Athabasca University

RAIC Centre for Architecture

Submission to the Alberta Climate Change Panel: The Role of Green Buildings

The Role of Green Buildings

Construction is an essential part of Alberta's (and Canada's) economy and green buildings are the future of construction. Green buildings are the fastest, most efficient and least expensive way of addressing climate change; and Alberta could play a leadership role in designing and building next generation green buildings. If linked together, various initiatives already underway in this province could create a green building cluster that would reduce greenhouse gas emissions and generate significant economic activity in the province, the country and even around the world.

Construction

In Alberta

1. The construction industry accounted for **10.6 percent** of the province's gross domestic product (GDP) in 2012 (Alberta Government, 2014, p.3)

2. With annual revenues of **$97 billion** (2014), (Alberta Government, 2015).

3. With exports of **$630** million annually (2012) (Alberta Government, 2015).

4. In 2014, **300,000** men and women in Alberta held jobs in a wide variety of construction trades and professions (Alberta Government, 2014, p.2).

5. This sector included some **27,000** businesses in 2014 (Alberta Government, 2015)

In Canada

1. The construction industry accounts for **7 percent** of Canada's gross domestic product (GDP) and is the 4th largest economic sector in the country (InvestorsFriend, 2015)

2. With a value of **$139 billion** annually (2014). (Calculated from InvestorsFriend, 2015).

3. The construction industry maintains and repairs more than **$2 trillion** in assets (BuildForce, 2015).

4. More than **1 million** Canadian men and women have jobs in a wide variety of construction trades and professions (BuildForce, 2015).

5. One out of 13 workers employed in Canada earns a living in the construction industry (BuildForce, 2015)

Globally

1. In 2103 this industry accounted for **US $7.5 trillion** of worldwide economic activity (Global Construction Perspectives, 2013, p. 6)

2. Or about **13.4% of the world's Gross Domestic Product** (Global Construction Perspectives, 2013, p. 6)

3. This amount is projected to grow to **US $12 trillion by 2020** and that more than **half** of that construction will take place in emerging markets (Global Construction Perspectives, 2013, p. 8).

4. During this time period, Canada is expected to move **from seventh to fifth place** in terms of the world's largest construction market. (Canadian Construction Association, 2015).

Buildings and Global Warming

1. According to Ed Mazria of Architecture 2030, "Buildings are the largest contributor to climate change." (Mazria, 2013)

2. According to the Canada Green Building Council, buildings consume:
    a. **40%** of the world's materials and energy
    b. **35%** of Canada's greenhouse gas emissions
    c. **33%** of Canada's energy consumption
    d. **50%** of Canada's natural resources consumption
    e. **12%** of Canada's non-industrial water use
    f. **35%** of Canada's waste going to landfill

    (Canada Green Building Council, 2015)

Why Green Buildings are Critical

1. Buildings represent the low hanging fruit of combating global warming so much so that Princeton's Carbon Mitigation Initiative has identified, "Use best efficiency practices in all residential and commercial buildings," as its own 'wedge' in their mitigation strategy where each wedge "has the potential to reduce global carbon emissions by at least **1 billion tons per year** by 2060." (Carbon Mitigation Initiative, 2015)

2. In fact, it is estimated that energy use in buildings could be reduced by **20 to 30%** over the next 20 to 25 years without any changes in technology (Lester and Hart, 2012, p. 79).

3. Improving the energy efficiency of buildings does increase the initial costs of a building but the long terms savings would be even greater. The National Research Council in the United States has estimated that a cumulative investment of $440 billion over the next 20 years could produce an annual **savings of $170 billion** in reduced energy costs. In other words, a 20-year program would pay for itself in less than 3 years (Lester and Hart, 2012, p. 79).

