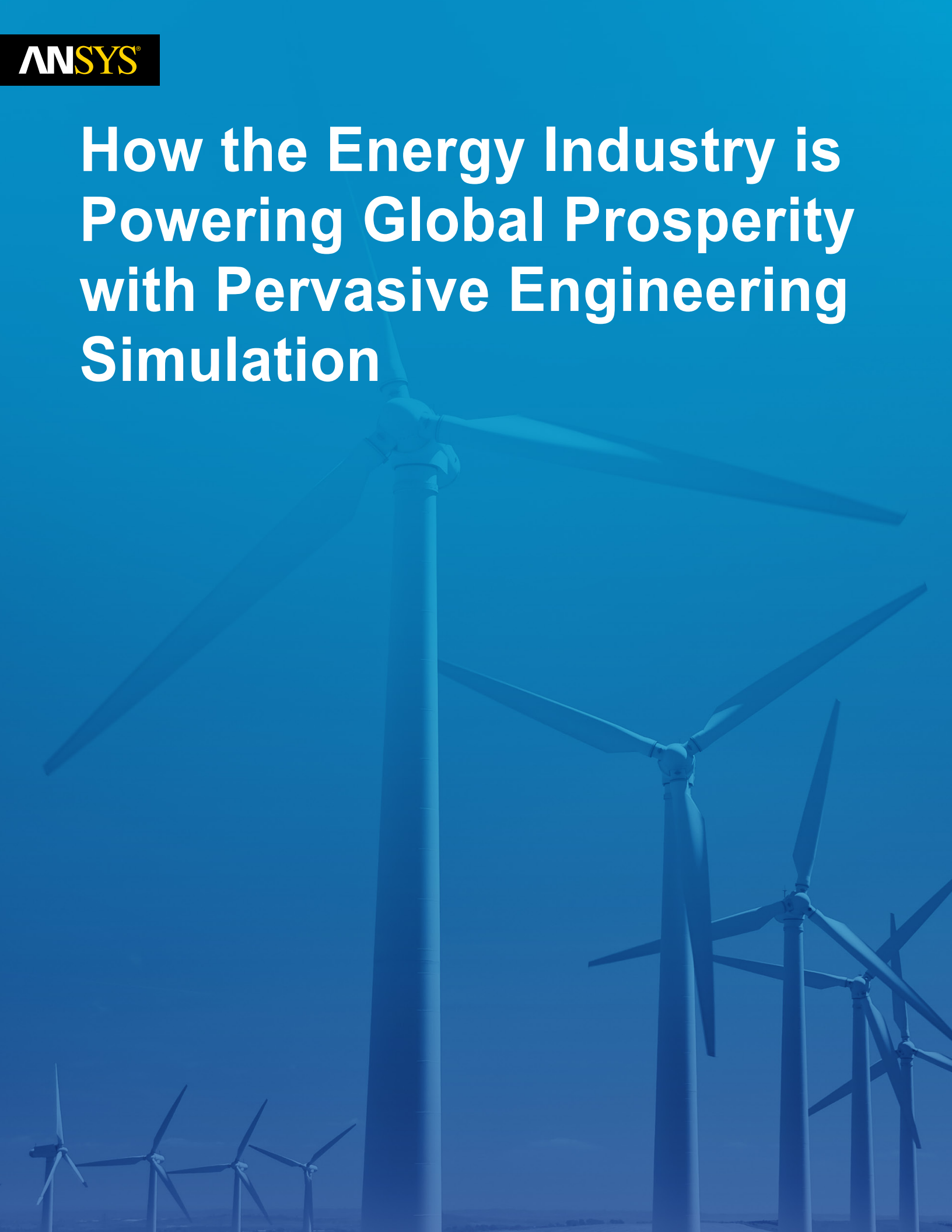
ANSYS®

How the Energy Industry is Powering Global Prosperity with Pervasive Engineering Simulation



