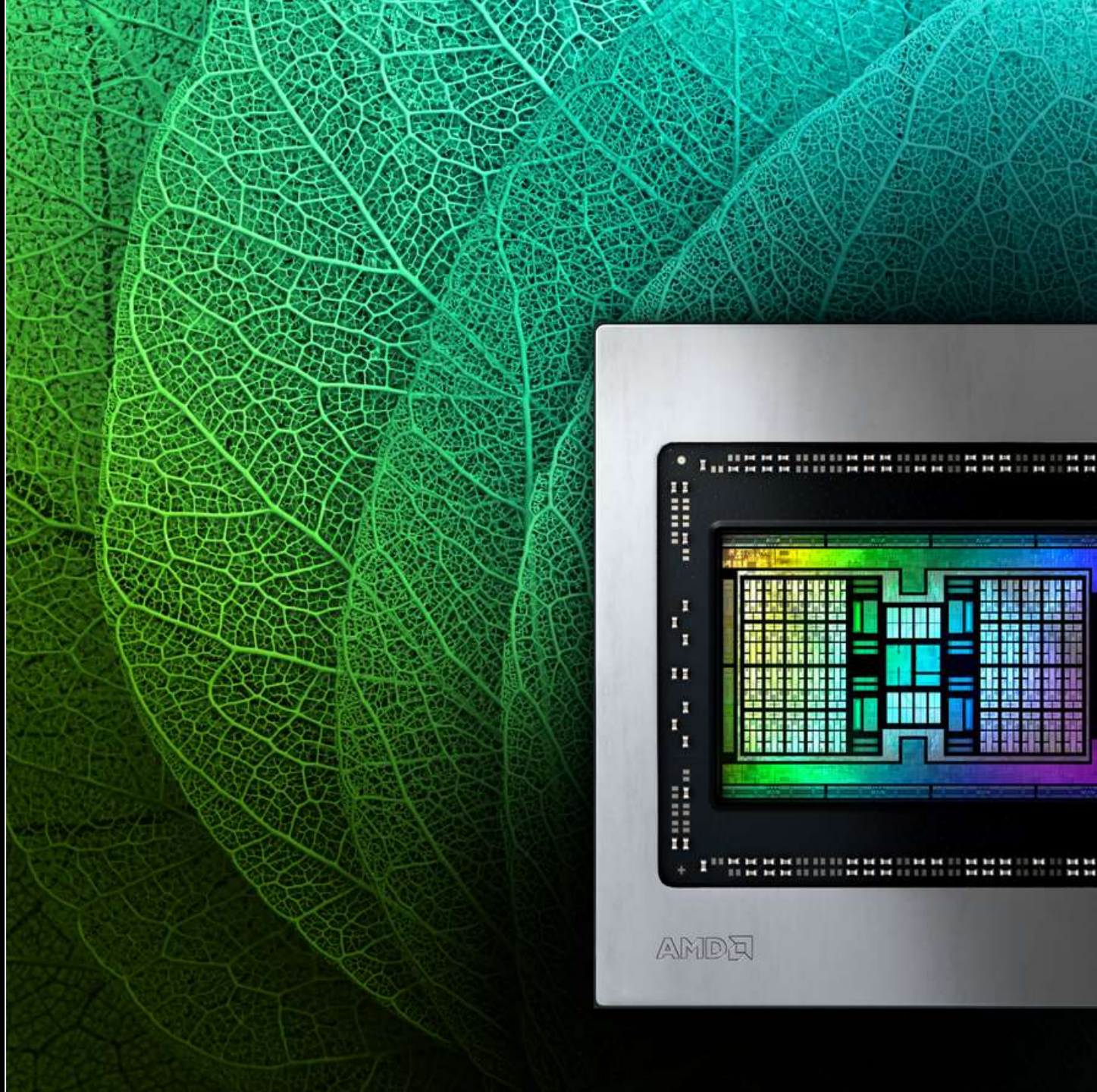


# AMD Environmental Sustainability & Roadmap

John Hampton  
Sr. Director, WW Customer Field Support





## Advancing Data Center Sustainability

Modern data centers are continuously striving for greater efficiency and scalability while delivering increased performance and security.

