An Update on the Department of Education's Heat Abatement Efforts

A Report to the Governor
and the Legislature of
the State of Hawai'i

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OFFICE OF THE AUDITOR
STATE OF HAWAI'I

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STATE OF HAWAIʻI

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Foreword

The Office of the Auditor undertook this review of the Department of Education's heat abatement efforts to account for the $100 million spent on its Cool Classrooms Initiative, which started in 2016. We also reviewed the department's subsequent approach to air conditioning classrooms, the School Directed AC program, which it initiated three years later.

We express our appreciation to the administrators and staff of the Hawai‘i Department of Education, and other individuals whom we contacted during the course of our review, for their cooperation and assistance.

Leslie H. Kondo
State Auditor

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Introduction

THROUGHOUT 2013 AND 2014, media reports proliferated of teachers and students at Hawai'i public schools complaining about the sweltering conditions in some of their classrooms, where temperatures at times climbed into the 90s and low 100s. At Campbell High School, it was reported that students were struggling to pay attention and learn amid the stifling heat. In some classrooms, teachers and students also had to contend with noise from airplanes and traffic, coupled with dust, when it was too hot to close the windows.

At the end of 2014, students decided to take matters into their own hands, forming a group called "Fahrenheit 73," and began raising money for air conditioners. The following year, Hawai'i would experience record-high temperatures.

Hawai'i's political leaders responded by making air conditioning a top priority. In January 2016, Governor David Ige announced in his State of the State speech that he was working to cool 1,000 classrooms by the end of the year. "The classroom is a sacred learning space, but students will fail to learn the lessons of their teachers when temperatures soar to over 100 degrees," Governor Ige told lawmakers and top government

Amid the public and political pressure, it fell to the Hawai'i Department of Education to act quickly to fulfill the governor's mandate to cool 1,000 of the state's hottest classrooms by the end of the year, a plan called the Cool Classrooms Initiative.

officials who had gathered at the Hawai'i State Capitol for his speech. That May, the Hawai'i Legislature approved $100 million in general funds to cool 1,000 public school classrooms. The measure was signed into law by the governor as Act 47, SLH 2016.

Amid the public and political pressure, it fell to the Hawai'i Department of Education (DOE or the department) to act quickly to fulfill the governor's mandate to cool 1,000 of the state's hottest classrooms by the end of the year, a plan called the Cool Classrooms Initiative.

The Office of the Auditor undertook a review of the heat abatement initiative to account for the $100 million and assess the effectiveness of the department's heat abatement efforts. We found that rushed planning and poor decisions early on – as well as instructions not to add to the energy load – contributed to DOE moving forward with expensive and complex solar-powered air conditioning systems (solar AC systems) that ultimately didn't work very well, eliciting a new round of complaints from teachers.

We also found that the solar AC systems installed under the initiative are often in need of repair, some have been completely scrapped and, overall, they've cost millions to salvage, fix, and grid connect. Despite spending, on average, more than $120,000 *per classroom*, some school principals report that the poorly performing air-conditioning systems have not done much to relieve the heat. Early on, teachers reported that the units didn't work or failed to cool their classrooms to a comfortable level and that the limited period of time – only five hours a day – in which the solar AC systems were intended to be operable often left classrooms sweltering during the rest of the school day. A decision by DOE to seal jalousie windows with plexiglass to create more airtight classrooms to maximize the efficiency of the systems exacerbated the heat problems during periods when the air conditioning was off, blocking trade winds that would normally cool classrooms.

Now, with the batteries that were installed on many of the solar AC systems nearing the end of their lifespans, one DOE official warned that the systems will need to be retired altogether. He called the heat abatement initiative a $120 million disaster.

We also reviewed DOE's subsequent approach to air conditioning classrooms, called the School Directed AC program, which the department announced in 2019. Unlike the initial heat abatement initiative, which was a one-time effort led by the department, the new program gives schools the authority to air condition classrooms themselves, with minimal department involvement. A former DOE Administrator said the School Directed AC program grew out of parents "dropping off window AC units at the curb" out of concern for their

children struggling to learn in warm classrooms. Under the School Directed AC program, at a school's request, DOE arranges and pays for schools' electrical assessments to help schools understand their capacity for added air conditioning units. In exchange, schools provide the department with an inventory of existing air conditioners. DOE noted in its press release that AC units could be paid for by the school, received as a donation from the community, or obtained through the department's legislative budget request.

We found that the department has provided minimal structure and oversight over the program; for instance, DOE intended that schools report their current inventory of air conditioning units before the assessment, but a department memo outlining the installation process does not list inventory reporting as a requirement. The memo does require that schools provide notice of installation and closeout to the department's project tracking website; however, the website does not include reporting on those requirements. Overall, we found DOE's knowledge of and involvement in the School Directed AC program to be so incomplete and limited that we were unable to assess it. Finally, at the end of our field work, we were informed by the Procurement and Distribution Specialist II, who also serves as Acting Branch Administrator for the Office of Facilities and Operations, that the department had recently issued a memo rescinding schools' authority to execute construction contracts, which the DOE official claimed effectively ended the program. He told us that the department had yet to establish a written policy, but it would be forthcoming. He would later provide us with the memo announcing the policy change but did not provide us with the official policy itself.

Overall, we found DOE's knowledge of and involvement in the School Directed AC program to be so incomplete and limited that we were unable to assess it.

Methodology

For this report, the Office of the Auditor reviewed the legislative and funding history of the governor's Cool Classrooms Initiative, the name given to DOE's effort to fulfill Governor Ige's call to cool 1,000 classrooms; minutes of department and Board of Education meetings; consultant assessments; DOE planning documents; and reports to the Legislature on the progress of the heat abatement effort. We analyzed design and construction contracts, as well as project close-out documentation, to obtain detailed information on expenditures and what equipment was installed at each school. We also surveyed schools about how well their respective air conditioning systems installed as part of the initiative have worked and reviewed DOE repair logs and information about the maintenance contracts for the solar AC systems. We visited one school - Castle High School - to observe the solar AC systems and spoke with principals and other staff.

We also gathered information on DOE's process for schools to air condition classrooms themselves, called the School Directed AC program, which transferred the responsibility of cooling classrooms from the department to the schools.

As part of our review, we interviewed current and former DOE officials involved in both the Cool Classrooms Initiative and the School Directed AC program and consultants contracted by DOE to help manage these programs.

Many of the employees directly involved in the Cool Classrooms Initiative are no longer employed by DOE, which hampered our ability to obtain information and documents related to the heat abatement effort. Among these employees is the former Public Works Administrator for DOE's Facility Development Branch, who was in charge of the design and execution of the program to cool classrooms. He retired from the department in 2017 and passed away in 2022.

DOE's heavy reliance on outside design and consulting firms also made it difficult for us to obtain documents and identify employees of these companies who were involved in DOE's heat abatement efforts. We found that DOE has not maintained copies of many documents relating to its past and current heat abatement programs; and a DOE official said in some cases no documents existed because some of the jobs had not closed.

DOE also struggled to locate documents that we requested because of its poor record keeping, its transition to a new database for project documentation, and the departure of key employees.

We were unable to obtain key documents from DOE for some of the heat abatement projects that would confirm the final payments made to construction contractors. In these cases, we had to rely on construction contracts to provide an estimate of the project costs; we were unable to determine the actual costs. Moreover, the construction contracts do not account for any change orders or the use of contingency funds. In some cases, we were not even able to confirm whether the contract was fully executed.

In our follow-up efforts for the School Directed AC program, we found similar issues with DOE's lack of documentation. In addition, employees directly involved in establishing the School Directed AC program no longer work at DOE or are in different positions that have no responsibility over the program. Many of the employees who currently have responsibility over the program, including the Interim Assistant Superintendent of the Office of Facilities and Operations, are relatively new to their positions. Instead, we had to rely on the contractor's Senior Project Engineer who is in charge of the electrical assessments to provide us with the specific and general details of the School Directed AC program.

Disclaimer

THE OBJECTIVE of this follow-up effort was to report on how DOE expended the $100 million for the Cool Classrooms Initiative announced by Governor Ige in 2016. In doing so, we fully expected that the department would be able to verify what was spent, where it was spent, and what it was spent on. DOE was unable to do so with complete confidence or certainty.

For example, in response to our initial request for a school-by-school list **of all DOE classrooms that had air conditioning systems installed under the initiative**, DOE provided us with a November 7, 2018 report, which listed 1,064 classrooms at 57 schools that were air conditioned or soon to be air conditioned. According to the report, total amount spent: $123 million, with $22 million spent on consultants, construction costing $95 million, and an additional $6 million spent on passive cooling measures such as LED lighting and water coolers.

Later, in response to a request for a detailed breakdown of what equipment was installed under the initiative, we received another list that accounted for a total of 48 schools with 958 classrooms air conditioned. A third list, a status report from the contractor that provided project management services, reported 54 schools receiving air conditioning. This list did not include the number of classrooms at each school that were air conditioned. The contractor did provide us with another document that contained a breakdown of classrooms; however, that document reported that contracts entered into by DOE provided for air conditioning of 1,722 classrooms, but only 1,671 classrooms were completed. But, that document did not include completion dates and appears to include classrooms that were cooled outside of the initiative.

Three additional documents provided by DOE included additional conflicting information.

As recounted in this report, we examined DOE's paper contract files, which were stored in individual project boxes at the department's offices in Kaimukī. The project boxes contained a project completion notice, which indicated that the project had gone through final inspections, had been closed out, and included the final contract amount to be paid to the contractor. We expected to verify DOE's expenditures against these contract completion notices; however, DOE was unable to find the boxes for all the projects.

Considering the incomplete and not-100 percent reliable data the department provided, we believe these cost estimates are the best achievable accounting of the amounts DOE spent on the Cool Classrooms Initiative.

In the end, DOE could not provide us with contract completion notices for 15 projects. For these projects, we included the contracted amounts in our calculations; however, without completion notices, these numbers may not reflect DOE's total expenditures if there were change orders or other amendments to the contracts that affected the original contract prices. Because of this inconsistent, incomplete, and sometimes contradictory information, the total cost and the breakdown of the amounts expended under the Cool Classrooms Initiative that we report are estimates. Considering the incomplete and not-100 percent reliable data the department provided, we believe these cost estimates are the best achievable accounting of the amounts DOE spent on the Cool Classrooms Initiative.

Report Objectives

1. Report on how DOE expended $100 million that was appropriated through Act 47, Session Laws of Hawai'i 2016, for the Cool Classrooms Initiative.
2. Describe DOE's process to air condition classrooms under the School Directed AC program, which shifted the responsibility from the department to individual schools.

Summary of Conclusions

Cool Classrooms Initiative

1. Faced with public and political pressure to cool 1,000 classrooms by year's end, DOE rushed to install complex, unfamiliar, and costly solar AC systems.
2. In total, $104,961,733 was spent on heat abatement at 53 schools where 838 classrooms were air conditioned, most with solar AC systems. On average, DOE spent $125,253 to cool a classroom.
3. From the start, many of the solar AC systems failed or didn't work properly, resulting in a salvage effort with an estimated cost of between $3.3 million to $6 million.

School Directed AC Program

4. DOE has provided minimal structure to and little oversight of the School Directed AC program.
5. DOE's knowledge of and involvement in the School Directed AC program is limited to non-existent.

Part 1: The Cool Classrooms Initiative

Faced with public and political pressure to cool 1,000 classrooms by year's end, the Department of Education rushed to install complex, unfamiliar, and costly solar-powered air conditioning systems.

