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Royal Roads University

## **The Economics of Green Buildings in Canada**

October 7, 2004 1:00pm - 3:00 pm (PST)

Moderated by Dr. Ann Dale and Rodney McDonald

### **Participants**

**Ann Dale**, Professor, Science, Technology & Environment Division, Royal Roads University

**Rodney McDonald**, MEM Learner, Royal Roads University

**Corin Flood**, Facilities Planner, Mountain Equipment Co-op

**Pierre Guevremont**, Chief, New Building Program, Natural Resources Canada

**Nils Larsson**, Director of International initiative for a Sustainable Built Environment, Ontario

**Gordon Shymko**, Principal of G. F. Shymko & Associates Inc., Vancouver, B.C.

**Paul Stevens**, ZAS Architects, Toronto, Ontario

**Alex Zimmerman**, President and CEO of the Canada Green Building Council, Ottawa, Ontario

### **Dialogue**

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#### **Ann Dale**

Thank you for participating in this dialogue on Green Buildings. I would like to start by having our panelists identify themselves. Following the introductions, Rodney would you then pose the first of the three questions that the panelists will be addressing.

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#### **Alex Zimmerman**

My name is Alex Zimmerman. I am the start-up President of Canada Green Building Council (CaGBC), a national environmental non-profit organization dedicated to transforming the market for green buildings in Canada. Prior to taking on this challenge in Aug of 2003, I lead various environmental initiatives at BC Buildings Corporation, including contaminated sites clean-up and establishment and ISO14001 certification of BCBC's EMS. I also lead the Canadian Team for the 2000 and 2002 rounds of Green Building Challenge.

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#### **Nils Larsson**

Nils here: In my mind I am tall, thin and all dressed in black, just like a real architect. I have some comments I prepared during the last half hour & I also found some attachments that may be useful.

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**Pierre Guevremont**

My name is Pierre Guèvremont. I am with Natural Resources Canada in Ottawa as Chief, New Buildings Program of the Buildings Division of the Office of Energy Efficiency. We deliver an incentive program called the Commercial Building Incentive Program (CBIP) which provides incentives for the design of new energy efficient commercial and institutional buildings.

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**Paul Stevens**

Good afternoon from Toronto. I trust that our collective experiences will generate some interesting discussion and comparisons. As an architect in private practice, since the early 1990's we have attempted to push the boundaries of sustainable design, primarily in the public sector. Some experiences I hope to share today.

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**Corin Flood**

Good afternoon from the sunny interior, my name is Corin Floor and I presently work for Mountain Equipment Co-op managing their building program (but will shortly be working for reSource Rethinking Building, a developer and consultancy primarily engaged in multi-unit residential development of the greener sort. They develop their own projects and provide consulting services to developers and land owners).

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**Gordon Shymko**

Hello. I am the principal of G. F. Shymko & Associates Inc., an engineering consulting firm specializing in energy and environmental engineering for commercial/institutional buildings. Among other things, I have a fair amount of experience with C-2000 and CBIP, and I am currently a member of the GBC/SB05 Canadian Team.

Not to take the easy way out, but I concur with Alex, who concurs with Ray's definition of a green building.

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**Rodney McDonald**

Good afternoon from Winnipeg,

As you know this e-dialogue is part of my Masters research and a way for me to tap into some of the best green building minds in the country. Let's start with the first question:

How do you define a green building?

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## **Alex Zimmerman**

I like the definition given by Dr Ray Cole of UBC (and I am paraphrasing here):  
A green building is one that shows a significant advance over current practice and which share key characteristics such as:

- radically reduced energy consumption,
  - improved resource efficiency,
  - reduced environmental impacts,
  - improved indoor environment,
  - less impact on local infrastructure,
  - easier to manage,
  - enhanced marketability and asset value, and
- which used a different design process to get there.

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## **Pierre Guevremont**

I like the LEED definition of 'design, construct and operate in a manner that is environmentally responsible, profitable, and healthy places to live and work'.

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## **Nils Larsson**

Here is mine:

Green v. Sustainable building

Green building covers a wide range of issues related to environmental performance. Sustainable building extends this to include consideration of some social and economic issues. For example, the new version of the GBTool assessment framework includes the following social and economic issues areas:

Cost and Economics

G1.1 Life-cycle cost

G1.2 Planned measures to minimize construction cost

G1.3 Measures planned for minimization of operating and maintenance cost

G1.4 Measures planned for affordability of residential rental or cost levels

G1.5 Planned measures to maximize support of Local Economy

G1.6 Planned measures to minimize Externality costs - not yet operational

Social Aspects

G2.1 Planned measures to minimize construction accidents

- G2.2 Measures planned to maximize security for building users
- G2.3 Access for physically handicapped persons
- G2.4 Access to direct sunlight from living areas of dwelling units
- G2.5 Access to private open space from dwelling units
- G2.6 Visual privacy from the exterior in principal areas of dwelling units
- G2.7 Access to views from work areas

Regarding Alex's quote from Ray Cole: I disagree that following is part of a green building definition - it is an element that makes a green building more likely, but one could have a brilliant architect following a normal design process who could produce a green building.