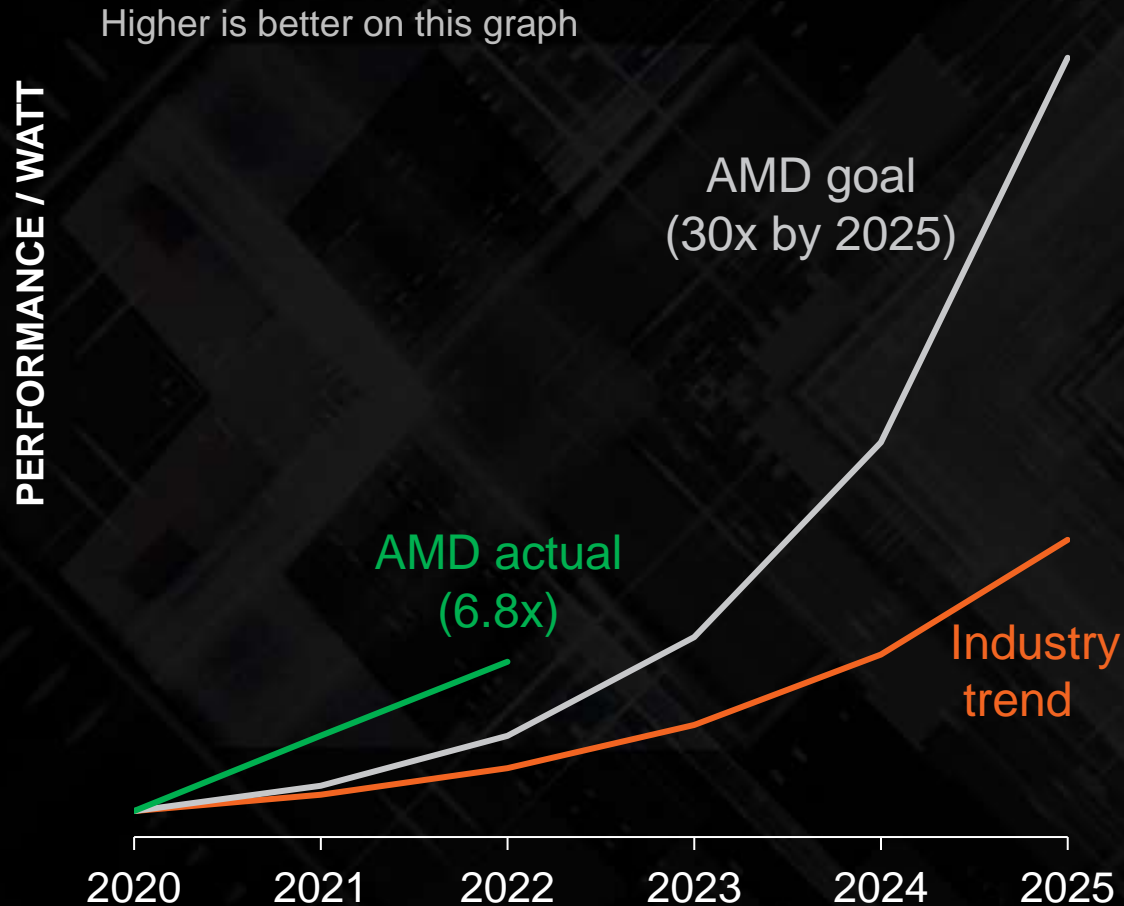
As designers of cutting-edge server CPUs and GPUs, we recognize our important role in addressing these critical priorities.

We are focused on accelerating server energy efficiency and delivering high-performance computing to help tackle some of the world's toughest challenges, including climate change research.

