

The Mass Water Consumption By Technology And AI “Visualizing The Invisible”

Marios Kourtis, Michalis Laloumis, Stelios
Birbakos, Christoforos Asprogerakas-Grivas

6th | edition

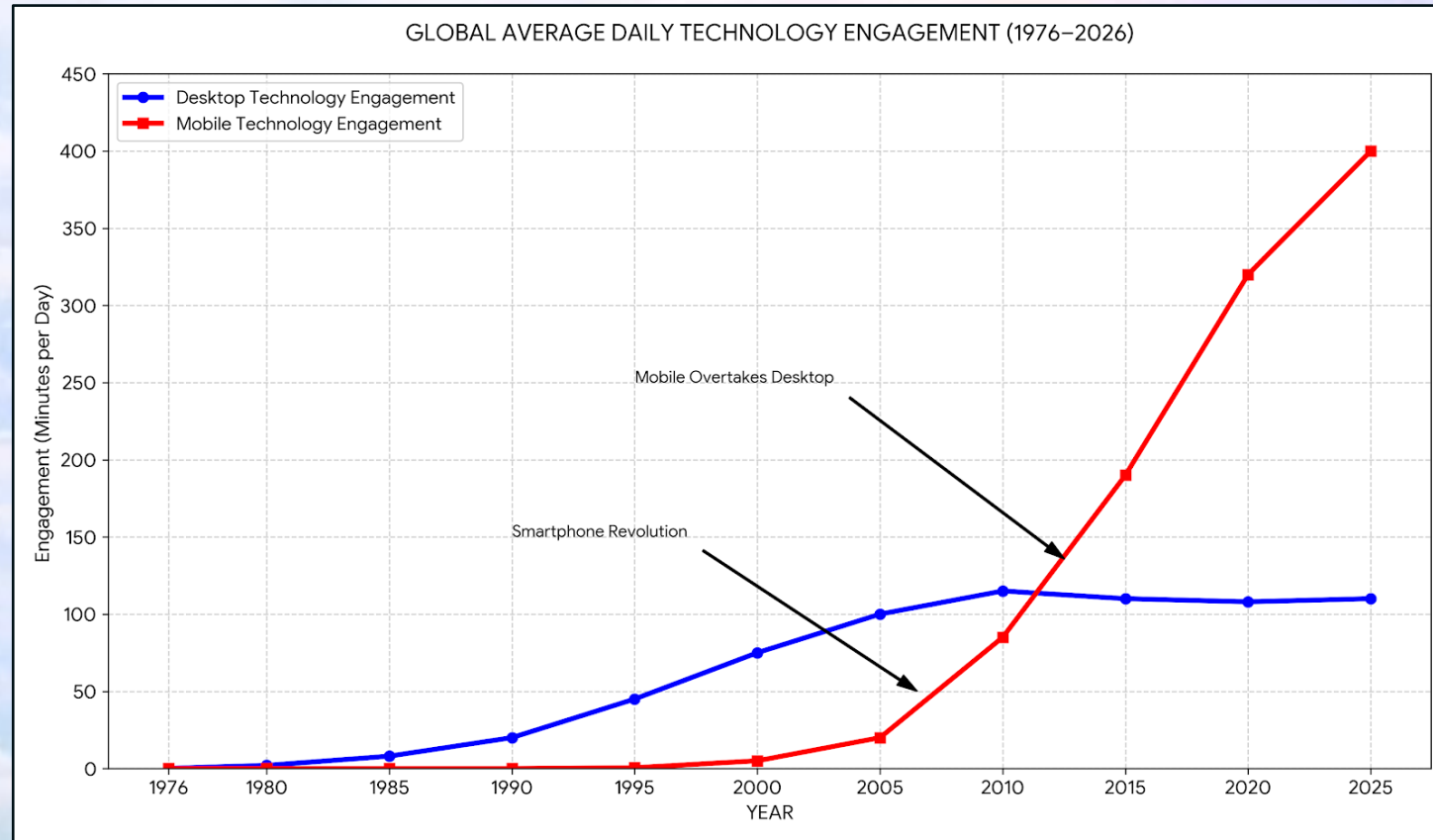


Introduction to the Topic

The mass water consumption by technology and Artificial Intelligence

How is the issue developing?