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**Rodney McDonald**

Do others also see a difference between "green building" and "sustainable building".

What is the difference?

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**Nils Larsson**

Sustainable building includes a range of social and economic considerations.

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**Alex Zimmerman**

Regarding the difference between green and sustainable, I agree that buildings need to do a better job of considering the other two legs of the sustainability stool, as it were.

However, I think it depends on whether you take the view that sustainability is a destination or a journey. I believe that sustainability is ultimately a destination, albeit one that is not yet well defined. In that light, I don't think sustainability really makes sense at a building level. At a global level certainly, a continental level probably, at a country or bioregional level, perhaps, at a municipality, neighborhood or building level, I don't think so. Buildings are too interconnected to their surrounding infrastructure to carry the weight of "sustainable" We might speak usefully of restorative as a worthwhile goal for buildings rather than sustainable.

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**Gordon Shymko**

At the risk of bringing personal perceptions into the discussion, I have become a bit sensitive to "green" to the extent that it seems to have taken on arguably distasteful marketing connotations in some circles. Sustainability to me seems to be a much more robust and comprehensive descriptor.

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**Ann Dale**

Alex, can you then expand on your meaning of 'restorative'?

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**Alex Zimmerman**

Restorative. What I mean is that even the best of buildings that we build now, either green or sustainable, really only do things less badly. They still generally degrade their local environments, they usually pollute the water to some degree, they usually use virgin materials and so on. As a goal, I think we need to take the closed systems approach and look to build buildings/systems that generate and perhaps export their energy, where the water leaving the building is cleaner than that going in, where they create habitat for nature.

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**Corin Flood**

I think Alex just hit the nail on the head, so to speak, buildings can only do so much, its behavioral change that will make the biggest difference. I am currently involved in a residential project that has underground parking that will be built at significant expense and based on a by-law ratio. The objective of the project is to build below market costs, the single biggest cost saving would be achieved by eliminating the underground parking. Since this is University housing built for staff on campus why the need for the car density, if the residents or developer was willing to deliver a car co-op as part of the project and the residents were willing to let go of their cars, they would have a more livable and substantially less expensive project with arguably no loss in quality of life, perhaps an improvement.

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**Rodney McDonald**

I think green building also considers economic and social aspects. The distinction I see is that sustainable building is a practice that ensures long term sustainability of ecosystem structure and function - green building does not necessarily ensure this (from my perspective).

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**Pierre Guevremont**

I agree with Rodney. I think the terms 'green' and 'sustainable' are almost interchangeable with respect to buildings except that sustainable would imply a longer term view. A sustainable building to me will always be green but the inverse may not necessarily be true.

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**Ann Dale**

To pick up on what Paul and Alex just said, a restorative or sustainable building is embedded in an ecosystem, thus, they are always part of a bigger picture or system? Their design determines whether they contribute or take away from that system? Isn't it just common sense to work with the system, rather than against it? But I also agree with Corin's statement about marketing, keep it simple, and green is more translatable than sustainable.

Corin, further to Pierre's comments, have your buildings cost more?

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**Corin Flood**

MEC is currently renovating an existing Canadian Tire building built with a marginal wall insulation R4 and ceiling of perhaps R7, the green building improvements mostly energy and storm water management related added 20% to the base budget, the payback on energy related upgrades was 3 years, it's a no brainer, but it is more money.

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**Paul Stevens**

Sustainable building certainly represents a set of broader social issues as identified by our panel and ultimately a longer-term solution to improving conservation, developing healthy communities and improving our quality of life. As an architect, I subscribe to something more than a "green-washing" of conventional projects.

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**Ann Dale**

It seems to me that there are many buildings that have been designed simply for the sake of the designer, without due regard to how people are going to live and work in that place and space. Without getting too esoteric here, green or I prefer sustainable buildings would also contribute to enhanced productivity in the workplace, if it is a more 'breathable' and 'liveable' place to work. For me, sustainable development can be regarded as a process of reconciliation of the ecological, social and economic imperatives. What is good for the environment, is good socially is good economically.

