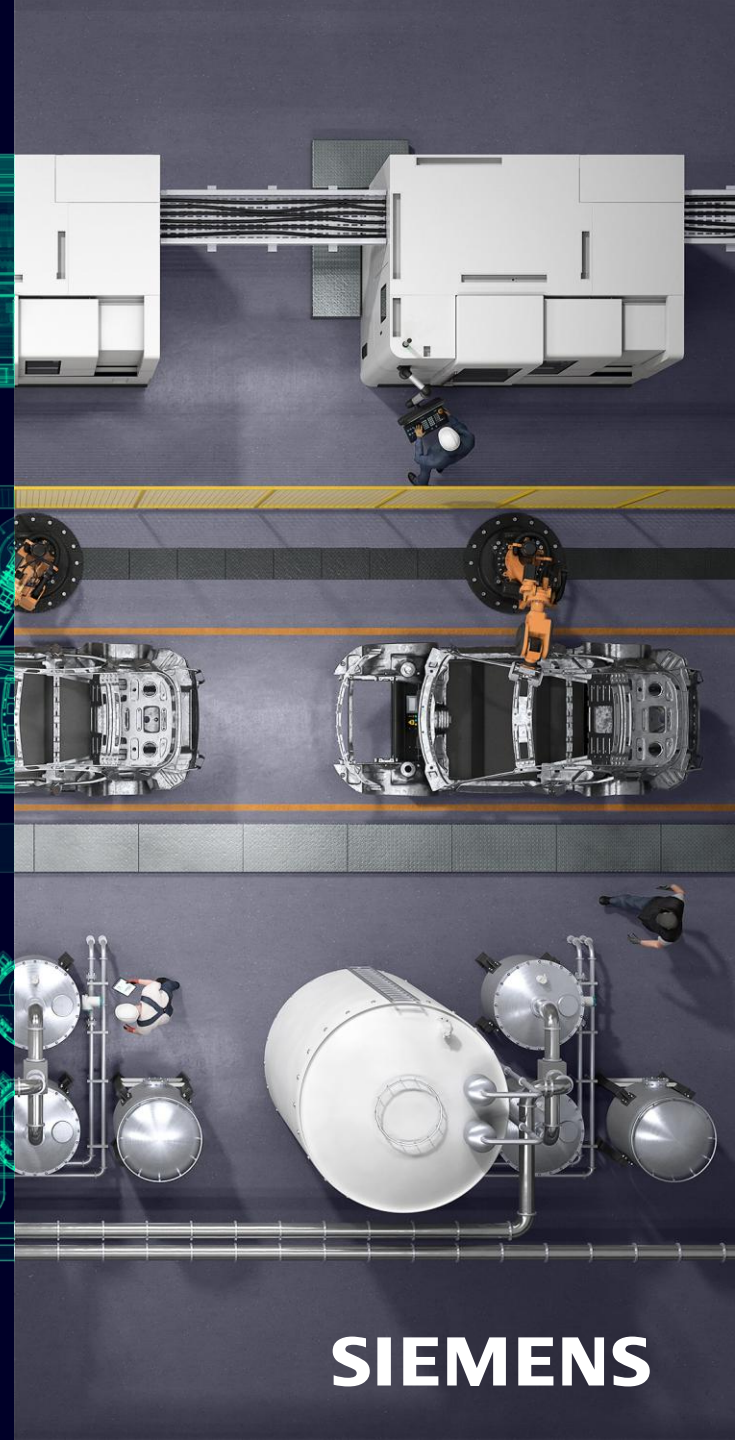
Supercharging Taiwan's Smart Manufacturing with Siemens' **Digital Twin** and **Industrial AI**



Henrison Fan 范栩
Deputy Director, Sales Acceleration, Siemens Taiwan

October 31, 2025

SIEMENS

SIEMENS

Worldwide Urgency of Industrial Sustainability: Emissions, Energy, and Waste

Decarbonization

30%

of global CO_2 emissions
come from industry

(Source: McKinsey)

Energy efficiency

38%

of the global energy
is consumed by industries

(Source: IEA)