Our goal is a 30x increase in energy efficiency for AMD processors and accelerators for AI-training and HPC from 2020-2025.<sup>4</sup>



# Accelerating Data Center Sustainability



Goal: 30x increase in energy efficiency for AMD processors and accelerators for AI-training and HPC from 2020-2025

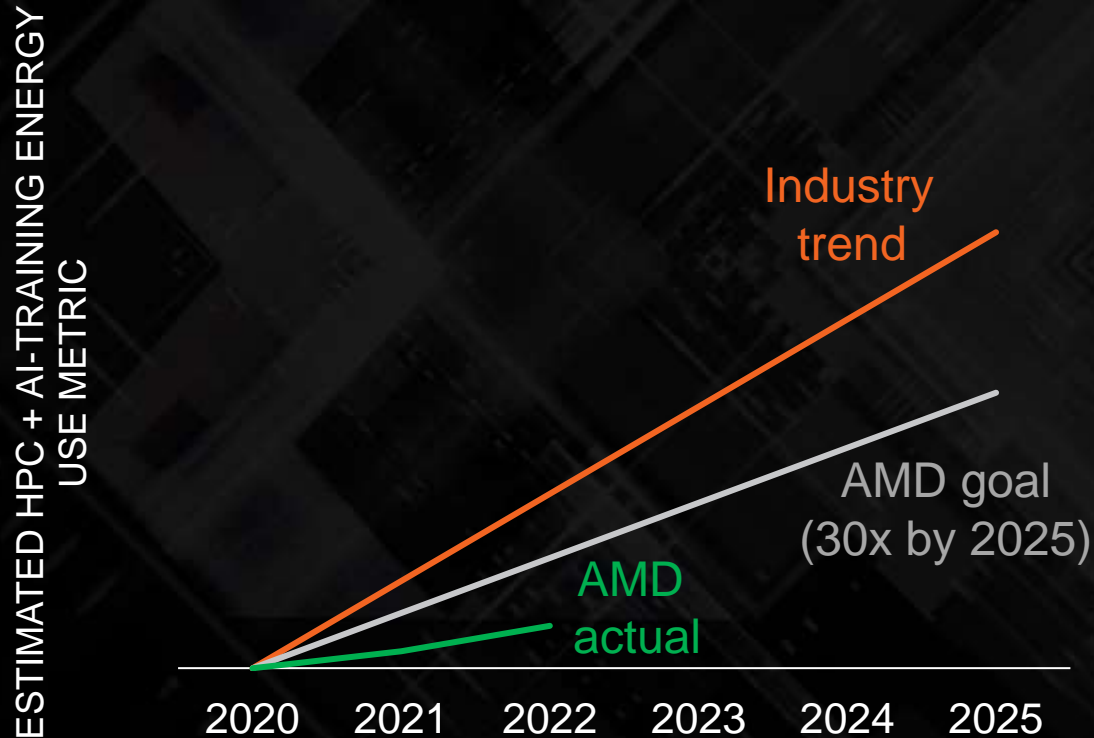
This represents more than a 2.5x acceleration of the industry trends from 2015-2020 as measured by the worldwide energy consumption for these computing segments<sup>5</sup> and equates to a 97% reduction in energy use per computation.

AMD is ON-TRACK to achieve the 30x goal, at 6.8x improvement, and well above the industry improvement trend from 2015-2020, using an accelerated compute node powered by one 3rd Gen AMD EPYC CPU and four AMD Instinct MI250x GPUs.

<https://www.amd.com/en/corporate-responsibility/data-center-sustainability>

# Accelerating Data Center Sustainability

Lower is better on this graph



The “industry trend” estimates global energy use for 2020-2025 following the same historical trend observed in 2015-2020 data.

The “AMD goal” trendline shows global energy use based on the efficiency gains represented by the AMD 30x25 goal with the desirable result of lower energy consumption.

The “AMD actual” trendline shows global energy use based on AMD compute node energy efficiency gains reported to date.