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**Corin Flood**

When the word 'sustainable' is in play I tend to couch it with a preamble, 'leading to a more sustainable outcome', for instance. In general terms sustainability is a hugely difficult issue and those who have thought about it conclude that it is likely not a very

marketable concept, therefore we skate around the edges never wanting to define it because it's unpalatable to our present direction. Sustainable and Green are equally subject to 'green wash' it all depends on who and in what context the term is being used.

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### **Alex Zimmerman**

"Sustainability" as a term also has its own baggage. I recall a conference I attend 3 years ago at which some said he had looked into it and found 721 different definitions of sustainability - and that was 3 years ago.

As for examples, given the above view, any of the buildings that have gone through a third party assessment or rating system such as the LEED certified buildings or buildings that have been assessed by the Green Building Challenge process could be considered green. There are certainly other buildings that have not been independently assessed that are green such as the CK Choi building and almost all of MEC's new stores for example. The challenge comes in defining what the criteria are and how to avoid "green wash".

Internationally, the BedZED project in London is good example of that direction, at least, I think we need to go. In principle, residents of that project are able to live within the global ecological footprint budget. Of interest there, though, is that the building can only do so much, People have to change the way they live and consume to make a bigger difference.

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### **Gordon Shymko**

I think that market realities, opportunism, and pressure come into this. "Green" is catchy and easy to understand. It's easy to sell, which I think is why it has taken fallen prey to marketing exploitation. "Sustainable" does not strike the average person as particularly catchy.

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### **Corin Flood**

I agree that 'green' buildings are defined by being 'less bad'. At present less bad is a pretty good thing and in my view the thing we have to make less bad is the energy burden our built environment places on the natural environment. I have some friends who live in a Teepee it's a pretty green building. Low embodied energy, small foot print, no heating system, except the love that resides inside! That would be an interior BC 'slow as you can' valley joke.

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**Rodney McDonald**

Can each of you please provide an example of what you think is the best Canadian example of a green building? Also, what about an international example?

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**Pierre Guevremont**

The Mountain Equipment Coop retail stores in Ottawa and Winnipeg. Distinguished by reuse and recycle of existing materials and constructed (Winnipeg) for future re-adaptation.

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**Rodney McDonald**

For Canada I too like MEC's Winnipeg store and the C.K. Choi building. Internationally I've been impressed with the new Swiss Re building and Pittsburgh's new convention centre.

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**Gordon Shymko**

I think that it's difficult to single out one, or perhaps even a handful of "best example" green buildings given where we are in the overriding definition of green. Witness what we have gone through in the last three go-rounds of GBC in selecting Canadian examples. I can think of perhaps a dozen buildings in Canada that stand out, and they all have something different to teach us. This is an early work in progress.

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**Alex Zimmerman**

Another very interesting international leading-edge project is the CII – Godrej building in Hyderabad, India, which I had the good fortune to visit a month ago (a LEED Platinum building). It reinforces the need to consider local context and how social aspects of that context are inseparable from the green aspects.

For example, the project put in a biological treatment that treats all run-off and wastewater on site, as the municipal system is simply inadequate. The final treatment is an outdoor pond where algae and fish do the final clean-up. When the pond was completed and as it started to fill up, the local homeless people started to use it as a water source as again, the municipal infrastructure is not adequate. The project had to fence in the grounds to protect the people from the building, which is clearly an unintended consequence.

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**Paul Stevens**

Let me preface my view that the best should strike a balance between the design excellence of a quality built environment and design techniques used to improve upon building performance. As such there are aspects to several projects that approach this, but sometimes at the expense of achieving this balance. York University CS Building gets my vote nationally, having not visited MEC Winnipeg yet.

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**Gordon Shymko**

Let me expand on my last comment.

When I say that our collective assortment of green buildings all teach us something, I mean that they all highlight both successes and failures at different levels. Again, this is a learning process.

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**Corin Flood**

I am not sure it is that useful to say “X” is the best example. For MEC all our projects have had different opportunities and constraints and though they have all had the same basic objectives the results have been very different. The recycled content of the Winnipeg store could not have been produced without the existing buildings on site, that said we could not get a geoexchange system going on the site where as we could in Montreal.

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**Rodney McDonald**

To follow up I like the MEC building in Winnipeg because of how materials were reused. It is my understanding that that 97% of the materials used to build the new building were harvested from two buildings on the site that were deconstructed (they could not be reused). Ironically the old Eaton's building across the street was demolished and land filled and new materials were brought in to build an arena on the site.

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**Alex Zimmerman**

An unexpected positive outcome on the York U project, resulting from the attention to good design, is that the building uses less energy in use than by design, The reason, apparently, when all other issues are factored out, is that the day lighting is so good that people use the electric lights much less than anticipated.

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**Ann Dale**

Paul, what is it about the York building that is sustainable?