On September 9, 2015, the Department of Education (DOE) sent an "urgent request" to then-Governor David Ige seeking the release of $20 million in general obligation bond funds to immediately address the "serious heat issues" in Hawai'i public schools. Governor Ige approved the request on September 23, 2015, using funds appropriated under Act 119, Session Laws of Hawai'i (SLH) 2015, the State's budget bill.

Act 119 also had earmarks for heat abatement projects at specific schools, including 'Ilima Intermediate, Kaimiloa Elementary, Noelani Elementary, Pearl Ridge Elementary, and Lincoln Elementary.

In May 2016, Governor Ige signed Senate Bill No. 3126, S.D.2, H.D.2, C.D.1 (2016 Regular Session), which became Act 47, SLH 2016, appropriating $100 million in general funds for the Cool Classrooms Initiative.

We initiated a review to report on how DOE expended the $100 million that it received under Act 47. However, during the course of our review, the department told us that the $20 million appropriated the prior year under Act 119 was also used for some of the planning work relating to the Cool Classrooms Initiative and other heat abatement projects. According to documents provided by DOE, a number of the heat abatement projects that the department included in its tallies of classrooms cooled under the Cool Classrooms Initiative were funded, in part, by appropriations other than Act 47. The comingling of funds complicated our efforts to get a precise accounting of how Act 47 funds were used.

We attempted to obtain an accounting of the department's expenditures toward the heat abatement effort by reviewing the project files at DOE's offices. We were told that DOE's policy is to retain paper copies of all documents relating to a project in boxes. However, DOE was unable to find boxes for all the projects we requested. The former director of the Office of Facilities and Operations' Auxiliary Services Branch told us that it was because DOE had run out of money for construction management and some of the projects had not closed. When we asked him about the location of information on open projects, "floating around," he responded.

We subsequently asked for contract completion notices for each heat abatement project DOE had listed as part of the Cool Classrooms Initiative, which would likely show that the project had gone through final inspections, had been closed out, and the final contract amount paid to the contractor. DOE was unable to provide us with the completion notices for 15 projects.

Compounding our difficulties in providing an accurate accounting of Cool Classrooms expenditures was the department's inability to provide a single, reliable listing of schools and classrooms that were air conditioned under the initiative. The number of classrooms air conditioned differed by source: In September 2017, the Governor marked 1,000 classrooms cooled and said 300 more classrooms would be cooled by the end of the month. But, a DOE official said the total was approximately 1,064, not in the 1,300 range. This may, in part, be attributable to the fact that contracts to cool certain schools and complete design work for a statewide heat abatement effort began prior to the $100 million appropriation that the department received in 2016. Projects funded by that appropriation also continued well-beyond the date Governor Ige declared success at cooling 1,000 classrooms. So, the number of classrooms that were reported as having air conditioning installed may have changed based on the date of certain reports.

Ultimately, we had to rely on the contracts that were awarded for design, construction, construction management, and project management under the Cool Classrooms Initiative to piece together what was spent at each school. The contracts, however, are not the documents that we expected to be our primary source of information about DOE's expenditures from the $100 million; we had expected the department to have tracked those expenditures and to be able to readily provide that information to us. DOE must be accountable for its spending, which it is not without a complete and comprehensive accounting that can be supported by documentary evidence.

Setting the stage

Planning work for statewide heat abatement efforts in Hawai‘i’s public schools was already underway when Governor Ige announced in January 2016 his intent to cool 1,000 classrooms by the end of the year.

Miller Kelley Architects, Inc., dba MKThink (MKThink), an architecture and planning firm with offices in San Francisco and Honolulu, had been working for DOE on a pilot project at four Campbell Complex Area schools in ‘Ewa Beach on O‘ahu to assess strategies for heat abatement. That work was expected to inform statewide policies for creating cooler classrooms, according to a report that MKThink issued in March 2015.

MKThink’s report listed three recommendations: (1) reduce solar gain, which can include lightening the color of roofs, insulating roofs, minimizing paved areas and asphalt, and creating natural shade; (2) increase natural ventilation; and (3) install fans and air conditioners. MKThink entered into a contract with modifications for $5.3 million for its consulting work.

7 Design Consultants – $25.3 million*:

SSFM International Inc.	$5.8 million
Miller Kelley Architects, Inc. (dba MKThink)	$5.3 million
Pacific Architects, Inc.	$2.8 million
Mitsunaga & Associates, Inc.	$3.2 million
WRNS Studio	$3.2 million
Chapman Desai Sakata, Inc. dba CDS International	$2.7 million
Bowers + Kubota Consulting, Inc.	$2.3 million
Total	**$25.3 million**

*In addition to design work, SSFM was responsible for overall project management, including the procurement of design and construction contracts. MKThink assisted with conceptual designs.

DOE would end up shelving much of MKThink’s multi-pronged conceptual framework for cooling classrooms as bids for installing expensive solar AC systems in classrooms consumed its $100 million budget.

DOE divided the heat abatement project into two phases. Phase 1 involved air conditioning classrooms, primarily using AC units powered through solar panels and battery storage. Phase 2 involved passive cooling strategies, such as creating shade, maximizing cross ventilation, and installing ceiling fans, which can reduce the perceived classroom temperature by four to five degrees.

However, none of the Phase 2 plans were put out to bid for construction, according to SSFM International Inc. (SSFM), an engineering firm hired by DOE to manage the heat abatement effort. Some of these strategies were incorporated into Phase 1 construction projects, but to a limited extent. For example, just 79 classrooms received ceiling fans, according to a spreadsheet provided to DOE that detailed what was installed as part of the Cool Classrooms Initiative; another 279 clasrooms received reflective paint on their roofs.

We were unable to ascertain what was included in the Phase 2 designs for the schools. We requested copies of the plans, but the Public Works Administrator told us he did not know where the records were located.

Who got cooled

To decide which ones would get air conditioning through the Cool Classrooms Initiative, we were told DOE ranked the schools based on the average temperature in their geographic location. The results showed miniscule differences from school to school. The average temperature at the hottest 200 schools ranged from 82.37 degrees at Kea'au Middle School to 86.8 degrees at Hickam Elementary School. Based on the rankings, if a school was just a fraction of a degree cooler, they could lose out on getting air conditioning.

"You go down this list and you can't possibly serve all of them, but a good number of them were still really, really hot," said a former DOE Administrator. "I mean, anything more than 80, 85, 86, 90 degrees is really hot."

Many of the schools that received air conditioning were not ranked among the hottest, according to our review of DOE's heat rankings, however, and it's not clear how they were chosen to be part of the Cool Classrooms Initiative.

One DOE Architect said he believed schools that were on the flight path for Daniel K. Inouye International Airport were given priority because the noise from planes made it hard for teachers to keep their windows open. But, other officials were vague as to their recollection of how schools and classrooms were chosen or said they didn't know.

Heat Abatement Ranking	School Name	No. Of Classrooms	Average Temperature
1	**Hickam Elementary**	42	**86.8**
2	**ʻEwa Beach Elementary**	37	**86.8**
3	**ʻIlima Intermediate**		**86.8**
4*	**Campbell High School**	149	**86.8**
6	**Kamaile Academy**		**86.79**
7	**Kaimiloa Elementary**	42	**86.79**
8	**Nimitz Elementary**	40	**86.78**
9	**Mokulele Elementary**	34	**86.78**
10	**Pearl Harbor Kai Elementary**	40	**86.78**
11	**Lehua Elementary**	30	**86.77**
12	**Waimalu Elementary**	43	**86.77**
13	**Aliamanu Elementary**	46	**86.74**
14	**Aliamanu Middle School**	50	**86.74**
15	**Waipahu High School**	88	**86.74**
16	**Ewa Elementary**	48	**86.73**
17	**Barber's Point Elementary**	52	**86.72**
18	**Waipahu Intermediate**	66	**86.72**
19	**Pearl Harbor Elementary**	41	**86.71**
20	**Ahrens Elementary**	96	**86.7**

Source: DOE

* Number 5 was omitted in the source list provided to us by DOE. The number of classrooms was not given for ʻIlima Intermediate and Kamaile Academy.

Based on the above chart, the vast majority of air conditioning systems were installed in central and west Oʻahu. East of downtown Honolulu, two projects were completed: solar AC systems were installed in four portables at Ala Wai Elementary School and one portable at Kaimukī High School was air conditioned, according to DOE records. Just one school on the North Shore was cooled: Waialua High and Intermediate School, which received solar AC systems in 37 classrooms and conventional air conditioning in six classrooms. On Maui, the schools receiving air conditioning were confined to the central and leeward sides of the island. On Kauaʻi, five schools received air conditioning systems, two in Kapaʻa and three on the leeward side. On Kauaʻi, the principal of Kapaʻa Elementary told us that no one at her school was consulted prior to installation, and as a result, portables that were already cooled by trade winds received solar AC systems, while air conditioning was not installed in permanent classrooms that did not have the advantage

of trade winds. "These are the rooms that should have received the AC units, but decisions were arbitrarily made and we were not asked or given any opportunity to say where we wanted them," she said.

DOE did not appear to have developed criteria to determine which classrooms were to be cooled in the initiative, and department officials and a senior principal could not explain how classrooms were chosen. Some classrooms chosen for air conditioning were inappropriate for solar AC systems, such as portable classrooms at Castle High School. (see Made in the Shade on page 24)

Focus on solar air conditioning

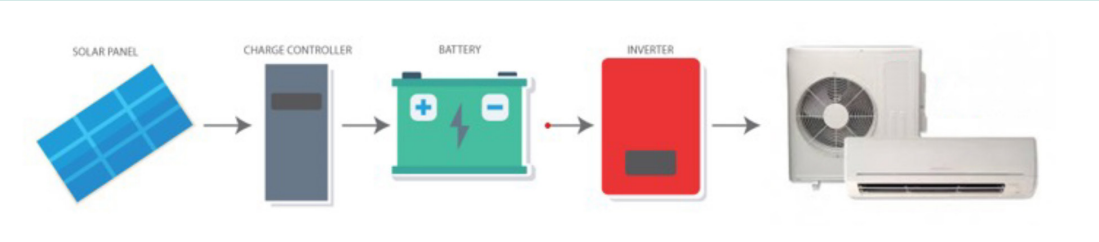
As Senate Bill No. 3126, S.D.2, H.D.2, C.D.1 (2016 Regular Session), which would become Act 47, SLH 2016, and would appropriate $100 million to cool Hawai'i public school classrooms, was making its way through the Legislature in the early months of 2016, another bill that was intended to work in tandem with the appropriations measure was also advancing. House Bill No. 2569, H.D.2, S.D.1, C.D.1 (2016 Regular Session) addresses the "challenges facing Hawai'i's classrooms, including soaring temperatures, outdated infrastructure, and costly electricity bills" by encouraging the use of renewable energy sources to power air conditioning.

The bill, which would be signed into law as Act 176, SLH 2016, specifically identifies solar AC systems, which do not need to be connected to the electric grid, as a way to avoid costly electrical upgrades while not adding significant cost to school electric bills. According to the act, "the legislature finds that it is in the public's interest to maximize the use of effective renewable technologies to reduce air conditioning installation and operating costs."

The bill pointed out that the department spends approximately $48 million annually on electricity, and it instructed DOE to establish a goal of becoming net-zero with respect to energy use, producing as much renewable energy as the department consumes across all its school facilities by January 1, 2035. DOE began design work on the Cool Classrooms Initiative before either of the bills was signed into law by Governor Ige, but the focus was already on using renewable energy. In his January 2016 State of the State address, the Governor stressed the importance of using renewable energy sources and energy efficiency measures in cooling 1,000 classrooms, and DOE began plans to use solar panels and battery storage. That technology would prove costly and complicated, and the pressure on DOE to move quickly would exacerbate problems with the department's decision-making as well as its rollout.

