

Ansys

**ACCELERATING A
SUSTAINABLE FUTURE
THROUGH SIMULATION**

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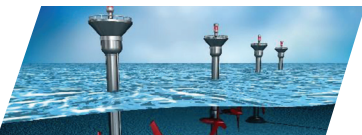
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What Stands Between us and a Healthy Planet?

Scientists and engineers are working to scale their sustainable innovations faster with the predictive power of simulation.

Simulation is essential to showing precisely how products will work, enabling innovators to move confidently from idea to reality at the pace our planet needs now.

Delivering on efficient energies — from wind, solar, hydrogen, consumer waste, biofuel, and more — involves solving complex, physics-based challenges.

The next great leaps in human advancement will be powered by Ansys.

Take a leap of certainty ... with Ansys.

“Ansys simulation products help our customers achieve their sustainability goals by accelerating their product development processes and assisting them with developing and validating their ideas in a virtual environment.”

Ajei S. Gopal,
President and Chief Executive Officer,
Ansys



Ansys' Commitment to ESG



A More Sustainable Future, Faster

At Ansys, we help our customers advance environmental sustainability through our simulation products that accelerate the creation of new, more efficient, and lower impact technologies with less waste while minimizing physical prototyping. By integrating environmental, social, and governance (ESG) objectives into our decision making, we can deliver long-term value for our business and our communities. Together with our customers and partners, we aim to enable a more sustainable future, faster.

The core values of our ESG program:

Advancing Sustainability Through our Products

At Ansys, we look for new and better ways to take a leap of certainty. By focusing on the creation of new technology, and by making current technology better, we support our customers in their design of products, making them more efficient, with less waste, and minimizing the need for physical prototyping.

Investing in our People and ONE Ansys Culture

Our people are at the core of driving product innovation for our customers. We aim to create a culture of belonging and inclusion where everyone can be themselves and thrive as a ONE Ansys team. We're proud of our expert workforce and its ability to translate creativity and dedication into product innovation and operational excellence.

Operating Responsibly

We strive to reduce the environmental and climate impact of our operations by measuring, analyzing, and reducing our resource use and emissions. We promote ethical business practices, data security, and good governance.

Collaborating with Stakeholders

We continue to engage with our stockholders, customers, employees, communities, and other stakeholders through feedback, engagement surveys, and by supporting the communities in which we live and work.



Ansyes Core Values: Environmental, Social, and Governance



Advancing Sustainability Through our Products

- Product handprint
- Innovation
- R&D



Investing in our People and ONE Ansys Culture

- ONE Ansys Culture
- DEI&B
- Attracting and retaining talent
- Employee development and engagement



Operating Responsibly

- GHG inventory
- Energy consumption
- LEED certifications
- Data security and data privacy
- Ethics and compliance



Collaborating With Stakeholders

- Strategic partnerships
- Startups
- Universities
- Materiality assessment
- Philanthropic efforts

The Power of Simulation for Sustainability

Simulation enables companies to save resources and energy, while reducing emissions before products are ever built. It then helps them create more energy-efficient products and processes to build those products..

Today, simulation is improving the speed and cost at which environmental innovators can develop, mature, and deploy new technologies.