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**Paul Stevens**

Keeping in mind the long developmental timeline to the York project, it represented a major step forward in utilizing building systems to the advantage of the occupant, and an important building insertion within the campus, as opposed to York' previous site planning pattern of campus sprawl.

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**Nils Larsson**

A few points:  
I heard from the facility manager of York that there are thermal comfort problems there.

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**Pierre Guevremont**

Further to Corin's comment on opportunities, it seems to me that MEC adapts their design to the site and available resources, which surely is a sustainable approach.

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**Gordon Shymko**

I suggest that the most important aspect of the learning process is to be level-headed about performance claims, and to be objective about where each project has succeeded, where it has failed, and where it has come in some where in between. There seems to be a growing amount of hype and competitiveness in this industry. It's obscuring, rather than assisting the dissemination of knowledge.

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**Ann Dale**

Gordon, a provocative question, can we do anything to speed up the learning, as Corin indicates, MEC has learned from each building and expanded on each one?

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**Alex Zimmerman**

Ann, let me also wade in with a reply to your question to Gord. The industry generally does a dismal job of getting feedback from real experience back to design, whether green or any other aspect of design. The structures are not in place to pay designers to

go back and measure whether what they have done actually works. This remains a goal for our organisation but it takes resources which we don't yet have. This may be one area where governments can make a significant difference for not a large expenditure.

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### **Rodney McDonald**

Another international example is the Eastgate building in Harare, Zimbabwe. They designed the building to cool itself by mimicking how termites design their mounds for cooling. Perhaps we will approach sustainable building when we design buildings using the concepts of biomimicry - mimicking natural systems.

Moving on to the next question:

What are the economic barriers to green building?

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### **Gordon Shymko**

The greatest economic barrier to green building is the perception that there are economic barriers.

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### **Nils Larsson**

On cost:

Incremental cost for green building can be high if performance measures are grafted onto an existing design. If an integrated design approach, and high performance is aimed for at the outset, then the incremental costs can be small, zero, or even negative. But it is harder to say what the incremental cost actually is in this second case, since the base or reference building is not well characterized. Our work on CBIP costs in 1999 indicated that many clients had an amazingly approximate idea of costs or normal elapsed time for the design process.

Examples of cost savings possible in an IDP approach are two C-2000 projects, where the steel and concrete structures originally planned were replaced by engineered wood structures. This resulted in a large capital cost saving despite extra costs for certain energy-related systems. So, in these cases it wasn't the "greenness" of the buildings that saved money, but other factors.

The issue of capital cost in green building is a red herring. The incremental cost is easily drowned out by other factors, such as tendering at the right or the wrong time, or extra fear factor costs added by sub trades unfamiliar with new systems.

In many cases, however, a responsible design team will have to tell the client that there may be some modest incremental costs, assuming that the project budget is based on reasonable assumptions. I would ask the client for an extra 5% and use that as an upset construction cost, and I would then provide analysis of projected operating costs. The modified payback period should make the case for the design.

In some cases this is not enough, and we are left with a situation where projected capital cost increases will not be recouped within the normal time horizon of a developer, e.g. 3 to 6 years. In such cases we really need a form of repayment guarantees so that the investor can obtain additional financing. Such guarantees would have to be provided by a special financial institution, and the institution would have to have some certainty that the high performance and reduced operating costs would actually occur. This implies the widespread use of performance rating and labeling.

The issue of incentive or disincentive for design professionals is certainly relevant. This applies primarily to mechanical engineers who stand to lose fees if the building performs very well. This is because good energy performance will reduce the size and cost of the mechanical plant, and fees are usually calculated as a percent of system cost. The solution to this is to establish fees as a fixed amount, based on a percentage of the reference building characteristics.

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### **Gordon Shymko**

Well said Nil's. Glad to have you on my side on this issue.

In my view a green building should not carry a significant capital premium if it is designed in a thoughtful, well-analyzed, and thoroughly integrated fashion. Costs get out of control when designers try to attach the trappings of green to an otherwise conventional building. It all becomes costly window dressing.

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### **Ann Dale**

Nils, is it possible to give us an estimate of the modified payback period, when one calculates in operating costs?

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### **Nils Larsson**

Ann, by modified payback, I mean including an estimate of energy costs changes, so it is a form of modified life-cycle cost. Real LCC is of course the goal and would show clearly the advantage of high performance, but almost no organizations use it, mainly because they have separate capital and operating budgets.

But a direct answer - one cannot generalize, it is a project-specific issue.

