



Center for Transportation Technologies and Systems



Next generation AH²PS technologies are projected to save about 15 million barrels of oil per year starting in 2010. This number could increase to as much as 200 million barrels of oil per year by 2020, according to the U.S. Department of Energy.

NREL's AH²PS research is funded by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy, and is led by NREL's Center for Transportation Technologies and Systems.

DOE/NREL's Advanced Heavy Hybrid Propulsion System Project

How can researchers develop a heavy vehicle that not only has a fuel efficiency 100 percent greater than conventional trucks and buses but that also meets 2007 EPA emission standards? That's the question being answered by the DOE/NREL Advanced Heavy Hybrid Propulsion System Project (AH²PS).

What is the AH²PS Project?

The AH²PS Project is a government/industry cost-shared research and development project for advanced, next-generation heavy hybrid propulsion components and heavy hybrid vehicle systems. Simply put, the AH²PS Project is developing the hybrid vehicle technologies that will power the trucks and buses of the future.

NREL researchers are working with DOE's FreedomCAR and Vehicle Technology (FCVT) Program, the 21st Century Truck Partnership, and industry to develop heavy vehicle hybrid propulsion components and systems that significantly improve fuel efficiency and reduce emissions. The project's goal is to commercialize heavy hybrid vehicles before the end of this decade by creating technologies that surmount the technical barriers of initial and lifecycle costs, performance, reliability, and durability. AH²PS will meet its goals through industry-teaming, to take advantage of complementary technologies and skills from various companies and national laboratories.

Why is the AH²PS Project Important?

DOE projections indicate that light-and heavy-duty trucks are the fastest growing transportation sector with regard to emissions and petroleum use. The AH²PS Project is important because it will develop and promote technologies that reduce petroleum use and emissions for much of this transportation sector. The project will also enable heavy trucks (Class 3-8) and buses that are as much as 100% more fuel efficient than today's vehicles; while still meeting EPA's stringent 2007 heavy-duty emission requirements.

AH²PS Project at a Glance

GOAL:

Develop advanced, next-generation heavy hybrid propulsion components and systems through technology research and development, project management, and technical support of AH²HPS subcontractors.

DURATION:

Phase 1: 2002-2006. Phase 2: 2006-2008

TECHNICAL BARRIERS:

Initial and lifecycle costs, performance, reliability, and durability.



How Does NREL Support the AH²PS Project?

NREL supports the AH²PS Project by providing vehicle- and component-level technical analyses and project management to four AH²PS subcontractors to lead research and development in the following areas:

- Class 6 heavy vehicle applications
- Class 7-8 heavy vehicle applications
- Heavy hybrid transit bus applications
- Waste energy recovery and utilization in heavy hybrid vehicles

The AH²PS team also works to identify heavy hybrid vehicle system requirements using technical target setting, which helps DOE and industry meet the goals of the AH²PS Project—to double the fuel economy for commercially viable vehicles. NREL researchers use the technical target setting process to find solutions that have the lowest associated research and development effort and life cycle cost.

The AH²PS Project is divided into two phases. Phase 1 is a 3-year technology development project to design, develop, characterize, and show the feasibility of energy and fuel saving heavy vehicle hybrid propulsion technologies. Phase 2 is a 3-year project intended to further develop and validate Phase 1 technologies and establish these next-generation technologies into a wide spectrum of heavy vehicle applications.

Who are the AH²PS Subcontractors?



Eaton Corporation is focusing on researching, developing, and validating a next generation hybrid electric powertrain to improve the fuel economy, emissions, and overall performance of Class 6 trucks and demonstrate positive customer acceptance and commercial viability.

Oshkosh Truck Corporation is researching, developing, and validating advanced hybrid electric powertrain technologies for Class 7-8 truck applications. Rockwell Automation, Rockwell Scientific, Ohio State University, ElectraStor, and JME are teaming with Oshkosh on this project.



Allison Transmission—a division of General Motors—conducts research, development, and validation of advanced, hybrid electric powertrain and motor technologies for heavy hybrid transit bus applications.

Caterpillar Inc. is researching and developing advanced hybrid waste energy recovery systems to support and enable heavy vehicle hybridization and electrification.



For More Information

On the Web

For more information, visit the **Advanced Heavy Hybrid Propulsion System** Web site at www.nrel.gov/vehiclesandfuels/ahhps/

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