Resource efficiency

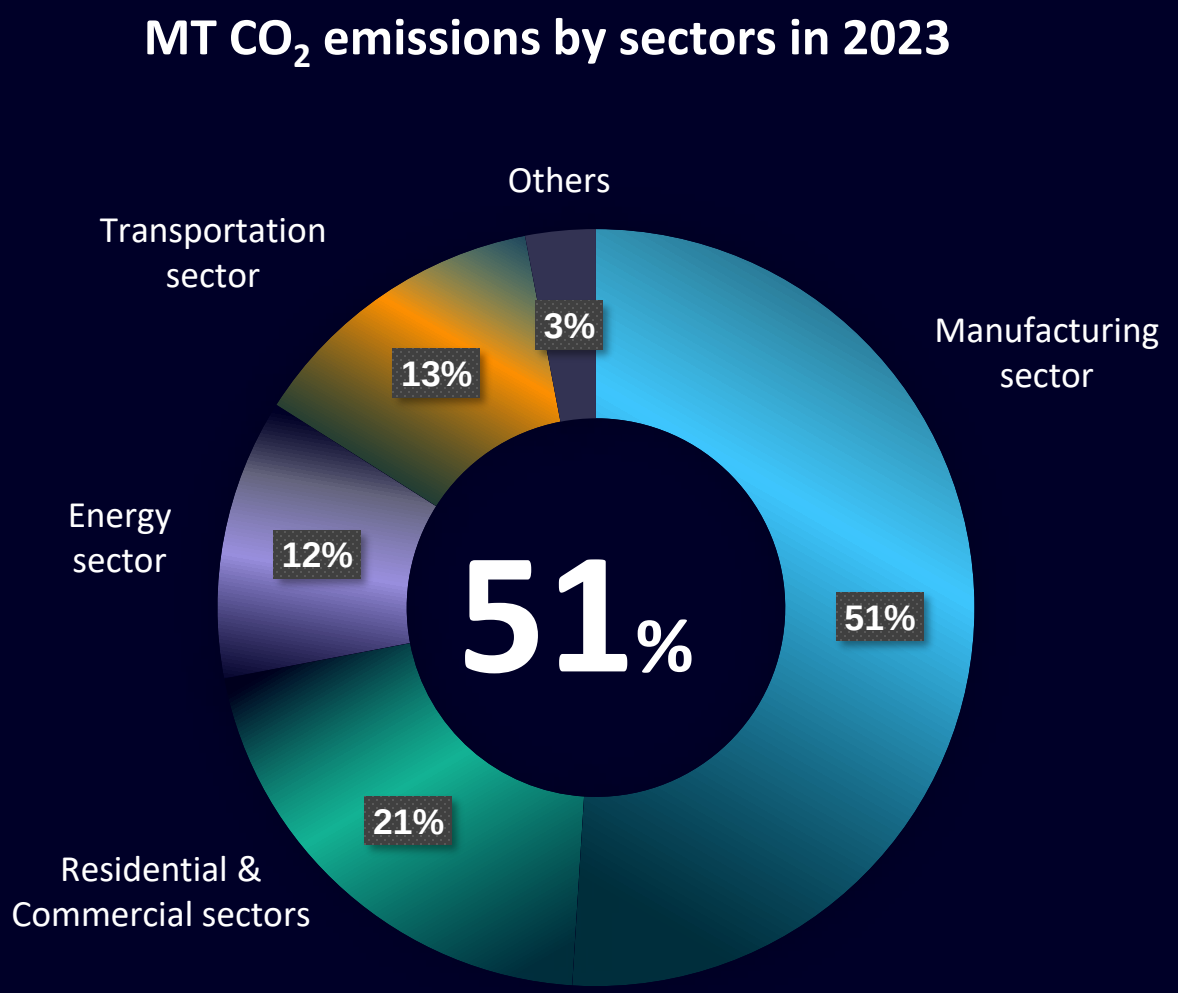
Only **13%**

of all global waste
is recycled

(Source: Accenture)

SIEMENS

Prioritizing **manufacturing** sector as focused area in Taiwan is crucial to advance **Net Zero development!**



Source: CCA

SIEMENS

Digitalization & Sustainability: Siemens’ Twin Pillars for a Net Zero Future

Top 10 software companies in the world to converge the power of hardware and software

>90% of Siemens’ business enables industries to achieve a positive sustainability impact

SIEMENS

Game-Changing Technologies Accelerating Net Zero at Scale

Digital Twin

can reduce 7.5 gigatons of CO_2 by 2030

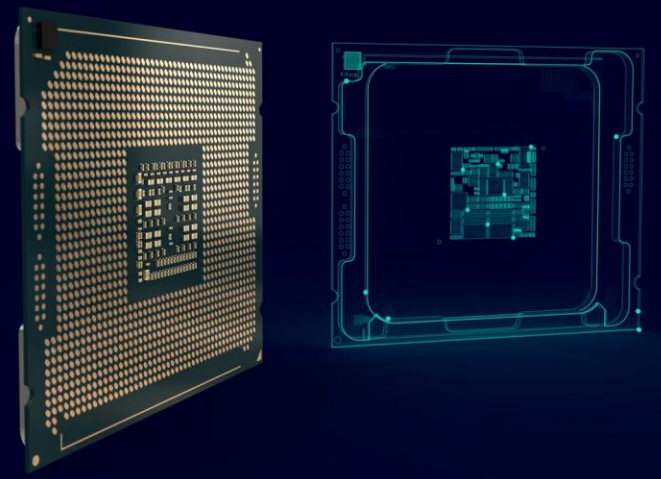
(Source: Accenture)

Industrial AI

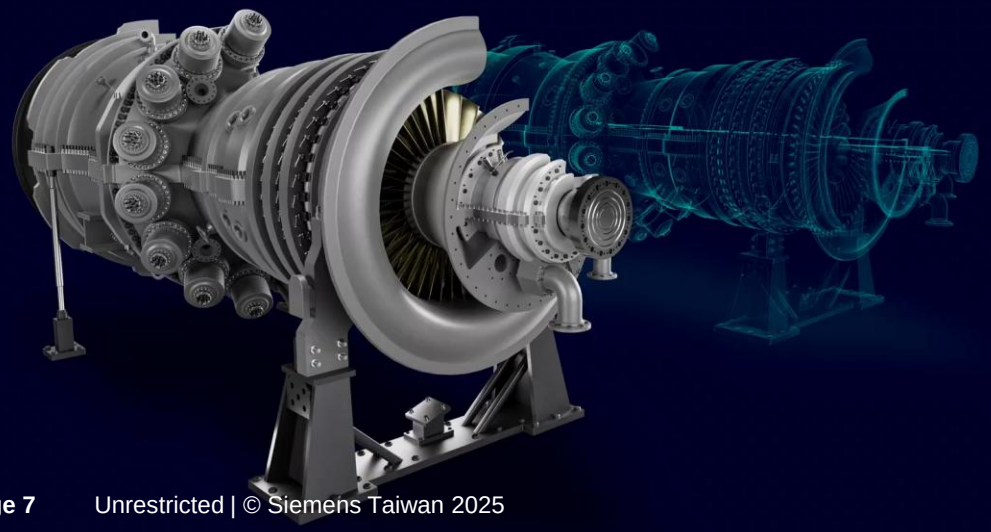
can reduce 2.6~5.3 gigatons of CO_2 by 2030

(Source: BCG)

SIEMENS



Digital Twin



SIEMENS

What is a **Digital Twin**?