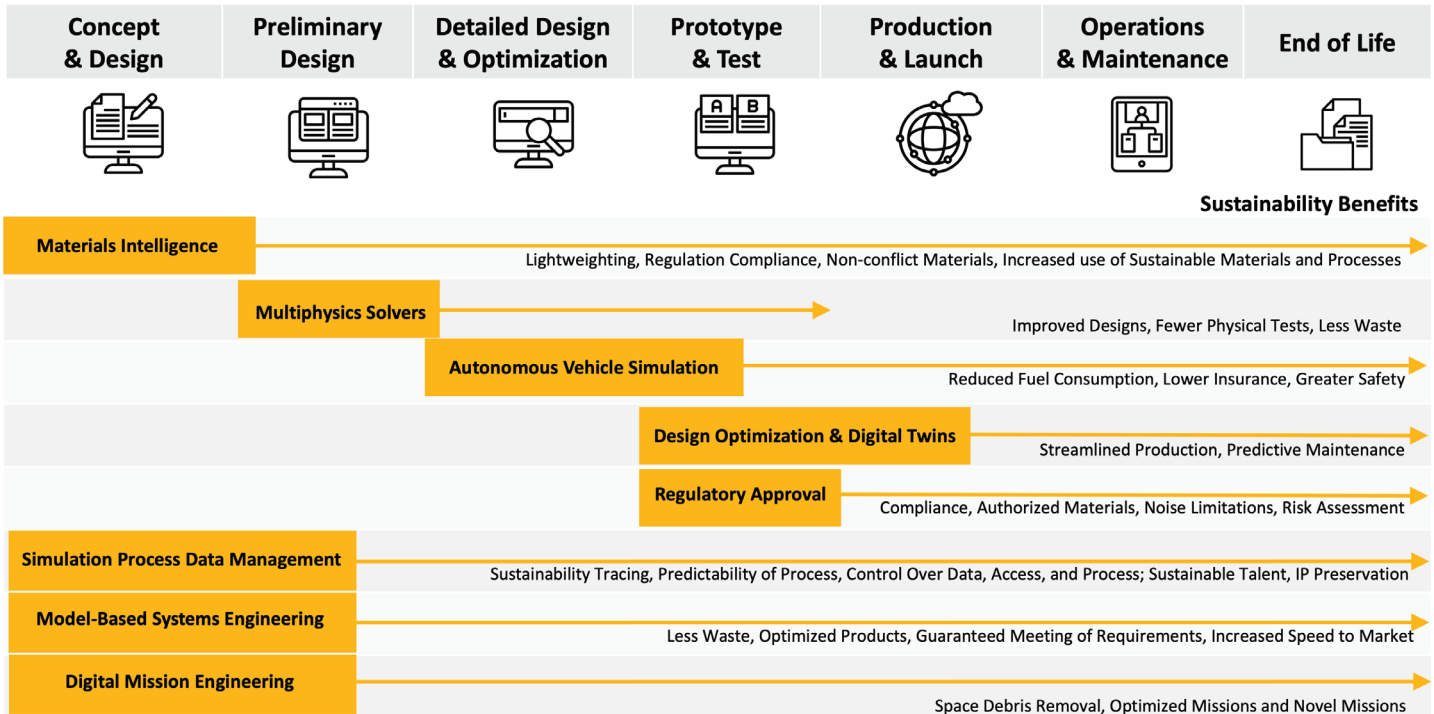
Through simulation, Ansys provides the predictive certainty to realize our customers' vision for a sustainable future.

What Stands Between us and a Healthy Planet?

Scientists and engineers are working to scale their sustainable innovations faster with the predictive power of simulation.

Simulation is essential to showing precisely how products will work, enabling innovators to move confidently from idea to reality at the pace our planet needs now.

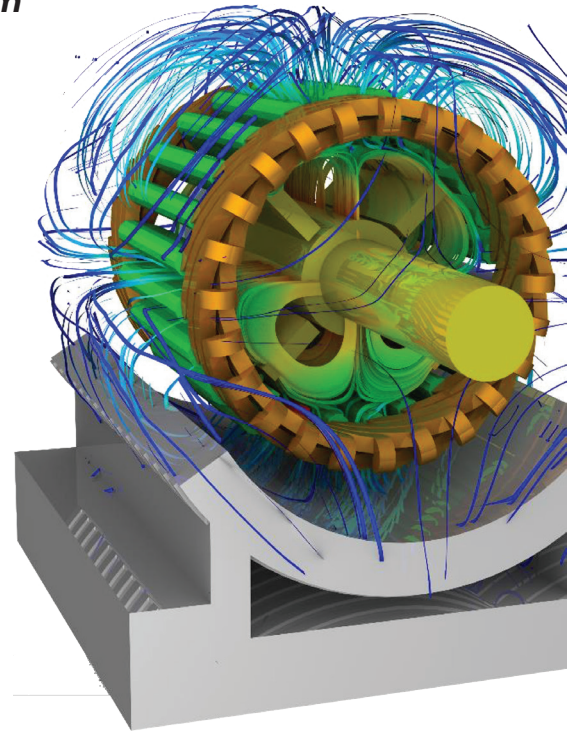
Delivering on efficient energies — from wind, solar, hydrogen, consumer waste, biofuel, and more — involves solving complex, physics-based challenges. The next great leaps in human advancement will be powered by Ansys.





“With proactive support from Ansys, we can streamline workflows and introduce high-quality, next-generation products faster than expected. Just as importantly, we will lessen our carbon footprint and move digital transformation forward.”

