


 Government of Canada / Gouvernement du Canada


Montréal 2005

***Low Hanging Fruits that Go Unnoticed:
Opportunities to decrease your energy bill by 10-30% with a two-year payback***


Climate talks December 9, 2005
Gilles Jean, Director General, CANMET
Energy Technology Centre-Varenes




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*We're taking climate action now
by ...*

- Building or renovating buildings using a Green Building or C-2000 standard
- Retro-commissioning existing building


Montréal 2005

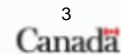
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More efficient building

Do you know that you can build/renovate a building that will

- Consume 50% less energy?
 - Consume 40% less water?
 - Produce 50% less waste?
- For essentially the same cost !

Examples: C-2000 buildings,
GREEN or LEED Buildings



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'C-2000 Buildings

Mayo School, Mayo YT



C-2000 was a challenge to the industry to design buildings that were 50% more efficient than the Model National Energy Code

Mountain Equipment Co-op - Winnipeg



- 95% recycling
- 65% less energy



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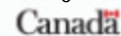
C-2000 Incremental Cost

Building Name	Gross Area (m ²)	% Over MNECB	Incremental Capital Costs
1138 Melville Street	16188	25	0.0%
Holy Rosary School	4228	25	10.5%
Touchwood Qu'Appelle Health District Centre	803	26	5.9%
Regional District of Fraser-Fort George	2275	26	25.3%
Peter D. Clark Long Term Care Centre	9474	27	2.4%
BC Gas Multi-Use Utility	2008	28	4.6%
Royal Bank	6148	29	0.4%
St. Joseph's Long Term Care Centre	21777	33	7.7%
Parke at Fish Creek	5000	34	3.5%
Strathroy Dental Office	6503	34	0.0%
Mother Theresa Elementary School	5038	35	0.0%
St. Andrew Elementary School	5038	37	0.0%
Breton Banville Office Building	4552	39	10.9%
Annapolis Royal Nursing Home	3421	40	0.0%
Yukon Energy Corporation Head Office	1200	42	0.0%
Sacred Heart of Jesus Elementary School	5038	42	0.0%
Northwood Lodge	1192	45	0.0%
Mountain Equipment Co-op (C-2000 project)	2484	56	11.0%
Gilliam School Library Addition	458	62	0.7%
Alice Turner Branch Library (C-2000 project)	1358	65	8.7%
Average	5209	37.5%	4.6%

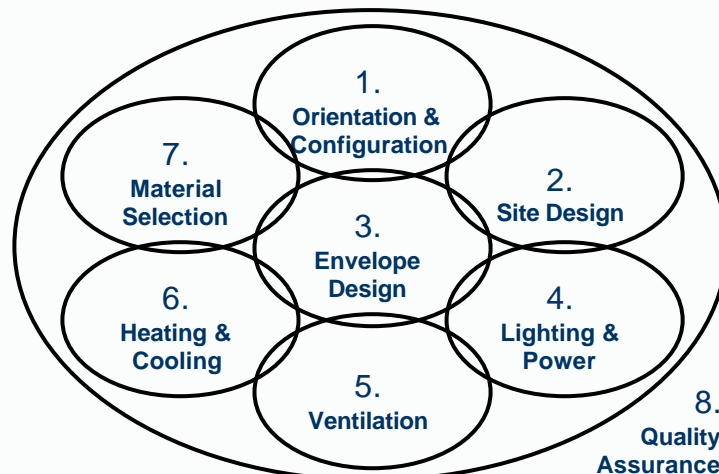
- Average cost +4.6%
- 32% of the buildings had no additional cost
- Technology is not what made the difference...
 - It is the process
 - and people...
- Green Buildings and LEED silver are cost neutral



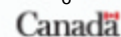
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The integrated design process



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The building operation problem ...

Most buildings :

- Have equipment problems unknown to the operator
- Are controlled by Building Energy Management Systems (BEMS) that are very rudimentary
- Have an operation is limited to preventive maintenance and the least possible intervention

The result: Energy waste of typically 20%



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The solution: retro-commissioning

- A systematic process for improving building operation
- Rarely used in spite of proven cost effectiveness

A few results:

