



Building Operator Certification – Level I



*A Partnership of the
NYC Department of Education
Division of School Facilities,
International Union of Operating
Engineers, and the
City University of New York*



Joel I. Klein, Chancellor



Cohort A
October, 2010 – June, 2011

Welcome

Building Operator Certification
for the NYC Department of Education

Partners

CUNY School of Professional Studies

CUNY Building Performance Lab

The BOC

IUOE Local 891

NYC DCAS



Joel I. Klein, Chancellor



Main Components of the Course

- Operations & Maintenance Focus
- Energy Efficiency with EnergyStar Portfolio Manager
- Indoor Air & Environmental Quality
- Certifications – BOC Level 1 and IUOE Indoor Air Quality Specialist

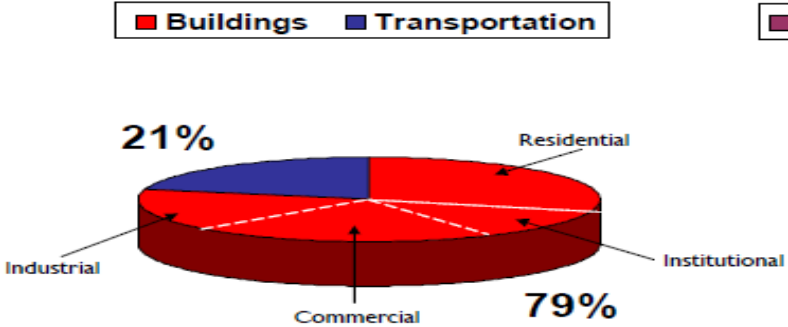


Joel I. Klein, Chancellor

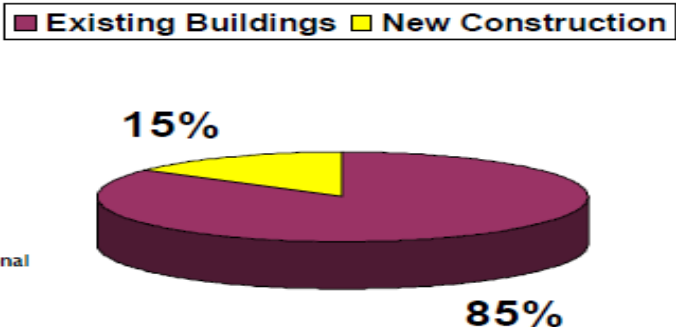


Significance of Buildings in New York City

Most of NYC's emissions come from existing buildings...



79% of all NYC emissions come from existing buildings...



And it is estimated that by 2030, 85% of emissions will come from buildings we already have



Joel I. Klein, Chancellor



NYC Municipal Buildings - Operations Goals



The Long Term Sustainability Plan for the City of New York.

- Within the Plan, the City commits to reducing energy use and greenhouse gas emissions from City operations 30% by 2017.



Joel I. Klein, Chancellor



NYC Municipal Buildings and Operations Goals

Schools comprise 40% of the City's total municipal building square footage and about 30% of its energy use

Improved O&M could save millions of dollars in energy costs annually.

Improved O&M could save 195,000 metric tons of greenhouse gas emissions annually

Source: <http://schools.nyc.gov/community/facilities/sustainability/default.htm>



Joel I. Klein, Chancellor



NYC Municipal Buildings and Operations Goals



DOE's Sustainability Initiative is lead by the Division of School Facilities to provide resources to optimize building operations and energy efficiency.



Joel I. Klein, Chancellor



The Significance of Building Operators in the Performance Of Buildings.



“Operations is becoming recognized as key in the energy and indoor environmental performance of buildings.” (Turner 2008, Gifford, 2008).



Joel I. Klein, Chancellor



The Significance of Building Operators

The proper operation of building systems can only be provided by operators who have the skills to monitor and assess them.

The building operator, on a managerial level, must be able to:

- Assess the performance of buildings and systems.
- Recognize and identify problems.
- Measure, quantify and document the problems.
- Support process of solutions and upgrades.



Joel I. Klein, Chancellor



Expected Outcomes of the Course

Improvements in Performance of School Facilities from Enhanced O&M Practices

- Indoor Air Quality
- Energy Efficiency
 - as shown in EnergyStar Portfolio Manager
- Reductions in Greenhouse Gas emissions



Joel I. Klein, Chancellor



Expected Outcomes of the Course

Value to You, the Custodial Engineer

- Enhanced knowledge and skills
 - mechanical / electrical systems and planned maintenance
- Greater understanding of energy management
 - planning and implementing energy projects
- Better ability to communicate in annual planning process and other forums
- Get nationally recognized Certification



Joel I. Klein, Chancellor



Building Operator Certification - BOC

- Building Operator Certification is a nationally recognized training and certification program for building operators.



- IUOE – Indoor Air Quality Specialist



Joel I. Klein, Chancellor



Dimensions of Building Performance

....and Why They Matter



Joel I. Klein, Chancellor



Dimensions of Building Performance

Inputs

- Energy
- Water

Outputs

- Indoor Environmental Quality (IEQ)
 - Indoor Air Quality (IAQ)
 - Illumination
 - Temperature
 - Acoustics
- **Comfort, Productivity and Health of**

Occupants



Joel I. Klein, Chancellor



Dimensions of Building Performance

Measuring Building Performance

“If you can’t measure it, you can’t manage it.”

“What gets measured, gets managed.”



Joel I. Klein, Chancellor



Dimensions of Building Performance

Measuring Building Performance

Tools

- **Hand-held instruments & data-loggers**
- **Web-based databases**
 - EnergyStar Portfolio Manager for energy and water
- **Building Environmental Rating Systems**
 - LEED building rating system – “EBOM”
- **Engineering Guidelines**
 - Standards for lighting levels and power densities
 - Guidelines for ventilation air and thermal comfort



Joel I. Klein, Chancellor



Dimensions of Building Performance

Measuring Building Performance

American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE) Performance Measurement Protocols for Commercial Buildings

Measurements in 6 Categories

- Energy Efficiency
- Water Efficiency
- Thermal Comfort
- Indoor Air Quality
- Lighting Quality
- Acoustics



Joel I. Klein, Chancellor



Dimensions of Building Performance

Why They Matter

- Evidence demonstrates the relationship between IAQ and human performance – in various settings, industrial, commercial and institutional
- Schools with better physical conditions show improved academic performance



Joel I. Klein, Chancellor



Dimensions of Building Performance

Why They Matter

- **Scientific evidence** has long demonstrated an association between **poor IAQ and respiratory health effects**, including asthma.
- Taking steps to improve the IAQ of schools is critical to bettering student health and academic performance.



Joel I. Klein, Chancellor



Dimensions of Building Performance

Why They Matter

- A growing body of research shows that IEQ, Indoor Environmental Quality, is linked to educational achievement and student performance.
 - Consistent with findings about productivity in industrial and commercial workplaces
- The physical environment plays an important role in achieving the overall educational objectives of the school.

Source: Guide to Operating and Maintaining EnergySmart Schools - US Dept of Energy



Joel I. Klein, Chancellor



EPA – IAQ Tools for Schools

How to open “Tools for Schools” reading #1

Go to the Home Page of “Tools for Schools”

www.epa.gov/iaq/schools/index.html

- See bottom of page “Products and Materials”
- First Reading: “How does indoor air quality impact student health and performance?”
- See the “Key Findings Document”
- See the left side bar and click on “Evidence from Scientific Literature”



Joel I. Klein, Chancellor