Going Solar

MOST OF THE air conditioning systems designed for the Cool Classrooms Initiative used solar energy and included battery storage. The systems rely on rooftop photovoltaic panels, generating direct current electricity that is regulated by charge controllers before being stored in batteries. An inverter converts the stored energy in the batteries to alternating current to power split-system air conditioning units.



Source: DOE

There were "a lot of good reasons why they went that route. Electrical capacity was the big one," said a former DOE Administrator who was involved with the initiative. "That was always the challenge with deploying air conditioning to all the different schools. You never knew if the school had enough [electrical capacity] to actually run the units. So somewhere along the line, you decided to adopt PV and a battery system to run it. It sounded OK superficially, but when you started digging into it, it didn't make a lot of sense." Besides minimizing electrical upgrades, other reasons included minimizing higher utility costs due to air conditioning usage and avoiding utility interconnection requirements and reviews.

DOE also didn't have much time. Department leaders had less than a year to get air conditioning into 1,000 classrooms to meet Governor Ige's goal, even though DOE capital improvement projects, which include air conditioning projects, typically take three to six years.

By March 2016, DOE had broken down the Cool Classrooms Initiative into two phases. Phase 1 would address Governor Ige's goal of air conditioning 1,000 classrooms by the end of 2016. Phase 2 would address DOE's long-term heat abatement strategy and include sustainable energy solutions, such as passive cooling features. Work that wasn't essential to air conditioning the 1,000 classrooms would be incorporated into Phase 2.

DOE prioritized installing solar AC systems throughout all the classrooms, starting with portable classrooms, unless an exception needed to be made for conventional air conditioning. Portables were prioritized because they were the "most straightforward and quickest to complete and moving them first will allow the project to 'gain traction' toward the goal of 1,000 classrooms as quickly as possible," according to a May 17, 2016 DOE memo that details what it calls "The Road to 1,000 Classrooms Execution Plan."

The solar AC systems were intended to operate independently from the school's electrical system and independent of the electric grids maintained by the local electric utilities or rely on the grids sparingly. To this end, DOE planned to install centralized battery charging cabinets across all campuses to minimize the costs and scheduling issues related to electrical upgrades.

Solar has its limits

While using solar panels and battery storage could help circumvent the need for costly electrical upgrades, assist the State in meeting its renewable energy goals, and curtail rising electrical bills, the technology also had limitations.

Hawai'i's schools are old. The average age is about 77 years, with one in five schools dating back more than a century. Many campuses installed portable classrooms in the 1980s and 1990s as a temporary measure to accommodate a growing student population, but they have since evolved into long-term fixtures that have outlived their intended lifespans. Classrooms in many of both the permanent and portable classrooms are outfitted with jalousie windows, which are numerous horizontal slats of wood or glass that do a poor job of sealing the rooms to maximize the efficiency of air conditioning. Hot air seeps in and cool air leaks out even when the slats are closed.

In order to cool the classrooms, the decision was made in the design process to install sheets of plexiglass over jalousie windows, as had been done in previous classroom air conditioning projects.

Even with this fix, a former DOE Public Works Administrator said parameters got further watered down because of cost. DOE could only install so many solar panels and batteries in order to stay within its budget.

The result: the systems were designed to work just five hours out of the day, or 80 percent of instructional hours, and cool the rooms to 75 – 78 degrees Fahrenheit. DOE documents provided conflicting numbers for how low the temperature could be set.

The limited design came with caveats, explained one DOE engineer. "So even that, it's not guaranteeing five hours. It's like, well, 80 percent of the year *maybe* we can give five hours a day at 78 Fahrenheit," he said. "But then there's, of course, there is a catch, lots of catches to it. If we provide insulation to the portable, sunlight-reflective paint (white paint), ceiling fans, some trees around . . . I mean if these conditions are met, then it's comfortable. But everything else just didn't happen, no trees, no ceiling fan, no insulation. Nothing happened."

"It's unbearable."

–DOE engineer on heat in classrooms with plexiglass-encased windows.

Consequently, even when their expensive solar AC systems were operating as designed, teachers and students complained that their classrooms weren't cool enough. And when the air conditioning was shut off, they sweltered in classrooms that were no longer cooled by trade winds since most of the jalousie windows were enclosed in plexiglass.

"It's unbearable," the DOE engineer said of the heat in classrooms that are mostly now lined with plexiglass.

Cost estimates were initially and persistently high.

What was perceived by some to be the extraordinarily high cost to cool Hawai'i classrooms came under public scrutiny throughout the rollout of the Cool Classrooms Initiative. Early on, in an attempt to lower costs, DOE canceled, then solicited more bids for the construction contracts. DOE's former Assistant Superintendent for the Office of School Facilities and Support Services attributed the problem to labor costs. In a public bulletin issued in July 2016, he said the cost of labor in bid proposals had come in extremely high, prompting another round of solicitations. He said the industry had initially estimated that it would cost $20,000 to cool a classroom with a solar AC system, but bids had come in as high as $135,000 per classroom. A media report at the time, which was based on DOE procurement documents, found that the highest per-classroom bid came in at $360,770, which was to install a solar AC system in one portable classroom at 'Ewa Beach Elementary.

The Problems with Portables

For project planners, installing solar AC systems in portable classrooms would "minimize the costs and scheduling issues." It didn't.

LESS THAN TWO MONTHS after Governor Ige announced his Cool Classrooms Initiative to the Legislature and public, project planners decided that solar AC systems with photovoltaic panels installed atop portable classrooms would be the primary "template" to cool 1,000 classrooms by year's end. According to a March 11, 2016 memo from contractor SSFM, the program management consultant, the template, a combination of photovoltaic panels, batteries, and split air conditioning units, would "minimize the costs and scheduling issues associated with electrical upgrades to the various schools."

In May 2016, a memo from then-DOE Superintendent Kathryn Matayoshi to the Board of Education noted that the first part of the heat abatement plan would be focused on providing solar AC systems in all portable classrooms that did not already have air conditioning. "These projects are the most straightforward and quickest to complete, and moving them first will allow the project to 'gain traction' toward the goal of 1,000 classrooms as quickly as possible," it said.

According to a former DOE Architect with the department's Facilities Group who was responsible for the project management of the Cool Classrooms Initiative, some project engineers thought the solar AC systems were too complicated. However, the department was under pressure to cool classrooms without increasing electric bills. There was also the issue that the department had no idea if a school's building/classroom had the electrical capacity to support grid-connected window AC units. Upgrading schools' electrical systems could cost $100 million, a DOE official estimated.

However, the choice of portable classrooms as the primary structures to receive the solar AC systems was more straightforward: wooden-framed, with exposed, uninsulated walls, portables get hot. "Yeah, I mean basically portables are, especially the older ones, are the hottest ones on campus," said the former DOE Architect.

The typical cost of a new, standard-sized portable classroom in Hawai'i is $144,000, which includes shipping, and installation, according to a 2020 doctoral report produced for the University of Hawai'i's architectural program. But in some cases, DOE spent approximately that amount to cool their aging portables. For example, at Wai'anae High School, DOE spent an estimated $144,880 to cool each of six portables.

In addition, according to the former DOE Architect, the mechanical engineers hired to design the AC systems quickly found that the portable classrooms were difficult to keep cool, which necessitated contract change orders to seal the windows with plexiglass to make the classrooms more airtight. In the project specifications, a couple of windows in each portable classroom were left uncovered, so that the classroom could have some outside ventilation when necessary.

While sealing windows with plexiglass may prevent some of the air conditioning leaks, it may exacerbate some air quality issues associated with air-conditioned portable classrooms. For instance, DOE commissioned MKThink, an engineering and architectural firm, to study various aspects of thermal comfort at Campbell complex schools in 'Ewa. Its 2015 report found that a portable classroom it tested had elevated carbon dioxide levels that neared the benchmarks (greater than 1,000 ppm) for poor ventilation and moderate decision-making impairment. A 2004 report by the California Department of Health Services found such deficiencies are associated with increased eye and throat irritation, lethargy, headache, and other symptoms that can impair the learning process and reduce performance.

The California report also found that portable classrooms had more HVAC (heating, ventilation, air conditioning) problems than traditional classrooms, including higher rates of dirty air filters (40 percent vs. 27 percent), blocked outdoor air dampers (11 percent vs. 3 percent),

A 2015 report found that a portable classroom it tested had elevated carbon dioxide levels that neared the benchmarks (greater than 1,000 ppm) for poor ventilation and moderate decision-making impairment.

and poor condensate drainage (59 percent vs. 12 percent), which can lead to microbial contamination.

But, for the former DOE Architect, the issues the department faced in cooling classrooms are symptoms of a much larger issue with the Hawai'i's schools: "This all stems from the whole deferred maintenance issue with our schools. Our schools – we should have been putting in five times the money into our schools 50 years ago. You know, these are basically 50, 60, 70-year-old schools that have never really been kept up."

"The newer ones [portable classrooms] are just passable," continued the former DOE Architect, "But the older ones are really, really hot. Not a good place to have people inside."

Despite getting new bids on projects, we found that the cost per classroom at most schools would exceed $100,000.

As part of our analysis, we sought to report how many classrooms were cooled at each school and at what cost. In response to a request for all contracts executed under the Cool Schools Initiative, DOE provided us with design and construction contracts for 53 schools. We were able to break down the estimated costs for many of these schools using the design and construction contracts, as well as subsequent requests for contract completion notices and monthly estimate reports.

In some cases, we had to estimate what was spent on construction using the contracts because DOE could not provide us with documentation showing that the project had been closed and the final amount that was paid to the contractor.

DOE's portable and traditional classrooms by the numbers

7.4
Percent of square footage in portables (1,819 statewide)

11
Percent of schools with >20 percent of space in portables

61
Average School Age in years

44
Average Building Age in years (weighted by SF)

53
Buildings over 100 years of age

– From *Update on Hawai'i Department of Education's "Jacob's Study"* (A Facility Inventory, Assessment, and Capacity Study), July 19, 2016

Classrooms That Were Cooled

IN RESPONSE to a request for all contracts executed under the Cool Classrooms Initiative, DOE provided us with design and construction contracts for just 53 schools, as well as some contract completion notices and monthly estimate reports. The information contained in the following chart is from these 53 schools only; the number of classrooms cooled under the initiative was likely more than this, but the information we were provided was not complete. The number of classrooms and descriptions of equipment installed are based on our best interpretation of the information DOE provided.

DOE was unable to provide contract completion notices for 15 schools. For these schools, we included the contracted amounts in our calculations; however, without completion notices, these numbers may not reflect DOE's total expenditures. Because of conflicting information we were provided by DOE, ultimately, we had to rely on the contracts that were awarded for design, construction, construction management, and project management under the Cool Classrooms Initiative to piece together what was spent at each school. For more on this process, please refer to the Disclaimer on page 5.

