
AABC Commissioning Group

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The Future of Building Optimization & Commissioning Services: Market Drivers, Barriers & Trends

Course Number: CXENERGY1603



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Course Description

The author of Navigant's widely cited 2015 research reports on future trends in demand for building optimization and commissioning services provides a primer on what's driving growth. Topics range from building envelope commissioning and onsite energy generation to demand for new technology from building owners and operators.

Learning Objectives

At the end of the this course, participants will be able to:

1. Understand the market drivers and barriers affecting the adoption of building commissioning in commercial buildings
2. Understand the dynamics shaping offering classes of commissioning services
3. Understand the technological trends in the commissioning market with specific focus on the demand for new technology from building owners and operators
4. Understand how perspectives on commissioning services vary on a global basis and how examples of commissioning successes will generate increased demand.

Scope of Services

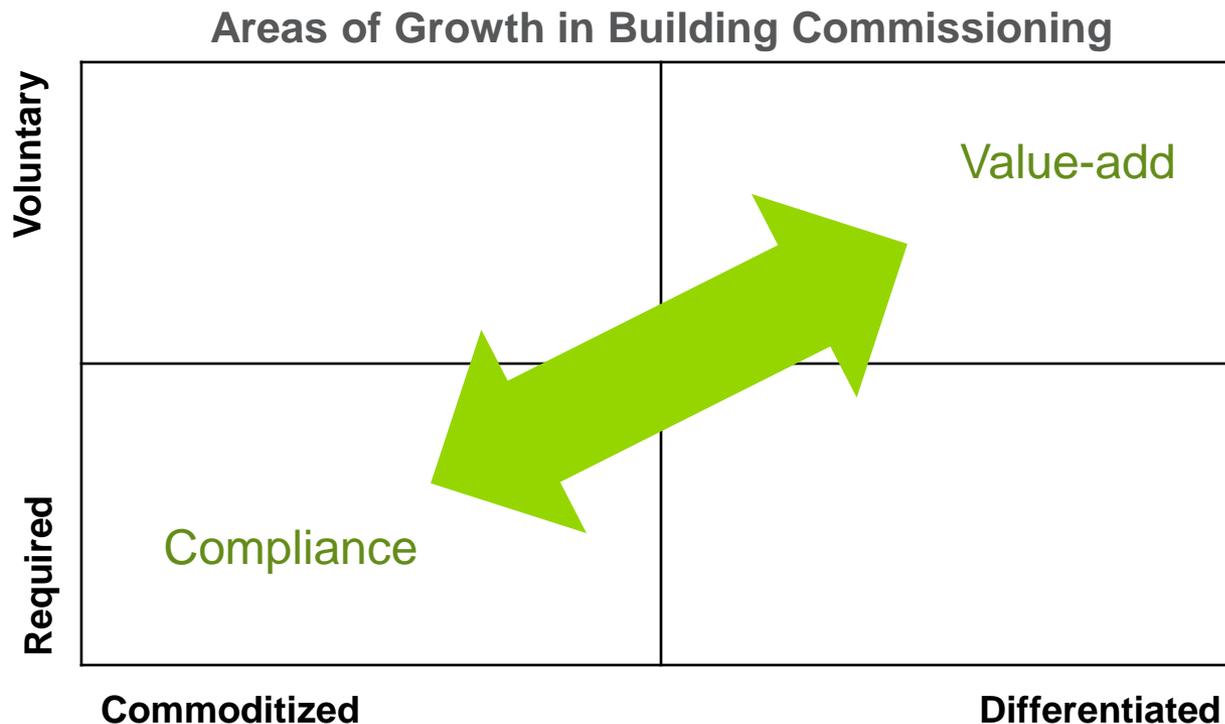
- There are three common types of optimization and commissioning services in the building industry:
 - Initial commissioning
 - Retrocommissioning
 - Monitoring-based commissioning

“Systematic process of assuring by verification and documentation, from the design phase to a minimum of one year after construction, that all facility systems perform interactively in accordance with the design documentation and intent, and in accordance with the owner’s operational needs, including preparation of operation personnel”

