

Amogy Accelerates Clean Energy Technology for Sustainable Heavy Transportation with HPC Built for the Cloud

Case study

Location: Brooklyn, NY

Focus: Energy, Batteries, Heavy Transportation

Founded: 2020

3-5x Increase

in engineering and scientific simulation solve speed. Zero queuing time

Thousands

of dollars in cost savings on cloud infrastructure each month

“We needed a solution with the best of speed, cost, reliability, and simplicity - that’s what led us to choose Rescale.”

— *Seonghoon Woo, CEO*

En Route to Solve Transportation’s Emissions Problem

Today heavy-duty transportation contributes 10% of greenhouse emissions annually. Clean energy companies like Amogy are using advanced engineering techniques to develop hydrocarbon alternatives, and their solution is already showing promise. CEO Seonghoon Woo and the cofounding team of former MIT PhDs set out to design an ammonia-based power system to fuel planes, trains, trucks, and shipping vessels. Amogy’s solution combines advancements in hydrogen fuel cells with the advantages of ammonia as a fuel source. The company aims to deliver a turnkey clean energy solution that can be easily integrated into existing vehicles, and by 2040 they expect to be able to reduce 10% of global greenhouse gas emissions.

The Need for Computational and Engineering Speed

Revolutionizing an industry dependent on hydrocarbon fuels requires an efficient and economical solution, which is why Amogy focuses heavily on computational research using high performance computing. Engineers at Amogy test multiple models, with a variety of different parameters, and under varying conditions. For example, the team can determine the optimal design that maximizes the ammonia to hydrogen conversion process in their reactors.

As Amogy’s simulations increased in volume and fidelity, the team needed a high performance computing solution to meet aggressive R&D deadlines. Seonghoon Woo described Amogy’s approach: “Simulation and modeling are critical to transforming heavy duty transportation - it’s essential for large scale projects. Proving out product designs and testing small changes upfront is important because hardware scaling is costly and takes a long time.”

A User-Centric Solution for Accelerated R&D

Long queue and solve times quickly became a barrier to productivity, so the team began to search for a cloud-based solution that they could quickly implement. Being focused on advanced research and development, Amogy needs access to state-of-the-art computing infrastructure and operations that do not require extensive IT support. Woo explained that a key

objective enabling engineering productivity: “We have great diversity of engineering backgrounds from chemical, electrical, and mechanical, so we needed a turnkey solution that is easy to use and supports a variety of use cases.”

After evaluating different cloud HPC options, Amogy selected Rescale as a complete HPC-as-a-Service solution with the best overall user experience according to lead simulation engineer, Chris Stanczak. He said: “We needed a solution with the best of speed, cost, reliability, and simplicity - that’s what led us to choose Rescale.”

After getting started, the business case was obvious: Rescale multiplied engineering productivity 3-5x by increasing their computational capacity and reducing queue times to zero. Additionally, the team discovered that they could optimize their applications by running on different hardware, ultimately reducing their infrastructure costs. Stanczak pointed out: “Rescale’s intuitive interface, end-to-end job monitoring, and easy-to-use templates help to streamline my day-to-day work.”



Pictured: Amogy team at Headquarters in the Brooklyn Navy Yard

New Capabilities for Business and Environmental Impact

Disrupting both energy and transportation is no small feat, but Amogy is proving that engineers, scientists, and researchers with the right tools can make big discoveries. Woo said: “Rescale simplifies high performance computing, which helps us improve our models and make new discoveries faster. Ultimately it’s about commercializing our technology faster so we can accelerate global decarbonization.” After already debuting a working prototype of its power system, the team is now rapidly developing a fleet of vehicles for demonstration later this year (2022).



Rescale optimizes 800+ applications on the latest hybrid cloud HPC architectures



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— Seonghoon Woo, Co-Founder & CEO



Rescale Integrates Best-in-Class Tools For Streamlined Computational Engineering and Accelerated R&D

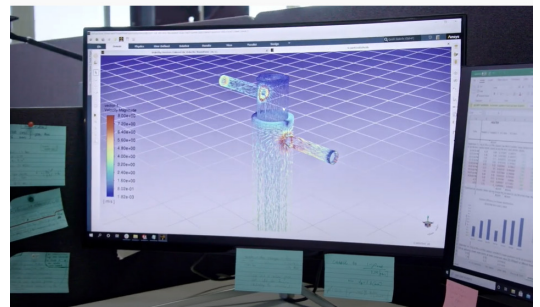
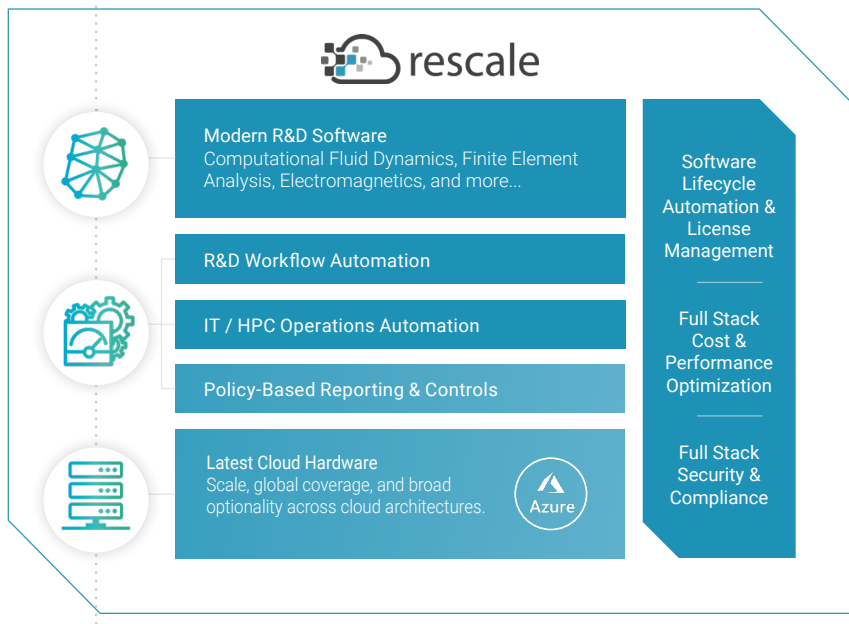
Spotlight on Innovation

Amogy provides a world-first energy solution with unmatched storage density using Ammonia (NH₃), the second most produced and available chemical in the world.



Define HPC and R&D Goals:

- » Accelerate Simulation Results
- » Standardize Best Practices
- » Increase Consultant Productivity
- » Reduce Overhead and IT Burden



Pictured: Amogy simulating prototype CFD performance



Pictured: Amogy ammonia-powered battery solution onboard a drone



Strategic Business Outcomes

- » Faster, easier engineer onboarding
- » End-to-End Automation
- » Improved Simulation Fidelity
- » Decreased Capital Expenditures



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