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WELCOME TO
ADVANCED EXISTING BUILDING COMMISSIONING

ONLINE TRAINING



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BEYOND SMART CITIES

GREEN BUILDING COMMISSIONING



2.What is Building Existing Commissioning?

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COMMISSIONING SPECIALIST CURRICULUM

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Initiatives to improve energy efficiency provide a means to cut emissions of greenhouse gases (GHG), as well as to decrease costs for companies and individuals in India, generate employment opportunities, encourage energy conservation, and give a boost to the economy.



Advanced Existing Building Commissioning - EBCx

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Learning Objectives

- Brief Introduction
- Definition of Existing Building Commissioning (EBCx)
- The Goals and Boundaries of the EBCx
- Several stages of EBCx

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Introduction

- Existing Building Commissioning, also known as EBCx, is the process of evaluating an existing building's systems and equipment to determine whether or not they are still operating as planned and designed, and if not, to make the appropriate modifications.

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Existing Building Commissioning

- Existing building commissioning projects are carried out for a variety of reasons, the most common of which is to address occupant comfort issues; however, these projects also play an essential role in analysing how the various systems and components of the building work together and how those working conditions can be enhanced.

- It is possible to significantly increase the value of your building assets by lowering their energy operating costs, as well as increasing occupant comfort and satisfaction.

- It has been demonstrated beyond a reasonable doubt that using EBCx practises can lower operating expenses while simultaneously raising IEQ standards in a building.

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Definition of Existing Building Commissioning (EBCx)

Existing Building Commissioning (EBCx) is a systematic process for planning, assessing, investigating, analyzing, improving, optimizing and verifying the performance of building systems and assemblies.

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Commissioning is an intensive quality assurance process that ensures that a building "operates as the owner initially intended and that building staff are prepared to operate and maintain its systems and equipment."1 Beyond being a final systems check, commissioning has evolved into a progressive process that includes systematic verification and testing, staff training, and thorough documentation of all systems.

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Why is EBCx important?

- All buildings experience performance degradation over time.
- mechanical, and control systems, reducing performance. Complex buildings feature interactive systems with sophisticated controls that may affect building operations. Here, little issues affect performance.
-
- EBCx helps all building occupants. Energy savings and equipment performance boost net operational revenue for property owners. Savings depend on building age, size, location, and EBCx scope. Retro-commissioning costs $0.13 to $2.00 per square foot and pays back 0.2 to 2.1 years, according to studies. Energy savings average 15%.
- EBCx is a significant tool when a building owner is seeking for ENERGY STAR certification. Retro-commissioned structures have gained 10 or more certification points.
- EBCx impacts facility management and tenants. Changes to temperature management and indoor air quality improve occupant satisfaction and help building managers manage building systems.

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Existing building commissioning is a broad term that encompasses commissioning options applied to existing buildings, including recommissioning, retrocommissioning, and ongoing commissioning, as defined below:

- Recommissioning is a re-optimization process for existing buildings. It seeks to improve how building equipment and systems are operating to meet current occupant needs. This is done by investigating to identify problems and integration issues and identifying low- or no-cost operational improvements to obtain comfort and energy savings. This process can be undertaken alone or along with a retrofit project.