The National Conference on Building Commissioning

A Bifurcated Market

- Fierce competition combined with increased regulation has led to downward pricing pressure
- Simultaneously, the savings building owners have achieved through the commissioning process has further driven demand for such services

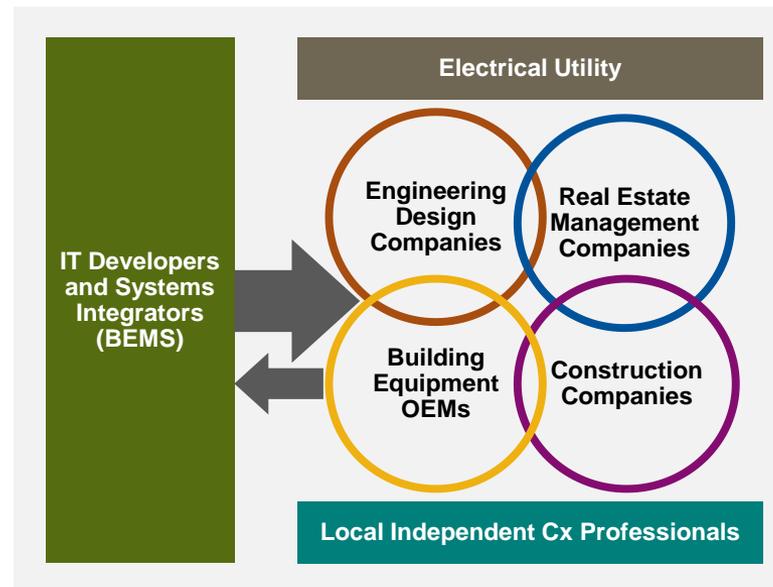


(Source: Navigant Research)

Services Provider Ecosystem

- Independent commissioning consultants with a direct reporting line to the building owner commonly provide commissioning services
- Other major service providers offer commissioning services as an extension of their broader strategies for selling equipment and material products, facilities management offerings, or design services

Building Commissioning and Optimization Services Provider Ecosystem

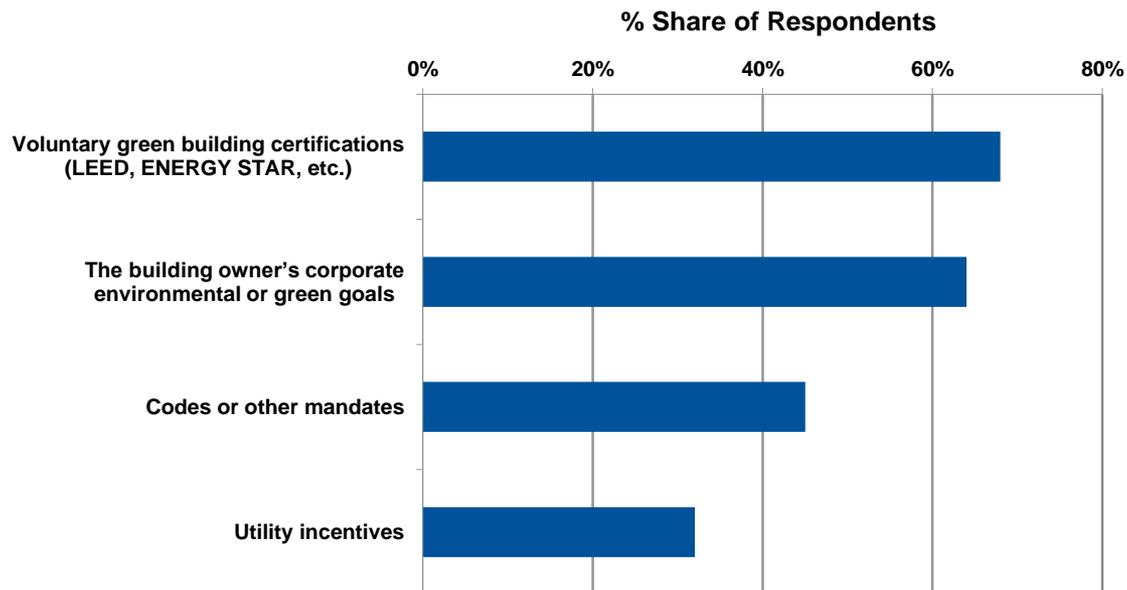


(Source: Navigant Research)