COOLING CLASSROOMS, BY THE NUMBERS

Total Cost*	Number of classrooms cooled
$104,961,733	838

O'AHU

Complex Area	School	No. of classrooms cooled	Description	Design Cost	Construction Management Cost	Construction Cost	Total Cost
'Aiea-Moanalua-Radford	Āliamanu Middle		Previously air conditioned	$195,177**		$0	$195,177
	Pearl Harbor Elementary		Previously air conditioned	279,800**		0	279,800
	Āliamanu Elementary	41	31 solar AC in 29 classrooms; 12 conventional (conv.) AC	421,578	241,671***	2,447,604	3,464,680
	Radford High	4	2 solar AC; 2 conv. AC	80,870		272,957	
	Waimalu Elementary	23	23 conv. AC	282,871		957,133	1,240,004
Campbell-Kapolei	Barbers Point Elementary	33	33 solar AC	502,278	101,193	4,143,151	4,746,622
	'Ewa Beach Elementary	32	32 solar AC	508,953		2,911,825	3,420,778
	'Ewa Elementary	17	17 solar AC	488,631		1,904,339	2,392,970
	'Ilima Intermediate	61	21 solar AC, 40 conv. AC	152,604		4,161,639	4,314,243
	Ka'imiloa Elementary	27	10 solar AC, 17 conv. AC	201,312		1,272,508	1,473,820
Castle-Kahuku	Castle High	17	20 solar AC in 17 classrooms	102,248	130,115	1,545,513	1,777,876
	Hau'ula Elementary		Project never went to construction	54,642**		0	54,642
	Ka'a'awa Elementary		Project never went to construction	62,766**		0	62,766
	Lā'ie Elementary		Unknown	150,000**		0	150,000
Farrington-Kaiser-Kalani	Dole Middle	3	3 solar AC	151,258			
	Farrington High	2	2 solar AC	129,273	73,064***	876,634****	1,373,004
	Kalākaua Middle	6	6 solar AC	142,775			
Kaimukī-McKinley-Roosevelt	Ala Wai Elementary	4	4 solar AC	70,948		394,800	465,748
	Kaimukī High	1	1 AC, unknown type	46,531		60,000	106,531
Kailua-Kalāheo	Kailua Elementary	1	1 solar AC	44,089			
	Kainalu Elementary	5	4 solar AC; 1 conv. AC	62,465	93,102***	1,258,333****	1,529,648
	Mōkapu Elementary	9	9 solar AC	71,659			
Leilehua-Mililani-Waialua	Waialua High & Intermediate	43	41 solar AC in 37 classrooms; 7 conv. AC in 6 classrooms	554,833	384,825	3,754,704	4,694,362
Nānākuli-Wai'anae	Leihōkū Elementary	39	76 solar AC in 38 classrooms; 1 conv. AC	680,919	101,193	3,962,642	4,744,754
	Nānākuli Elementary	26	50 solar AC in 25 classrooms; 2 conv. AC in 1 classroom	463,744		3,442,942	3,906,686
	Nānākuli High & Intermediate	63	112 solar AC in 63 classrooms	1,121,166		7,945,913	9,067,079
	Wai'anae Elementary	5	10 solar AC in 5 classrooms	177,417	46,417	488,010	711,844
	Kamaile Academy[1] (charter school)	40	18 solar AC in 9 classrooms; 31 conv. AC	548,468		1,635,865	2,184,333
	Wai'anae High	6	6 solar AC	174,882	56,401	637,995	869,278

[1] Kamaile Academy is a conversion charter school. A conversion charter school is a former public school that has transitioned to operate as a charter school.

Pearl City-Waipahu	**August Ahrens Elementary**	**5**	10 solar AC in 5 classrooms	607,523		597,143	**1,204,666**
	Highlands Intermediate	**5**	5 solar AC	85,088		473,000	**558,088**
	Kaleiopu'u Elementary	**4**	4 solar AC	81,682		362,000	**443,682**
	Lehua Elementary	**12**	12 solar AC	246,924		981,000	**1,227,924**
	Mānana Elementary		Previously air conditioned	539,431**		0	**539,431**
	Waiau Elementary	**8**	8 solar AC	114,566		813,000	**927,566**
	Waipahu Elementary	**10**	20 solar AC in 10 classrooms	592,521	91,037	985,800	**1,669,358**
	Waipahu Intermediate	**3**	3 solar AC	581,030		363,864	**944,894**
	Waipahu High	**16**	16 solar AC	687,981		2,150,761	**2,838,742**

MAUI / LĀNA'I / MOLOKA'I

Complex Area	School	No. of classrooms cooled	Description	Design Cost	Construction Management Cost	Construction Cost	Total Cost
Baldwin-Kekaulike-Kūlanihāko'i-Maui	**Kahului Elementary**	**16**	16 solar AC	$332,281		$1,445,000	**$1,777,281**
	Lihikai Elementary	**48**	50 solar AC in 48 classrooms	383,682		4,915,017	**5,298,699**
	Maui High	**74**	74 solar AC	453,987		7,587,669	**8,041,656**
	Maui Waena Intermediate	**8**	8 conv. AC	320,063		629,000	**949,063**
	Waihe'e Elementary	**12**	12 solar AC	319,148		1,098,761	**1,417,909**
Hāna-Lahainaluna-Lāna'i-Moloka'i	**Kaunakakai Elementary**			319,470**		unknown	**319,470**
	Lahaina Intermediate	**28**	31 solar AC in 28 classrooms	383,990		3,164,474	**3,548,464**
	Lahainaluna High	**8**	8 solar AC	282,452		786,798	**1,069,250**
	Princess Nāhi'ena'ena Elementary	**35**	35 solar AC	382,354		3,380,227	**3,762,581**

KAUA'I

Complex Area	School	No. of classrooms cooled	Description	Design Cost	Construction Management Cost	Construction Cost	Total Cost
Kapa'a-Kaua'i-Waimea	**Kapa'a Elementary**	**6**	6 solar AC	$206,225		$2,018,765****	**$2,446,718**
	Kapa'a High	**12**	12 solar AC	211,728			
	Kekaha Elementary	**17**	13 solar AC; 4 conv. AC	518,571	84,600***	2,472,811****	**3,398,919**
	Waimea Canyon Middle	**2**	2 solar AC	160,591			
	Waimea High	**1**	1 solar AC	162,346			

HAWAI'I

Complex Area	School	No. of classrooms cooled	Description	Design Cost	Construction Management Cost	Construction Cost	Total Cost
Honoka'a-Kealakehe-Kohala-Konawaena	**Kahakai Elementary**	unknown		$599,481**		unknown	**$599,481**

* This figure includes $16.5 million in design for individual schools, $8.6 million in project management and conceptual design costs, and $175,000 in miscellaneous design fees.
** Design was completed but never went to construction.
*** Construction management cost bundled for multiple schools in the complex.
**** Construction cost bundled for multiple schools in the complex.

For these 53 schools, we estimate*:

- $25.3 million was paid to seven firms for design and project management.
- $78.3 million was spent on construction.
- $1.4 million was spent on construction management.
- In total, $105 million was spent on heat abatement at 53 schools where 838 classrooms were air conditioned, most of which were solar AC units.

* Costs are estimates because DOE was unable to provide project completion notices for many projects contracted.

On average, DOE spent $125,253 to cool a classroom at these 53 schools.

Included in this average are design costs for Phase 2, which included many passive cooling strategies that never came to fruition. Construction costs also included more than just installing photovoltaic panels, batteries, and air conditioners.

Additional documents and spreadsheets provided by DOE included eight other schools that were at least partially funded under the initiative, for a total of 61 schools. We were unable to get a precise breakdown of costs at those schools.

Conflicting data obscures how DOE spent the $100 million appropriation to cool classrooms.

Ultimately, DOE was unable to fully account for the money that was expended under the Cool Classrooms Initiative.

DOE provided us with various figures for how much was spent, as well as different accounts of which schools were included in the heat abatement effort and how many classrooms were ultimately cooled.

One DOE funding report dated November 7, 2018, more than a year after Governor Ige and DOE declared success at cooling 1,000 classrooms, placed the total amount spent at $122.8 million, which included $22 million for consultants, $95 million for construction, and another $6 million on LED lighting and water coolers. Governor Ige declared victory in August 2017. According to that document, contracts were awarded to cool 1,064 classrooms at 57 schools; and 1,020 of those classrooms had been cooled as of the date of the report. Of the 1,064 classrooms, 84 percent had received, or were to receive, solar AC systems, with the rest being cooled by conventional air conditioning.

The Night Shift

ONE RECOMMENDATION DOE did adopt from the 2015 MKThink report was to utilize "nocturnal flushing," which uses nighttime air to cool classrooms. The consultant's report had highlighted it as "by far the most promising strategy" for cooling classrooms in multi-story buildings.

But DOE officials told us that night flushing fans, which were installed as part of the Cool Classrooms Initiative, ended up being ineffective because, in Hawai'i, there is not a large enough differential between daytime and nighttime temperatures.

The nighttime flushing devices would also end up draining the battery charge on the solar AC systems, according to DOE.

During our visit to Castle High School to observe how well the air conditioning systems were working, the nighttime flushing fans were still installed in classrooms, but the Vice Principal and a teacher told us that they didn't know what they were or if they ever came on.

We could not confirm how many nighttime flushing fans DOE installed. The department provided us with inventory logs and list of equipment installed during the initiative; however, because of the inconsistent identification of equipment, we were unable to determine the number of nighttime flushing fans installed. In addition, a DOE official said that she could not confirm whether the inventory that was provided to our office was complete. We also were not provided with a total cost for the fans, but it was likely considerable. At Castle High School, the total cost of 19 nighttime flushing fans was $80,900, or $4,258 per classroom, for technology that the DOE engineer said doesn't work in Hawai'i.

In a report on the problems encountered on heat abatement systems installed on Maui, SSFM also concluded that nighttime flushing fans "do not provide any perceivable benefit."

The devices were just one of many design flaws that beset the Cool Classrooms Initiative.

Another undated breakdown provided by DOE indicates 1,129 classrooms were air conditioned at 57 schools. The two documents include different schools in their tallies. Another document provided by DOE, which was from a post on its website, touts more than 1,300 classrooms cooled as of May 2018.

A report by SSFM lists 54 schools. The status report was provided to DOE on a monthly basis. SSFM said that it stopped tracking the projects after this report, dated April 1, 2019, because its contract had expired. The document indicates that not all projects had been fully completed by that date. SSFM had only been paid 72 percent of its $3.3 million program management contract as of April 1, 2019. SSFM did not follow through on our request for a contract completion notice that would show it had fulfilled its contract requirements and how much it was ultimately paid.

Waste by Design

AT SOME SCHOOLS, scrapped designs amounted to considerable waste.

For example, DOE spent close to $1 million at Waipahu Intermediate School where ultimately just three portable classrooms were cooled with solar AC systems. This amounts to, on average, **$314,965 per classroom**, the highest average cost among the 53 schools that had classrooms air conditioned under the Cool Classrooms Initiative.

However, some of that money, $581,030, was paid to WRNS Studio, an architecture, interiors, and planning firm, to design heat abatement strategies that were never implemented.

WRNS Studio was contracted to design solar AC systems for the three portable classrooms as part of Phase 1 work as well as an array of other cooling strategies for other parts of the school, including roof coatings, shading devices, landscaping, painting, ceiling fans, and night purge devices as part of Phase 2 work.

The estimated construction costs for all the work for Phase 1 and Phase 2 was $3.6 million, according to the design contract. While the design work for Phase 2 was completed, that portion of the project had not been started before the final status report that SSFM provided to DOE in April 2019 as part of its work tracking heat abatement projects.

At three other schools – Āliamanu Middle, Pearl Harbor Elementary, and Mānana Elementary – design work for Phase 2 was all that was completed. The schools were among DOE's top 25 priority schools. But, documents indicate that when designers went to the schools, they found that they were already fully air conditioned.

According to an SSFM status report dated April 1, 2019, on O'ahu's North Shore, DOE spent $117,408 to design solar AC systems in portables at Hau'ula Elementary School and Ka'a'awa Elementary School. However, according to the status report, construction had yet to begin, and it is unclear if construction ever took place.

The shelved design plans at the five schools amounted to approximately $1.1 million in wasted money. DOE officials said that they do not know what happened to the design plans for that work or any of the other Phase 2 plans.

Overall, DOE spent $16.7 million just on design at 53 schools. Our office requested copies of all the design plans, but DOE did not provide any. According to a former DOE architect, DOE couldn't use "off the shelf" air conditioning systems because the directive from the governor was to utilize battery storage technology; therefore, engineers had to size each system. He said engineers took into account solar gain for the area and the size of the classroom.