A virtual replica of your factory or machines that lets you design, simulate, and optimize in the digital world before taking risks in the real world.

Digital Twin of Products

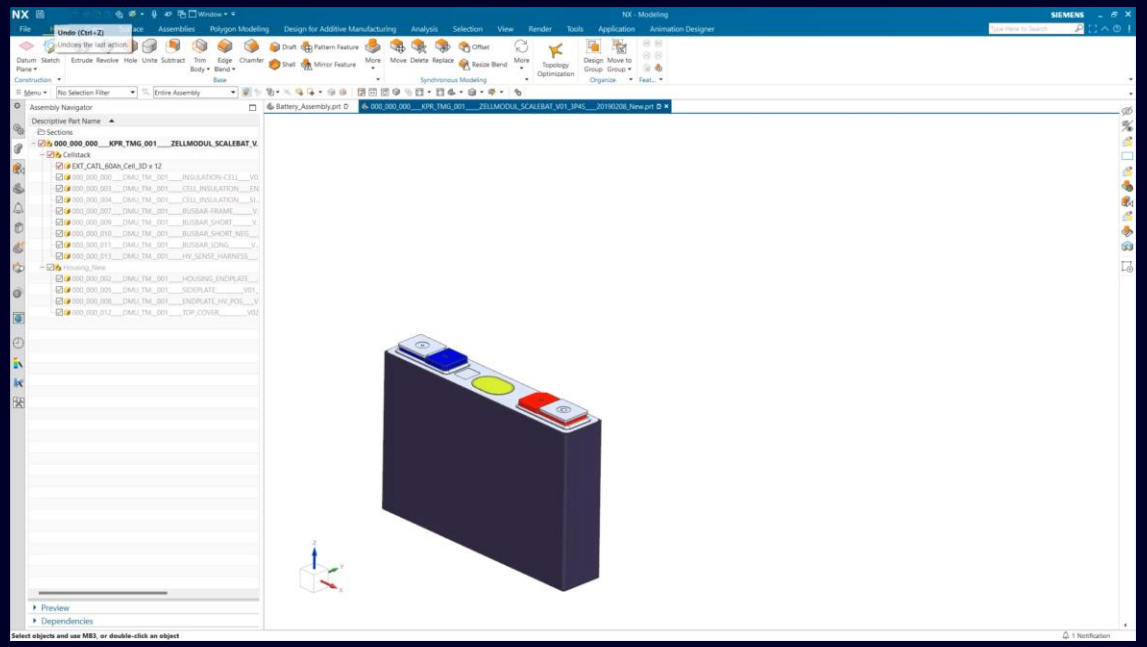
Digital Twin of Production

Digital Twin of Performance

SIEMENS

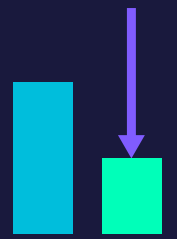
Digital Twin for Products

Up to 80% of a product's environmental impact is determined during its design phase!



Source: Ellen MacArthur Foundation

Resource-efficient



50%

material savings can be achieved by reducing costly prototyping with Digital Twins