Market Drivers

- Historically, green building certification standards have been the primary driver
- Wider sustainability goals, building codes, and utility incentives are also important

Drivers of Commissioning Demand, 2013



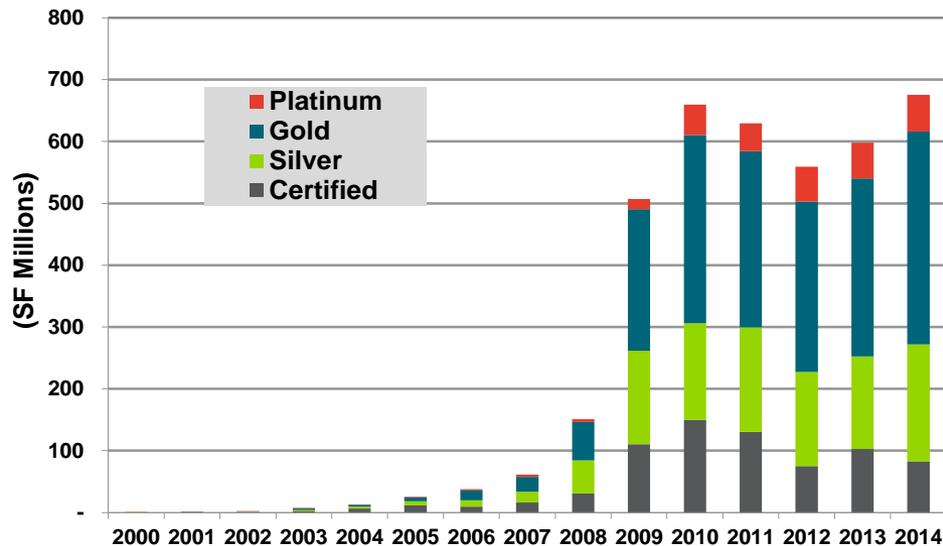
(Sources: Portland Energy Conservation, Inc., Building Commissioning Association)



Green Building Certification Programs

- Green building certification programs, particularly the U.S. Green Building Council's (USGBC's) LEED program, have been essential in the establishment of the commissioning services industry.
- Fundamental commissioning is required for all LEED BD&C and ID&C projects

Annual LEED-Certified Space, World Markets: 2000-2014



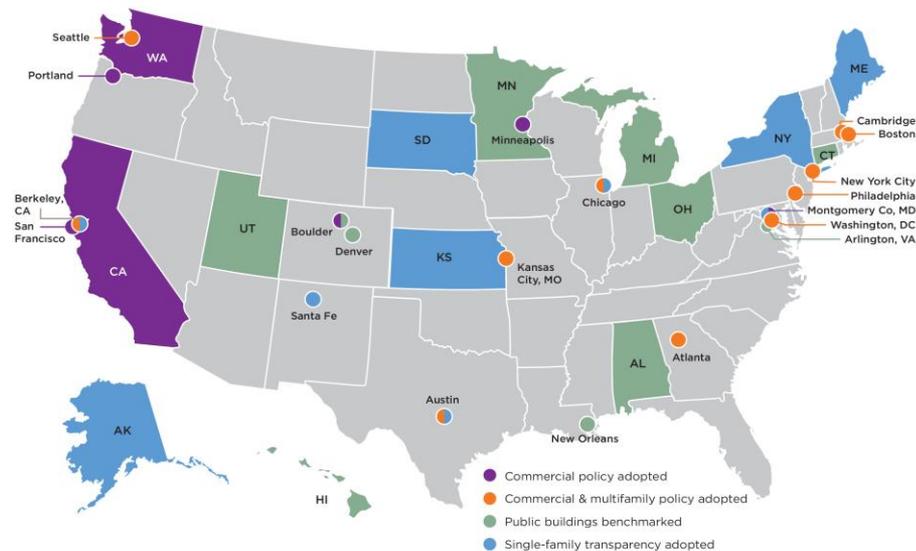
(Source: Green Building Certification Institute)