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## **Corin Flood**

MEC has to date not certified a building under LEED (Winnipeg is in process) this is because I want good design not point accrual. My standing offer to design teams is that if they want to pursue LEED MEC will share the cost once the design is complete. LEED is a good tool because it allows easy communication, but it has the potential to as Gordon puts it 'obscure' the point. There is value in communicating about what appears to be the cutting edge but hopefully it is communicated with the intention of improving the pool of knowledge not gaining bragging rights.

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## **Alex Zimmerman**

The question is always asked about what is the premium for a green building. In my view, this is a “how long is a piece of string” question. CaGBC’s workshop faculty, who include several leading edge practitioners in Canada, have identified a number of variables, based on their experience, that can affect potential additional costs for a green building. These variables are:

- building type – more complex means less premium
- building size - larger means less premium
- climate zone – more severe means less premium
- design team experience – more experience means less premium
- green market maturity - more mature means less premium
- flexibility of owner – more flexible means less premium
- LEED target level – more premium for Certified or Platinum, Silver or Gold are neutral
- who carries the risk of innovation – designers and contractors or owners

If all of these variables line up in favour of the project, a green building does not cost more and we can all point to buildings that have had no increases in standard budgets and have achieved good green performance. If all of the factors line up against the project, it is going to cost more.

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## **Ann Dale**

Alex, could you be a little more specific about what government policies and/or incentives should be in place to facilitate this?

Nils, again, common sense, just get the prices right and the market will respond? Is there any specifics you could think of that would move us in this direction?

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**Alex Zimmerman**

Re government policies and/or incentives: This is also part of a larger issue which is that of barriers. West Coast Environmental Law Society did a study a few years ago that identified a number of both regulatory and non-regulatory barriers and I would urge people to obtain that and read it. I think that generally, though, governments could be doing things to address market failures - imperfect information such as the lack of feedback, or high transaction costs - where to find information on how to do things better. It would also help if the playing field were level with respect to the provision of alternative energy - equivalent incentives, or not, for green energy sources compared to traditional sources.

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**Nils Larsson**

More on costs:

I heard an interesting approach on this, namely that the most important factor for the investor is the time required for cash flow to turn positive - this takes into account capital repayment and operating costs but also includes consideration of how much financial leverage there is (e.g. the investor only puts up a portion of the total cost).

On fear factor pricing by subtrades:

One can reduce this by holding subtrade meetings to carefully explain the new systems and what they involve.

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**Rodney McDonald**

Nils, you mention the fear factor costs, which I assume you mean to be the extra amount contractors and the trades will pad their estimates because they are unfamiliar with green building. It's almost a type of insurance for them. The problem with the fear factor is that it could then perhaps scare off a developer who wants to go green.

Is there anyway that government could help with an insurance to provide the trades with some protection so they can take a risk?

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**Gordon Shymko**

Building on Alex's points, I would suggest that a key problem is expertise capacity in the industry. I grow increasingly concerned that designers, through business, economic and social pressure, are being pushed pursue green performance objectives without really

knowing how to go about it. This is an invitation to disaster and bound to set back the industry to some degree.

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### **Paul Stevens**

Further to Gordon's point, I believe many designers are being pushed to design too quickly without an acknowledgement that more time is required to develop a successful green building project. We are not producing widgets.

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### **Ann Dale**

Corin, is it more money if full life-cycle costs are included, including the costs of waste of tearing down the building?

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### **Corin Flood**

From a capital perspective the green solution is more expensive from an expense perspective it provides a net saving. Lifecycle analysis almost always produces a positive outcome. Full cost accounting always does, the reason we see so many sub-optimal outcomes is because our present economic structure does not cost resources accurately.

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### **Rodney McDonald**

The term life-cycle costing is being used. I think that life-cycle costing should be the costing version of life-cycle analysis. However, I get the sense that life-cycle costing is not being used that way here.

What about all of the external costs (environmental, social) of non sustainable building practices? I think sustainable building would be the norm if all external costs were internalized. I'm not sure how to go about this.

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### **Ann Dale**

Paul and Nils have raised an interesting point, that of time, time to educate the trades about these new technologies and features, and no one likes to feel stupid, and time, for some of the creativity and innovation that is critical to this area. Is there any way governments could 'invest' in incentives here? What kind of incentives?

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## **Nils Larsson**

Rodney, even though LCA and LCC have similar names, they are quite different. Re. cost externalities, this is hard to include - a general issue is that things only work well if the extra costs come out of the same pocket as the operating cost savings go into, and this is seldom the case. You start to get congruence between these two factors in, for example, a municipality that puts up an owner-occupied building - in such a case the municipality-wide expenses can be included.

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## **Alex Zimmerman**

Nils point about time to positive cash flow brings up another point. We have been talking about costs and how to minimize them, but very little work has been done on defining the resulting increase in value, in a strict real estate sense of the word, from green building. If the value is ultimately there, then cost to some degree becomes irrelevant. CaGBC is collaborating with the Royal Institute of Chartered Surveyors and others on just such a study, which we hope to complete early in the new year.

