

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

The Team



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Competition Overview

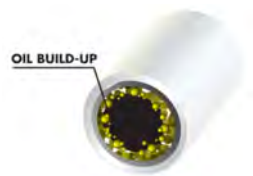


- The Allegheny Region CleanTech University Collegiate Competition was sponsored by the Department of Energy's Energy Efficiency and Renewable Energy office.
- The competition took place during Carnegie Mellon University's Energy Week.
- The goal was to catalyze clean energy technology start-ups, support educational opportunities and encourage clean energy student entrepreneurs as well as providing them funding for development of their ideas.
- The Collegiate CleanTech Competition is the precursor to the Department of Energy's National Clean Energy Business Plan Competition.

Competitors



The Problem



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 an area than a 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.

HVAC Market



Our Tech



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:

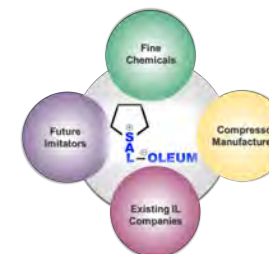
- High thermal stability
- Resistance to degradation
- No vapor pressure
- No reactions with current refrigerants

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

Business Model



Future Plans



To expand our business and research opportunities, Saleem 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.