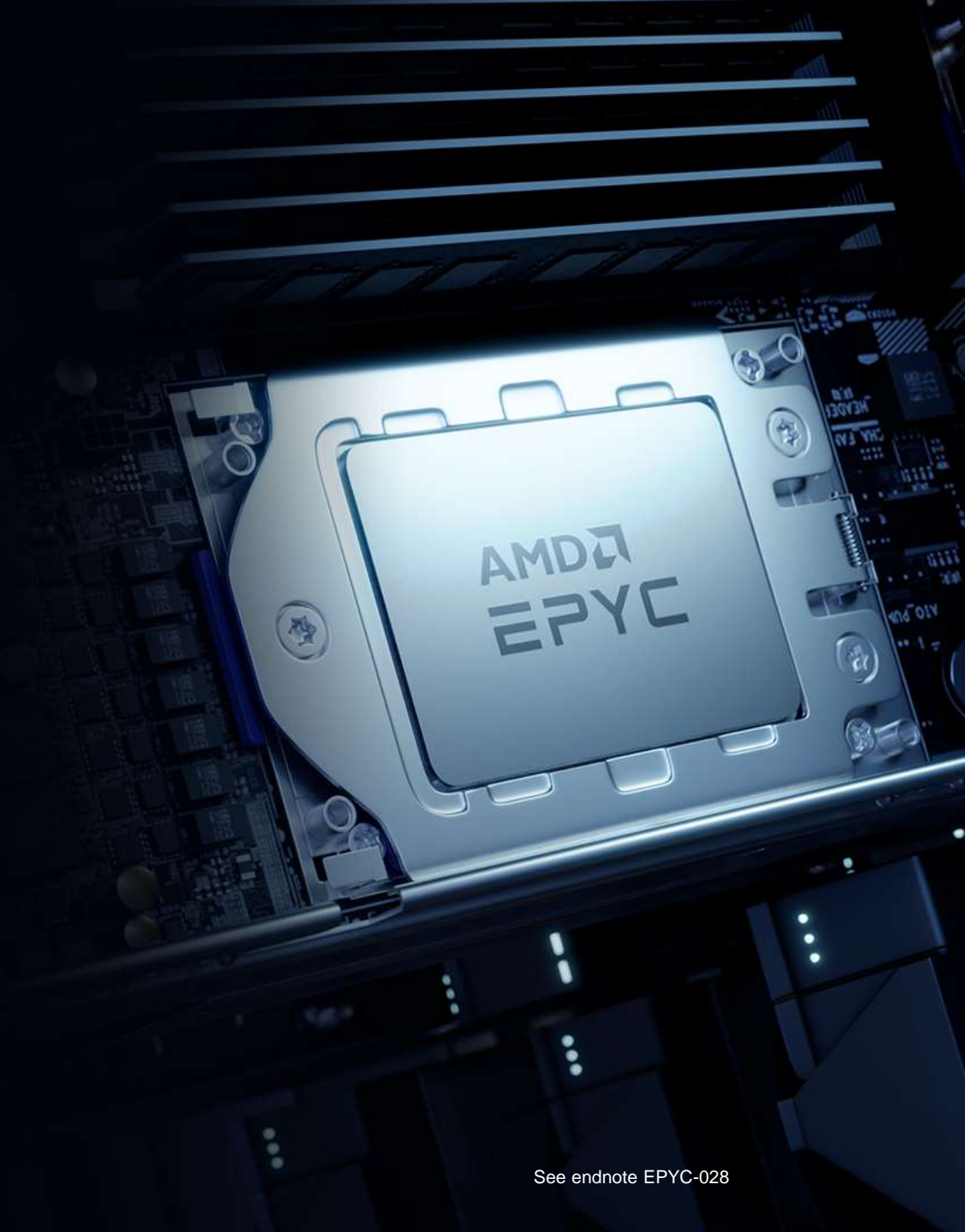
When comparing the AMD goal trendline to baseline industry trends (i.e., if all AI and HPC server nodes globally made similar gains to the AMD goal), equivalent savings include: <sup>6</sup>

- ❑ Up to 51 billion kilowatt-hours (kwh) of electricity and \$6.2 billion USD in electricity costs
- ❑ Electricity generated by 7,500 wind turbines in a year, or
- ❑ Carbon sequestered by 600 million tree seedlings grown for 10 years



AMD EPYC™ processors power the most energy efficient x86 servers, delivering exceptional performance and reducing energy costs.

EPYC CPUs help minimize environmental impacts from data center operations while advancing your company's sustainability goals and objectives.



