AIRPower - Electric powertrain system for Class-8 trucks

Our core team and the stakeholders and extended team include Yale, Cornell, and MIT graduates: a serial entrepreneur with an MBA and an advanced degree in engineering, 3 others also have MBA degrees and two have advance degrees in engineering, one is a serial inventor and has a degree in engineering. Advisors include Cornell University professors, and industry experts. Other stakeholders include Yale and Cornell universities and Airbus.

Our goal is to make a significant impact in the environment by building an integrated system that by 2025 would help reduce by 50% the levels of current CO_2 emissions produced by medium and heavy-duty trucks.

We are working on a design of a sustainable all-electric powertrain system for class-8 trucks. It is designed to replace the trucks' diesel engines and transmissions with electrically driven motors, generators, batteries, telemetry and software. The system would work well in retrofits as well as new trucks.

Photovoltaic (PV) panels installed on the roof of the truck capture sunlight and converts it into electricity. The electricity is stored in a Lithium-ion battery. This system serves as an auxiliary power unit (APU) that is used to release compressed air energy stored (CAES) in carbon fiber compressed air tanks to turn mechanical power from motors and generators into the electricity that runs the truck. This APU also runs some of the truck's electric components including the lights, air conditioning and hotel loads. The compressed air tanks are designed so that they can be refilled or they can be easily switched and replaced throughout the distribution network. The truck would create a net-zero carbon footprint.

A key element of the powertrain energy storage system, is that the compressed air tanks are filled by using renewable energy. AIRPower offers a *solution to renewable energy curtailment* by using the excess supply of renewable energy and redistributing it. At solar and wind farms we would use the sun's energy and ambient air as the power sources to electrify the air compressors. The air compressor would compress air which will be stored in underground caverns or in high-pressure tanks. We will use a similar method at hydroelectric power plants. We would purchase the renewable electricity at the cheapest time and we would lease space from the solar and wind farms and hydroelectric power plants location for our operations.

Similar to the system of how diesel tankers move the fuel throughout the distribution network, we would create a distribution network where compressed air would be delivered by compressed air tankers to the final destination throughout the network.