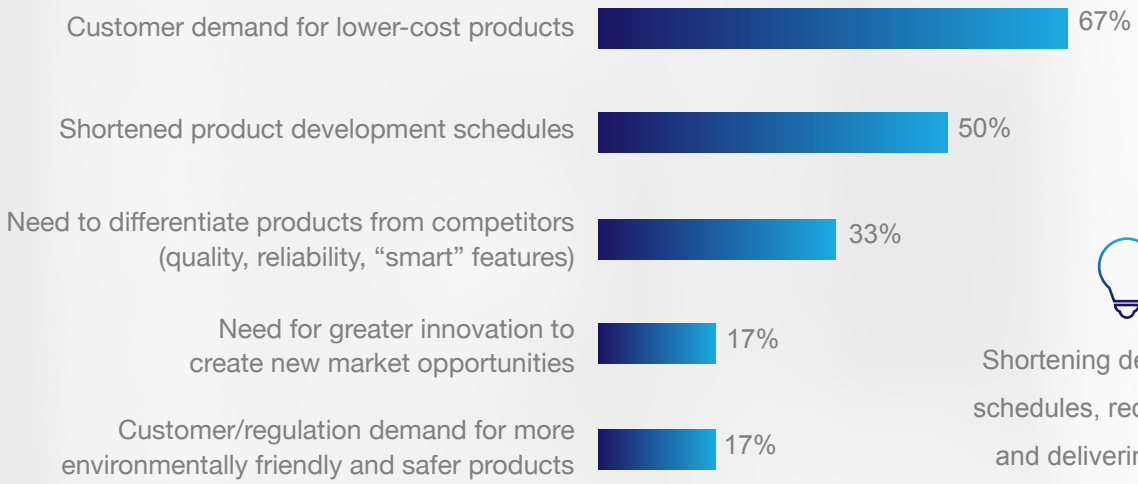
Market Trends Drive the Energy & Power Design Process

Global prosperity requires reliable energy at a reasonable cost. To meet this demand, the industry is changing the way it produces energy and power, whether it comes from hydrocarbon, nuclear or renewable means. Supplying it requires disruptive technologies, sustainable development, environmental stewardship, compliance with regulations, and cost management.

Shifting Market Trends are Driving Investments in Key Business Initiatives

Increase Energy Production	Improve Energy Production, Expand Infrastructure
Cost & Complexity	Standardization, Digitization & Reduce Manpower
Safety & Regulation	Optimize & Develop Efficient Operations
Reliability & Asset Management	Integrated Advanced Technologies
Emission & Sustainability	Environmental Stewardship

Energy and Power Industry Competitive Pressures



Aberdeen Group, February 2017

Shortening development schedules, reducing costs and delivering product innovation/quality/reliability/ smart features are key energy & power industry competetive pressures

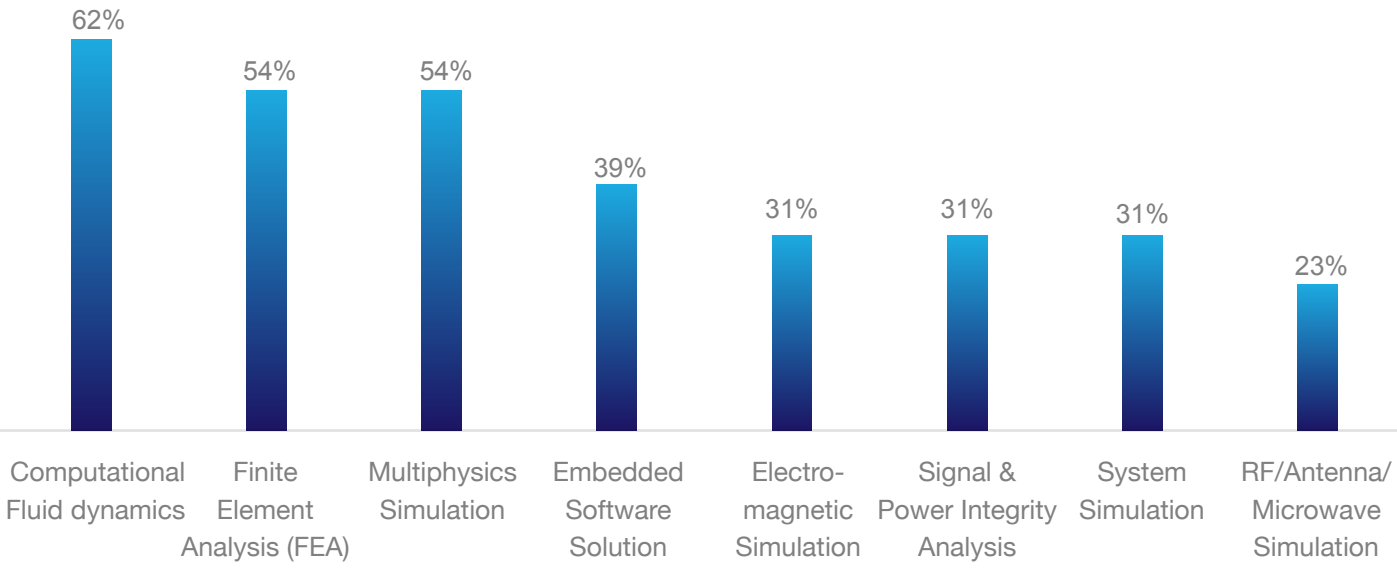
Energy & Power Industry Product Challenges