DAEHWA JEONG,
Executive Vice President and Head of Production Engineering Research Institute, LG Electronics



“Schneider Electric leverages Ansys simulation to accelerate key business initiatives, improving the quality of our products while making them smarter. This is an enabler of our vision for a more sustainable, energy-efficient future.”

JAYARAMAN RAGHURAMAN,
Senior Vice President, Schneider Electric



Ansys Sustainability Pillars



Clean Environment

- Emission Tracing and Control
- Carbon Capture, Utilization, and Storage
- Water Treatment and Management
- Environmental Noise
- Dust
- Orbital Space Debris

Ansys solutions help our customers filter pollution out of our environment, use energy more efficiently, and even capture carbon from the air.

“A key R&D partner for more than 25 years, Ansys has accelerated our digital transformation and ingrained simulation into the DNA of our company, enabling us to rapidly and accurately deliver engines with improved emissions profiles and other environmental attributes.”

WAYNE ECKERLE,
Vice President, Research and Technology, Cummins Inc.



Materials & Circularity

- Materials Management and Selection
- Packaging
- Lightweighting
- Chemical Safety
- Compliance & Traceability
- Recycling, Reuse

Ansys solutions are revolutionizing the way customers create, manufacture, sell, recapture, sort, and reuse products to design waste out of our shared future.

“We connected material data with CAD, CAE, and PLM, enabling Granta MI: Enterprise to serve as a single source of truth for all engineering processes connected with material data.”

NICOLA CAMPO,
Senior Director Model Based Enterprise, Baker Hughes



Energy Solutions

- Wind, Solar, Hydrogen, Nuclear, and other Alternatives
- Consumption
- Integrated Energy Systems
- Storage Solutions
- Electric Motors
- Fast Charging Batteries and Fuel Cells

Ansys is enabling customers to drive the decarbonization of energy systems by providing technical leverage to transition to energy-efficient and renewable solutions.

“Ansys’ CFD and FEA simulation allows us to develop, test, and validate extremely complex technology to create sustainable solar fuels. Particularly, in developing our solar receiver, we needed sophisticated and accurate software and Ansys delivered. Thanks to Ansys’ software, we could reduce prototyping time and build our first industrial receiver more quickly.”

LUKAS GEISSBÜHLER,
Head of Thermal Systems, Synhelion



Manufacturing & Operational Efficiency

































- Advanced Manufacturing
- Digital Twins
- Prognostic Health Management
- Energy Efficiency
- Reliability, Durability
- Workflow Optimization
- Process Automation
- Safety

Ansys solutions can help manufacturers plan and optimize operations to use materials more efficiently and improve reliability, which reduces power consumption and emissions.

“Ansys offers a wide range of tools to investigate a product’s reliability. By using the tool Sherlock, Continental sets a focus on reliability prediction and lifetime estimation of electronic products in a virtual environment. This leads to a reduction of avoidable time- and cost-consuming design loops and shortens development cycles.”

JULIA KLEINEIDAM,
Continental

Sustainability Solutions in Focus: Automotive


Powertrain Electric, hybrid, fuel cells, hydrogen internal combustion engine (HyICE), conventional	   	Electronics Reliability, electromagnetic interference/compatibility (EMI/EMC)	   
Storage Hydrogen, battery	   	Vehicle Platform and Body Lightweighting, aerodynamics, lighting	   
Safety Safety analyses, certification, embedded software, autonomy	   	Operations Model-based system engineering (MBSE), digital twins	   
Noise Lower acoustic levels for occupant comfort	   	Manufacturing Materials intelligence, advanced manufacturing	   

“We chose Ansys as a partner for BMW because there is a strong background in simulation itself, over several domains, with a combination also of engineering know-how. With this, there can be a clear business model for Ansys, and a clear solution for us as an OEM.”

Dr. Nicolai Marti,
Senior Vice President, Driving Experience,
BMW Group



Sustainability Solutions in Focus: Aerospace
































Propulsion Electric, hybrid, fuel cells, liquid hydrogen (LH2), engine design, SAFs	   	Storage Battery, liquid hydrogen fuel system	   
Noise Lower acoustic levels	   	Safety Safety analyses, certification, embedded software	   
Electronics Electromagnetic interference/compatibility (EMI/EMC), reliability	   	Aircraft Structure Lightweighting, aerodynamics	   
Manufacturing & Operations MBSE, digital twins, materials intelligence, advanced manufacturing, autonomy	   		

“Lacking historical design precedent for these highly sophisticated electric aircraft, simulation remains the only way to safely develop innovative technologies under incredibly tight deadlines. Partnering with Ansys, Air Race E teams will leverage leading-edge simulation technology to design new aircraft, achieve world-class performance levels and cross the finish line at incredible speeds. These advances will help usher in the next chapter of electric aviation.”