Market Drivers - Benchmarking

- One of the most successful market-based policy measures is commercial building benchmarking
 - Two states and several cities have adopted commercial building benchmarking laws
 - Some EU member states have established national databases of building-related data that can be used to benchmark buildings

U.S. Building Benchmarking and Transparency Policies



(Source: Institute for Market Transformation)

Market Drivers - Utility Demand Side Management (DSM)

- Commissioning services are becoming an increasingly important part of the utility DSM toolbox
- About 50% of North America’s utility DSM programs include incentives for building tune-ups and/or controls upgrades

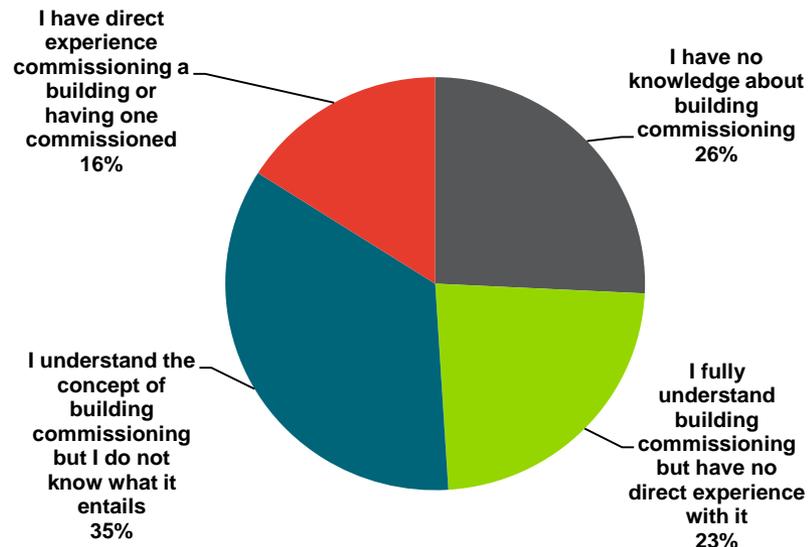
Sample of Utility Rebate Programs in the United States

Program Name
ComEd - Smart Ideas
Ameren Illinois - ActOnEnergy
DTE Energy - Energy Efficiency Program for Business
AEP Ohio – Retrocommissioning Program
Missouri Ameren Missouri (Electric) - Business Energy Efficiency Program
Texas CenterPoint Energy - Commercial and Industrial Energy Efficiency Programs
California SCE - Non-Residential Energy Efficiency Programs
New York Existing Facilities Rebate Program
Washington Puget Sound Energy - Commercial New Construction Energy Efficiency Grant Program
Massachusetts NSTAR (Electric) - Business Solutions Program
Arizona APS - Energy Efficiency Solutions for Business
Maryland Baltimore Gas & Electric Company (Electric) - Commercial Energy Efficiency Program
Illinois Retro-Commissioning (RCx) Program
Maryland Delmarva - Commissioning and Operations Incentive Programs

Market Barriers – Lack of Familiarity with Commissioning

- Only a relatively small fraction of building owners are opting for commissioning services independently
 - Global awareness of commissioning is still low
 - Many building owners remain unconvinced of its benefits

How familiar are you with building commissioning? (n=400)



(Source: Navigant Research)