He said that DOE separated out the design phase from construction because that's how DOE has traditionally done procurement.

"So I think the department just felt that the traditional design-bid-build project delivery system was, you know, what we were most comfortable with."

From the start, many of the solar AC systems failed or didn't work properly, resulting in a salvage effort with an estimated cost of between $3.3 to $6 million.

According to DOE, contractors were responsible for repairs to their work for the first year after project completion. However, according to a DOE air conditioning troubleshooting and repair draft report, in the case of the Cool Classrooms Initiative, contractors failed to monitor system performance and to address and resolve issues during the first-year period. Due to the complexity of the solar AC systems, schools were not able to readily identify problems themselves; however, when schools did report a problem, contractors often quoted "five hours of runtime" to dismiss underlying issues. The systems were designed with a five-hour runtime, and if a school reported usage longer than five hours per day, contractors closed the case without inspections and detailed reviews. In other instances, contractors claimed that the solar AC systems were designed to be slightly undersized for the classroom, so "heat abatement – not meant to cool room" was used to justify the lack of performance.

The troubleshooting team dispatched by DOE would later discover that, from the start, many of the solar AC systems failed or didn't work properly. They noted that contractors' final inspections found obvious installation issues, such as missing insulation, exposed wires, and other issues, but were not able to identify many of the hidden PV and battery problems. The troubleshooting team also found air conditioners that were damaged by geckos or rodents, which contractors and contract managers considered "act of God" damages, which they were not obligated to repair.

But the troubleshooting team also found "fundamental issues" that could have been addressed during design and planning stages, which would have avoided prohibitively expensive remedies. For instance, leaky roofs had been a maintenance issue for schools that were only aggravated by the installation of rooftop PV panels. Panels were also installed on classrooms that were entirely or partially under the canopies of large trees. (see "Made in the Shade" on page 24)

Schools were provided with contradictory and erroneous information about the performance capabilities of their solar AC systems, according to DOE documents, causing teachers to run the systems beyond their design capabilities. This contributed to batteries being drained and systems failing. DOE officials said that teachers had high expectations of their solar AC systems, and they therefore operated them beyond

SOURCE OFFICE OF THE AUDITOR

Made in the Shade

WHEN WORKERS were installing photovoltaic panels atop a handful of portable classrooms in a corner of campus, Castle High School's current Head Custodian knew it wasn't a good idea. The portables are located directly below or in close proximity to large monkeypod trees. The Head Custodian and Castle High School's Vice Principal told us neither the custodial staff nor anyone else at the school was consulted by project planners about the placement of the solar AC systems. According to the Vice Principal, Castle High School has 21 portable classrooms on campus, and all 21 received solar AC systems as part of the Cool Classrooms Initiative.

"I'm not an architect or an engineer, but we figured that it wasn't going to end well," said the Head Custodian.

It didn't.

In late 2018, a DOE Engineer dispatched by DOE to troubleshoot problems with Castle High School's solar AC systems found that the photovoltaic panels on some of the portable classrooms in the shady area were producing less than 20 percent of their designed power output. Besides the significant shading provided by the monkeypod trees, the team noted "quite a bit" of debris from the trees covering the panels. Two portable classrooms' panels were almost completely covered with debris.

When asked why project planners would place photovoltaic panels under the canopies of large, sun-blocking trees, the former DOE Architect, who served as the Cool Classrooms Initiative's project manager, acknowledged that the initiative was "a very rushed project" and that the trees were something the design consultant team missed in their "field observations." He said, in these situations, the department would have to go back and pay a contractor to trim the trees.

But, branches and leaves grow back, and according to a draft report on DOE's troubleshooting and repair effort, removal of the trees was not an option. The eventual solution was to connect the solar AC systems to the electrical grid, which would enable nighttime charging of the batteries. However, doing so only boosted performance to about 50 or 60 percent, so air conditioning usage also needed to be restricted to five hours a day.

"It's dark most of the day [under the trees' canopies] and nobody stopped it [installation of panels]. I just couldn't believe it," said the DOE Engineer who had been responsible for the troubleshooting effort. "But, if this is your house, probably somebody would stop, right? At some point. But in the end, everything was installed."

their designed capabilities – at 74 degrees instead of 78 degrees, causing the systems to malfunction. But we found that DOE itself provided schools with erroneous information – at one point stating that teachers are allowed to run their newly installed solar AC systems as long as they want and at whatever temperature they desire.

In addition, a DOE official said that the department's subsequent effort to maintain and fix the systems was hamstrung by their complicated design as well as the numerous contractors, subcontractors, and manufacturers used in the effort.

"Nothing is standardized," said the DOE official who described some of the technology as "experimental." He said some of the vendors were akin to "early-stage funding start-ups" that likely went out of business. According to a tally of companies contained in an inventory provided by DOE, eight different companies installed photovoltaic systems, 12 companies installed air conditioners, and there were nine general contractors. This is in addition to subcontractors who might be employed by a general contractor or other company.

There were also five battery manufacturers, five photovoltaic panel manufacturers, and six air-conditioner manufacturers. According to one former DOE official, because the technology was so new, there wasn't a single vendor that could provide all the different components. Particularly problematic were the charge controllers, components that regulate the flow of power between solar panels and the batteries to ensure that they remain at a proper level of charge. Firmware, which is program code embedded in hardware, and software updates can disable the systems, and power outages reset settings and timers.

"You know, it's super complex," said another DOE official. "And [the component parts] all different technologies. We have problems maintaining window AC units … so it was a nightmare on how to even fix this stuff."

The result was a multi-million-dollar salvage effort. DOE provided us with different undated documents that cite costs to fix, grid-connect, and maintain the systems that vary from a total cost of $3.1 to $6 million. Because the effort is continuous – and on-going today – all these costs may be accurate depending on the point in time that they were reported. For instance, a DOE repair log registered nearly 1,800 requests for air conditioning maintenance from 2018 to 2024.

"We installed an untested and very complicated hybrid [solar AC] system to a large number of classrooms. DOE and the installers did not have prior experience of a hybrid AC system. We learned about the system as we installed the equipment. In general, installation and maintenance issues multiply with greater complexity."

– From *Heat Abatement AC Troubleshooting and Repair (DRAFT)*

An Early Sunset

MŌKAPU ELEMENTARY SCHOOL sits on a 14.2-acre site on Kāneʻohe's Marine Corps Base Hawaiʻi, serving mainly the children of the Marines living on base. The campus was originally constructed in 1960 and features 12 permanent buildings, along with a number of portable classrooms, which were first added as early as 1965. As of January 2023, Mōkapu Elementary School's enrollment was nearly 900 students from pre-kindergarten through grade 6. According to the U.S. Secretary of Defense's Public Schools on Military Installations Prioritized List, the school's enrollment capacity should have been around 630 students.

Mōkapu Elementary School was one of the schools selected for DOE's Cool Classrooms Initiative, with installation of solar AC systems on nine portable classrooms completed in September 2018 by CC Engineering & Construction. The cost for the nine solar AC systems was bundled with the contractor's work at nearby Kainalu Elementary School and Kailua Elementary School, so we were unable to determine the final cost of the systems installed at Mōkapu Elementary School; however, CC Engineering & Construction's March 2017 proposal for the project estimated the cost for the Mōkapu Elementary School work at nearly $750,000.

On April 25, 2022, the Department of Defense announced that it was awarding a $96 million grant to the State of Hawaiʻi for the construction of a new school to replace Mōkapu Elementary School's permanent buildings and portable structures. The project broke ground in early January 2023 with a final price tag of $146 million — the Department of Defense's Office of Local Defense Community Cooperation contributing $116.5 million and the State of Hawaiʻi contributing $29 million, or about 20 percent of the total cost.

The new school will feature a two-story administration/library building, a two- and three-story classroom building with 55 classrooms, a cafeteria, and a covered playground and will be built on the same site, with students shifting to the new classrooms as the construction is completed. Construction is expected to be completed in four years, with the first of two phases to be finished by the summer of 2025. The new school will have an enrollment capacity of nearly 1,000 students.

ILLUSTRATION: DOE

According to Mōkapu Elementary School's principal, five of the school's portable classrooms were demolished in March 2024. The principal said they were in such poor shape that their floors weren't being waxed for fear that they couldn't support the weight. The contractor replaced the structures with other portables. Since the newer portables already came installed with air conditioning, the five solar AC systems that were installed as part of the Cool Classrooms Initiative were not repurposed at Mōkapu Elementary School. According to DOE, the solar panels and other parts were recovered from the Mōkapu Elementary School systems and are being used to complete repairs of solar AC systems at other schools.

The dust and noise from campus construction has prompted efforts to air condition almost all of the school's remaining classrooms. The project provided air conditioning for 5 to 15 classrooms closest to the construction site. Ten classrooms already had air conditioning, which left 10 classrooms that needed to be cooled. According to the principal, the school paid approximately $5,000 to air condition each classroom, which included the cost of two window units, their installation, along with a maintenance contract. The school also paid $40,000 to upgrade one building's electrical system so that one of the classrooms in the building had the electrical capacity to support its air conditioning units.

In the end, the school was able to air condition about the same number of classrooms for a fraction of the nearly $750,000 DOE contracted for in 2018.

Conclusion

The objective of this follow-up effort was seemingly straightforward: report on how the Department of Education expended $100 million that was appropriated through Act 47, SLH 2016, for the Cool Classrooms Initiative. However, many of the employees directly involved in the Cool Classrooms Initiative are no longer employed by DOE, which hampered our ability to obtain information and documents related to the heat abatement effort. We also found that DOE's heavy reliance on outside design and consulting firms made it difficult for us to obtain documents and identify employees of these companies who were involved in DOE's heat abatement efforts. In addition, DOE has not maintained copies of many documents relating to its past and current heat abatement programs; those documents have remained with these consultants.

As a result, DOE was unable to fully account for the money that was expended on the Cool Classrooms Initiative. DOE could not provide us with a detailed breakdown of the costs, and DOE's documents detailing various projects were incomplete and inconsistent as to which schools were included in the effort. Therefore, we are only able to provide an estimate of the cost of the initiative, albeit a more precise estimate than what DOE has provided: In total, $104,961,733 was spent on heat abatement at 53 schools where 838 classrooms were air conditioned, most of which were solar AC systems. On average, the department spent $125,253 to cool a classroom.

We did learn that facing a tight timeline to cool 1,000 classrooms by year's end and under a mandate to be net-zero in energy usage by 2035, DOE contracted for solar AC systems that appeared to be a possible solution to both. Instead of a thoughtful, well-planned approach, which may have included the passive (and much less costly) cooling strategies that DOE's consultant had recommended in the past, the department rushed to contract with multiple contractors, installing equipment from multiple manufacturers. As a result, the complex, unfamiliar, and costly solar AC systems were sometimes incorrectly installed, resulting in equipment failures and user misunderstandings at rollout. These systems are often in need of repair, some have been completely scrapped, and overall they've cost millions to salvage, repair, and maintain.

However, the next chapter in the initiative's story will be unfolding shortly and there are many unanswered questions. The batteries that were installed on many of the photovoltaic systems are now nearing the end of their lifespans. Should the batteries be replaced? Or should the solar AC systems be scrapped altogether and replaced with conventional window air conditioning units?

If so, what about DOE's longstanding mandate to become net-zero, producing as much renewable energy as the department consumes?

PHOTO: ISTOCK.COM

Part 2: School Directed AC Program

DOE has provided minimal structure to and little oversight of the School Directed AC Program.

