2016 Allegheny Collegiate CleanTech Competition
Green Chemistry Students Receive Funding to Pursue Clean Energy Startup

The Team

The Problem

Our Tech

Future Plans

All cooling systems suffer from a long identified efficiency problem known as oil carryover. In the extreme environment of an active piston, oil particulates are carried by the refrigerant which end up depositing as a layer along the areas responsible for temperature exchange. This build up results in the system working harder and longer to cool than another comparable system unaffected by this problem. This extra work, multiplied by the incredible number of inefficient systems in America, corresponds to an amount of wasted energy. In fact, if our innovation (adopted nationwide) solves this problem to yield a 20% increase in efficiency, the energy saved annually would be sufficient to power NYC for 288 days.

Our solution to oil carryover is the use of a highly tunable class of molecules known as ionic liquids. These novel substances have received much attention in recent years due to their unique properties as liquid phase salts at room temperature. The properties include:

- High thermal stability
- Resistance to degradation
- No vapor pressure
- No reactions with current refrigerants

In light of having no vapor pressure ionic liquids do not carry over into the heat exchange lines like all other oils on the market. This results in a 20-30% increase in energy efficiency for the HVAC system.

Our Tech Future Plans

To expand our business and research opportunities, Saloleum will be seeking funding through more scheduled competitions and grant options. In the near future, surveying of ionic liquids and identifying potential targets will be the main focus. Selected ionic liquids will then be tested on compressors while energy data will be collected.

Acknowledgments

We would like to thank Chatham University for their support throughout the competition. Thanks to the Green Chemistry Program for pushing us to think outside the box and cultivate creative innovative ideas. Special thanks to Dr. Macagno and his continual encouragement and mentoring.