



## PROJECT AT A GLANCE

Location  
Cambridge, Massachusetts

Facility  
Large-scale campus encompassing academic laboratories, classrooms, student dormitories, athletic centers, and office spaces.

## FDD delivers most cost effective energy and carbon reduction measures on campus

Clockworks™ used for measurement and verification of 2.1M kWh and 950,000 therms in savings for campus energy efficiency

## RESULTS

### 2.1M kWh and 950k therms

in annual energy savings measured and verified for utility incentives

- Knowledge sharing between MIT, its utility provider, and KGS Buildings led to the development of guidelines for using FDD to support utility incentive program measurement and verification
- MIT's MBCx Program supports the university on its path to exceeding its campus energy goals in 2030—reducing emissions by 32% from its 2014 baseline.
- Clockworks uncovers construction or design concerns in new buildings that were previously unable to identify during the commissioning process at MIT.

### Paving the Way for campus-wide FDD in facility operations

MIT is one of the first universities to utilize fault detection and diagnostics (FDD) campus-wide to enable predictive maintenance, data-driven energy and carbon reduction, and analytics-supported building commissioning. Since 2010, MIT has connected buildings to Clockwork for data-driven facility operations. In 2013, it began leveraging FDD to support its energy and carbon reduction goals. Through a partnership with its utility provider, a subset of FDD-driven operational efficiency measures were verified to have achieved 2.1 million kWh in electric savings and over 950,000 therms in gas savings. These operational efficiency measures had the lowest simple payback out of all efforts to achieve and energy and carbon reduction.

### Data-driven operations is key to future facilities management

MIT's commitment to energy efficiency stretches across its campus. Its Facilities Executives and Managers are focused on achieving measurable success by driving more proactive operations and maintenance using FDD and data-driven metrics for operations, incorporating FDD into new projects, commissioning and day to day facility operations..

- Planned Projects for MOU 3 to 2023 GHG Reduction Projects
- Completed Projects under MOU 1 & 2



**9,700**  
EQUIPMENT MONITORED

**20 million**  
DATA POINTS ANALYZED  
PER DAY

**90**  
BUILDINGS

**10,200,000**  
SQUARE FEET

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### Results

Since implementing Clockworks™, the university has significantly reduced energy and carbon emissions while increasing operational efficiency, with support from their utility to reduce electric and gas consumption through a collaborative energy efficiency program.

The graphic below highlights the cost-effectiveness of FDD-driven monitoring based commissioning (MBCx) measures to achieve energy and carbon reduction.

Project Type	kWh	Therms	MMBtu	GHG (MTCO <sub>2</sub> e)	Simple Net Payback
<b>MBCx</b>	<b>2,103,080</b>	<b>951,527</b>	<b>102,329</b>	<b>8,599</b>	<b>0.5</b>
Lighting	10,620,747	-	36,239	3,292	3.1
Mechanical	2,982,255	1,473	10,323	935	5.6
Equipment	1,645,840	-	5,616	510	0.7
Insulation	9,176	266,761	26,707	1,475	0.8
Capital	3,861,074	184,077	31,582	2,505	
<b>MOU Totals</b>	<b>21,592,814</b>	<b>1,403,838</b>	<b>212,797</b>	<b>17,316</b>	<b>1.6</b>

### About KGS Buildings

KGS Buildings provides state-of-the-art building performance management software for facility managers, engineers, and service providers. KGS's flagship software, Clockworks™, provides automated diagnostics that reveal prioritized and actionable insights to improve facility performance and reduce costs, allowing teams to focus their time and resources on achieving the most impact. Using rich data and analytics, we help top-notch facilities teams stay on top by providing instant visibility into the highest-priority issues impacting their facilities every day.