It is spiraling out of control in recent years, due to an increase in the use of technology in almost every aspect of our day



Source: Gemini 1.5 Flash via custom prompting, based on Utrecht University & NOAA Datasets



Introduction to the Topic

The mass water consumption by technology and Artificial Intelligence

What is happening that **we cannot see?**

Without us even knowing or seeing anything, every technological aspect of our daily lives is wasting mass amounts of water to cool down the Data Centres that are used to store data



Source: Envato video generation



Introduction to the Topic

**WATER
GAP**

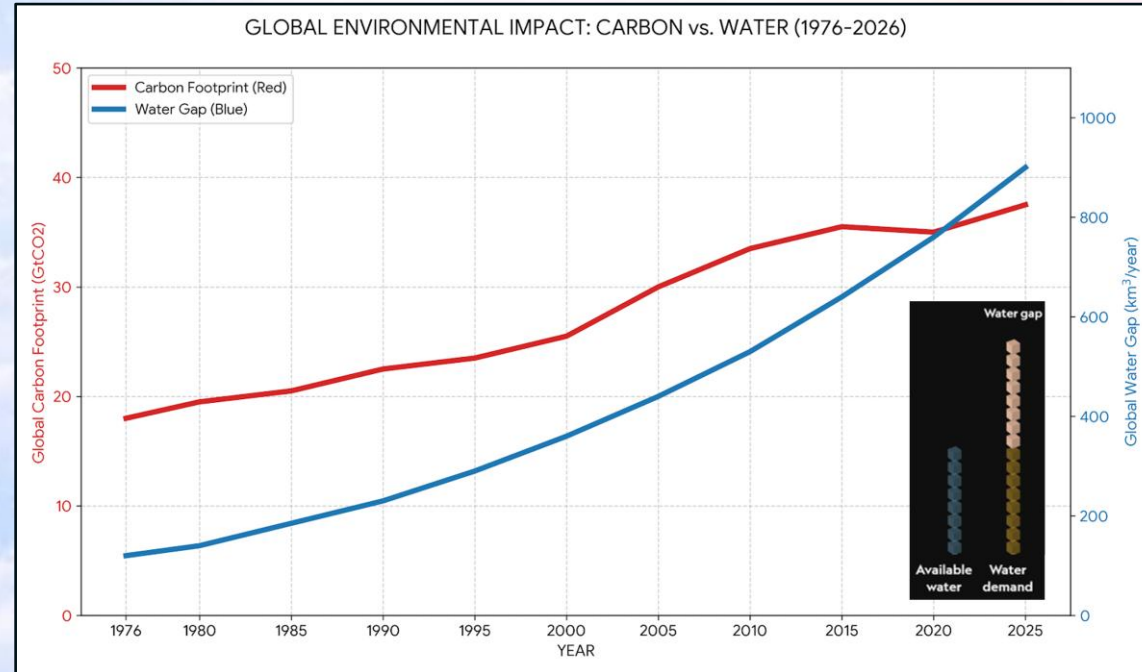
**WATER
STRESS**

**WATER
FOOTPRINT**



Introduction to the Topic

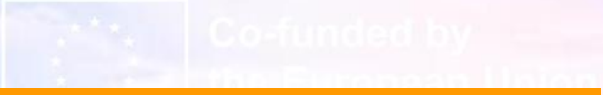
WATER GAP



Source: Gemini 1.5 Flash via custom prompting, based on Utrecht University & NOAA Datasets

This issue arises when people use more water than the land and water cycle can provide. We deplete aquifers because human extraction is eight times higher than a century ago.

Introduction to the Topic



This phenomenon refers to human needs for water compared to actual availability.

**WATER
STRESS**



Countries experience this when clean water availability per person falls below 1,700 cubic meters per capita annually.

