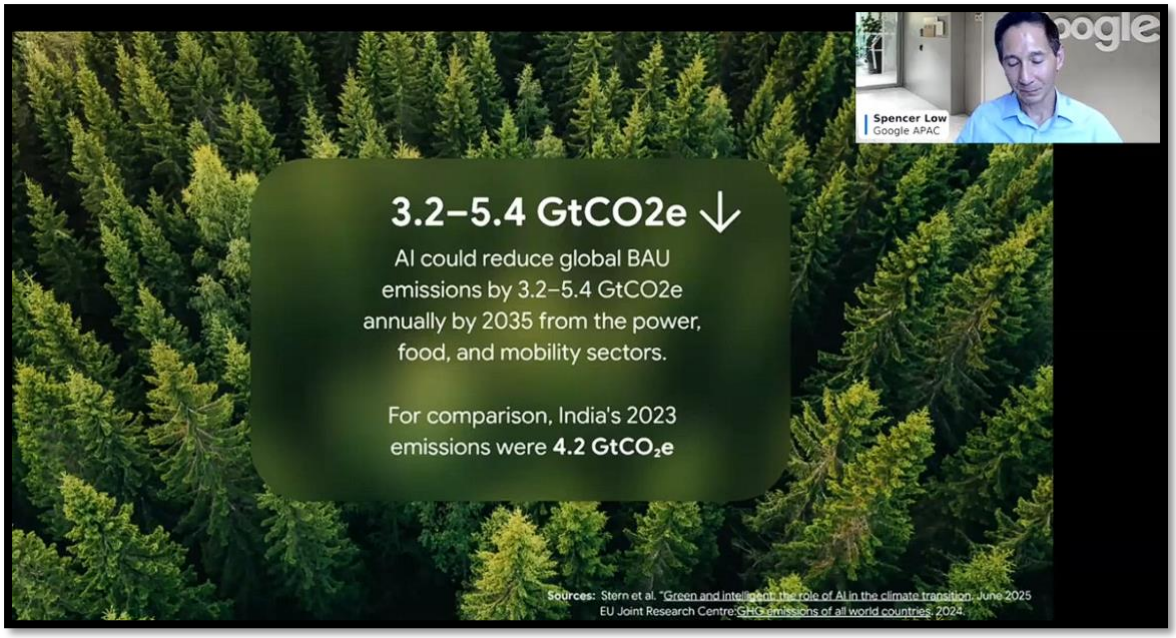
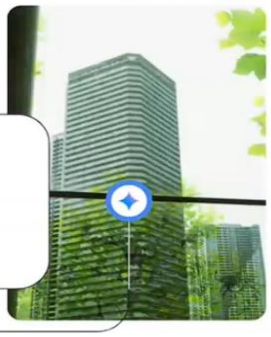

3.2–5.4 GtCO2e ↓
AI could reduce global BAU emissions by 3.2–5.4 GtCO2e annually by 2035 from the power, food, and mobility sectors.
For comparison, India's 2023 emissions were 4.2 GtCO₂e
Sources: Stern et al. "Green and intelligent: the role of AI in the climate transition", June 2025
EU Joint Research Centre GHG emissions of all world countries, 2024.
Spencer Low
Google APAC

Companies face increasing pressure to build m resilient and sustainable businesses

- Supply chain transparency
- Monitoring ESG progress
- Opportunities in climate finance
- Optimizing operations and reducing cost
- Transition to clean energy
- Rapidly changing regulations

Google

5 AI trends are changing how companies manag sustainability



Trend 1 — **Multimodal AI:** Unleash the power of context

Trend 2 — **AI Agents:** From chatbots to multi-agent systems

Trend 3 — **Assistive Search:** The next frontier of knowledge work

Trend 4 — **AI Powered Customer Experience:** So seamless, it's almost invisible

Trend 5 — Security gets tighter - and tougher - with AI

Google

Creating new opportunities for competitive advantage

Geospatial Reasoning

Accelerate real-world problem solving

Multimodal AI

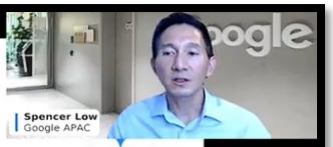
Deeper understanding of unstructured data

AI Agents

Automate data gathering and ESG reporting

Google

Creating new opportunities for competitive advantage



Geospatial Reasoning

Accelerate real-world problem solving

Multimodal AI

Deeper understanding of unstructured data

AI Agents

Automate data gathering and ESG reporting

Google

AI helps companies reimagine their sustainable practices to drive business growth

01 Measure progress towards ESG targets

02 Optimize energy across operations

Grow your business in the low-carbon transition

Build tools to reduce costs and carbon footprint

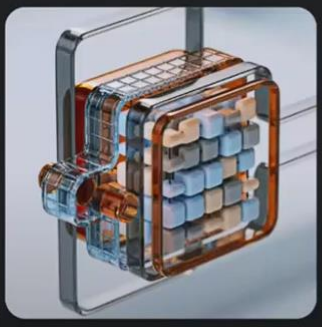
Optimize energy and resource usage across operations and supply chains

Where sustainability leaders are focusing their efforts

Enhance supply chain efficiency

Reduce fleet emissions and optimize routes

Improve network performance and resource allocation



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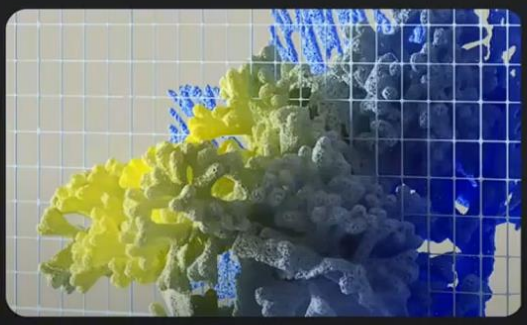
Grow your business in the low-carbon transition

Where sustainability leaders are focusing their efforts

Integrate geospatial data to improve financial decisions

Unlock new services to drive innovation



Google

Build tools to reduce costs and carbon footprint

Where sustainability leaders are focusing their efforts

Reduce emissions of cloud apps and infrastructure

Google