Jeff Zaltman,
Founder and CEO, Air Race Events

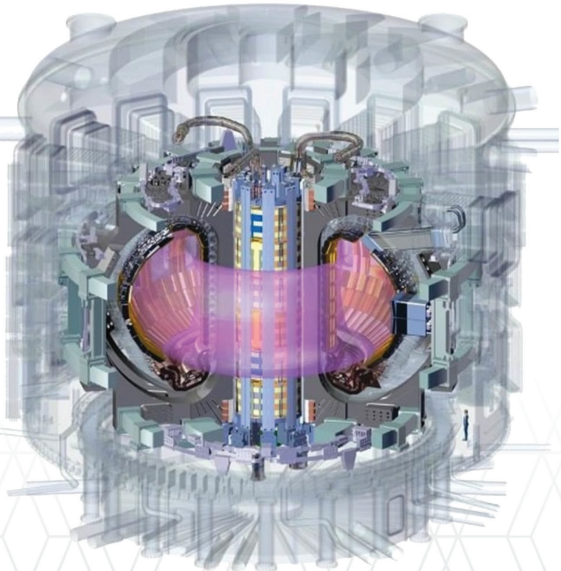


Sustainability Solutions in Focus: Energy

























Low-Carbon Energy Solar, wind, tidal, next-gen nuclear	  	Greenhouse Gas Emissions Flaring, fugitive emissions, drone inspections for leaks	   
Power & Storage Fuel cells, batteries, compressed hydrogen, ammonia	   	Safety Remote digital inspection, safety requirement standards, hydrogen	   
CCUS Carbon capture, utilization, storage	   	Low-Carbon Products Hydrogen, biofuels, sustainable aviation fuels (SAFs), bio-plastic, EV fluids	   
Operations Predictive maintenance, IIoT, AI/ML, autonomy, subsea electrification, ultra-fast charging	   	Installation Wind farms, solar farms, cranes/lifting equipment, ship vessels	   

“Ansys simulation solutions will continue to help our team to satisfy the required safety and accuracy levels for this first-of-a-kind initiative ... For ITER to achieve hydrogen fusion at industrial scale requires unprecedented levels of engineering precision, so it is incredibly important that our simulation software is highly reliable and efficient. Ansys has consistently delivered that capability to us for many years, enabling our team to safely push boundaries, dream bigger, and deliver Earth’s biggest fusion reactor.”

Bernard Bigot,
Director-General, ITER Organization



Sustainability Solutions in Focus: High Tech


Power Efficiency Semiconductor power, performance, area, thermal (PPAT), data center performance efficiency	   	Mobile Electronics packaging, battery performance, thermal reliability, human body interactions (SAR, chemical safety), optimized connectivity	   
Reliability EMI/EMC, electro-thermal mechanical reliability, life cycle predictions	   	Storage Battery management systems, fuel cell systems, data storage systems	   
Manufacturing Digital twins, predictive maintenance, IIoT, water management, carbon emission reductions	   	Materials Materials intelligence, packaging, e-waste recovery	   

“Ansys PowerArtist analyzes real-world use cases within a few hours, which is orders of magnitude faster than standard approaches. Qualcomm’s differential energy analysis early in the design flow using Ansys PowerArtist delivers 10% higher performance per watt.”


Yadong Wang,
Staff Engineer, Qualcomm

Sustainability Solutions in Focus: Industrial Equipment

Low-Carbon Energy
Renewable sources, alternative fuels (hydrogen, biomass, etc.), electrification, hybrid-electric (“dual”) equipment, etc.




Advanced Manufacturing
Re-manufacturing, reuse & recycle rate, 3D printing, tool design, lightweighting, etc.




Energy Efficiency
Recuperative heat recovery, equipment efficiency




Operations
Digital twins, IIoT, AI/ML, automation, drive utilization rate




Reduce Water Intensity & Loss
Water reuse, steam recapture, wastewater processing and discharge




Electronics
Reliability, electromagnetic interference/compatibility (EMI/EMC)



Greenhouse Gas Emissions
Pollution control, environmental compliance, CCUS, cleaner combustion technology



Safety
Functional safety, embedded software



“It is clear that the Ansys tools will dramatically improve our productivity. This is crucial in the mining industry, where every minute counts when equipment is down due to mechanical failure ... We have found that Ansys software has already reduced our modeling time significantly.”