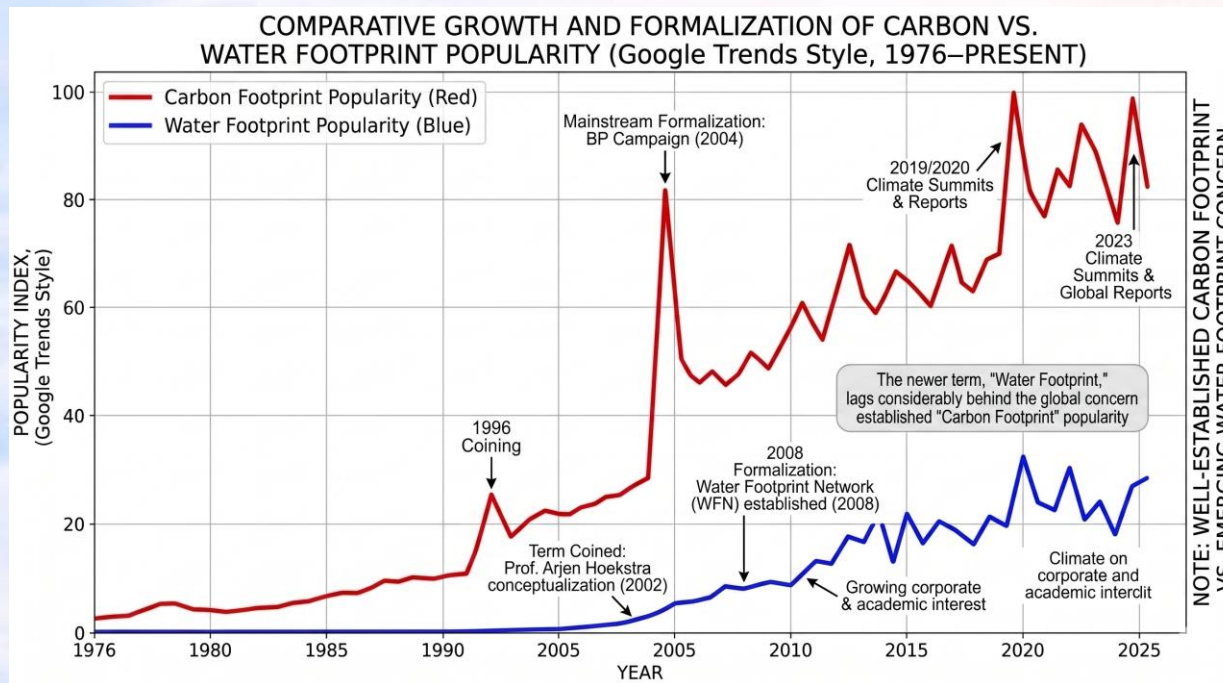
Introduction to the Topic

It is the total volume of freshwater used to produce goods and services, directly or, it is mostly indirectly. For technology indirectly. For technology "invisible" water used for manufacturing and cooling data centers



EU CONEXUS

the European Union



Source: Gemini 1.5 Flash via custom prompting, based on Utrecht University & NOAA Datasets

WATER FOOTPRINT



Community Awareness

We took some initiatives and we designed some posters that we put up in school classrooms to spread awareness and draw interest to our classmates about this sustainability issue

Το Αόρατο Ταξίδι του Νερού σε Κάθε σου Κλικ

Η Αφετηρία: Μια Απλή Ψηφιακή Ενέργεια



Βλέπεις μόνο την επιφάνεια: Μια απλή ενέργεια, όπως το άνοιγμα της τηλεόρασης, φαίνεται να καταναλώνει μόνο ρεύμα.

Το Κρυφό Ταξίδι του Νερού

1. Παραγωγή Ηλεκτρικής Ενέργειας

Οι σταθμοί παραγωγής ενέργειας χρησιμοποιούν νερό για την ψύξη και τη δημιουργία ατμού.

