Green + Smart Buildings

for reducing GHG emissions

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Progress Towards GHG Reduction - Canada

Historical greenhouse gas emissions and projections to 2030 with policies and measures as of November 1, 2016, Canada, 2005 to 2030
Climate Action Tracker - USA

CPP – Clean Power Plan (calculated via reduction of power sector emissions by 30% below 2005 levels by 2025)

CAP – Climate Action Plan (calculated via the quantification of the targets to double renewable energy generation by 2020 and double energy productivity by 2030 compared to 2010 levels).
“Leaders” represent 3.8% of building area

US Building Area vs. LEED Certified Building Area, End of 2015
Source: Jerry Yudelson: Reinventing Green Building, 2016
Can Big Data help?
Using the Big Data Analytics to identify energy saving potential of Cambridge Buildings

Source: Data Analytics for Energy Efficient Retrofits of Cities
Why buildings do not perform?

1. Building **occupancy changes** faster than anticipated.
2. Correlation between good building performance and the **quality of the management**.
3. Building should be designed to the **capacity of the building operation** management.
4. Complex and innovative systems will often require several years to refine and understand.
5. Correlation between insufficient **commissioning** and poorer performance

*Do our green buildings perform as intended?*

[Link to article](http://iisbecanada.ca/umedia/cms_files/Conference_Paper_1.pdf)
Why Smart buildings?

Increased operating efficiency through performance monitoring and ongoing commissioning

The typical facility will become 3-5% less efficient every year without intervention.
Examples of diagnostic solutions provided by Smart Buildings

- Equipment running in excess of scheduled operations-overage
- Simultaneous Heating and Cooling
- Economizer Malfunction
- Leaky Valve
- Night Setback
- Morning warm-up
- Space temperature variations
- Optimum Start-up/Stop
- Duct Static Pressure Reset
- Chiller Analysis

* Such diagnostics are normally provided by commissioning agent
Smart Building Concept

- effective monitoring and analytics
- ongoing commissioning
- advanced proactive maintenance

1. Buildings from all over the world are monitored from a central location where data is gathered.

2. When an anomaly is detected, the data is analyzed by a Subject Matter Expert (SME).

3. A decision is made, and the proper course of action is taken.

- Average 2 years ROI
- 3-10% savings
Command Center Leverages Experts and Technology

Utilizes **subject matter experts** to assist FM operations;

**Continually optimizes millions** of data points across thousands of assets;

**Remotely optimizes** equipment;

**Reduces** both reactive work orders and unnecessary engineer call-outs;

Seamless **integration with work order** system; dispatches technicians with the proper expertise, tools and repair parts.
Effective Approach to GHG Reduction

Combination of measures to meet the objectives of the key Real Estate Stakeholders

Source: https://www.cagbc.org/CAGBC/Advocacy/Building_Solutions_to_Climate_Change.aspx
Value Proposition

Green + Smart buildings are effective means of reducing GHG emissions which provide effective monitoring and analytics, ongoing commissioning and advanced proactive maintenance.
Thank you