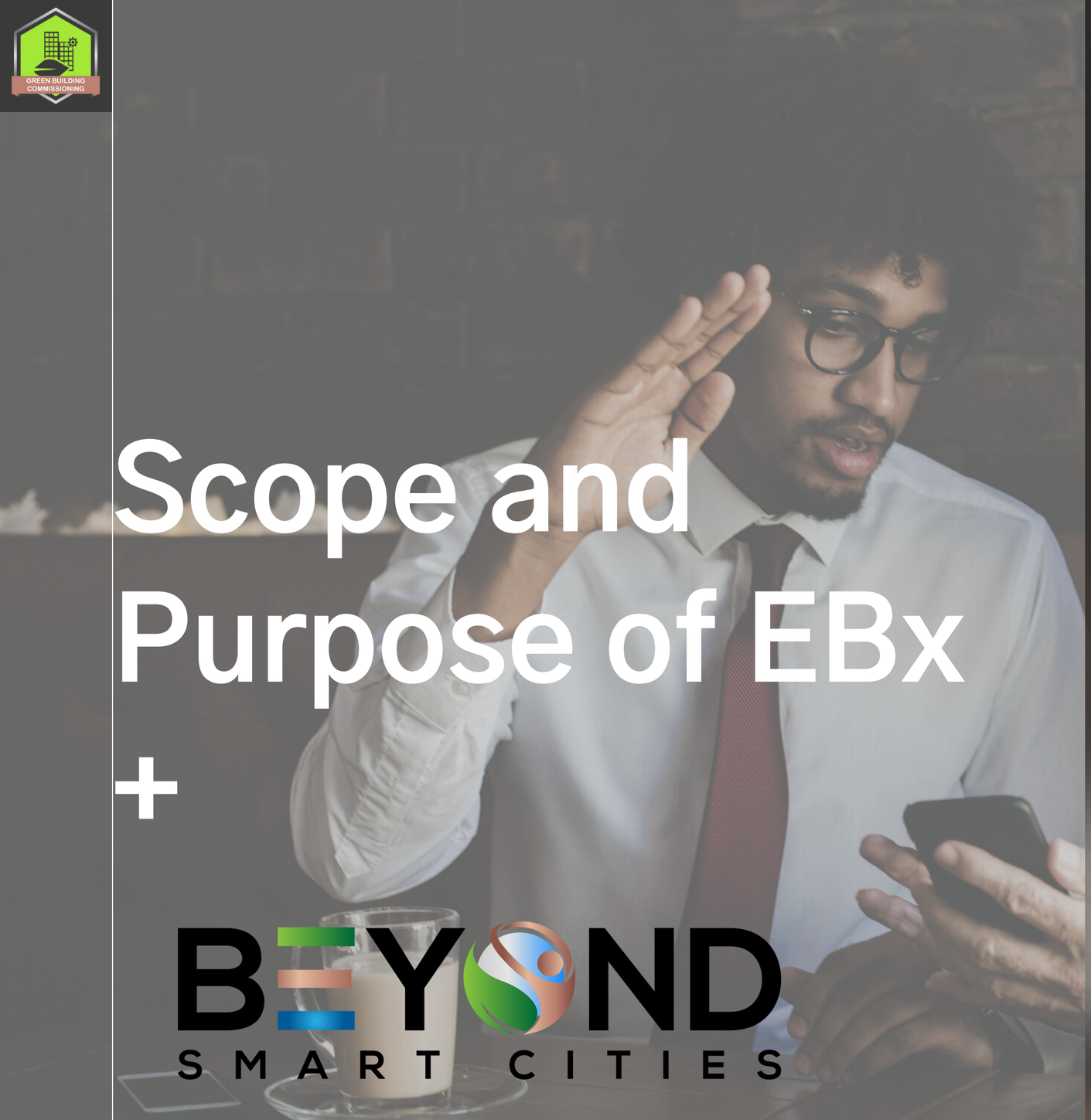
- Retrocommissioning is a similar term for the same process, but it refers to an already-built building that wasn't commissioned when it was first built.However, further investigation is usually needed due to the lack of previous recommissioning data.

- Ongoing commissioning is the continuous process that helps monitor and ensure effective and efficient building performance over its lifecycle. Energy use, benchmarking, conformance to and continuous revision of the current facility requirements, automated fault detection and diagnostics, and training are all key parts of the ongoing commissioning process.

Scope and Purpose of EBCx

- The scope of EBCx includes existing buildings, systems, and assemblies which may or may not have been previously commissioned.

- The scope may be limited to energy-using equipment or expanded to include other systems that affect comfort, such as temperature control or air quality impacting systems, life safety and other mission critical or redundancy equipment in healthcare, industrial process, and similar facilities, building envelope elements like roofs, windows and doors, curtain walls, and other building envelope assemblies, or even aesthetically pleasing systems.



Scope and Purpose of EBx +

The goal of EBCx is often to address facility issues such as those listed below:

- A shift in the functional requirements, building usage, or ownership of the structure.
- The structure consumes more energy than it should or than it ever has in the past.
- The building is plagued with issues, some of which have an effect on the people who live there or the functioning programme.
- The systems and assembles are either not functioning correctly or are in a poor state.
- A wing or other extension that was added to the building.