There are of course additional benefits and value, but if it can be demonstrated that the increased real estate value is there, the rest is a bonus.

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## **Corin Flood**

This goes to Gordon and Nils' comment, the time from incurring the first project cost i.e. purchasing the land, to getting the first income from a development is critical to its financial success. We rush the design and construction because it costs too much not to, it's just a fact of life. Green design has to live within the economic drivers if it takes too long to design green it is the first barrier to broader uptake. As we accrue knowledge it should be less time consuming to design green, we aren't reinventing the wheel every time we go out are we?

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## **Ann Dale**

Critical question, Corin. I characterize this country as solitudes, silos and stovepipes, we don't build on one another's successes, and I suspect we only talk to one another in our own regions, however small or large we make that. The Association of Canadian Community Colleges (ACCC) initiated a highly successful three-year task force, comprised of the people who had to be talking to one another to advance energy efficiency in the college sector. This was led by Deanna Doulas, Bursar of Langara College and initiated by ACCC's Vice-President, Terry Anne Boyles with some

involvement of myself, and a strategic partnership with NRCan. It also built on the idea of peer group influence to more widely disseminate best practices.

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### **Nils Larsson**

I had an interesting discussion on costs with a commercial real estate lending guy. I said that he should be willing to lend more for high performance, since the building would have a higher asset value. His response was that by the time "asset value" is being talked about, he is also dealing with lawyers and thick reports. So, from his perspective, the only thing that matters is whether the borrower is paying back on schedule.

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### **Alex Zimmerman**

Ann, from a purely self-serving perspective, capacity building in the industry is one of CaGBC's strategic objectives. We are constrained at present by lack of resources. If governments care to give us additional money, we can deliver the training!  
(commercial break now ended)

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### **Rodney McDonald**

Nils, what about the wall that exists between capital budgets and operating budgets at all levels of government?

Also, let's begin to discuss the final prepared question:

Is the design process integral to the success of a green building project?

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### **Gordon Shymko**

In my view design integration, whether regardless of the mechanics by which it is achieved, is the foundation of a green building. The most common problem that I encounter is that design teams do not take full advantage of design synergies and end up with de facto design redundancy. This of course is a waste of money and resources.

A very rudimentary example is downsizing or rethinking HVAC systems in response to envelope upgrades. It sounds obvious, but these types of relationships are seldom exploited to their full potential. This is what I mean by design integration and cost optimization. Building performance needs to be addressed at the most fundamental levels. Everything else then falls into place.

Tacking green systems and "features" on to a building design does not make it green.

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**Nils Larsson**

Rodney: re. the wall between capital and operating costs - this exists in almost all organization. The only case I have heard of a change is in the Alberta schools system, where an integrated budget is now being permitted (as of about 3 years ago).

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**Alex Zimmerman**

RE wall between capital and operating budgets:

There are as many solutions as there are organizations and markets. Solutions that have been worked out in the past usually involve some sort of financial transfer mechanism to effectively provide additional capital by borrowing against future operating cost savings. This is really an organizational change question for owner-operators. Once the political will is there, solutions can be worked out that fit their unique circumstances.

For private sector markets, there is a need and an opportunity for new financial instruments to be developed. We are just starting to see hints of how this might be done, as in the "micro-utility" concept being pioneered by "The Currents" in Ottawa (at least I think it's a first)

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**Corin Flood**

A funny thing about MEC's projects is that we get much more publicity and attention for the tack ons than for the things that make the buildings relevant from a green building perspective. Thus we see more tack ons in general, more insulation and optimized systems just isn't sexy.

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**Gordon Shymko**

Nils, I haven't seen any change in Alberta's operating/capital policies, particularly regarding schools.

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**Nils Larsson**

You wanted to kick off discussion on design process issues. The IDP process is relevant here, and several of the panelists have experience with it.

The Integrated Design Process (IDP) was developed within the C-2000 program, and has proven to be a very effective way of optimizing the design process and improving building performance. IDP (at least in the C-2000 process) includes the following elements:

- Inter-disciplinary work between architects, engineers and operations people right from the beginning of the design process;
- Discussion of the relative importance of various performance issues and the establishment of a consensus on this matter between client and designers;
- The provision of a Design Facilitator, to raise performance issues throughout the process and to bring specialized knowledge to the table;
- The provision of other specialists, e.g. for day lighting, thermal storage etc., for very short consultations by the design team during the early design stage;
- A clear articulation of performance targets and strategies, to be updated throughout the process;
- The use of energy simulations to provide relatively objective information on a key aspect of performance

The introduction of specialized skills early in the process facilitates the integration of systems, which will maximize performance. In a psychological sense, IDP can be said to help the client and architect to avoid becoming committed to a sub-optimal solution.