In the aftermath of the Cool Classrooms Initiative and its many challenges, people and classrooms were still hot. DOE officials were fielding angry calls from schools whose solar AC systems had failed or were underperforming, as well as schools that were underserved. Meanwhile, new air conditioning window units were being dropped off at the curbs of some schools by parents who felt their children were suffering in the heat.

According to a former DOE Public Works Administrator, the sudden public response presented the department with a dilemma. Since the department was unaware of the electrical capacity of individual schools to accommodate the additional electrical loads, it routinely denied a school's request to install air conditioning units. But now, schools had these important resources literally at their doorsteps, and they wanted to install them. Since the department did not have a full inventory of air conditioners on its campuses, let alone an individual campus's capacity to support the electrical load created by additional air conditioning, such haphazard installations represented a safety risk to the schools.

The former DOE Public Works Administrator said, to take advantage of this opportunity while balancing its concerns about overburdening schools' electrical infrastructure, the department thought "outside of

the box" and developed the School Directed AC program, which offered schools department-arranged and -funded electrical assessments. In exchange for the service, which is funded by the Cool Classrooms Initiative and costs approximately $6,000 to $7,000 for O'ahu schools and $11,000 to $12,000 on the neighbor islands, schools would provide the department with the current inventory of air conditioners on campus. (We were told the department does not have current (or accurate) information from its schools about the classrooms that are air conditioned.) With electrical assessments in hand, schools would understand their capacity to support the additional electrical load, while the department would be provided with the beginnings of an air conditioning inventory.

In addition, it is unclear how the School Directed AC program addresses DOE's mandate to be net-zero with respect to energy use, producing as much energy as it consumes by 2035. When we asked the Procurement and Distribution Specialist II and Acting Branch Administrator for the Office of Facilities and Operations about the mandate, he said that he couldn't see the department reaching its goal of net-zero but pointed out that he's "not driving that bus."

The former DOE Public Works Administrator said, "It was maybe not the ideal way to do it, but it was a way to address a lot of the needs and concerns all around, right – the teachers, the students, the parents – to cool their classrooms and from the facility side, making sure that we were reasonably comfortable that they weren't going to blow up their buildings."

Five years later, the School Directed AC program is clearly not an ideal program, and at the end of 2024, we learned that DOE had rescinded the authority of schools to do construction projects, which the Procurement and Distribution Specialist II and Acting Branch Administrator for the Office of Facilities and Operations said essentially ended the School Directed AC program. Up to that point, we had found that the department had provided minimal structure to and little oversight of the program. For instance, the requirement that schools submit their current air conditioning inventory to receive an electrical assessment was never communicated to the schools or enforced by the department. Under the program, schools simply request a electrical assessment directly to the DOE contractor through a project tracking website. No questions asked, and no follow-up by the department. The contractor doing the assessment prepares reports for the department, as requested, including how many schools were assessed in the year and the approximate costs.

DOE's guidelines for the School Directed AC program require schools to provide notice of the air conditioning units that they install as a result of the assessments as well as the closeout of those projects. Those reporting requirements, however, appear to be voluntary and unverified. When we reviewed DOE's project tracking website, the most recent time in

March 2025, we found that a very limited number of schools appear to have reported complete and current inventories, with many schools not reporting inventories at all. For example, 6 out of the first 10 schools on DOE's website for the School Directed AC program did not list any air conditioning inventory as of the end of our fieldwork.

We also found that, while many schools have taken advantage of the electrical assessment service, DOE's knowledge of and involvement in the program is limited. Employees directly involved in establishing the School Directed AC program no longer work at DOE or are in different positions that have no responsibility over the program. Some of the employees who currently have responsibility over the program, including the Interim Assistant Superintendent of the Office of Facilities and Operations, are relatively new to their positions. However, none of these current DOE officials could provide us with basic program information such as how many schools had participated in the School Directed AC program, which featured electrical assessments paid for by the department, or the number of air conditioners that have been installed under the program.

A Simple Request

DOE was never able to provide us with a list of schools that have participated in the School Directed AC program.

AT THE START of our follow-up effort, we made what we thought was a simple, straightforward request: Please provide us with a list of schools that have participated in the School Directed AC program. DOE, however, was never able to provide us with such a list or other basic details about the program, such as its budget.

We asked the former DOE Public Works Administrator how many schools participated in the School Directed AC program during his tenure at the department. (He left government service in 2020.) "He told us that he didn't know the number but that the previous director, who once headed the program, would have those numbers."

When we asked the then-DOE Director of the Office of Facilities and Operations' auxiliary service branch for a list of schools that participated in the School Directed AC program, we received a cryptic e-mailed non-reply: "SDAC [School Directed AC program] is a self reporting [sic] system by the schools with no audit trail. Legislature does not provide AC funding to inventory and account for all the AC systems at the DOE."

We asked the SSFM Senior Principal for a list of schools that have participated in the School Directed AC program. She did not have one. At first, she told us that the former DOE Director of the Office of Facilities and Operations' auxiliary service branch who had headed the program had a list, but then she said that the SSFM Senior Project Manager had a list and that she would provide it to us. She never did give us a list, as of the end of fieldwork, and she directed us to DOE's School Directed AC program's project tracking website, which did not contain updated information about the program.

We had asked DOE facilities officials numerous times for a current list of schools that have participated in the program, most recently at a meeting in September 2024, but DOE facilities could not fulfill that request. The next month, near the end of our fieldwork, SSFM's Senior Project Manager was able to compile a list for us. It featured 185 schools that received at least one electrical assessment.

Instead, we had to rely on the contractor's Senior Project Manager, who schedules the electrical assessments, to provide us with the specific and general details of the School Directed AC program. However, while the engineer was able to tell us the number of electrical assessments the company had performed, he believed that because of the way the program is structured, schools don't have a way of informing DOE what actions they have taken.

In addition, late in our follow-up effort, we learned from the SSFM Senior Project Manager that the project tracking website that DOE had directed us to had been updated about two years earlier. DOE, via its contractor, SSFM, had pointed us to the older version of the website. It is not clear if DOE officials we were working with were aware of the updated website themselves.

When we requested access to the 2.0 version of the website, we were only given access to the training section of the site. We were promised by DOE that they would "check on it" with the contractor, but we had not heard anything further by the end of our fieldwork, and we were unable to continue our review.

During a later meeting with the Interim Assistant Superintendent of the Office of Facilities and Operations, he informed us that a recent change in department procurement policy effectively put an end to the School Directed AC program. He later provided us with a November 4, 2024, memorandum from the superintendent to school principals and other department officials announcing changes in the delegation of procurement and contracting authority to schools; however, at that time, the department had not issued a memorandum officially rescinding the School Directed AC program.

Thinking outside of the box

The August 22, 2019, press release, "School Directed AC program empowers schools and communities to take the lead on cooling classrooms," describes a new process designed to more quickly deploy air conditioning into school buildings. According to the press release, the School Directed AC program was unlike DOE's previous system-wide heat abatement effort, the Cool Classrooms Initiative, which featured department-installed, solar-powered, battery-backed air conditioning systems. Instead, under the School Directed AC program, the department said schools are supposed to install energy-efficient window air conditioning units.

According to the press release, schools always had the ability to install air conditioning in their classrooms, but they also had the responsibility to conduct an electrical assessment. Now, under the School Directed AC

Calling the Shots

DOE and its schools have landlord-tenant relationship, with the schools believing they are the landlords.

AT THE START OF THE PROJECT, we met with DOE's former Deputy Superintendent of Operations, its former Director of the Office of Facilities and Operations, and four other department officials.

They explained to us that one of the challenges of its heat abatement efforts had been the school system's decentralization of decision-making when it comes to campus improvements.

The former Deputy Superintendent of Operations explained that the department and schools seem to have a tenant-landlord relationship. To illustrate this point, he recounted a department-led project to reduce energy usage at a school by installing photovoltaic panels, which would provide a parking shade structure. However, the school's principal preferred the panels to be located at a different site, which he considers "absurd." At the time, the issue, which had been raised with the superintendent, had yet to be resolved.

On the topic of the decentralized structure of DOE, the former Deputy Superintendent said, "I am not the king of anything. There are 258 kings and queens."

When we asked if DOE has an air conditioning inventory for its schools, we were told that the department had created a database in which schools self-report their air conditioning inventory, but the "schools will not comply." The former Deputy Superintendent explained that the department could hire a consultant to compile such a listing, but there is no additional funding for air conditioning.

"It's an uncomfortable situation. If you leave it to the schools, they will do it a certain way, right or wrong," he said.

program, the cost of the assessment is covered by the department, the results of which will inform schools which buildings they can install air conditioning in and how many units they can put in each building.

The process starts when a school requests an electrical study or assessment from the department's contractor SSFM through a DOE website. These assessments are to determine whether there is sufficient electrical capacity for air conditioning in classrooms and are paid for by the department, not the schools, under existing heat abatement contracts. According to the department's press release announcing the School Directed AC program, once the assessment is completed, the school then has the option to start budgeting for the project, partnering with community groups for equipment donations, engaging lawmakers, or seeking funds through the department's legislative budget request.

"We have schools that have available funding and equipment donations in the pipeline, and this program allows schools to move forward with that," said the then-assistant superintendent for the Office of Facilities and Operations.

In the press release, the department provided broad guidance on window air conditioning unit capacity and specific models to install, but the purchase or donation, installation, and maintenance of the air conditioning units are school responsibilities.

According to the press release, at the time, the department had completed electrical assessments at more than 40 schools, with 200 energy-efficient window air conditioning units installed or about to be installed in classrooms.

According to the former DOE Public Works Administrator, who was the manager of the project management section, while the School Directed AC program was created by DOE to streamline the process for schools and their communities to cool their classrooms themselves, it was also designed to provide the department with valuable information about its schools' air conditioning while also providing assurance that the new air conditioners were being installed without exceeding the school's electrical capacity.

The "carrot" DOE offered to the schools for this information was that the department would provide electrical assessments in exchange for the schools' air conditioning inventories. "Tell us what's at your school, make a request for ACs. We'll fund the load study and then that will enable you to install your air conditioning, right?" said the former DOE Public Works Administrator.

The electrical assessment indicates if a building's electrical capacity can support the installation of air conditioning and how many units can be installed in that building. According to DOE, by taking responsibility for this process, the department can mitigate some of the risk that additional air conditioning units will exceed their electrical capacity.

However, we found that the department has little control or involvement in the electrical assessment process, which it has contracted out. For instance, the requirement that schools provide their current air conditioning inventory in order to receive an electrical assessment was never communicated to the schools.

In addition, the only department guidance we could find was a two-page June 5, 2019 memo from the Assistant Superintendent to the Deputy Superintendent, Complex Area Superintendents, Principals, School Administrative Services Assistants, and School Head Custodians that describes the procedures for air conditioning of DOE classrooms and administrative spaces. Potential participants are informed that the process utilizes an online CIP project tracking system (CPT system); however, the description of procedures is minimal based on our review. The memo, which preceded DOE's School Directed AC program press

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OFFICE OF SCHOOL FACILITIES AND SUPPORT SERVICES

June 5, 2019

TO: Deputy Superintendent
Complex Area Superintendents
Principals (All)
School Administrative Services Assistants
School Head Custodians

FROM: Dann Carlson
Assistant Superintendent

SUBJECT: **Procedure Changes for Air-Conditioning of Department of Education Classrooms and Administrative Spaces**

Procedure changes for air-conditioning (AC) of Department of Education classrooms and administrative spaces. The Schools Directed Air Conditioning (SDAC) replaces Policy 6700 using the online CIP Project Tracking (CPT) system.

SDAC

CPT System

- SDAC replaces Policy 6700 form for window AC's.
- Classrooms.
- CPT publishes electrical capacity by building or school hires contractor to determine electrical capacity.
- School hires contractor following Small Purchases HRS 103D-305 or Job Order Contractor or SPO Price List.