2. Λειτουργία Data Center

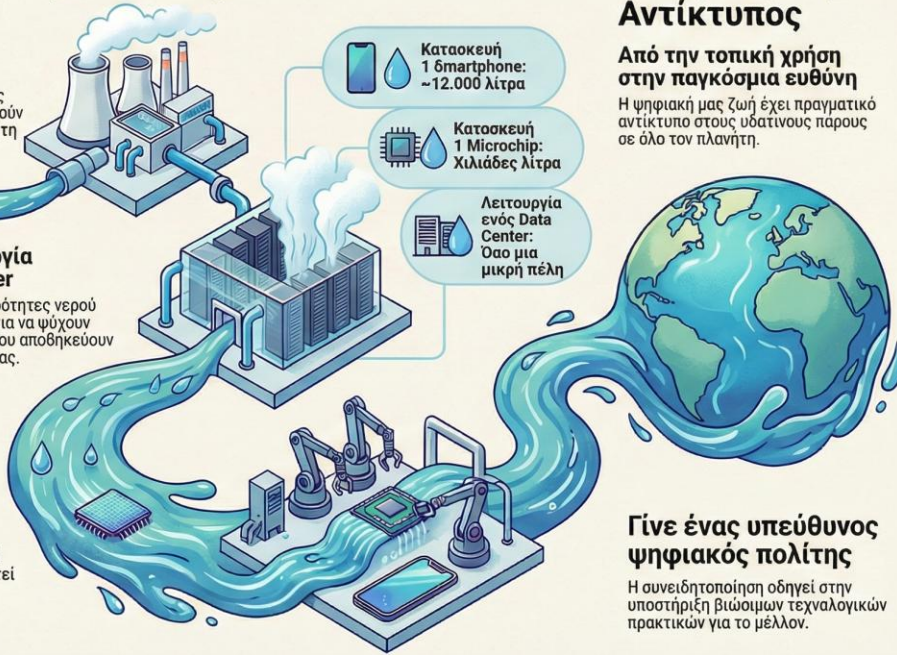
Τεράστιες ποσότητες νερού εξατμίζονται για να ψύχουν τους servers που αποθηκεύουν τα δεδομένα μας.

3. Κατασκευή Συσκευών

Η παραγωγή ηλεκτρονικών, ειδικά των microchips, απαιτεί χιλιάδες λίτρα υπερκαθαρού νερού.

Η πραγματικότητα είναι πολυεπίπεδη

Πίσω από την οθόνη κρύβεται μια αλυσίδα κατανάλωσης νερού σε πολλαπλά, αόρατα στάδια.



Ο Παγκόσμιος Αντίκτυπος

Από την τοπική χρήση στην παγκόσμια ευθύνη

Η ψηφιακή μας ζωή έχει πραγματικό αντίκτυπο στους υδατικούς παρους σε όλο τον πλανήτη.

Γίνε ένας υπεύθυνος ψηφιακός πολίτης

Η συνειδητοποίηση οδηγεί στην υποστήριξη βιώσιμων τεχνολογικών πρακτικών για το μέλλον.

NotebookLM

Το υδατικό αποτύπωμα της τεχνολογίας.

+1,000 Λίτρα Νερού
ανά Χρήστη τον Μήνα

Για τον αποθηκευτικό χώρο στο cloud
• Imperial College London



2,000 μπουκαλάκια νερού
για κάθε χρήστη κάθε μήνα

52,000 Λίτρα Νερού
για κάθε Gigabyte στο Cloud

• Για την παραγωγή ενέργειας που καταναλώνεται • EESI



+104,000 μπουκαλάκια νερού 500ml για κάθε Gigabyte στο cloud

+200,000,000 Λίτρα Νερού κάθε Μέρα στα Data Centers

• Για την ψύξη και την κατασκευή microchips • DCW, Nature



x 40,000,000

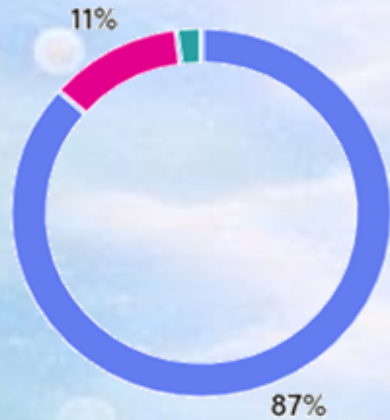
Πηγές: Imperial College London, OECD, European Commission, European Environmental Agency, EESI