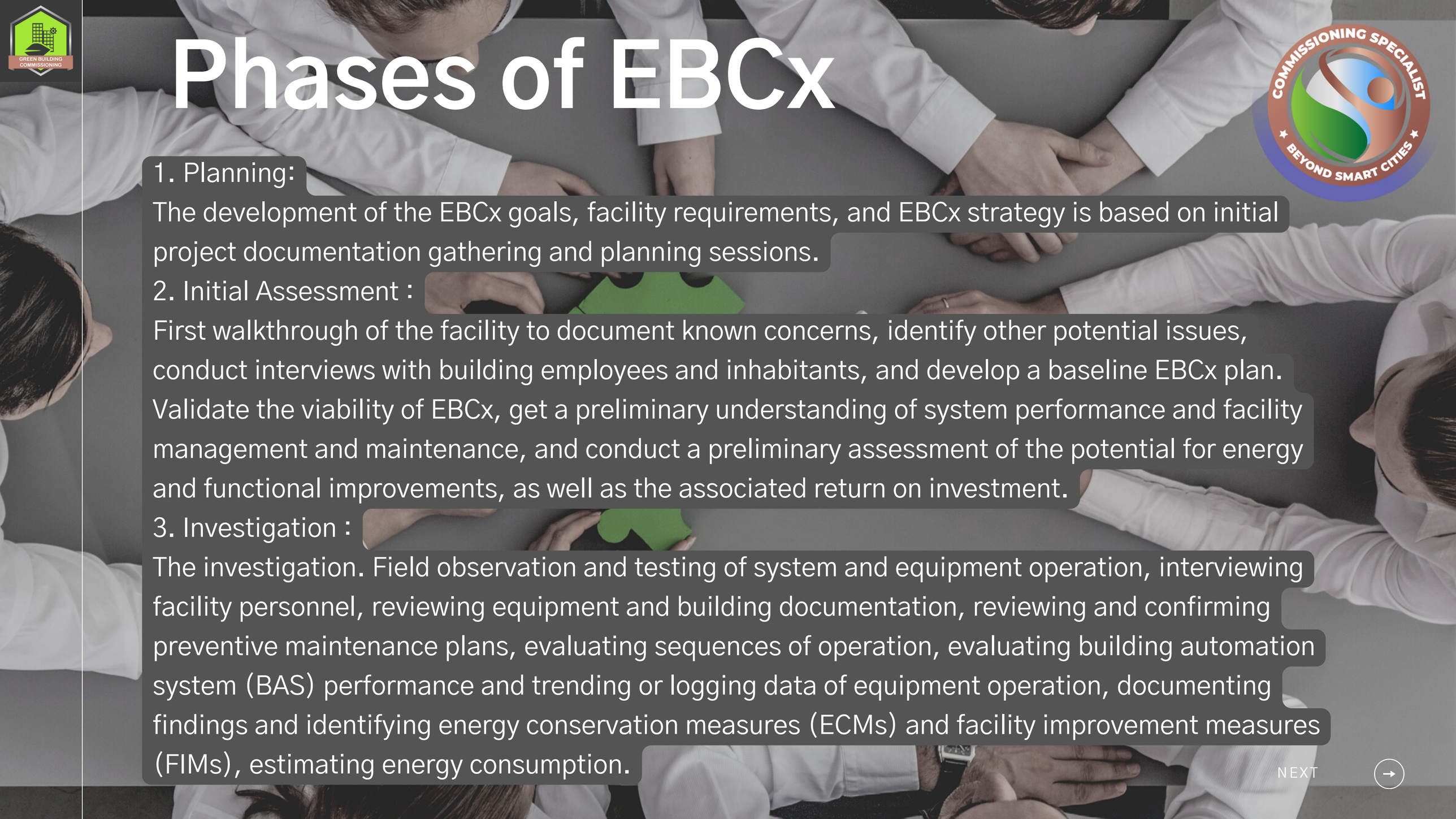
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Scope and Purpose of EBx +

EBCx solves these conditions with a carefully designed, comprehensive, and methodical procedure. The following are key process aspects that have a favourable impact on building asset management and energy efficiency: A comparison of the current functional requirements of the facility with the original design foundation Field-verified current performance is compared to the original design basis and opportunities to optimise performance.

- Taking strategies to fix performance weaknesses and capitalise on opportunities
- performance optimisation opportunities.
- Discover and capitalise on new systems, equipment, and technology that may not have existed previously.
- The structure was built to improve and optimise performance.

Planning and Initial Assessment, or Initial Assessment and Investigation Phases, are periodically merged to minimise cost and/or avoid duplication of effort, depending on the size, scope, and complexity of the project, and in coordination with the Owner or representative.



Phases of EBCx

1. Planning:

The development of the EBCx goals, facility requirements, and EBCx strategy is based on initial project documentation gathering and planning sessions.