Operating environment complexities, limited resources, and competitive differentiation are key energy & power Industry design challenges

Aberdeen Group, February 2017

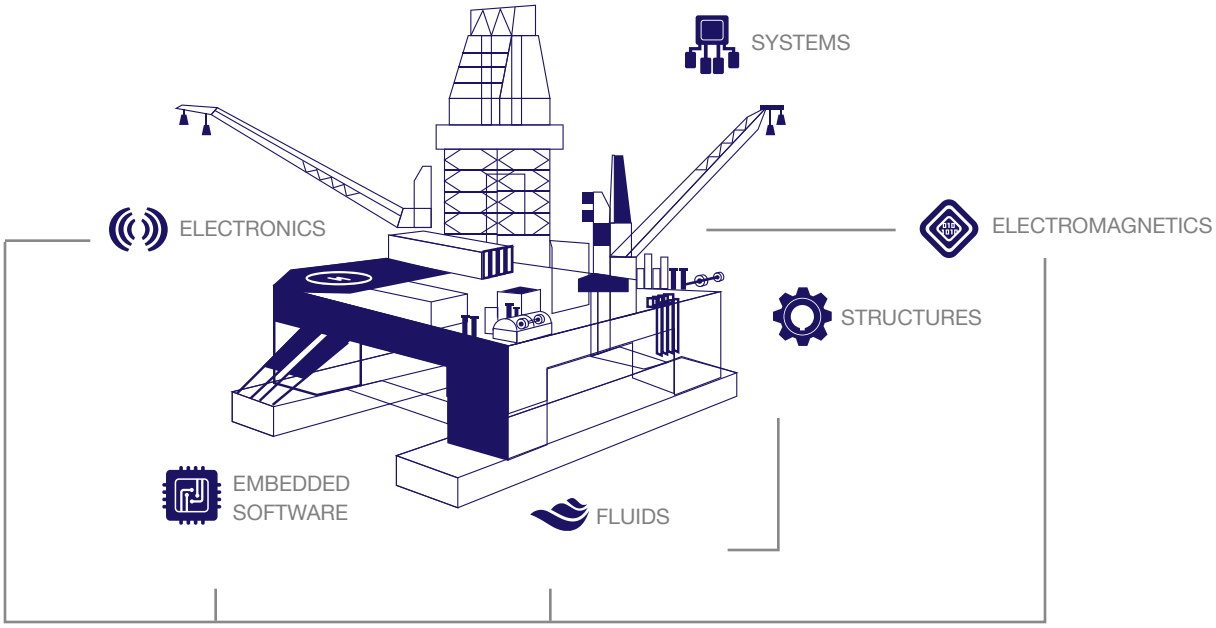
To address these design challenges, research shows that Best-in-Class companies invest in a broad portfolio of engineering simulation tools. The use of engineering simulation in the energy & power industry is pervasive from the component to the system level.

Engineering Simulation Investments by Best-in-Class Firms



Aberdeen Group June 2016

Pervasive Engineering Simulation from the Component to the System



The benefits of engineering simulation are significant.

What percentage of your company's products CURRENTLY meet your targets for the following?

	NON-SIMULATION USERS		SIMULATION USERS
Product Launch Date Target	50%	▶	71%
Product Cost Target	45%	▶	67%
Quality Target	60%	▶	77%

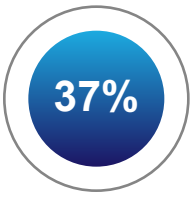
Simulation users are better at meeting their product launch date, cost, and quality targets

Energy & Power Companies Extend Their Market Leadership Using a Consolidated Engineering Simulation Platform

The Best-in-Class maximize their advantage by performing all engineering simulation within a common simulation platform. By doing so, they can further improve engineering productivity and the quality of their engineering design and analysis. This enables them to further reduce development time to deliver projects on time and under budget, all while reducing the total cost of ownership by consolidating their engineering simulation tools.

