

NBI is driving energy efficiency and carbon reduction in the building sector.

Program Areas include:

- 1. Advanced new and existing buildings*
- 2. Continuous code and policy innovation*
- 3. Zero energy leadership and market development*



High Performance and Zero Energy in Education



K-12 Schools



Community Colleges



Higher Education



Libraries



Science Centers

Key Findings in School Construction and Retrofit Market Characterization



Kathleen Grimm School of Leadership and Sustainability | New York, NY
Photo Courtesy: SOM Architecture

- Primary driver of decision makers in the school market is **educational outcomes**
- Energy is not necessarily a consideration in overarching planning documents or in operational practices
- Deferred maintenance needs in school facilities are substantial
- Complicated market structure, disaggregated decision making

Importance of High Performance Schools

Students spend approximately 1,000 hours per year in a school.¹ Transforming classrooms into healthy and productive spaces is of the utmost importance, especially when short-term and long-term health of students and staff is at risk.



1. Center for Public Education - <http://www.centerforpubliceducation.org/research/time-school-how-does-us-compare>



Discovery Elementary School | Arlington, VA
Photo Courtesy of VMDO Architects

Non Energy Benefits in High Performance Schools

Did you know that the classroom environment can affect a child's academic progress over a year by as much as

25%¹



65%



Reduction in asthma cases among elementary students when school indoor environment quality improves.²

3%



Reduction in teacher turnover in green schools - saving US\$4 per square foot over a 20 year period.³