Decarbonized

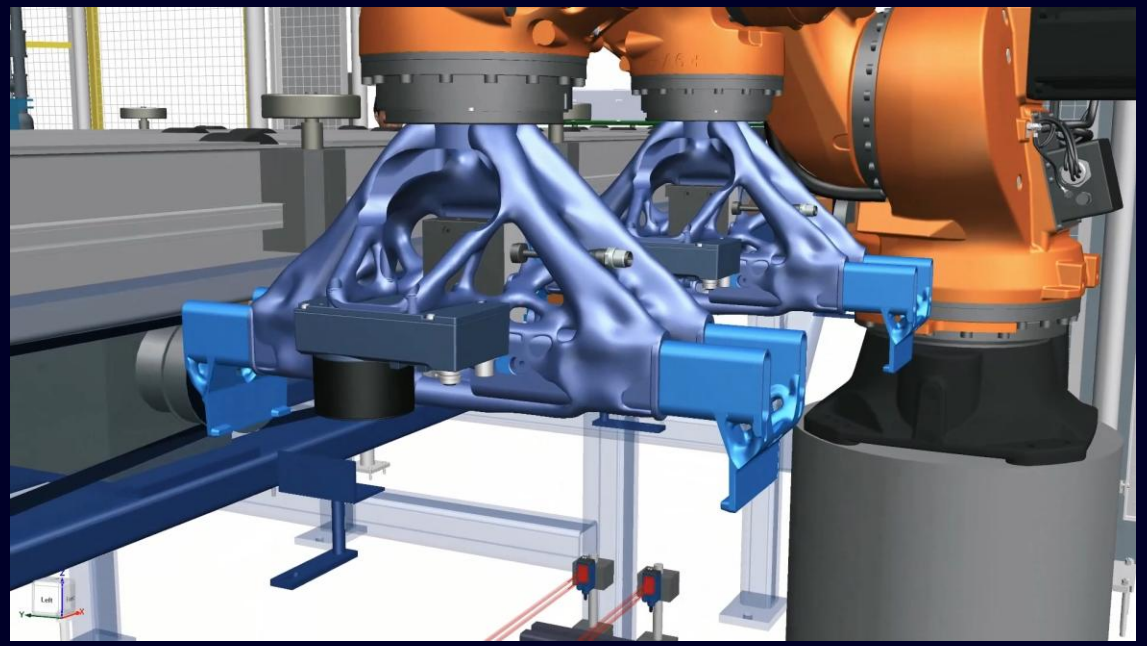
25%

cut in energy and CO_2 emissions through end-to-end design optimization

SIEMENS

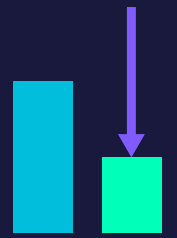
Digital Twin for Products

Reducing the CO_2 footprint of industrial production by just 1% can save 90 million tons of CO_2 every year!



Source: IEA

Energy-efficient



40%

energy savings through digitally optimized production and energy management

Decarbonized

50%

CO_2 reduction in manufacturing enabled through advanced data analysis

SIEMENS

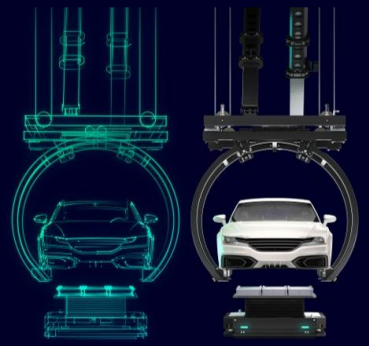
Digital Twin of Performance

Continuously optimize product and production by feeding performance data back to the Digital Twin

SIEMENS

Major Companies across multiple industries are using Siemens' Digital Twin

Mercedes-Benz



Co-creating a **Digital Energy Twin** to improve the integration of energy efficiency and sustainability measures in factory designs and upgrades.

BOEING

Partnering to implement a unified, company-wide **Digital Twin Enabled Platform** for electrical systems design, electronics, and mechanical simulation.

Heineken®

Decarbonizing 15 global production sites by deploying a **Digital Energy Twin** to simulate and optimize heating and cooling systems, enabling 20% energy savings and 50% CO_2 reduction per site.

Pfizer

Leveraging **Digital Twin** to optimize manufacturing processes and rapidly scale up vaccine production, cutting the estimated over-a-year timeline to just five months.