4. The other benefit of this approach is that green buildings are healthy buildings and have been shown to reduce absenteeism and increase productivity significantly. According to the Commission for Environmental Cooperation, "… green building have the potential to generate an additional **$200 billion annually** in the United States in worker performance by creating offices with improved indoor air quality (Commission for Environmental Cooperation, 2008, p.4)."

5. Alberta could play a pivotal role in the development and commercialization of new products such as Cross Laminated Timber (CLT), green concrete and Nanocrystalline Cellulose.

The Opportunity

1. Green Buildings are the easiest, fastest, cheapest and most effective means of addressing global warming.

2. A region that is seen as a leader in this field will be able to export products and services to the $7.2 trillion global construction market.

3. Already Alberta has shown leadership and expertise in this field with exemplary buildings and urban designs such as:
    a. The Child Development Centre at the University of Calgary which achieved LEED Platinum status
    b. The Energy Environment Experiential Learning Building also at the University of Calgary which is also rated as LEED Platinum
    c. The work of the firm of Manasc Isaac of Edmonton which has designed pioneering green buildings including: the Mosaic Centre, the Athabasca University Academic and Research Centre, the Water Centre [with Sturgess Architecture], the Spruce Grove City Hall, the Yellowhead County Administration and the Greenstone Government of Canada building
    d. The work of Barry Johns (Architecture) Limited which has been designing green buildings since the 1980's including: Cardel Place in Calgary (with Gibbs Gage Architecture) – the first LEED Gold Building in Alberta; the renovation of Triffo Hall at the University of Alberta; and the BCTL Centre in Red Deer (with the Group 2 Consortium).
    e. The Blatchford Urban Design and Master Plan, which was an international competition for a carbon neutral community for 25,000 people in Edmonton. It was won by the Perkins + Will, Barry Johns (Architecture) Limited and the Group 2 consortium and is a landmark in environmental design.

With this breadth and depth of experience in sustainable design, Alberta has the potential to be a world leader in the field – and realize the associated economic benefits.

Recommendations

This document supports the four recommendations made to Minister Phillips in a letter of September 23rd, 2015 from the Alberta Construction Association:

1. Partner with and support industry-led organizations promoting adoption of innovative technologies such as the Alberta Centre of Excellence for Building Information Modeling (aceBIM) and the Canadian Construction Association Lean Construction Institute.
2. Work with the post-secondary institutions to ensure that training places are available and reflect emerging industry skill requirements such as energy modeling.
3. Continue to drive increased building performance through energy efficiency requirements in the Alberta Building Code. Changes to the Building Code are preferable to procurement requirements that use a third-party standard, as a third-party certifications can create significant compliance costs and administrative burdens that may exclude small and medium sized entities from being able to compete.
4. Provide financial support to offset the high upfront costs of remodeling the existing building stock for energy efficiency (Alberta Construction Association, 2015, p.1)

At the same time, Alberta could become a world leader in green buildings with a few simple, additional steps:

1. Establish a Green Building Research and Commercialization Network which includes architects, engineers, contractors, developers and academics (from both universities and colleges). The focus would be on bringing to market new products and services that could make healthier, more energy efficient buildings.
2. Make all new provincial buildings net zero and hold competitions each year to design these buildings.
3. Subscribe to the 2030 Challenge which aims to make all new and renovated buildings net zero by 2030
4. Add to the partnership with our post-secondary institutions to also explore Cold Climate Architecture, Building Science, Sustainable Interior Design and Integrated Building Systems Engineering

<u>As a world leader in green buildings, Alberta would also be seen as being proactive in the field of climate change.</u>

For the average Albertan this means:

1. They save money on their monthly heating and electricity bills
2. They have healthier homes and workplaces
3. More jobs in construction, engineering and architecture
4. They can help save the planet

For Alberta this means:

1. Jobs
2. Innovation (in an industry that desperately needs to be more innovative)
3. Increased exports of products and particularly design services
4. Increased productivity through reduced absenteeism
5. Alberta can play a leadership role in greenhouse gas reduction targets

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