

THE GREENING OF CLIMATE CHANGE CENTRAL'S OFFICE: A CASE STUDY

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Building an office can be a journey through a maze of complicated choices: balancing location, leasing terms and legal issues with the financial bottom line. What often gets missed in the process is the effect that every decision has on the environment and the potential to save energy costs.

Climate Change Central's (C3) mandate is to reduce Alberta's greenhouse gas emissions. Established in November, 1999, this unique private/public partnership is a catalyst for climate change activities in Alberta by individuals, businesses, institutions and governments.

Energy use results in carbon dioxide emissions. C3 decided to make its office a demonstration project in sustainable design, hiring a design consultant to reduce emissions during construction, in materials and equipment, and in day-to-day energy use. Design guidelines were the following:

- save energy, thereby reducing greenhouse gas emissions,
- be affordable for a comparative business or organization,
- create a pleasant, productive and healthy working environment,
- reflect a sophisticated, professional atmosphere, and
- educate business leaders, policy makers, design professionals and the public about the merits of environmental design.

Climate Change Central's office is the second in Canada to be certified under the EcoLogo Program, a voluntary standard based on use of environmentally-friendly products and compliance with stringent environmental criteria. EcoLogo requires a green procurement and waste minimization plan. While involving a significant commitment of time and finances, the EcoLogo standard is an important part of C3's commitment to reducing greenhouse gas emissions.

There is no manual for designing a sustainable office. Each organization has its own circumstances to weigh, including location, length of lease, budget and commitment by management. EcoLogo certification is a helpful design tool, but is not the complete answer.

"Our office is a step towards sustainability and we are proud of the results," says C3 director Simon Knight. "By sharing our journey through this case study, we encourage others to do more and hopefully, exceed our results."

Locations and landlords:

In spring, 2000, C3 searched for Calgary office space that reflected its not-for-profit status, gave ground-floor accessibility and visibility, and offered parking and access to public transportation. A 4,900-square-foot space was chosen in the Connaught district of Calgary, an affordable alternative to high-rent downtown properties.

The first major design decision involved the heating/air conditioning system, the biggest single energy consumer of any workspace. The design team found it too expensive to retrofit the h/a.c. system, given the 30-year age of the building and type of lease. Minor modifications were made to the existing system and the air flow was balanced in the office.

The landlord needed to be persuaded of the following:

- green design is mechanically sound and looks professional,
- energy-efficient features will save the building owner money, and
- the office can be a showcase for prospective lessees.

The standard triple-net lease can often work against energy efficiency. Because the tenant pays for utilities, building owners have little incentive to make major changes to a space. Tenants need to persuade building owners to make energy-efficient retrofits when negotiating the lease. In the long-term, this is a win/win situation: the tenant saves energy costs, the landlord has a more competitive space for leasing, and fewer emissions are released into the environment.

Length of lease is an essential design and budget consideration. C3's original lease is for three to five years, prompting the designers to choose moveable furniture and floor coverings (carpet tiles). Moveable wall partitions were also considered, but the landlord preferred permanent walls.

Energy-efficient lighting:

Abundant, free natural light is one of the office's biggest energy savers. The whole office is designed around this free-flowing resource. Glass walls around private offices and meeting rooms help distribute natural light and provide an open, pleasant feeling. A ribbon of self-adhesive obscuring film on the glass gives privacy to occupants of the offices.

Horizontal louver blinds on exterior windows help manage daylight intensity. The blinds are mounted to leave a top gap to harvest daylight while maintaining privacy. Light colours were chosen for the ceiling, window walls and flanking walls to transmit daylight and reduce glare.

C3's lighting uses one-quarter of the energy of standard office lighting. The office saves 21 tonnes of carbon dioxide per year for lighting, an annual savings of \$2,500 at current electrical rates. Lighting features include:

- highly-efficient T5 and T8 fluorescent tubes with electronic ballasts,

- 300-500 lux for ambient lighting (old standard of 700-1000 lux is too high for visual comfort, particularly when using computer screens), individual task lighting at work stations,
- occupancy sensors that turn lights off when a room is empty.

Other ways to save electricity:

- purchase energy-efficient computers and screens under Energy Star label,
- combine photocopier, fax, printer and scanner in one machine,
- purchase dishwasher and fridge under EcoLogo certification,
- use paper towel instead of electric hand dryers in washrooms.

Energy-efficient floor coverings:

Climate Change Central's carpets are one of its most innovative office features. Installed as tiles, it's simple to replace the 10 - 20 per cent of the carpet that shows the most wear, reducing replacement costs and office disruption. The carpets represent the "closed loop" cycle of energy flow. Made from billions of carpets and textiles saved from the landfill, the tiles can be removed when worn and remade into an identical new product. The process reduces stress on landfills and retains the embodied energy of the textile.

Other design features in office floor coverings include:

- a safety floor outside the shower manufactured from recycled pop bottles,
- organic washable flooring in the washrooms, and
- re-use of existing flooring in the file/server room.

"Green" office furniture:

Office chairs are 100 per cent recyclable. Furniture fabrics were selected with their eventual recycling in mind: organic fibres with non-toxic dyes that will return to the planet as food, petrochemical fibres that will return to the technical cycle. Again, the designers plan to retain the embodied energy of the technical fibre through many cycles of its life, thus saving materials and energy. By using "systems" furniture, C3 can adjust and replace parts when worn or to achieve a different look. The reception desk was built in parts so it can be moved to another location.

Wood as a finishing feature:

Wood, a renewable resource with low embodied energy, was used for doors, door frames and carpet baseboards. Certified wood from renewable forests was used. Mill work was re-used in the coffee room to further conserve this resource. Maple veneer on the reception desk was salvaged from logs in the Great Lakes.

The advantage of paint over vinyl wall coverings:

Research shows that low toxicity, low-VOC (volatile organic compound) paints are healthier for people than vinyl wall coverings. C3 saved about \$3,000 by choosing paint over vinyl coverings.

Salvaging building elements:

A key energy decision involved re-using building elements rather than dumping them in landfills. Some of the salvaged elements include ceiling tile, flooring in the file/server room, washroom dividers and a shower stall.

Water conservation measures:

Low-flush toilets and urinals and a low-volume shower head conserve water in the office.

How much does green design cost?

In this case, the cost is comparable to conventional office interiors in the Calgary market.

Guiding principles:

- consider air quality, energy and water conservation in every aspect of design,
- reuse or refurbish where possible,
- buy locally to reduce transportation,
- question environmental and social policies of suppliers and manufacturers,
- factor health and safety of office staff into all decisions,
- choose building materials that are sustainably managed,
- consider end-of-cycle life when selecting materials.

Further information:

Natural Capitalism: Creating the Next Industrial Revolution, Paul Hawken, Amory Lovins, L. Hunter Lovins. Little Brown, 1999

Mission Design, WRI's Office Environment, World Resources Institute. ISBN 0-56973-425-9

Cool Business Guide – Lower Costs, Higher Productivity and Climate Change Solutions, Duncan Noble. Pembina Institute, 2001

Websites:

Rocky Mountain Institute <http://www.rmi.org/>

World Resources Institute <http://www.wri.org/wri>

William McDonough + Partners <http://www.mcdonough.com/>