SIEMENS

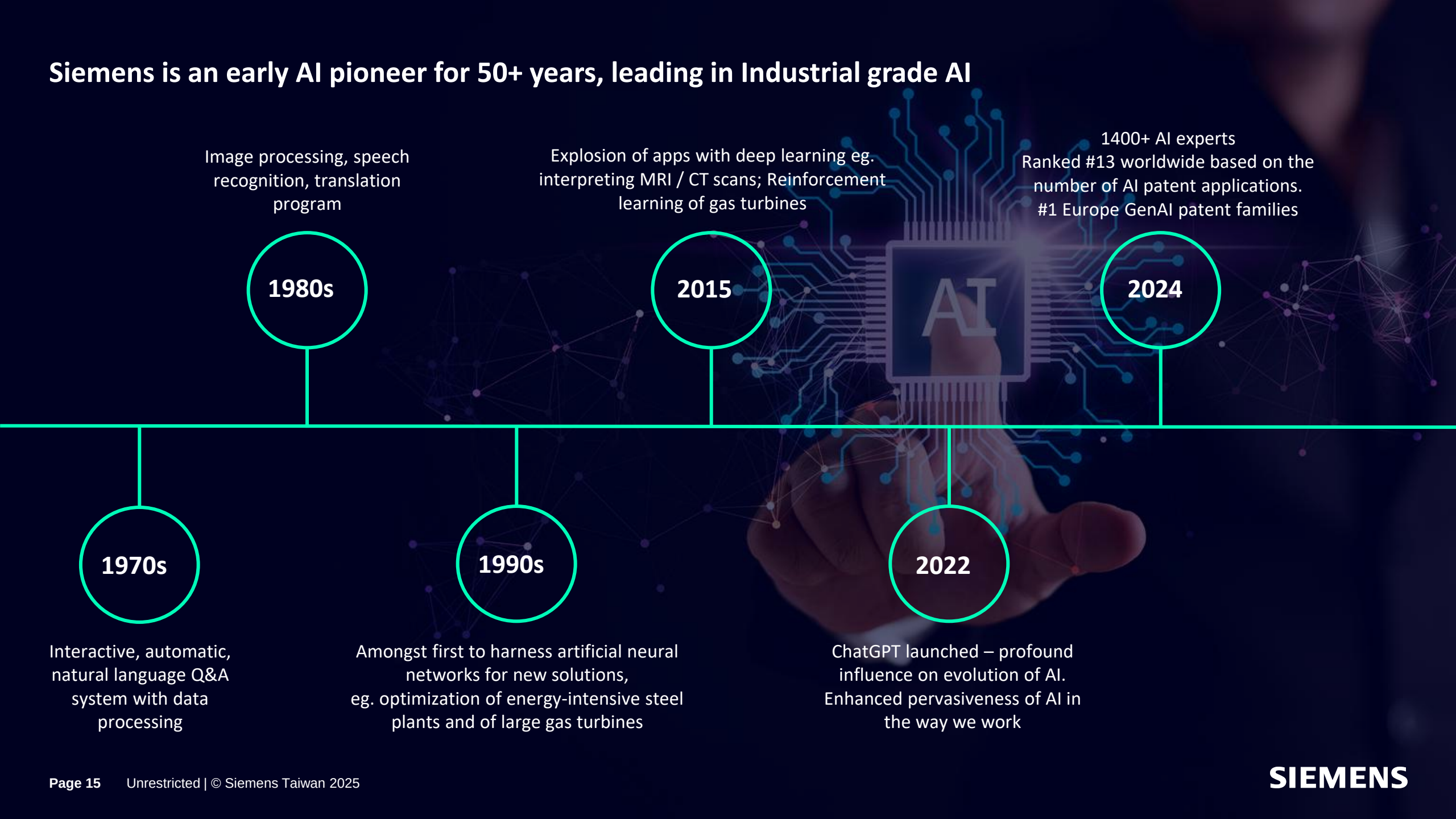
Industrial AI

In industry, AI still has a way to go!

Source: Gartner, 2024; Boston Consulting Group; KPMG, 2024

SIEMENS

Siemens is an early AI pioneer for 50+ years, leading in Industrial grade AI



1970s

Interactive, automatic, natural language Q&A system with data processing

1980s

Image processing, speech recognition, translation program

1990s

Amongst first to harness artificial neural networks for new solutions, eg. optimization of energy-intensive steel plants and of large gas turbines

2015

Explosion of apps with deep learning eg. interpreting MRI / CT scans; Reinforcement learning of gas turbines

2022

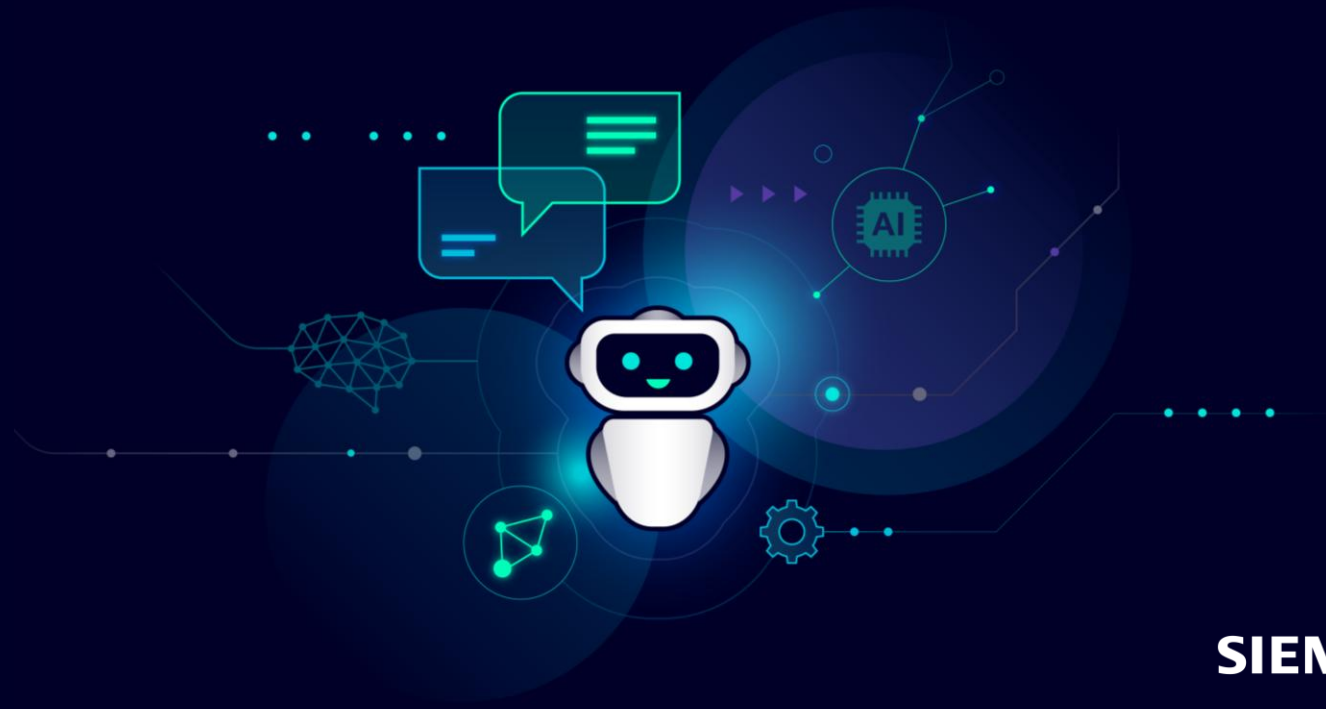
ChatGPT launched – profound influence on evolution of AI. Enhanced pervasiveness of AI in the way we work

2024

1400+ AI experts
Ranked #13 worldwide based on the number of AI patent applications.
#1 Europe GenAI patent families

SIEMENS

Siemens AI Strategy:
AI with Purpose



SIEMENS

1 AI must be **industrial grade**

SIEMENS

2 Industrial AI must be **accessible to all – democratization** of AI

SIEMENS

3 Industrial AI needs **strong ecosystems**

SIEMENS

Ecosystem Partners to Scale Digitalization & Sustainability Impacts with Industrial AI

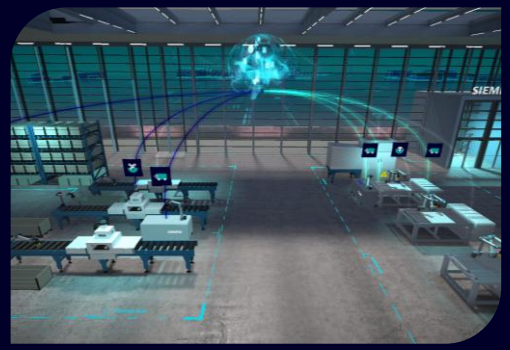
Microsoft

Co-developing a **Gen AI** powered assistant called **Siemens Industrial Copilot**, aiming at improving human-machine collaboration and boost productivity.

aws

Partnering to **democratize AI** by making it easy for anyone to use through a no-code platform with drag-and-drop tools and visual interfaces.

