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**AB-2232 School facilities: heating, ventilation, and air conditioning systems.** (2021-2022)

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**Assembly Bill No. 2232**

**CHAPTER 777**

An act to add Chapter 8 (commencing with Section 17660) to Part 10.5 of Division 1 of Title 1 of the Education Code, relating to school facilities.

[ Approved by Governor September 29, 2022. Filed with Secretary of State September 29, 2022. ]

**LEGISLATIVE COUNSEL'S DIGEST**

AB 2232, McCarty. School facilities: heating, ventilation, and air conditioning systems.

Existing law establishes the California State University, which is administered by the Board of Trustees of the California State University, and the University of California, under the administration of the Regents of the University of California, as segments of public postsecondary education in this state.

Existing law, the Leroy F. Greene School Facilities Act of 1998, provides for the adoption of rules, regulations, and procedures, under the administration of the Director of General Services, for the allocation of state funds by the State Allocation Board for the construction and modernization of public school facilities.

This bill would require a covered school, defined as a school district, a county office of education, a charter school, a private school, the California Community Colleges, or the California State University, and would request the University of California, to ensure that facilities have heating, ventilation, and air conditioning (HVAC) systems that meet specified minimum ventilation rate requirements, unless the existing HVAC system is not capable of safely and efficiently providing the minimum ventilation rate, in which case the bill would require a covered school, and request the University of California, to ensure that its HVAC system meets the minimum ventilation rates in effect at the time the building permit for installation of that HVAC system was issued. The bill would also require a covered school, and request the University of California, to install filtration that achieves specified minimum efficiency reporting values (MERV) levels, determined by the school to be feasible with the existing HVAC system, as provided. The bill would require, upon the next triennial update of the California Building Standards Code, the California Building Standards Commission and the Division of the State Architect to research, develop, and propose for adoption mandatory standards for carbon dioxide monitors in classrooms of a covered school and the University of California. By imposing new duties on local educational agencies, this bill would impose a state-mandated local program.

The California Constitution requires the state to reimburse local agencies and school districts for certain costs mandated by the state. Statutory provisions establish procedures for making that reimbursement.

This bill would provide that, if the Commission on State Mandates determines that the bill contains costs mandated by the state, reimbursement for those costs shall be made pursuant to the statutory provisions noted above.

Vote: majority Appropriation: no Fiscal Committee: yes Local Program: yes

# THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

## **SECTION 1.** The Legislature finds and declares all of the following:

(a) It is the policy of this state that school facilities be designed and operated using available measures to provide a healthy indoor environment for students, teachers, and other occupants including, but not limited to, healthy indoor air quality and adequate ventilation with outdoor air.

(b) In November 2003, the State Air Resources Board and the State Department of Health Care Services issued a report to the Legislature detailing the adverse impact that poor indoor air quality is having on California schools. The report found significant indoor air quality problems, including problems with ventilation, temperature, humidity, air pollutants, floor dust contaminants, moisture, mold, noise, and lighting. The report found that ventilation with outdoor air was inadequate during 40 percent of classroom hours and seriously deficient during 10 percent of classroom hours in both portable classrooms and traditional classrooms.

(c) In February 2005, the State Air Resources Board approved an indoor air quality report that cites proven health and economic benefits to reducing indoor air pollution, which is estimated to cost California \$45 billion per year. The report noted that children are particularly vulnerable to poor indoor air quality. According to the report, children under 12 years of age spend about 86 percent of their time indoors with 21 percent of the time being spent in schools.

(d) A 2019 report by the University of California, Davis, Western Cooling Efficiency Center and the Indoor Environment Group of the Lawrence Berkeley National Laboratory identifies numerous studies finding that underventilation of classrooms is common and negatively impacts student health and learning. Improved heating, ventilation, and air conditioning (HVAC) system performance improves student and teacher health and attendance, student productivity, and the performance of mental tasks, such as better concentration and recall. The report found that students in classrooms with higher ventilation rates have a significantly higher percentage of students—13 to 14 percent—scoring satisfactorily on mathematics and reading tests than students in classrooms with lower outdoor air ventilation rates.

(e) A 2018 report in the Environment International Journal found that short-term carbon dioxide exposure beginning at 1,000 parts per million (ppm) negatively affects cognitive performances, including decisionmaking and problem resolution. The Wisconsin Department of Health Services states that carbon dioxide levels between 1,000 and 2,000 ppm are associated with drowsiness and attention issues. Carbon dioxide levels above 2,000 ppm affect concentration and cause headaches, increased heart rate, and nausea.