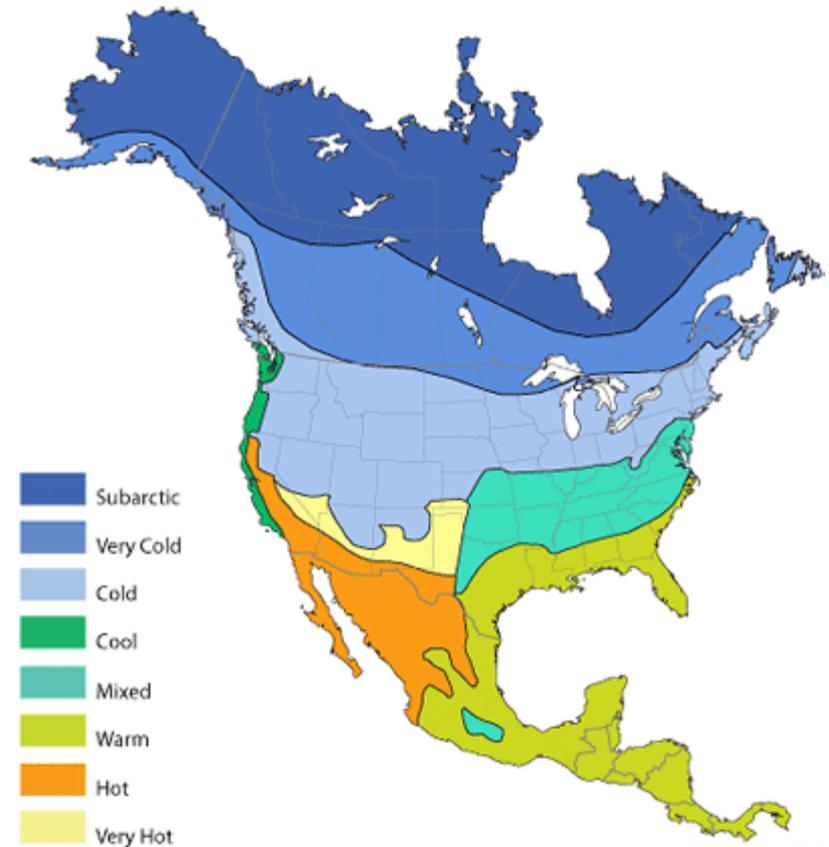
Market Barriers

- Lack of Qualified Service Providers
 - Many geographical areas still have a shortage of qualified commissioning engineers
 - The industry has yet to coalesce around a single certification, leading to varied levels of skill and experience among commissioning agents
- Misaligned Incentives
 - Commissioning offers benefits that often do not directly serve those who are responsible for paying the costs of commissioning
- Cost
 - Full building commissioning can add between 1% and 4% to the mechanical and electrical construction costs of a project

Global Dynamics – North America

- The commissioning services market in the United States has received a considerable boost in recent years, due in large part to the increasing adoption of LEED certification as well as ENERGY STAR scoring required by benchmarking rules
- Demand for commissioning services in Canada has focused on commissioning new buildings, but retrocommissioning is now emerging for existing buildings

Hygrothermal Climate Zones of North America



(Sources: Whole Building Design Guide)

Global Dynamics – Europe

- Throughout the rest of Western Europe, commissioning is a familiar but not often utilized practice, with a few exceptions
 - Commissioning is most common in Norway, Sweden, Finland, and the Netherlands
 - A handful of other countries, such as Belgium and the Czech Republic, have national research agendas around building optimization

The 28 Countries of the European Union



(Sources: European Union)

Global Dynamics – Asia Pacific

- The maturity of the building optimization and commissioning services market in the Asia Pacific region varies considerably
 - Commissioning is standard practice in Japan and Taiwan
 - no major regulations in China require building commissioning services
 - Contrasting with mainland China, Hong Kong has a relatively developed building commissioning and services market
 - The building commissioning services market in Australia has grown through the increased adoption of green building certification as well as corresponding laws, such as Mandatory Disclosure