2. Initial Assessment :

First walkthrough of the facility to document known concerns, identify other potential issues, conduct interviews with building employees and inhabitants, and develop a baseline EBCx plan. Validate the viability of EBCx, get a preliminary understanding of system performance and facility management and maintenance, and conduct a preliminary assessment of the potential for energy and functional improvements, as well as the associated return on investment.

3. Investigation :

The investigation. Field observation and testing of system and equipment operation, interviewing facility personnel, reviewing equipment and building documentation, reviewing and confirming preventive maintenance plans, evaluating sequences of operation, evaluating building automation system (BAS) performance and trending or logging data of equipment operation, documenting findings and identifying energy conservation measures (ECMs) and facility improvement measures (FIMs), estimating energy consumption.

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Phases of EBCx+

4. Implementation :
Implementation of desired energy saving and facility improvement measures, followed by commissioning and verification of outcomes and performance via documented trending and post-implementation testing and data collection. This may involve the examination of remediation designs and the installation of matching remedies.

5. Hand-Off :
Systematic transition from a commissioning activity and commissioning team to normal operating practise and the operations and maintenance (O&M) team; implements measures to ensure continued performance, such as updating documentation, revising preventive maintenance requirements, training, and performance tracking; may include plans for an Ongoing Commissioning Phase.
In some utility-funded EBCx programmes, HandOff is referred to as the "Verification Phase."

6. Ongoing Commissioning (OCx):
Ongoing Commissioning (OCx): The ongoing procedure that helps to monitor and assure the effective and efficient operation of a building throughout its life. Energy consumption, benchmarking, conformity with and continual adjustment of the current facility needs, automated fault detection and diagnostics, and training are all essential components of the ongoing commissioning process. The Building Commissioning Association is slated to publish OCx Best Practices in early 2020.

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EBCX Process Overview

Planning Phase
- Screen and select the building
- Define objectives
- Define current facility requirements (CFR)
- Define scope and roles; engage a CxP

Initial Assessment Phase
- Review building documentation
- Develop initial EBCx Plan
- Analyze energy data
- Conduct a kickoff meeting
- Perform initial walk-through
- Conduct staff interviews
- Document findings
- Meet with Owner to focus work for investigation
- Update EBCx Plan and scope

Investigation Phase
- Run and analyze trends and monitoring
- Conduct further document review
- Conduct more staff interviews
- Conduct deeper field inspections
- Conduct functional testing
- Document findings
- Estimate savings and implementation costs
- Review findings with Owner
- Select findings to implement
- Update Cx Plan for implementation and handoff

Implementation Phase
- Complete additional investigation and engineering
- Engage subcontractors, as needed
- Implement selected findings
- Verify performance of ECMs and FIMs
- Adjust energy savings estimates and costs

Hand-Off Phase
- Train facility staff
- Update sequences of operation
- Update Systems Manual
- Update preventive maintenance procedures
- Implement performance tracking
- Develop ongoing commissioning recommendations

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Existing Building -EBCx Commissioning Benefits And Goals

- EBCx is a four-step process that starts with an in-depth assessment of the current building's water and energy efficiency, operation, and benchmarking analysis, which informs the planning, improvement, and performance phases.
- Knowing the criteria enables a ranking of potential changes from lowest to highest importance. It also tackles undiscovered structural flaws that will impact operational improvement efforts. The documentation of the process, results, and enhancements are subsequently sent to operator training to conclude the EBCx.
- The purpose of this research is to examine the existing Mechanical, Electrical, Plumbing, automation, and Building Envelope systems in order to manage energy expenses and fix operational issues that go beyond the scope of routine maintenance. Changes in operations or occupancy may need reconfiguration of matching controls to enhance indoor air quality and building pressurisations.

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Existing Building –EBCx Commissioning Benefits And Goals

- In addition to enhancing energy efficiency, EBCx offers several additional advantages. They include, without limitation:
- During EBCx, equipment problems are found and resolved permanently, resulting in long-term cost benefits.
- Visual and Thermal Comfort: Illumination, temperature, and humidity enhancements are addressed.
- Modernizing HVAC operations reduces air pollutants and excessive humidity, hence improving indoor air quality. This is a significant improvement since humidity promotes the growth of mould and dust mites, which in turn induce allergic responses and asthma attacks.
- Optimally functioning equipment has a longer service life, allowing building owners to defer the capital expenditures that arise from equipment replacements.
- Little things, such as noise or flickering lights, have the potential to have a significant influence on productivity. Issues are detected and addressed during the retrocommission.

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