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### **Alex Zimmerman**

Integrated Design:

While it is more than possible to achieve green design without using IDP, it is very likely going to cost more and the performance is unlikely to be as high. The reason is that a good process captures synergies and thereby improves performance and reduces costs. Traditional linear design processes rarely capture synergies.

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### **Ann Dale**

Alex, also a critical point, see my comment on ACCC's energy initiative, perhaps the best role governments can play is in increasing capacity within the sectors by mobilizing the existing networks of professionals and trades to share information?

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### **Paul Stevens**

Ann, your point about sharing information amongst professionals is admirable, but a "Trade Secrets" atmosphere generally exists in the design industry. This would be the major hurdle to overcome.

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**Corin Flood**

Integrated design is without doubt a useful tool particularly on larger projects, on smaller projects where the basic remedies are known it may have less relevance. I use a modified approach with MEC's smaller projects bringing the design team together at critical points. For me Energy modeling is the most important feature of MEC's design process. It's the modeling that leads to getting the systems the right size.

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**Nils Larsson**

Paul, the habit of keeping trade secrets makes government-financed projects of special importance, since results are in the public domain.

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**Gordon Shymko**

I'm not sure that it's necessary to share trade secrets to advance the industry (I am a businessman myself). I think that it would be sufficient to objectively measure, and then disseminate performance outcomes.

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**Ann Dale**

Paul, thank you, in my desire for openness and transparency and not working in a competitive world, I forget about this. Now that you have posed this problem, although it is probably like our disciplinary wars, is there any way to overcome the 'trade secrets'. Probably, of course, not the design, but perhaps at the trades level, or engineering level, something like sharing lessons learned, or am I being naive?

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**Rodney McDonald**

Critical points have been raised; integrated design, life-cycle costing, energy modeling, education, and government investment. I hate to stop the ongoing dialogue, but we should take a couple questions from the audience.

The first question is:

"The current fee structure mindset with architects and engineers is so ingrained; spend more money on a project, receive higher remuneration."

"As a developer, I want the best product for the most reasonable life-cycle cost. How can we move the fee based professionals away from thinking bigger is better to doing away with maybe an entire mechanical system? The integrated design process may

mean that the mechanical engineer cost envelope gets reduced to nothing and yet his contribution still needs to be rewarded. How do we get these professionals to participate on new terms?"

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### **Alex Zimmerman**

Some alternate approaches have been tried with some success. One is a two envelope approach whereby a proposal is split into design approaches and fees in separate envelopes. As a developer, you open all of the first envelopes from design firms (without the fees) and pick the one that fits best what you want to do. You then open the corresponding fee envelope and if the price is acceptable, you accept it and send the rest back unopened. If not and you can't negotiate a better fee, you move on the next until you find one you can live with. This assumes the design teams know what they are getting into with green design and IDP.

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### **Pierre Guevremont**

In the CBIP experience, the projects that report using integrated design are generally the projects that achieve the highest energy performance levels. They are also the projects that often report no incremental capital cost for the project.

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### **Corin Flood**

I guess I usually pay for people's knowledge but I know of a number of architectural associations that have programs aimed at the dissemination of experience, the amount of information on the web also provides significant resources. I don't see trade secrets getting in the way of progress, but they may get in the way of reducing costs.

As an MEC employee I have always been available to people contemplating a green building, it would sadden me if I found that any of the architects I have worked with would not provide access to information if it were asked for.

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### **Nils Larsson**

More on proprietary information: Many private owners like to keep all operating info close to the vest, but this overlooks the fact that the building may have ten owners and thousands of occupants over its lifetime. This points out the need to push for making at least a core of operating information (energy performance, reports of bad IAQ etc.) public.

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**Alex Zimmerman**

Ann, one last response to your point about governments doing more to mobilize existing networks. Governments are doing some of that and their support for us has been absolutely crucial as one example. I think there is a larger issue here though, and that is a tendency among all of us to look for technological fixes, when many of the best solutions and practices have to do with behavior or social considerations – my earlier point about BedZED and Corin's about parking are cases in point.. The whole IDP discussion is also not so much about technology as mindset and practices. I think, however, it is politically more difficult to have ribbon-cutting ceremonies around changing a process than celebrating launch of a new plant to produce a new technology.

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**Gordon Shymko**

If I can speak from the energy and environmental engineering side, our fees are never directly related to project cost. They are usually fixed based on the scope, complexity, size, and demands of the project. I personally see no reason why the traditional design disciplines have to work based on % of construction cost.