Community Awareness

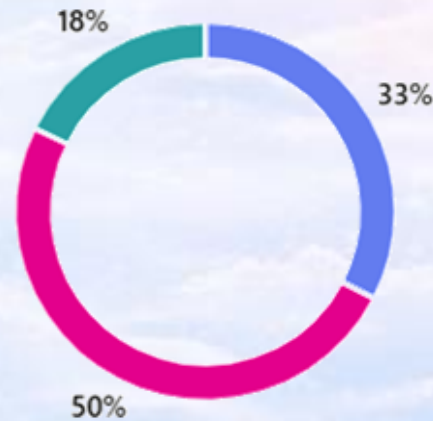
In our school, we have taken multiple actions to make our classmates aware of this issue. First, we created a **small questionnaire** which we shared with young people from 7th grade up to the 12th

Do you consider water waste to be an existing problem in our society?



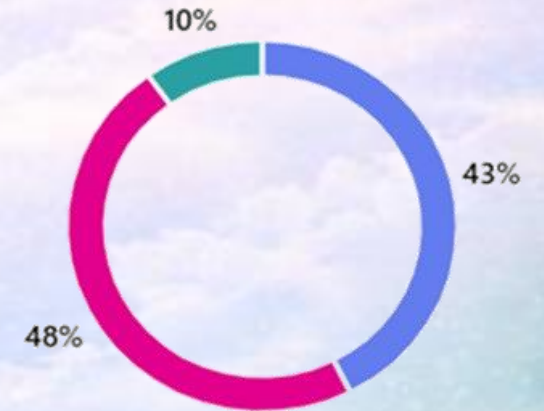
Yes	122
Maybe	16
No	3

Were you aware that technology consumes water?



Yes	46
No	70
I'm not sure	25
Yes	3

Would you be willing to change some of your digital habits if you knew that it reduces water waste??



Yes	60
Maybe	67
No	14



Immersion Cooling

What is Immersion Cooling?

Immersion cooling is: an alternative cooling method for data centers that significantly reduces water and energy consumption and it works by fully submerging the servers in a thermally, but non-conductive liquid



The Two Types of Immersion Cooling

Single-phase
Immersion Cooling is:

The method in which the single-phase coolant never changes state;

+

It does not boil nor freeze,
It always remains in its liquid form.

Two-phase
Immersion Cooling is:

The working fluid can exist in both a liquid or gas state.


+

the gas then rises above the pool where it is then condensed back to its saturation temperature and falls back into the tank.




VISUALISING THE INVISIBLE


Our Own Innovative Solution




AI TEXT GENERATION




VIDEO CALLING




DATA STORAGE



DOOM SCROLLING



VIDEO STREAMING



AI IMAGE GENERATION



- SELECTED SERVICES
- AI Text Generation
 - Video Calling
 - Data Storage
 - Doom Scrolling
 - Video Streaming
 - AI Image Generation

The ECO-VISION team

SEE THE WATER FOOTPRINT

BACK TO MENU

The Water Footprint Behind Video Streaming

TOTAL AI TEXT GENERATION VIDEO CALLING DATA STORAGE DOOM SCROLLING VIDEO STREAMING AI IMAGE GENERATION

PER HOUR: **02** RESET

PRE-COMPUTATION (ENCODING)	0.10 - 0.20 L
EDGE DELIVERY	0.30 - 0.45 L
NETWORK INFRASTRUCTURE	0.35 - 0.55 L
USER DEVICE	0.15 - 0.25 L
SERVER DATA RETRIEVAL	0.25 - 0.40 L
LOCAL PROCESSING (BUFFER)	0.10 - 0.15 L
TOTAL CONSUMPTION:	1.25 - 2.00 L/hour
EST. (2 x 1X):	3.25L

