NREL
NATIONAL RENEWABLE ENERGY LABORATORY

# MEMO

**Date:** Monday, March 07, 2011

**To:** AASHE

**From:** Otto Van Geet, PE

**Subject:** Fume hoods letter of verification

Otto Van Geet is a senior engineer at NREL. He has over 25 years experience with the design and operation of energy efficient research lab buildings. Otto has been involved with the Labs21 program since its inception and provides technical guidance for the program. His experience also includes passive solar building design, use of design tools, renewable energy system design, energy audits, and minimizing energy use. Mr. Van Geet author many technical reports and conference papers and has been recognized with many awards from professional associations including the 2007 Presidential Award for Leadership in Federal Energy Management. Mr. Van Geet is a Registered Professional Engineer, a Certified Energy Manager, a LEED Accredited Professional, and a Project Management Professional.

Cleveland State University is one of only 34 colleges and universities partnering with the U.S. EPA and Department of Energy's Laboratories for the 21st Century (Labs 21) program dedicated to improving the environmental performance of labs in the U.S. The Labs 21 Technical Team assisted CSU with a retrofit project that was known at the time to be the only lab building project in the country financed solely based on energy savings.

Beginning in early 2008, the Science (SI) and Science and Research Center (SR) buildings at Cleveland State University, constructed during the early 1970s and 1980s, respectively, underwent the removal or replacement of their outdated, malfunctioning, and inefficient fume hoods. After evaluating various options for fixing and/or upgrading its equipment, CSU decided to replace its fume hoods with the latest, energy-efficient models (or remove those hoods deemed unnecessary) and install variable frequency drives and a heat recovery system in both buildings.

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These upgrades reduced SR's energy consumption from an average of nearly 300,000 British thermal units (BTUs) per square foot per year to approximately 84,000 BTUs per square foot per year. SI's energy consumption decreased from 170,000 BTUs per square foot per year to just over 52,000 BTUs per square foot per year. The total cost of the project was slightly more than $10 million, with a projected payback period of five years. The project was completed at the end of 2008.

The Labs 21 team of Otto Van Geet from NREL and Paul Mathew from LBNL became involved in the CSU project when they taught the Labs21 "introduction to high performance labs" course at CSU. Otto had significant follow on work in assisting with the RFP for the ESPC, evaluating the ESPC proposals, reviewing the ESPC design and follow on energy savings verification.