- CPT guidelines for schools to follow; no form; responsibility of the school.
- CPT notice of installation.
- CPT closeout of installation.

- School Initiated Project (SIP) replaces Form 1 and Policy 6700 form for non window AC's.
- Bigger areas with large air volume (cafeterias) and/or split AC systems. (involves holes in walls and concrete pads)
- CPT publishes electrical capacity by building or school hires contractor to determine electrical capacity
- School hires designer and/or school hires contractor following Small Purchases HRS 103D-305 or Job Order Contractor or SPO Price List.

- SIP will be on CPT.
- Facilities review and approval by Asset Management Section.
- Need to consider building envelope and other mechanical AC considerations.
- Often requires permits.

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

Minimal Guidance

The description of the School Directed AC program's policies and procedures includes a list of six brief items.

Deputy Superintendent, et al.
June 5, 2019
Page 2

SDAC process:

1. Installation of window AC units only.
2. Licensed electricians shall be used for any/all installations or any work involving the electrical system of a school.
3. Schools follow guidelines for electrical capacity, Hawaii Revised Statutes (HRS) 103D procurement, and Department of Health fresh air requirements.
4. Schools install comparable window AC units.
5. Schools provide notice of installation and closeout with CPT.
6. Policy 6700 form is no longer required.

We appreciate your support for the SDAC initiative.

If you have any questions, please contact Rocky So, Engineer for the Auxiliary Services Branch, at (808) 586-3452 or via Lotus Notes.

DC:rs
Attachment

c: Superintendent
Facilities Maintenance Branch
Accounting Services Branch
Auxiliary Services Branch

Source: DOE

release by a few months, makes no mention of the requirement to submit an air conditioning inventory to receive an electrical assessment, nor does it indicate how one requests the assessment, noting instead that a school can hire a contractor to assess the electrical capacity. However, the memo does make clear that schools are required to report the air conditioning that was installed to the online tracking system.

According to the June 5, 2019 DOE memo, the process for the School Directed AC program is described, below:

1. Installation of window AC units only.
2. Licensed electricians shall be used for any/all installations or any work involve the electrical system of a school.
3. Schools follow guidelines for electrical capacity, Hawai‘i Revised Statutes (HRS) 103D procurement, and Department of Health fresh air requirements.
4. Schools install comparable window AC units.
5. Schools provide notice of installation and closeout with the CPT project-tracking website.
6. Policy 6700 form is no longer needed.[2]

A service, not a program

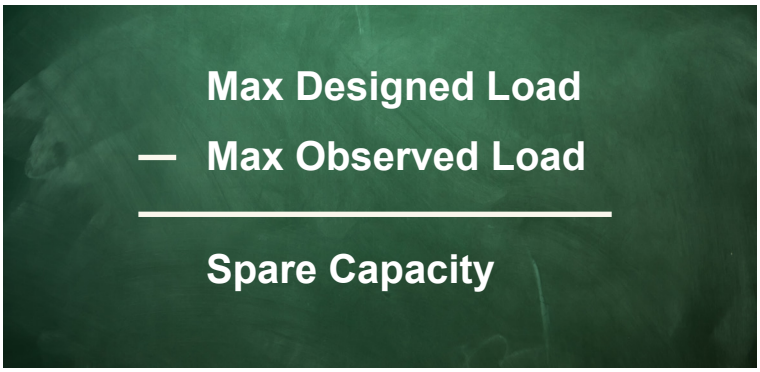
After neither DOE officials nor a SSFM Senior Principal were able to provide details on the School Directed AC program, we requested to speak with someone who is familiar with the day-to-day operations. We were referred to the SSFM Senior Project Manager who oversees the electrical assessments. He said that as of September 2024, about 230 electrical assessments have been conducted as part of the program. This number includes multiple assessments a school might have had involving different parts of their campus, as well as any re-assessments. The senior project manager also provided us with a list of 185 schools, including ones on O‘ahu, Kaua‘i, Hawai‘i Island, Maui, and Moloka‘i, that have received at least one electrical assessment through the program.

According to the Senior Project Manager, electrical assessments are done by two people – an electrician and an electrical engineer – and take two days to complete. For the assessment, an energy meter is attached to conduits of circuit breaker panels at a school. The assessment also involves meeting with the school principal and custodian because the principal is usually the person who had requested the information, and the custodian has access to the utility closets that house breaker panels.

[2] To get more clarity on the issue, we requested a copy of Policy 6700, which the June 5, 2019 memo replaced; however, the department could not locate that document.

The assessments cost between $6,000 to $7,000 for O'ahu schools or about $10,000 to $11,000 for Neighbor Island schools, he said.

The results of the assessment are expressed in an equation:



Max Designed Load – Max Observed Load = Spare Capacity, where the Maximum Designed Load is obtained from the electric company.

The spare capacity is divided by a factor that converts it into the number of window unit ACs that can be installed.

The Senior Project Manager said the electrical assessments associated with the School Directed AC program continue to be funded by moneys that were part of the 2016 Cool Classrooms Initiative appropriation, with about $100,000 remaining. He said there was an additional appropriation of $400,000 in 2022, also for electrical assessments.

According to the Senior Project Manager, once the electrical assessments are completed and the results are uploaded to the DOE website, which notifies the schools, his job ends. Apparently, so does the "program." Even though schools are required to provide notice of installation and closeout, the Procurement and Distribution Specialist II and Acting Branch Administrator for the Office of Facilities and Operations confirmed that DOE does not verify what schools install. He said he doesn't know why the department doesn't follow up regarding AC installations because the program was set up by his predecessor. The Senior Project Manager said he was not sure how DOE controls or monitors installations.

The Senior Project Manager expressed concern that improper installation of air conditioners or circuit breakers not working properly could pose a fire risk.

DOE's knowledge of and involvement in the program is limited to non-existent.

To ascertain DOE Office of Facilities and Operations' purpose for and involvement in the School Directed AC program, we met with the Interim Assistant Superintendent of the Office of Facilities and Operations. The meeting included the Interim Assistant Superintendent of the Office of Facilities and Operations and her assistant, the Procurement and Distribution Specialist II and Acting Branch Administrator for the Office of Facilities and Operations, and the Public Works Administrator for the Office of Facilities and Operations.

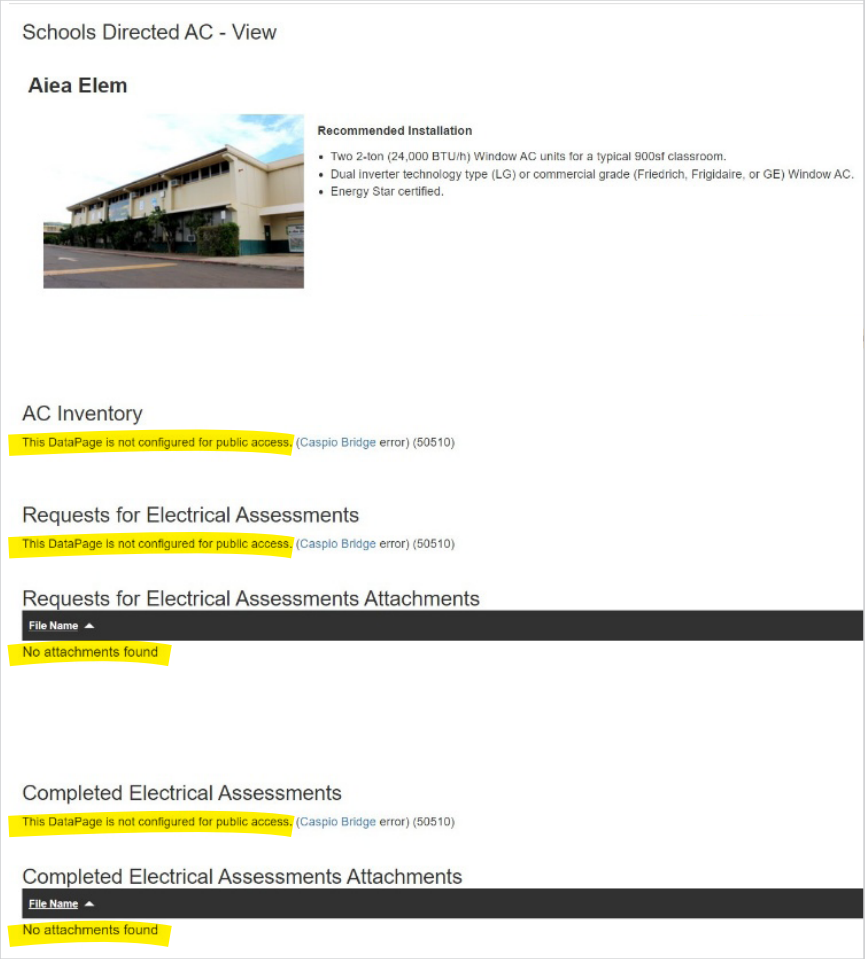
We asked DOE officials if the department tracks the number of air conditioners installed after a school's electrical assessment, the Procurement and Distribution Specialist II and Acting Branch Administrator for the Office of Facilities and Operations said they do not. He said that the department does not have "a 100 percent understanding" of the inventory of air conditioners in schools. The known air conditioners have ongoing maintenance contracts and are "separate and distinct from School Directed AC," the Procurement and Distribution Specialist II and Acting Branch Administrator for the Office of Facilities and Operations said. He added that some information is available through its GIS [Geographic Information System].

When asked how DOE knows if an unnamed school had followed the School Directed AC program's guidelines in installing a large number of air conditioners, the Interim Assistant Superintendent of the Office of Facilities and Operations said she didn't know, but added that the department sometimes only finds out if a school didn't follow rules when something goes wrong, either something "blows up" or because the school's electrical capacity is inadequate. "They just do whatever they want to do," she said.

At the time of our meeting, DOE officials themselves were not sure about their own policies — whether schools are required to inform the department of construction work to be done or are free to act on their own. During the meeting, the Interim Assistant Superintendent of the Office of Facilities and Operations called for an impromptu vote on whether schools "should" or "must" inform the department of pending projects. The Interim Assistant Superintendent believed it was a "must," despite her earlier claim of the department's lack of control over the schools. Another DOE official in attendance also voted "must" and the third DOE official's vote could not be heard. It was unclear if the vote was a reaffirmation of or change to current department policy and how the decision would be communicated to the schools.

Incomplete

The School Directed AC program's project tracking website was intended to enable DOE to track projects, including schools' air conditioning inventory. The website appeared to be inactive when we visited it.



Source: www.hidoefacilities.org, April 22, 2024

A "new" website and an old problem

The School Directed AC program's project tracking website, called CPT which stands for "CIP Project Tracker," was intended to enable DOE to track projects, including schools' air conditioning inventory.

In late April 2024, we visited the website, and it appeared to be inactive. The "Search for Your School" function called up school pages that were missing any school-specific data. The pages each included the school name and photo as well as information on Recommended Installation and Guidelines, which were featured on all schools' pages. Based on our review, information on AC Inventory was missing, as was any data on Requests for Electrical Assessments or Completed Electrical Assessments. Under the AC Inventory column was the notation: "This DataPage is not configured for public access."

During an April 2024 meeting, DOE officials confirmed to us that the site was "dead," describing it as a "rendering" of a site and saying it should be taken down; however, a few weeks after meeting with DOE officials, the site was populated with large collections of data that appeared to have been uploaded over a short period of time, including attachments with the same time stamp of "05/17/2024," such as those listed for ʻAiea Intermediate. The suddenly present information appeared to be of little value. For instance, the ʻAiea Elementary School pages feature an AC inventory of 24 window units and one split system installed between 2014 – 2020. The page has one entry in the Request for Electrical Assessment column, but that request was submitted on October 11, 2018, which predates the School Directed AC program. And there are no entries in the Completed Electrical Assessment column, so it is unclear if ʻAiea Elementary participated in the School Directed AC program at all. However, there is an entry for a single window unit installed on January 1, 2020. We question the value this information has for the department or the school community.