(f) The California Building Energy Efficiency Standards set minimum ventilation rates for classrooms. Sections 17002 and 17070.75 of the Education Code require school districts to ensure schools are maintained in good repair, including HVAC systems that are functional, supply adequate ventilation to classrooms, and maintain interior temperatures within acceptable ranges. Regulations adopted pursuant to Section 142.3 of the Labor Code require that HVAC systems be maintained and operated to provide at least the quantity of outdoor air required by the California Building Standards Code (Title 24 of the California Code of Regulations) in effect at the time the building permit was issued. Despite these requirements, poorly performing HVAC systems and underventilation of classrooms continue to be a significant problem in California.

(g) The 2019 report by the University of California, Davis, Western Cooling Efficiency Center and the Indoor Environment Group of the Lawrence Berkeley National Laboratory found that over one-half of new HVAC systems in schools had significant problems within three years of installation and that the vast majority of classrooms in California, including 95 percent of the classrooms studied in the central valley, continue to fail to meet minimum ventilation rates. Some classrooms were found to have carbon dioxide concentrations above 2,000 ppm for substantial periods of the day. The study recommended periodic testing of HVAC systems and continuous real-time carbon dioxide monitoring to detect and correct these problems.

(h) Monitoring levels of carbon dioxide in classrooms will help ensure that California students' school environment is healthy and conducive to learning and performing well on tests.

(i) A March 2021 study found that proper ventilation in classrooms could reduce COVID-19 infection risk by over 80 percent compared to classrooms without ventilation.

(j) The Centers for Disease Control and Prevention and the American Society of Heating, Refrigerating and Air-Conditioning Engineers recommend that schools, buildings, and homes combine filters and air cleaners to achieve minimum efficiency reporting values (MERV) levels of performance for air cleaning of 13 or higher.

**SEC. 2.** Chapter 8 (commencing with Section 17660) is added to Part 10.5 of Division 1 of Title 1 of the Education Code, to read:

## **CHAPTER 8. Heating, Ventilation, And Air Conditioning Systems**

**17660.** The Legislature finds and declares that it is the policy of the state that school facilities provide healthy indoor air quality, including adequate ventilation, to students, teachers, and other occupants in order to protect occupant health, reduce sick days, and improve student productivity and performance.

**17661.** (a) For purposes of this section, the following definitions apply:

(1) "Covered school" means a school district, a county office of education, a charter school, a private school, the California Community Colleges, or the California State University.

(2) "HVAC" means heating, ventilation, and air conditioning.

(3) "MERV" means minimum efficiency reporting values.

(b) (1) A covered school shall, and the University of California is requested to, ensure that facilities, including, but not limited to, classrooms for students, have HVAC systems that meet the minimum ventilation rate requirements set forth in Table 120.1-A of Part 6 (commencing with Section 100.0) of Title 24 of the California Code of Regulations, unless the existing HVAC system is not capable of safely and efficiently providing the minimum ventilation rate.

(2) If a school's existing HVAC system is not capable of safely and efficiently providing the minimum ventilation rate required pursuant to paragraph (1), then a covered school shall, and the University of California is requested to, ensure that its HVAC system meets the minimum ventilation rates in effect at the time the building permit for installation of that HVAC system was issued. In addition, the covered school shall, and the University of California is requested to, document the HVAC system's inability to meet the current ventilation standards set forth in paragraph (1) in the annual HVAC inspection report required by Section 5142 of Title 8 of the California Code of Regulations, which shall be available to the public upon request.

(c) (1) Subject to paragraph (2), a covered school shall, and the University of California is requested to, install filtration that achieves MERV levels of 13 or higher to the extent determined to be feasible and appropriate for the existing HVAC system, as determined by the school.

(2) If, pursuant to paragraph (1), it is determined that the existing HVAC system is not designed to achieve MERV levels of 13 or higher, a covered school shall, and the University of California is requested to, install filtration that achieves the highest MERV level that the school determines is feasible without significantly reducing the lifespan or performance of the existing HVAC system.

(d) Upon the next triennial update of the California Building Standards Code (Title 24 of the California Code of Regulations), the California Building Standards Commission and the Division of the State Architect shall research, develop, and propose for adoption mandatory standards for carbon dioxide monitors in classrooms of a covered school and the University of California.

(e) This section shall apply to the University of California only to the extent that the Regents of the University of California, by resolution, make it applicable.

**SEC. 3.** If the Commission on State Mandates determines that this act contains costs mandated by the state, reimbursement to local agencies and school districts for those costs shall be made pursuant to Part 7 (commencing with Section 17500) of Division 4 of Title 2 of the Government Code.