



## HB 3031

The National Energy Management Institute (NEMI) works with public, private, and government organizations to make indoor environments safer for people in schools nationwide.

- Students in the US spend about 1,000 hours per year at school, second only to their homes.<sup>i</sup>
- “The mean breathing rate over the first 12 years of life is almost twice as great relative to adult breathing rates”<sup>ii</sup>

HB3031 recognizes and addresses our children’s susceptibility to poor Indoor Air Quality to ensure that the HVAC systems serving Oregon school buildings are not *just* operational but verified to be achieving design intent, providing the code required ventilation rate, and proper filtration while meeting the energy efficiency goals.

**HB3031 helps ensure the taxpayer funded HVAC infrastructure operates as designed.** Unfortunately, without the minimum workforce standards proposed by HB3031, studies repeatedly show that design intent is commonly not achieved due to work being performed by technicians without adequate training and certification.



- A study by UC Davis and Lawrence Berkely National Lab showed only 15% of new units were providing adequate ventilation only 3 years after installation.<sup>iii</sup>
- Poor quality installation is pervasive. A Study by a state Department of Energy found that over 50% of new HVAC systems and 85% of replacement HVAC systems that they evaluated were not performing correctly due to poor quality installation.<sup>ivv</sup>
- Poor quality installation of HVAC systems results in a 20% to 30% increase in energy use.<sup>vivii</sup>

## **And what are the benefits to adequate Ventilation and Filtration?**

### **Absenteeism and Health**

- Adequately sized Mechanical Ventilation with air changes of 6 or more has the ability to reduce Sars-COV-2 infection risk by over 80%.
- A study of 162 classrooms for two years found a 1.6% decrease in absence for each 2 cfm per person increase in ventilation rate.<sup>viii</sup>

### **Productivity**

- Proper indoor temperatures and higher ventilation rates resulted in 13–14% higher percentage of students scoring satisfactory in the mathematics and reading tests compared to schools with higher temperatures and lower ventilation rates.<sup>ix</sup>

### **Energy**

- HVAC systems account for 52% of the energy used in US K-12 schools within the Pacific Region.<sup>x</sup>



- Properly commissioning an existing building system can provide an energy savings of up to 16%.<sup>xi</sup>

### **But won't an increased ventilation result in higher energy bills?**

- If the ventilation rate is below legal levels and you increase it to legal levels... yes there will be an increase in energy use, but this can be mitigated by HVAC components, like an economizer, functioning as designed.

### **True Cost of Adequate Ventilation Rates**

- Increasing ventilation rates to meet or exceed current standards imposes energy and capital costs that are typically less than 0.1%<sup>xii</sup> typical public spending on elementary and secondary education in the US.

Thank you for your continuous work to improve the health and wellbeing of Oregon's children, teachers, and educational staff.

A handwritten signature in black ink, appearing to read 'Christopher Ruch'.

Christopher Ruch

Director of Education

National Energy Management Institute (NEMI)

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<sup>i</sup> Drew DeSilver, "School Days: How the US Compares with Other Countries," Pew Research Center, 2014, <https://www.pewresearch.org/fact-tank/2014/09/02/school-days-how-the-u-s-compares-with-other-countries/>.

<sup>ii</sup> Miller, Mark D., et al. "Differences between children and adults: implications for risk assessment at California EPA." *International journal of toxicology* 21.5 (2002): 403-418

<sup>iii</sup> Chan, et al, Ventilation rates in California classrooms: Why many recent HVAC retrofits are not delivering sufficient ventilation, *Building and Environment Journal* 167 (2020) (<https://www.sciencedirect.com/science/article/pii/S0360132319306365>).

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<sup>iv</sup> California Energy Commission, *Strategic Plan to Reduce the Energy Impact of Air Conditioners* (June 2008), CEC-400-2008-010, at p. (v) (<https://docplayer.net/6285926-Staff-report-strategic-plan-to-reduce-the-energy-impact-of-air-conditioners-california-energy-commission-june-2008-cec-400-2008-010.html>);

<sup>v</sup> Zabin, et. al, *Workforce Issues and Energy Efficiency Programs: A Plan for California's Utilities*, Don Vial Center for Employment in the Green Economy (2014), at pp. 32-34 and Appendix 2B (<http://laborcenter.berkeley.edu/workforce-issues-and-energy-efficiency-programs-a-plan-for-californias-utilities/>).

<sup>vi</sup> California Energy Commission, *Strategic Plan to Reduce the Energy Impact of Air Conditioners* (June 2008), CEC-400-2008-010, at p. (v) (<https://docplayer.net/6285926-Staff-report-strategic-plan-to-reduce-the-energy-impact-of-air-conditioners-california-energy-commission-june-2008-cec-400-2008-010.html>);

<sup>vii</sup> Zabin, et. al, *Workforce Issues and Energy Efficiency Programs: A Plan for California's Utilities*, Don Vial Center for Employment in the Green Economy (2014), at pp. 32-34 and Appendix 2B (<http://laborcenter.berkeley.edu/workforce-issues-and-energy-efficiency-programs-a-plan-for-californias-utilities/>).

<sup>viii</sup> Marche Region Italy. (n.d.). *Controlled Mechanical Ventilation (CMV) works*. <https://www.fondazionehume.it/data-analysis/controlled-mechanical-ventilation-cmv-works/>

<sup>ix</sup> U. Haverinen-Shaughnessy, R.J. Shaughnessy, E.C. Cole, O. Toyinbo, D. J. Moschandreas, An assessment of indoor environmental quality in schools and its association with health and performance, *Build. Environ.* 93 (2015) 35–40. <https://www.semanticscholar.org/paper/An-assessment-of-indoor-environmental-quality-in-Haverinen-Shaughnessy-Shaughnessy/d8ce5901edcd7401e118bf43d4bce436a77cb82e>

<sup>x</sup> Emma Hines and Sara Ross, *HVAC Choices for Student Health and Learning: What Policymakers, School Leaders, and Advocates Need to Know*, RM I and Undaunted K12, 2023, <https://rmi.org/insight/hvac-choices-for-student-health-and-learning/>.

<sup>xi</sup> Evan Mills, *Building Commissioning: A Global Opportunity for Reducing Energy Costs and Greenhouse Gas Emissions* (Berkeley: A Lawrence Berkely National Laboratory, July 21, 2009) <http://cx.lbl.gov/documents/2009-assessment/lbnl-cx-cost-benefit.pdf>

<sup>xii</sup> Fisk, William. (2017). The ventilation problem in schools: Literature review. *Indoor Air.* 27. 10.1111/ina.12403.