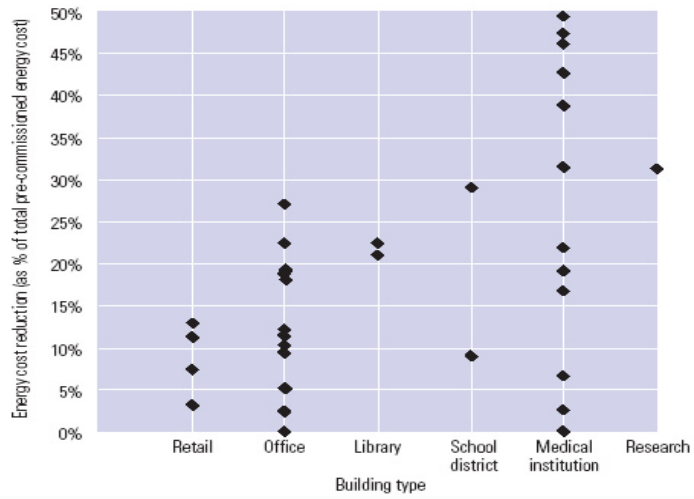
1. « Commissioning existing buildings », Joan Gregerson, E-Source, Report TU-97-3; WWW.esource.com
2. « The cost effectiveness of commercial buildings commissioning », Lawrence Berkeley National Laboratory, Portland Energy Conservation Inc., Energy Systems Laboratory, Texas A&M University; December 15, 2004

Note : All data are US \$

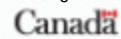


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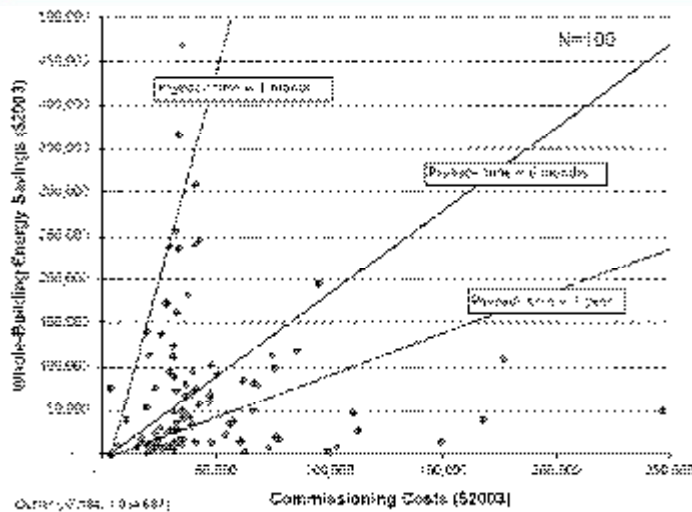
1. Commissioning existing buildings, Joan Gregerson, -Source, Report TU-97-3; WWW.esource.com



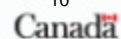
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2. THE COST-EFFECTIVENESS OF COMMERCIAL-BUILDINGS COMMISSIONING – Lawrence Berkely et al.



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But it is rarely done! Why?

- Lack of knowledge of building owners and building managers
- Lack of standard methodology
- Lack of expertise
- A mentality of investing the least possible in building operation
- Waste is not visible ... what you don't know does not hurt!

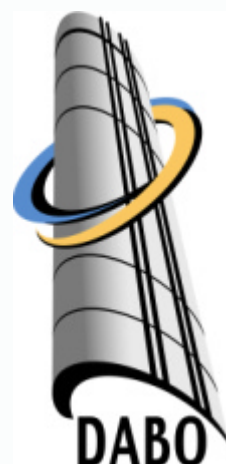


One option to change that..

Use of artificial intelligence for

- Continuous monitoring
- Continuous diagnostic
- Continuous optimisation

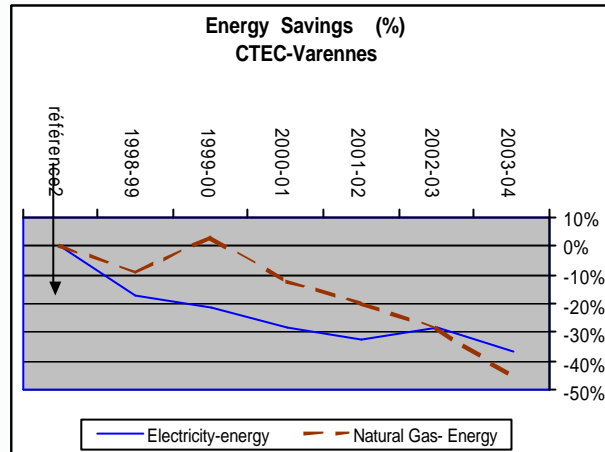
DABO= Diagnostic Agent
for Building Operation





Energy Savings

40% energy consumption reduction following the implementation of DABO and the correction of identified problems



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Conclusions

- Very cost effective opportunities to decrease energy consumption
- Opportunities rarely implemented for a number of reasons :
 - Competing for capital
 - Lack of awareness
- How can we continue to waste typically 10-30% of the energy consumed in the building sector (and the associated money) when we have cost effective solutions like those?



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