7
500ML WATER BOTTLES



MULTIPLIER: 480p 720p **1080p** 4K

MANAGE SERVICES

AI Text Generation	0.20 - 0.44L/prompt
Video Calling	1.15 - 1.95L/hour
Data Storage	0.15 - 0.38L/GB
Doom Scrolling	0.66 - 1.20L/hour
Video Streaming	1.25 - 2.00L/hour
AI Image Generation	0.42 - 0.85L/image

Combined Water Footprint All Selected Services

TOTAL AI TEXT GENERATION VIDEO CALLING DATA STORAGE DOOM SCROLLING VIDEO STREAMING AI IMAGE GENERATION

AI TEXT GENERATION (4 PROMPTS x 1X)	1.3L
VIDEO CALLING (4 HOURS x 1X)	6.2L
DATA STORAGE (8 GB x 1X)	2.14L
DOOM SCROLLING (4 HOURS x 1X)	3.72L
VIDEO STREAMING (2 HOURS x 1X)	3.25L
AI IMAGE GENERATION (6 IMAGES x 1X)	3.18L
GRAND TOTAL:	19.79L

40
500ML WATER BOTTLES



MANAGE SERVICES

AI Text Generation	0.20 - 0.44L/prompt
Video Calling	1.15 - 1.95L/hour
Data Storage	0.15 - 0.38L/GB
Doom Scrolling	0.66 - 1.20L/hour
Video Streaming	1.25 - 2.00L/hour
AI Image Generation	0.42 - 0.85L/image

But why only explain to you when we can show you!!!
<https://visualisingtheinvisible.com>

Source: watercalculator.org, what-uses-more.com, ChatGPT 5.3 custom prompting

The ECO-VISION team

BACK TO MAP

The ECO-VISION team

BACK TO MAP

Combined Water Footprint

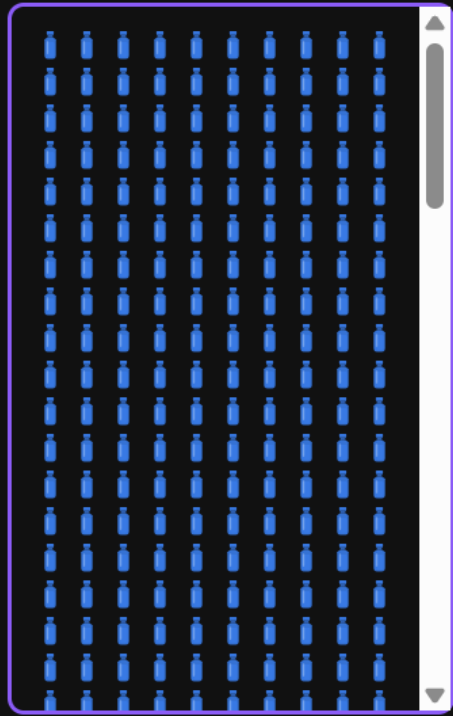
All Selected Services

- TOTAL
- AI TEXT GENERATION
- VIDEO CALLING
- DATA STORAGE
- DOOM SCROLLING
- VIDEO STREAMING
- AI IMAGE GENERATION

AI TEXT GENERATION (537 PROMPTS × 1X)	174.53L
VIDEO CALLING (32 HOURS × 1.2X)	59.52L
DATA STORAGE (79 GBS × 1X)	21.13L
VIDEO STREAMING (27 HOURS × 1X)	43.88L
AI IMAGE GENERATION (91 IMAGES × 1X)	57.79L
GRAND TOTAL:	356.85L

714

500ML WATER BOTTLES



MANAGE SERVICES

AI Text Generation	0.20 – 0.44L/prompt
Video Calling	1.15 – 1.95L/hour
Data Storage	0.15 – 0.38L/GB
Doom Scrolling	0.66 – 1.20L/hour
Video Streaming	1.25 – 2.00L/hour
AI Image Generation	0.42 – 0.85L/image

Our Project Water Footprint



Positive Impact



**Thank You
for your attention**