Google Cloud



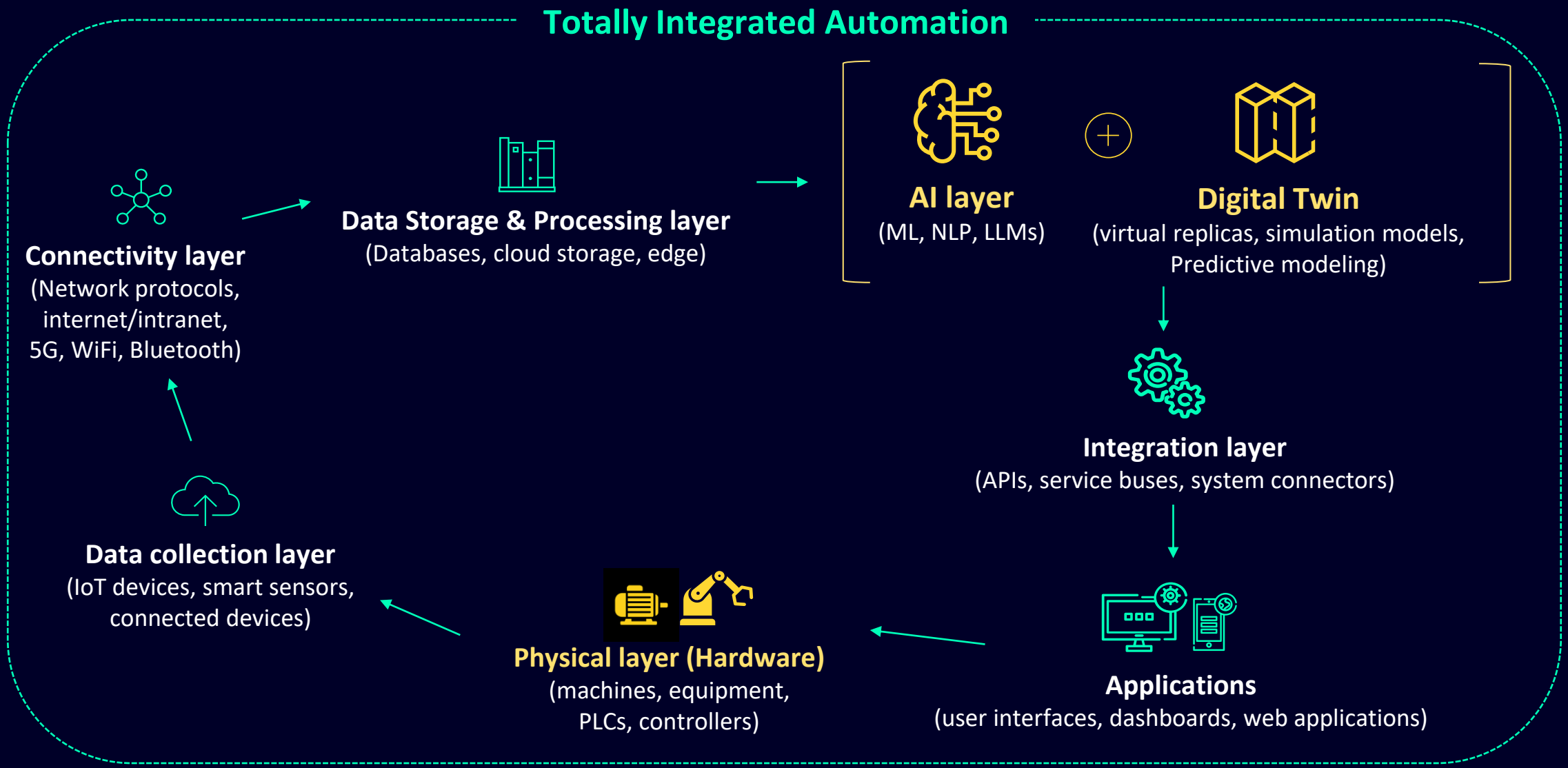
Collaborating to deliver **AI-enabled factory automation** at scale by integrating AI and machine learning into manufacturing, optimizing operations, and enhancing productivity.

NVIDIA

Expanding collaboration on Gen AI for immersive real-time visualization, driving increased use of **AI-driven digital twin technology**.

