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To: State Dept. of Education – Finance & Infrastructure Committee

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Subject: Testimony - Heat Abatement Solutions for School Classrooms

Problem: With recent summer weather patterns, high temperatures and humidity within the classrooms caused teachers and students significant heat discomforts, impairing teaching/learning. Need a practical, affordable approach that provides lasting results. .

Background: Recurring problem every August through early October, the hottest, humid period for Hawaii according to ASHRAE Handbook (American Society of Heating, Refrigerating, & Air Conditioning Engineers). This issue has been ongoing for years. The State's bureaucracy in timely, effective execution, compliance with strict codes/regulations for air conditioning, expensive engineering designs, inflated cost estimates, and lack of funding all contribute to finding resolution. In addition, the lack of good maintenance has impaired those schools that already have air conditioning.

Solution: First, take steps to passively cool the buildings, such as insulating roofs and using reflective coatings (most heat gain from direct sunlight). Installing high-quality ceiling fans provide good, inexpensive air movement with or without air conditioning.

Second, is a paradigm shift to ***re-classify "air conditioning" classrooms to "supplementary cooling" classrooms***. This is the big game-changer. It eliminates all the codes/regulation compliance required for air conditioning and greatly reduces the installed cost without sacrificing safety, quality or efficiency.

Keep the classroom design simple by installing ductless split (DLS) systems in the offices and classroom. It's energy-efficient as any of the expensive designs, it's quiet, it's very affordable, it's very reliable, it's easy and inexpensive to maintain, it's expendable. This would cut the proposed $1.7 billion budget far less than half.. The only maintenance would be cleaning the filters, cleaning drain lines, and washing the outdoor coil, which can be done by school custodians. If a unit should break, each component and spare parts are so inexpensive, backup equipment and parts could be be kept on campus to mitigate immediate repairs. Expected life of ductless systems, properly maintained is 10-15 years. Federal Dept. of Energy guidelines continuously increase the energy efficiency, making equipment obsolete every 5-10 years, making large commercial air conditioning equipment life-cycle of 25 years superfluous.

There are many quality, competitive brands to keep pricing competitive: Carrier, Daikin, LG, Mitsubishi. Panasonic, Samsung. .