



CASE STUDY /

## **Ansys + Turntide Technologies**

“Ansys Gateway powered by AWS unleashes the computing resources we need to quickly solve electromagnetics-related challenges in our Smart Motor System™ designs. We get tremendous acceleration during development with the added computational power, going from weeks to days to come up with answers to our most pressing technological challenges which otherwise would not have been possible.”

**Avisekh Banerjee, Ph.D.**

Director of Simulation and Analysis / Turntide Technologies

# Turntide Bursts Through the Cloud to Optimize Smart Motor System™ Designs 7x Faster with Ansys

*The sustainable technology company uses Ansys Gateway powered by AWS and Ansys Maxwell to accelerate Smart Motor System™ development*

Skyrocketing energy costs and aggressive sustainability goals are driving increased demand for high-impact energy conservation like Turntide Technologies' Smart Motor System™, which reduces energy use in HVAC systems by an average of 64%. As demands for its sustainable motor technology continue to grow, Turntide — a sustainable technology company — is challenged to optimize its own motor designs and speed time to market. This task requires analysis across multiple domains in a data-driven, high performance computing environment. Enabled by Ansys Maxwell and Ansys Gateway powered by AWS, Turntide can mitigate risk through detailed analysis across many domains on the cloud to speed time to market of high-quality motor designs that advance customer decarbonization objectives.

## / Challenges

Motor development considers multiple domains such as electromagnetics, thermal, and structural — each with its inherent challenges in a disruptive design environment. The presence of many nonlinear interactions and the changing physics involved made it difficult to estimate behavior in various areas involving changing design parameters. Overcoming these dynamics required continuous iteration both at the domain level and across domains. In the absence of an automated workflow, Turntide's biggest challenge was computing all these interactions and quickly scanning through a large number of design variables to arrive at an optimal solution.

## / Ansys Products Used

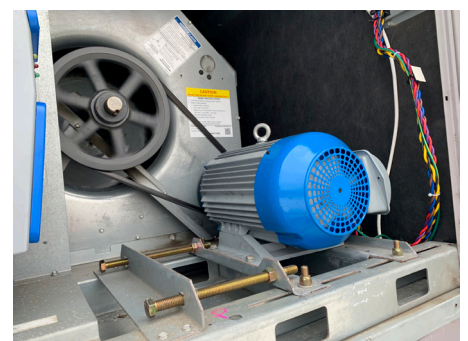
- Ansys Maxwell
- Ansys Gateway powered by AWS

## / Engineering Solution

Turntide looked to Maxwell simulation software to optimize electromagnetics in its Smart Motor System designs via cloud bursting on several independent workstations. This was accomplished using Ansys Gateway powered by AWS to run a virtual cluster coupled with Maxwell's electronics solvers to realize greater efficiency in electromagnetic optimization. It also helped Turntide establish a more flexible, collaborative workflow that enabled its engineers to run more design points faster in a high-performance computing environment while removing previously existing hardware barriers.

## / Benefits

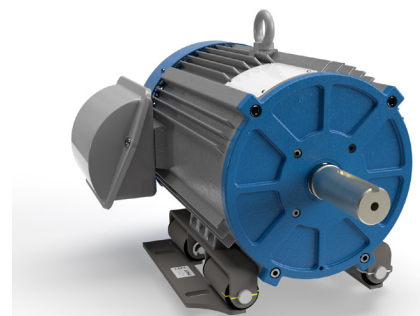
- Ansys Gateway powered by AWS enables a large computational infrastructure defined by virtual machines and configured for cloud bursting to support peaks in overall IT demand.
- Thanks to higher computation capabilities available on AWS, Turntide can analyze its designs 7X faster than on-premises and simultaneously run 125,000 simulations on Maxwell 2D software on the AWS cloud, reducing development cycles from months to weeks.
- Previously using 32 cores on-premises, it took more than 4 weeks on a workstation to optimize Smart Motor System designs. Now, with Ansys Gateway powered by AWS, users can easily create clusters with 4x the number of the cores and complete the simulation in less than 4 days.



- With pay-as-you-go options for cloud hardware resources on AWS coupled with the easy-to-use web interface within Ansys Gateway powered by AWS, engineers are just a few clicks away from the compute resources needed to run very large models.
- End users can spin up a cluster in a matter of minutes and remove any hardware barriers, easily scale up or down, and add remote users from satellite locations to improve overall agility and speed proof of concept.
- For Turntide, Maxwell 2D enabled by Ansys Gateway powered by AWS is key to quickly understanding the electromagnetics and related physics that lead to the optimization of its motor designs.

## / Company Description

Turntide Technologies Inc. is a company that develops and scales innovative technologies to accelerate electrification and promote sustainable operations in energy-intensive industries. Their integrated, open systems cater to commercial and industrial vehicles, building operations, and agriculture, optimizing energy consumption across these sectors. By tackling energy waste at every level, Turntide enables companies to become industry leaders and operate smarter for accelerated growth.



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