The Additional Benefits of a Consolidated Simulation Platform

more likely to meet product launch dates



more likely to decrease their length of development time

more likely to see a decrease in simulation TCO (past 12 months)

Using a consolidated engineering simulation platform, the Best-in-Class are even more likely to meet launch date and cost targets while reducing the total cost of ownership of their engineering simulation tools

ANSYS provides the most widely adopted engineering simulation platform that enables comprehensive simulation of complete digital prototypes that are both scalable and extensible

ANSYS Consolidated Engineering Simulation Platform

COMPREHENSIVE SIMULATION

Systems & Multiphysics

Digital Twin & Big Data

SCALABLE SOLUTIONS

Process & Data Mgmt

Desktop to Cloud

EXTENSIBLE ECOSYSTEM

Partner Networks

Customizable Apps

ANSYS provides the most widely adopted engineering simulation platform

Industry Leaders Acknowledge the Power of the ANSYS Consolidated Engineering Simulation Platform

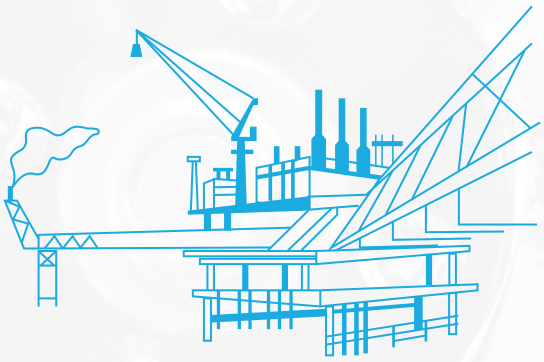
Case in Point: Siemens' steam turbine business unit is leveraging the most advanced technologies to support innovation and ensure its engineering team remains at the forefront of the industry.

"Best-in-class engineering tools and practices, including simulation, are a way of life across our global business."
- Dr. Leif Paulukuhn, head of global technology development at Siemens' Steam Turbine Business.

READ ARTICLE

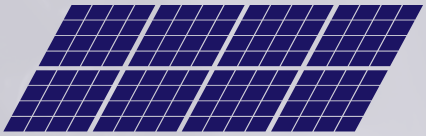
Complete Digital Prototyping in Energy & Power: Production, Generation, and Transmission from ANSYS

OIL & GAS



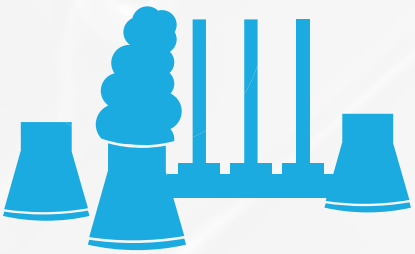
- THERMAL SYSTEMS & EMISSION CONTROL
- REMOTE OPERATIONS & MONITORING
- POWER CABLES & POWER GENERATION SYSTEMS
- ELECTRIC MACHINES & POWER
- BOOSTING & COMPRESSION SYSTEMS
- PROCESSING & EMISSION CONTROL SYSTEMS
- ELECTRONIC COMMUNICATION SYSTEMS & DATA TRANSFER
- DRILLING & DOWNHOLE TOOLS & SYSTEMS
- STRUCTURES & MECHANICAL SYSTEMS
- WELL HEAD & SUBSEA SYSTEMS

RENEWABLE ENERGY



- PHOTOVOLTAIC SYSTEMS
- BIOFUELS & BIOMASS SYSTEMS
- ENERGY STORAGE SYSTEMS
- CONCENTRATED SOLAR POWER PLANTS
- GEOTHERMAL SYSTEMS
- POWER ELECTRONIC SYSTEMS
- WIND ENERGY SYSTEMS
- FUEL CELLS
- HYDROPOWER SYSTEMS
- WAVE AND TIDAL ENERGY SYSTEMS

NUCLEAR ENERGY



- NUCLEAR FUSION R&D
- THERMAL HYDRAULIC SYSTEMS
- SMALL MODULAR RECTORS
- NUCLEAR FISSION POWER GENERATION
- INSTRUMENTATION & CONTROL SYSTEMS
- SAFETY & CONTAINMENT SYSTEMS
- MINING & PROCESSING SYSTEMS
- BALANCE OF PLANT
- FUEL RODS & FUEL SYSTEMS
- SPENT FUEL PROCESSING