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**Nils Larsson**

Rodney: I think your cost and fee questions have already been answered. Relate the fees to the base or reference building and then there is no incentive to gild the lily.

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**Corin Flood**

I generally ask consultants to bid based on the scope of work rather than the projected budget, generally I still find submissions conforming pretty closely to a percentage fee. One way to change this is a performance based fee or some type of bonuses system for avoided construction cost. I have yet to see a model that was acceptable to the consultant or practical from a management perspective.

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**Ann Dale**

Another question from the audience, from Dennis "Would it make sense to tie remuneration for the project based on different performance measures, in other words, reward them for targets that encourage systems redesign, energy efficiency and so forth?"

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**Alex Zimmerman**

Reply to Dennis. In principle this is possible, but there is a significant time lag between when the design work is done and whether you know you have achieved those performance targets in reality, not just by design.

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**Rodney McDonald**

Nils, what do you do when professionals want to charge a premium for green design?

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**Nils Larsson**

There have been some experiments with bonus fees linked to measured performance, after the building is commissioned. It is a promising direction to go. The other side of the coin is presumably penalties if you don't reach the performance level.

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**Alex Zimmerman**

Rodney, a premium for green design may not be the wrong thing to do, depending on the level of performance achieved and benefits expected

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**Corin Flood**

I shared some thoughts with Rodney earlier this week, and have to agree with Alex that the tools, IDP amongst them, are only that-tools. Until we have a mindset that recognizes the abyss upon whose edge our society sits, we will not see substantive change in the way we approach development, technology or anything else to do with a consumer society.

The choice to go green is primarily an ethical decision, not an economic decision. If you are not there from a ethical or moral perspective, it doesn't matter how good the economics may look. The Bush camp would see reduced fossil fuel consumption as an affront to its corporate buddies therefore not a useful goal.

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**Paul Stevens**

I would agree with Corin's view that a bonus system with assignable targets for each phase of the project could be one model to use. This has been used in the building industry for years. It seems to work for construction managers, why not designers.

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## **Gordon Shymko**

I co-chair the New Construction Committee of the International Performance Measurement and Verification Protocol (IPMVP - [www.ipmvp.org](http://www.ipmvp.org)). We have been wrestling with this issue for the last 8 years. While we have produced a protocol for measuring and verifying the energy performance of new construction, the technical aspects are extremely complex and I seriously doubt if the "noise" could be separated from the core performance sufficiently to provide the basis for a legally binding performance-based fee agreement.

As Nils pointed out, this has already been tried. However, the feedback that we have received is that success has been questionable.

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## **Corin Flood**

It would be hard to hold a consultant to a fee unless they managed the building, our experience at MEC is that the building performance has a lot to do with the diligence and objectives of the building manager and varies by significantly depending on who the manager is.

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## **Nils Larsson**

Following on Gord's comment, a problem is that if you are going to have performance-based fees, then the building must be operated as intended.

This results in possible conflict and has (I believe) caused some lawsuits in the world of performance contracting.

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## **Alex Zimmerman**

There are a couple of other motivators, Corin, in addition to ethics.

One is avoidance of regulation -current or anticipated.

Another is opportunity, which is I think still vastly unexplored in this arena.

From my perspective it doesn't matter much which of the three gets people moving. As a former boss of mine was fond of saying - "the right thing done for the wrong reason's still the right thing to do"

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**Rodney McDonald**

On behalf of myself and Dr. Dale, thank you for joining us in this e-Dialogue on the economics of green buildings. Thank you for your time and commitment. This has been a very valuable and rich experience for me both academically and professionally. I have a clearer understanding of the distinction between green and sustainable building.

The discussion about economics challenges the general assumption in the marketplace the green costs more. It is evident that the process, and using an integrated process, is key to successful and cost effective green building.

I think that the choice to go green is both ethical and economic. I hope that my research will show how economic these buildings can be.

Thank you for these insights and for participating in my research.

Before we sign off, are there any concluding comments?

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**Gordon Shymko**

This has been a very unusual mode of communication, but great fun nonetheless! Thank you for the opportunity to participate and good luck in your work. Do not hesitate to call if I can be of further assistance.

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**Corin Flood**

Ditto Gordon's comment.

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**Alex Zimmerman**

As a concluding comment, I can do no better than to quote Red Green:

"Remember, we're all in this together!"

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**Nils Larsson**

It has been fun and worthwhile, despite some technology issues.

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**Pierre Guevremont**

From here as well, thanks for the chance to participate.

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**Paul Stevens**

Thanks for the opportunity. Until next time and with faster typing skills hopefully.

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**Rodney McDonald**

Thank you all and good evening.