In addition, we found that the information varied widely by school. For example, a report for Castle High School included air conditioning inventory from 2022 and detailed information on the remaining warranties of donated air conditioners. Castle High School also listed numerous completed electrical assessments from 2019 to 2023. However, many other schools were not so up to date or complete. Kahala Elementary School's list includes units that date back to 2007, with one unit from 1993. In addition, the school's page did not include requested or completed assessments, so it doesn't appear that the school had even participated in the program. Six out of the first 10 schools on the website's list did not have air conditioning inventories at all, including ʻAiea High School, ʻAiea Intermediate, Aina Haina Elementary, Ala Wai Elementary, Alakai O Kauaʻi, and Āliamanu Elementary.

In a follow-up interview with the SSFM Senior Project Manager to clarify how schools request electrical assessments, we learned that the website we had been reviewing had been updated to a 2.0 version about two years ago. This was surprising, since we had been directed to the 1.0 version by the senior principal of SSFM and a DOE official and had previously discussed with them the website's lack of activity. They did not mention the existence of the 2.0 version.

Program, What Program?

Information on the School Directed AC program was passed on at informal, monthly meetings between administrative services assistants and a previous DOE director. Those meetings are not held anymore.

AT ITS BUSIEST, DOE's contractor was doing about 8 to 12 electrical assessments per month. According to the contractor's Senior Project Manager, in 2024, that number was down to about three per month, partly due to lack of publicity about the service, he said. He said the previous Office of Facilities and Operations Director had monthly informal meetings with DOE staff and administrative services assistants when the department's electrical assessment efforts may have been discussed, but those are not taking place anymore and it is doubtful that information on the School Directed AC program is currently being communicated. He said he wishes there was a newsletter or other ways to get information out to the schools about the electrical assessments supported by DOE.

This lack of awareness of the School Directed AC program extends beyond the department. We found a total of six pieces of legislation introduced by a Hawaiʻi Island Senator related in part to electrical assessments from 2020 to 2022. Most recently in 2022, Senate Concurrent Resolution No. 43 and Senate Resolution No. 38 sought to have DOE conduct electrical assessments of all public and charter schools to determine electrical capacity for air conditioning and air purifying devices.

Access to the 2.0 version requires a login and password. DOE provided us with these credentials; however, when we attempted to log on, our access was limited to the site's training section. We later met with the department's Procurement and Distribution Specialist II, who also serves as acting Branch Administrator of Office of Facilities and Operations, Auxiliary Services Branch, who was the one who had requested access to the system for us and who walked us through the site. However, we still weren't able to gain full access with his assistance.

Toward the end of the meeting, the Procurement and Distribution Specialist II and Acting Branch Administrator for the Office of Facilities and Operations mentioned that, earlier in the month, DOE had rescinded the authority of schools to do construction projects, which, he said, essentially ended the School Directed AC program, saying it was "no more." He explained that the department would continue to provide and pay for schools' electrical assessments, and schools can still replace old window air conditioning units. However, he said schools are no longer allowed to do a full electrical upgrade on their own or other construction projects such as cutting into a wall to accommodate additional air conditioners. Everything needs to come through the Facilities Department, he said. But altering walls or full electrical upgrades were never a part of the School Directed AC program: In 2019, the installation of School Directed AC program's window units were introduced as less complex "where we're not having to tear down walls or install solar panels or battery systems," and a full electrical upgrade could be avoided due to cost.

The Procurement and Distribution Specialist II and Acting Branch Administrator for the Office of Facilities and Operations told us that the department had issued a memo earlier in the month announcing the changes in procurement and contracting authority but had yet to issue a written policy regarding the termination of the School Directed AC program. He told us that guidelines would be forthcoming.

Per our request during the meeting, the Procurement and Distribution Specialist II and Acting Branch Administrator for the Office of Facilities and Operations later provided us with the November 4, 2024 memo. Section II C of the memo states that procurement and contracting for small purchases was delegated to the Deputy Superintendents, Assistant Superintendents, Complex Area Superintendents, Directors, Section Administrators, and School Principals.

Per the November 2024 memo, DOE had delegated schools' authority to execute "small purchase solicitations and their resultant contracts excluding construction (if applicable)." The memo does not specify that the policy changes rescind the School Directed AC program, as

previously stated by the Procurement and Distribution Specialist II and Acting Branch Administrator for the Office of Facilities and Operations. Moreover, it is our understanding that, if a school's electrical assessment indicates that its buildings can accommodate additional air conditioners, the school can proceed to install the approved number of window units. It is unclear whether schools are required to procure or contract for that installation work.

At the conclusion of our fieldwork, we had not received a written policy from DOE terminating the School Directed AC program or any guidance on how the change in department procurement and construction delegation affects schools' heat abatement plans.[3]

Absent such guidance, it is unclear who is responsible for cooling DOE schools and how they go about doing it.

Conclusion

In 2019, the Cool Classrooms Initiative was succeeded by the School Directed AC program, touted as "empowering schools to lead the charge on cooling classrooms." Under the program, the department was to provide schools looking to air condition their classrooms with electrical assessments that would determine which buildings and classrooms could handle the additional electrical load. In what was described to us as an example of "outside-of-the-box" thinking, the program would provide schools with the opportunity to get much-needed electrical assessments, while the department could start collecting a much sought-after air conditioning inventory of its schools.

While many schools have taken advantage of the electrical assessment service, in the end, the School Directed AC Program may be no more than an afterthought for the department. We found that DOE provided minimal structure to and little oversight of the School Directed AC Program. For instance, the requirement that schools submit their current air conditioning inventory to receive an electrical load assessment was never communicated to the schools or enforced by the department. Under the current system, schools simply request an electrical assessment directly to the DOE contractor through a project tracking website. When we reviewed DOE's project tracking website, we found that a very

[3] On July 30, 2025, more than six weeks after we had provided the draft report to the department for its review and comment, the department provided us with a memo dated January 20, 2025 to Complex Area Superintendents and Principals, which describes "procedural changes" for the School Directed AC program. Among other changes, schools are responsible for the cost of electrical assessments and the department's Office of Facilities and Operations is responsible for any design work and installation of the units. Schools are also required to "fully fund" the air conditioning upgrades, including the cost of the units as well as other associated installation costs.

limited number of schools appear to have reported complete and current inventories, with many schools not reporting inventories at all.

We would later learn that the project tracking website that DOE had directed us to had been updated about two years earlier. DOE had provided us with access only to the older version of the website. So it is not clear if the DOE officials we were working with were aware of the updated website themselves.

In addition, none of the DOE officials we spoke with could provide us with basic program information such as how many schools had obtained an electrical assessment service (paid for by the department) or the number of air conditioners installed under the program. During one of our meetings, department officials were unsure about one of the program's requirements, so they took an impromptu vote and interpreted their understanding of the policy.

Finally, at the end of our fieldwork, and at the end of a call, the Procurement and Distribution Specialist II and Acting Branch Administrator for the Office of Facilities and Operations mentioned a recent change in department procurement policy that he said effectively put an end to the School Directed AC program. We requested but did not receive an official announcement ending the program, so it is unclear if there is still a School Directed AC Program, and, if it still exists, what it entails.

Office of the Auditor's Response on the Department of Education's Comments to the Audit

WE RECEIVED A LETTER from Superintendent Keith T. Hayashi dated August 1, 2025, providing the Department of Education's comments regarding our report about the department's heat abatement efforts. A copy of the Superintendent's letter is Attachment 1 to this response.

The purpose of the department's written comments is unclear, but the comments do highlight the department's serious misunderstanding about its responsibility and the importance of being accountable for its operations and use of public funds. As we report, the department was unable to provide us with a complete and accurate accounting of the $100 million that the Legislature appropriated to fund Governor Ige's initiative to air condition 1,000 of its classrooms. Being able to account for use of public funds is quite simply a basic, fundamental responsibility of the Department of Education.

It is noteworthy that the Superintendent's letter does not address how, going forward, the department will ensure it is accountable for its use of public funds, not even indicating that the department will look to develop a system of internal controls to prevent such a significant failure in the future. We find it concerning that the department's response ignores the serious problems that we report.

Instead, the superintendent expresses appreciation to us for noting the significant turnover of staff who worked on the department's heat abatement efforts, seemingly to suggest that the turnover somehow excuses the department's inability to account for its use of $100 million of public funds. Staff turnover is not unique to the Department of Education. We refer to the turnover in the report and mentioned it during our meeting with department officials because we were unable to fill some of the gaps and inconsistencies in the department's inadequate accounting and recordkeeping by talking with current staff. We likely would not have made mention of the staffing issue if the department was able to account for its spending of the $100 million and had other documentation relating to its implementation of the initiative.

To be clear, staff turnover does not – and should never – justify a state agency's inadequate recordkeeping and accounting of its expenditures of public money; turnover does not relieve the department's responsibility to be accountable for its performance.

If it is unclear from the report, the department should develop a systematic process to timely and accurately account for its expenditures; it should develop clear policies and procedures to maintain contracts and other project-related documents, especially since most of those documents are kept only in paper format; it should hold management and staff accountable to implement those policies and follow those procedures.

In closing, the Superintendent says that "The department is committed to continuous improvement, operational transparency, and compliance with applicable laws and policies." However, in our efforts to understand and report on the department's heat abatement efforts, we found there was limited transparency; we found there was a demonstrated disregard for policies and procedures; and we found there was little, if any, accountability. We hope that commitment to continuous improvement includes addressing the issues that we report.

JOSH GREEN, M.D.
GOVERNOR

KEITH T. HAYASHI
SUPERINTENDENT

STATE OF HAWAIʻI
DEPARTMENT OF EDUCATION
KA ʻOIHANA HOʻONAʻAUAO
P.O. BOX 2360
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OFFICE OF THE SUPERINTENDENT

August 1, 2025

The Honorable Leslie H. Kondo
State Auditor
Office of the Auditor
465 S. King Street, Room 500
Honolulu, HI 96813-2917

Re: Response to the Office of the Auditor's Draft Report – An Update on the Department of Education's Heat Abatement Efforts

Dear Mr. Kondo:

Thank you for the opportunity to meet with your office to discuss the observations and our ability to provide comments on the DRAFT, An Update on the Department of Education's Heat Abatement Efforts, Report No. 25-xx/June 2025.

The Hawaii State Department of Education (Department) appreciates the report's acknowledgment of the significant staff turnover within the Heat Abatement Program, noting that virtually none of the key managers involved during the review period remain with the program. The Department also appreciates the recognition of the challenges in implementing legislation under exceptionally tight timelines.

While the Department acknowledges that your office concluded its field work at the end of 2024, the Department had already initiated proactive measures to enhance procedures for the School Directed Air Conditioning Program. The Department appreciates the inclusion of the footnote in your report, which helps provide important context.

The Department is committed to continuous improvement, operational transparency, and compliance with applicable laws and policies.

The Honorable Leslie H. Kondo
August 1, 2025
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Should you have any questions, please contact Audrey Hidano, Interim Assistant Superintendent of the Office of Facilities and Operations, at (808) 784-5000 or via email at audrey.hidano@k12.hi.us.

Sincerely,

Keith T. Hayashi
Superintendent

KTH:cb
c: Office of Facilities and Operations
Internal Audit
Facilities Development Branch
Auxiliary Services Branch