20%



Faster progression in math in schools with good daylighting.⁴

26%



Faster progression in reading in schools with good daylighting.⁴

10%

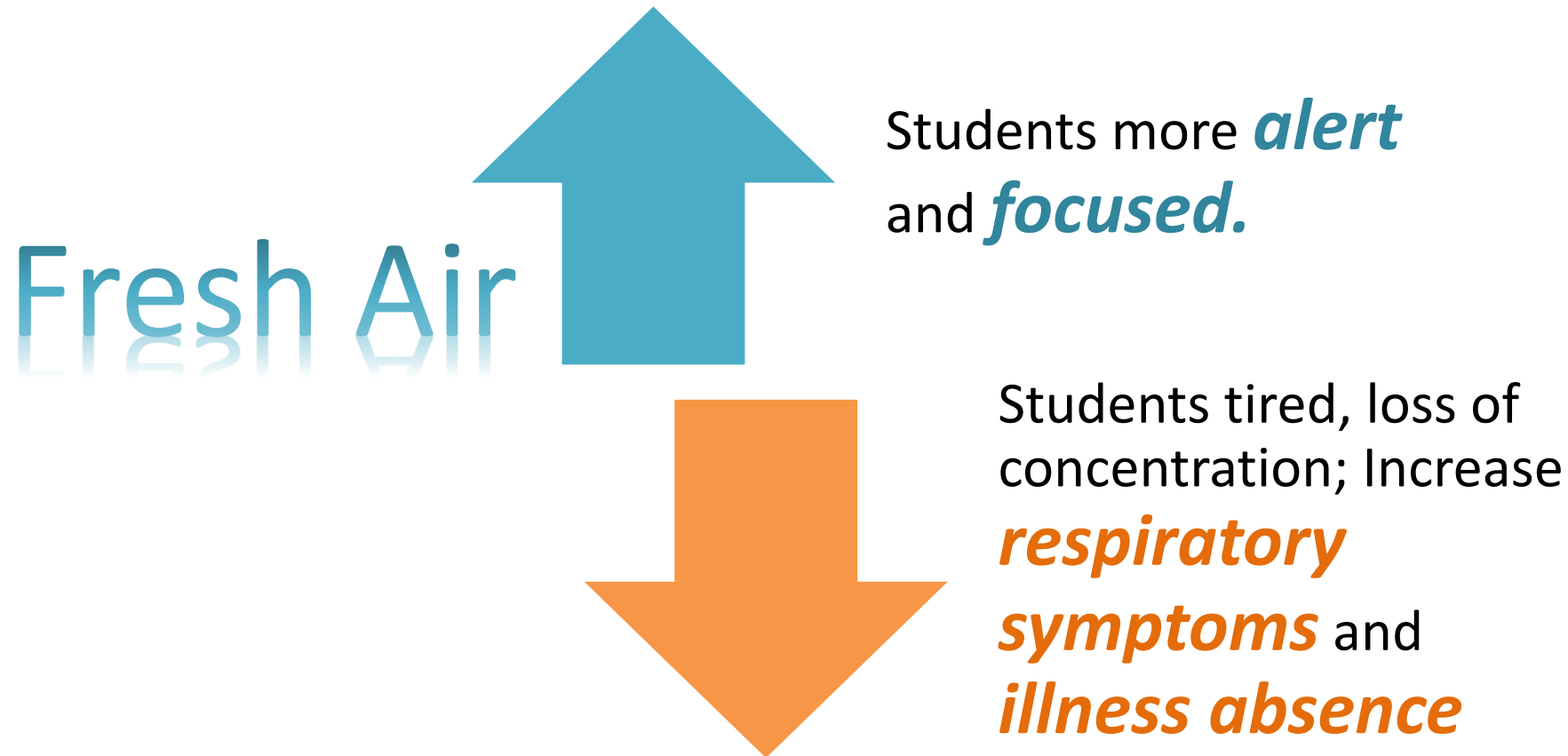


Increase in overall performance in schools with good daylighting.⁴

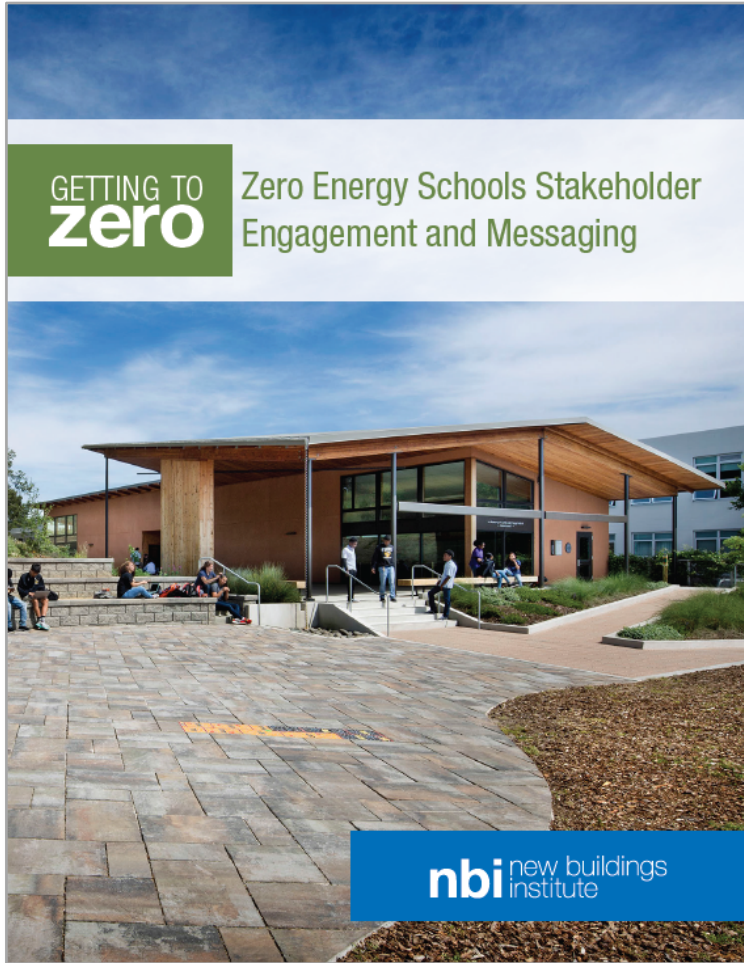
1. Barrett, P., Zhang, Y., Moffat, J., & Kobbacy, K. (2012, October 03). A holistic, multi-level analysis identifying the impact of classroom design on pupils' learning.
2. Meng, Y., Babey, S. H., & Wolstein, J. (2012). Asthma-Related School Absenteeism and School Concentration of Low-Income Students in California.
3. Katz, G. (2006). Greening America's Schools: Costs and Benefits.
4. Heschong Mahone Group. (1999). Daylighting in Schools: An Investigation into the Relationship Between Daylighting and Human Performance.

Source: World GBC

Recommendation: Provide Adequate Ventilation



Benefits of ZNE Schools



- Higher test scores
- Increased average attendance
- Reduced operation costs
- Increased teacher satisfaction and retention
- Reduced liability
- Reduced environmental impacts
- Building as a teaching tool

