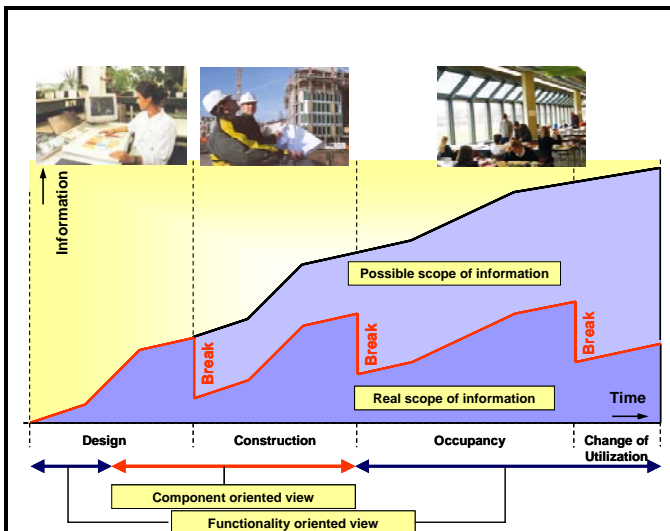




The Executive Committee of the Energy Conservation in Buildings and Community Systems (ECBCS) program established a new research project (Annex) in June 2005 called *Cost-Effective Commissioning for Existing and Low Energy Buildings*. Natascha Castro from the National Institute of Standards and Technology and Daniel Choinière from the CANMET Energy Technology Centre – Varennes of Natural Resources Canada are the Co-Operating Agents of Annex 47.

The goal of Annex 47 is to enable the effective commissioning of existing and future buildings in order to improve their operating performance. The commissioning techniques developed through this research will help transition the industry from the intuitive approach that is currently employed in the operation of buildings to more systematic operation that focuses on achieving significant energy savings. The Annex will also exchange information on commissioning practices in different countries and disseminate relevant information to national practitioners.



Design, construction, commissioning, and operation and maintenance are typically done by different people and even different companies. By changing the players within a project, knowledge that would be helpful or even important for future tasks is often lost. Due to the difficulty of maintaining consistent information representation, not all data available in the previous phase is made available when transitioning to subsequent phases. Design intent information is no longer kept in working drawings and design specifications, the complete design specifications are no longer available in the commissioning report, and O&M manuals rarely contain information about the insights gained during commissioning. Therefore, information rapidly atrophies during these transition points (e.g., 'Real scope of information') and has to be subsequently recovered.

Background

The usual practice when commissioning buildings is to attempt to make the building work as designed. However, the "as-built" and "as-used" building virtually always differs from the original design. Hence new buildings can often operate using 5-10% less energy if they are optimized based on actual use and occupancy rather than using only the information available to the designer.

Commissioning methods and tools are required to ensure that advanced components and systems reach their technical potential and operate energy-efficiently. Likewise, commissioning methods and tools should strive to improve the energy efficiency of conventional and advanced existing buildings beyond just the design intent. However, documented commissioning methods are currently only available for conventional HVAC systems and do not address the advanced systems and system combinations that are important for low energy buildings. Without suitable methods and tools to ensure the correct interaction between components and systems, their performance in the field can be expected to fall significantly short of what is intended.

The environmental and energy saving benefits for commissioning are significant but there is a need to address technological and process barriers to achieve greater market penetration. It is generally recognized that demonstrating cost-effectiveness, including the persistence of commissioning measures will remove a major barrier to the wider market acceptance of commissioning.

Objectives

The objectives of Annex 47 are to:

- Extend existing methods and tools to address advanced systems and low energy buildings, utilizing design data and the buildings' own systems in commissioning.
- Automate the commissioning process to the extent practicable
- Develop methodologies and tools to improve the operation of buildings in use.
- Quantify and improve the costs and benefits of commissioning, including the persistence of benefits and the role of automated tools in improving persistence and reducing costs without sacrificing other important commissioning considerations.

Scope Annex 47 will address:	Subtasks
1) What can be done for future buildings to enable cost-effective commissioning?	Initial Commissioning of Advanced and Low Energy Building Systems
	<ul style="list-style-type: none"> • Develop information flowchart • Develop information model • Develop general commissioning methodology for advanced & low energy buildings <ul style="list-style-type: none"> – Functional test procedures – Control strategies for advanced systems – Case studies
2) What can be done for existing buildings and systems to conduct a cost-effective commissioning?	Commissioning and Optimization of Existing Buildings
	<ul style="list-style-type: none"> • Develop tools <ul style="list-style-type: none"> – Data visualization – Field optimization – Commissioning • Perform and disseminate fully documented case studies
3) How can the cost-benefit situation of commissioning be represented?	Commissioning Cost-Benefits and Persistence
	<ul style="list-style-type: none"> • Develop cost-benefit methodology • Develop methodology & tools to enhance persistence • Develop international databases <ul style="list-style-type: none"> – Commissioning cost-benefit – Persistence

Outputs

- Methods and tools for commissioning advanced systems and low energy buildings.
- Methods and tools for field application.
- Information on the costs and benefits that can be used to promote the wider use of commissioning.

Management of the Annex

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Annex 47

Cost-Effective Commissioning for Existing and Low Energy Buildings

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