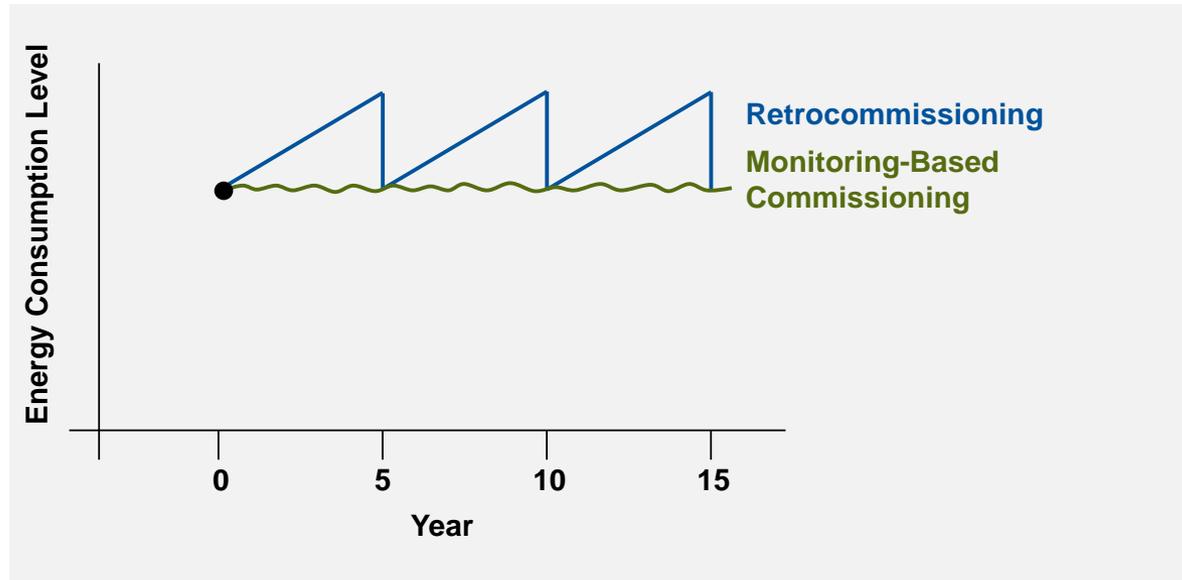
Global Dynamics – Rest of the World

- The market for commissioning services in Latin America is concentrated in Brazil, where intense green building activity and regulatory schemes supporting energy efficiency have driven significant market growth in recent years
- In the Middle East, commissioning is concentrated in major construction centers such as the United Arab Emirates, Qatar, Saudi Arabia, and Oman

Technology - Cloud-Based Ongoing Commissioning

- New SaaS platforms are increasing the level of granularity in commissioning events to constantly detect anomalies and enable building owners and facilities managers to address those anomalies immediately
- The two main capabilities are:
 - Fault detection and diagnosis
 - Real-time monitoring, reporting, and advising

Retrocommissioning vs. Monitoring-Based Commissioning

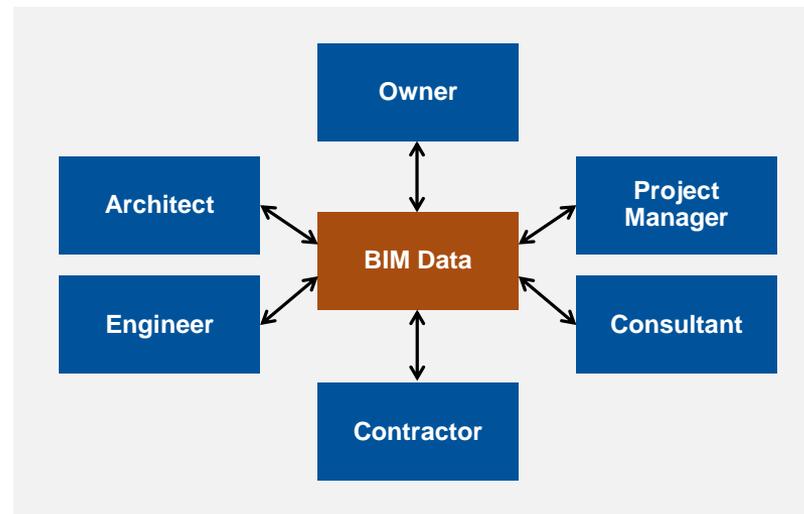


(Source: Navigant Research)

Technology - Integration with Building Information Modeling

- BIM is starting to become a more common process and technology suite for the building construction process
- Enhancements to the BIM platform with SaaS-based solutions that will support higher levels of collaboration and whole-systems design

Diagram of BIM Project Team Interaction



(Sources: Navigant Research)

Conclusions

- With low barriers to entry and a growing market, competition is increasing, driving costs down
- Growth for commissioning providers will be difficult, as existing markets will become more competitive and scaling up does not provide substantial improvements in efficiency.
- Modest technological improvements to the commissioning process have been made, such as the use of electronic documentation and cloud storage
- even as awareness and education among building owners remain a hurdle, growth in monitoring-based commissioning is expected as commissioning agents incorporate the technology into their process

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