SIEMENS

Basic Concept of Digital Twin + AI



SIEMENS

Acquisition of Altair & Dotmatics

Leading the future of industrial software, AI and digital twin technology with the world's most complete AI Portfolio

ALTAIR

US$10.6 billion strategic investment to acquire global leader in **computational science & AI software**

Dotmatics

US$5.1 billion to create world leading AI-powered PLM portfolio to seamlessly connect R&D through manufacturing

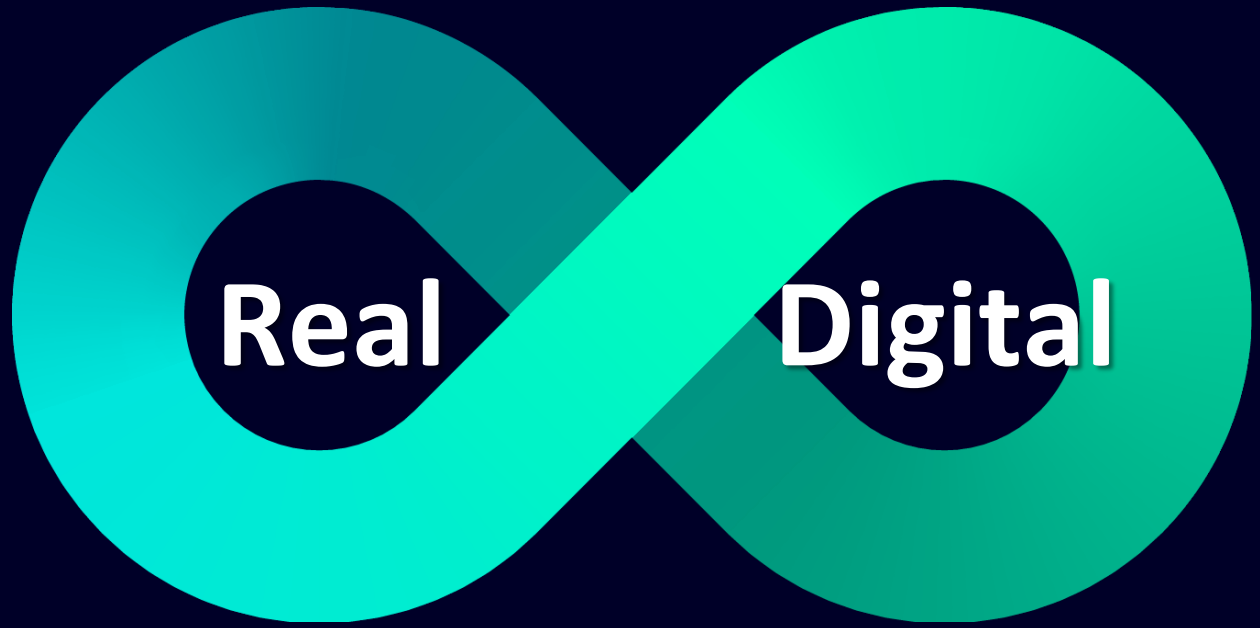
SIEMENS

Supercharging Smart Manufacturing in Taiwan

SIEMENS

Supercharging Net-Zero Transformation through Digital Twin & AI

SIEMENS



Our strategy

Combining the real and digital worlds through AI and Digital Twin to **Achieve MORE with LESS.**

節 源 減 碳

Water

Electricity

Land

Workforce

Talent

SIEMENS

Supercharging the World's First Large-scale Semiconductor Solutions Mega Site

Boosting semiconductor supply chain resilience and growth by building the smart factory with **digital twin solution SIMIT**:

- ✓ **Improved efficiency**: Real time plant simulation enables virtual commissioning & testing, cuts costs and time-to-market, and reduces trial run times by **50%**
- ✓ **Operational simplicity**: Realistic simulated environment simplifies training at every stage, from system planning to application
- ✓ **Agility in high-tech industry**: Helps meet tight deadlines and adapt to short product life cycles, enabling rapid responses to market demand

SIEMENS

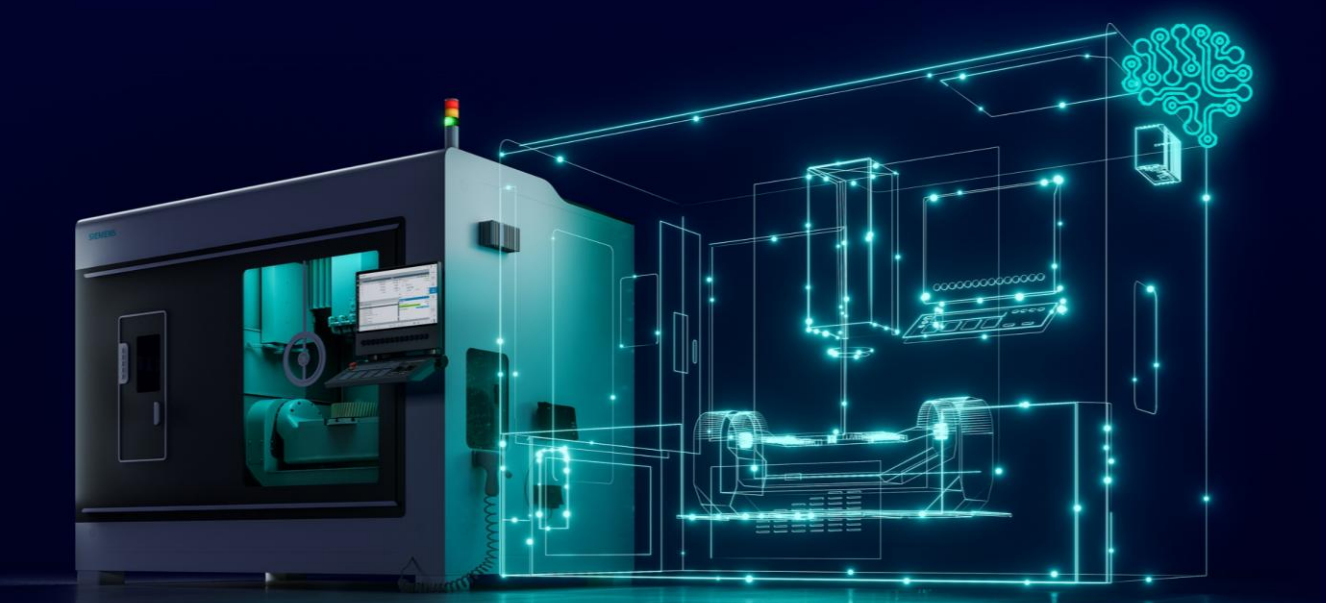
Supercharging Visual Technology and the Future of Displays