# AMD EPYC™ PROCESSORS: ENERGY EFFICIENCY LEADER

# #1

## SPEC POWER® 2008

- ✓ OVERALL
- ✓ 1S / 2S OVERALL
- ✓ 1U / 2U / BLADE
- ✓ LINUX® / WINDOWS®

## SPEC CPU® 2017 Energy Metrics

- ✓ 2S SPECspeed® 2017 Integer
- ✓ 1S / 2S SPECspeed® 2017 Floating Point
- ✓ 1S / 2S SPECrate® 2017 Integer
- ✓ 1S / 2S SPECrate® 2017 Floating Point

# GREEN500 List-Jun2022

Rank	System	Rmax (PFlop/s)	Power (kW)	Energy Efficiency (Gflops/watts)
1	Frontier TDS - HPE Cray EX235a, AMD Optimized 3rd Generation EPYC 64C 2GHz, AMD Instinct MI250X, Slingshot-11, HPE DOE/SC/Oak Ridge National Laboratory, United States	19.20	309	62.684
2	Frontier - HPE Cray EX235a, AMD Optimized 3rd Generation EPYC 64C 2GHz, AMD Instinct MI250X, Slingshot-11, HPE DOE/SC/Oak Ridge National Laboratory, United States	1,102.00	21,100	52.227
3	LUMI - HPE Cray EX235a, AMD Optimized 3rd Generation EPYC 64C 2GHz, AMD Instinct MI250X, Slingshot-11, HPE EuroHPC/CSC, Finland	151.90	2,942	51.629
4	Adastra - HPE Cray EX235a, AMD Optimized 3rd Generation EPYC 64C 2GHz, AMD Instinct MI250X, Slingshot-11, HPE Grand Equipement National de Calcul Intensif - Centre Informatique National de l'Enseignement Suprieur (GENCI-CINES), France	46.10	921	50.028
6	SSC-21 Scalable Module - Apollo 6500 Gen10 plus, AMD EPYC 7543 32C 2.8GHz, NVIDIA A100 80GB, Infiniband HDR200, HPE Samsung Electronics, South Korea	2.27	103	33.983
7	Tethys - NVIDIA DGX A100 Liquid Cooled Prototype, AMD EPYC 7742 64C 2.25GHz, NVIDIA A100 80GB, Infiniband HDR, Nvidia NVIDIA Corporation, United States	2.25	72	31.538
8	Wilkes-3 - PowerEdge XE8545, AMD EPYC 7763 64C 2.45GHz, NVIDIA A100 80GB, Infiniband HDR200 dual rail, DELL EMC University of Cambridge, United Kingdom	2.29	74	30.797
9	Athena - FormatServer THOR ERG21, AMD EPYC 7742 64C 2.25GHz, NVIDIA A100 SXM4 40 GB, Infiniband HDR, Format sp. z o.o. Cyfronet, Poland	5.05	147	29.926

**Top 4**

Systems running on AMD EPYC CPU & INSTINCT GPU

**8 out of Top 10**

Systems running on AMD EPYC CPU

# INDUSTRY LEADING OPTIMIZED SILICON



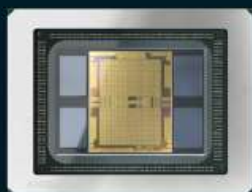
2019

2024





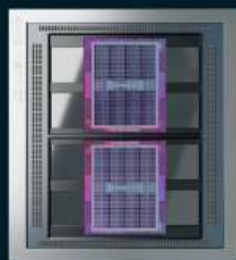
# OUR JOURNEY IN GPU ACCELERATION



**AMD Instinct™ MI100**  
AMD CDNA™

## Ecosystem Growth

*First purpose-built GPU architecture for the data center*



**AMD Instinct™ MI200**  
AMD CDNA™ 2

## Driving HPC and AI to a New Frontier

*First multi-die data center GPU expands scientific discovery and brings choice to AI training*



**AMD Instinct™ MI300**  
AMD CDNA™ 3

## Data Center APU

*Breakthrough architecture designed for leadership efficiency and performance for HPC and AI*

2020



2023

# AMD INSTINCT™ MI300

## THE WORLD'S FIRST DATA CENTER APU

- 4<sup>th</sup> Gen AMD Infinity Architecture: AMD CDNA™ 3 and EPYC™ CPU “Zen 4” Together  
CPU and GPU cores share a unified on-package pool of memory
- Groundbreaking 3D Packaging  
CPU | GPU | Cache | HBM
- Designed for Leadership Memory Bandwidth and Application Latency
- APU Architecture Designed for Power Savings Compared to Discrete Implementation

Available **2023**



**>8X**

Expected AI Training Performance  
vs. MI250X

**AMD** 