De Wet Strydom,
Lead Engineer, Anglo Technical Services



ANSYS SUSTAINABILITY PILLAR	CAPABILITY	APPLICATIONS							
			Ansys Fluent / Ansys CFX	Ansys Model Fuel Library/ Chemkin	Ansys Rocky	Ansys Mechanical/ Ansys LS-DYNA	Ansys Autodyn	Ansys Aqwa	Ansys Comsol
Clean Environment	Emission Control and Mitigation	Mitigating NOx from fossil-fuel power plants; automotive exhaust aftertreatment; external aerodynamics; electric aircraft; additive manufacturing; parking garage and roadside air quality; aerodynamic performance; fuel consumption							
	Clean Combustion	Combustor design; fuel variability; hydrogen as a fuel; sustainable aviation fuels (SAFs)							
	Emission Capture	Carbon capture; wet scrubbers							
	Hydrocarbon Leaks and Spills	Flaring and dispersion; well blowout prevention; pipeline and equipment integrity							
	Water	Water treatment mixing tank; UV light water purification; stormwater sediment removal; spillway and culvert flow rating improvements; ballast water purification; efficient appliances							
	Environmental Noise	Aviation noise; automotive noise							
	Orbital Space Debris	De-risking orbital collision							
	Human Health	Air transport of pharmaceuticals; lyophilization; packaging in healthcare; steam sterilization; human safety in public spaces; wind engineering							
	Biodiversity	Turtle tracking and conservation; protecting aquatic habitats; fish passage engineering							
	Climate	Remote sensing satellites; landslides and debris management; earthquakes; seismic evaluation of large civil structures; flooding; hurricanes; dust storms; coastal waves; wildfires							
Materials & Circularity	Carbon and Energy Footprint	Designing an environmentally friendly office chair; filling applications in high-tech industry							
	Chemical Safety	Sustainable materials for filling applications in high-tech industry							
	Packaging	Designing more sustainable packaging; food packaging; reducing plastics use in packaging							
	Lightweighting	Pouch-filling application for pharma/nutrition/cosmetic industries; traction e-motors; gearbox							
	Recycling	Recycling filters for face masks; plastic sorting							
Energy Solutions	Renewable Energy	Wind power; solar power; tidal power; ocean thermal; ambient radio frequency harvesting; PV reliability; concentrating solar-thermal power (CSP) reliability; heat exchangers for CSP							
	Alternative Fuels	Fuel blending; gasoline blending optimization; biofuel							
	Integrated Energy Systems	Accelerating zero-carbon energy							
	Energy Storage	Fuel cells; batteries							
	Hydrogen Production	Steam methane reforming; pyrolysis; water electrolysis							
	Hydrogen Storage, Transport, and Distribution	Composite vessel/tank design and optimization; structural integrity issues; pipeline; managing hazards; hydrogen storage							
	Hydrogen Compression and Pumping	Hydrogen compressor design and optimization; hydrogen/cryogenic pump design and optimization; hydrogen compressor and pump							
	Hydrogen Combustion	Combustion; gas turbines; flame flashback							
Fuel Cells	Fuel cells								
Manufacturing & Operational Efficiency	Energy Consumption Efficiency	Household appliances; dynamic lighting efficiency, photonic metamaterials; fired heater design; cleaning and clean-in-place; sheet metal forming; aluminum forming; tilling machines; semi-autogenous grinding mill; electric motors; batteries; gas turbines and heat exchangers							
	Fuel Efficiency	Fuel economy in aviation, automotive							
	Green Buildings	Green building design							
	Equipment Efficiency, Reliability, PHM	Sustainable assets; equipment integrity; electronics reliability; digital manufacturing; sheet metal forming; e-motor winding life design							
	Data Centers	Data center cooling							
		Chip level power budgeting; chip level power analysis							
		Optical transceivers							
	Thermal integrity and design reliability								



When visionary companies need to know how their world-changing ideas will perform, they close the gap between design and reality with Ansys simulation. For more than 50 years, Ansys software has enabled innovators across industries to push boundaries by using the predictive power of simulation. From sustainable transportation to advanced semiconductors, from satellite systems to life-saving medical devices, the next great leaps in human advancement will be powered by Ansys.

Take a leap of certainty ... with Ansys.

Visit www.ansys.com for more information.

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