Advancing MicroLED display mass production through **digital twin solutions Simcenter, MCD / SIMATIC Machine Simulator, T-CPU)**:

- ✓ **Improved efficiency**: Simulate machine behaviors before assembly & production, reduce trial time, optimize performance
- ✓ **Early issue detection**: Helps improve machine design & development through early detection of integration failure
- ✓ **Operational simplicity**: Graphical interface helps designers start easily and launch products on schedule
- ✓ **Sustainability**: Digital simulations reduce hardware setup and material waste, supporting sustainability

SIEMENS

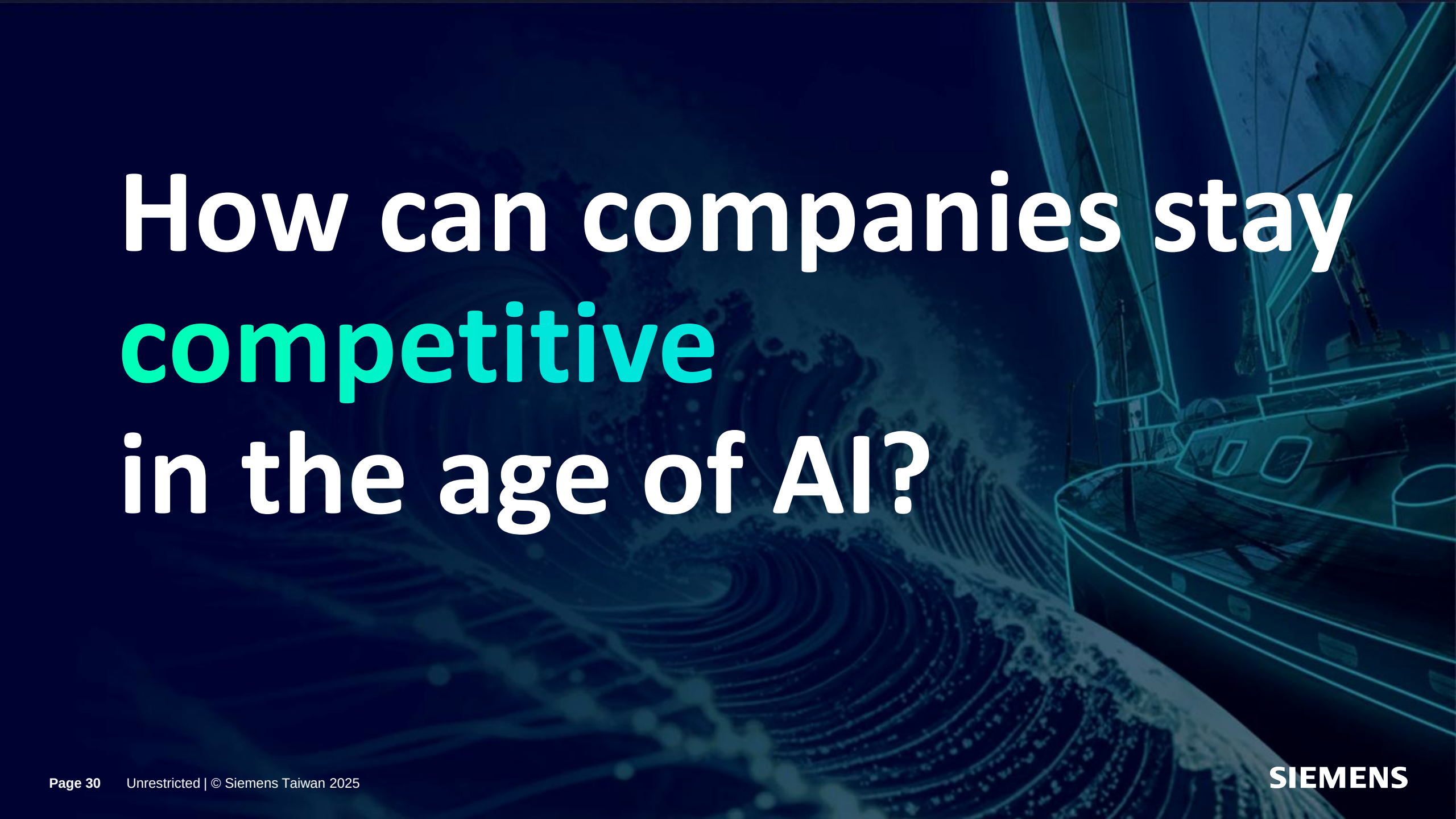
Supercharging Sustainability through AI in Taiwan's Machine Tool Industry



Siemens' Adaptive Control & Monitoring (ACM) with **AI-driven smart learning** capabilities:

- ✓ Assists **HOTA INDUSTRIAL** (Taichung) to overcome limited factory space and labor shortage problems
- ✓ Assists **GOODWAY MACHINERY** (Taichung) to optimize machining processes without additional investment or changes to existing procedures
- ✓ ACM's AI capabilities improve stability, cutting tool protection, and on average **20%** increase in productivity

How can companies stay competitive in the age of AI?



SIEMENS

SIEMENS

SIEMENS