

Recycling of Coal Combustion Products Contributes to Canadian Sustainability Objectives

Executive Summary

The recycling of Coal Combustion Products (CCPs) contributes significantly to the sustainability of coal-fired utilities as well as the construction and manufacturing industries.

The importance of air quality safeguards and emission reductions mean we need to consider how CCP recycling supports Canadian sustainability objectives far beyond the utility gates. **Efforts to prepare for more stringent regulation of Mercury and other emissions suggest a range of technology retro-fit mitigation options. However, these are not equal in terms of their effects on the characteristics of CCPs;** while some will safeguard valued properties of CCPs, others will render them unusable for significant markets. **This raises the prospect of unintentionally undermining practices that contribute to the efficiency and sustainability of Canadian industry in surprisingly far-reaching ways.**

While coal-fired generation may not currently be the favoured option, improved technology and processes can significantly reduce the environmental impact of these plants. Further, in terms of capacity, productivity and reliability it outstrips other “greener” options currently available on the scale needed to replace it. As long as coal-fired utilities contribute so significantly to the Canadian economy, and to the security and diversity of its energy supply, it is logical to maximize their sustainability contributions and defend their operation from the often unforgiving public scrutiny to which they are subject.

Increasing concern with air quality and greenhouse gases has inspired a review of industry practices which has culminated in recognition of **recycling CCPs as a means to reduce the environmental footprint of Canadian industry and achieve greater sustainability** through:

- ◆ Recovery of value from energy and natural resources expended to produce electricity.
- ◆ Reduced landfill use (for stockpiling or disposal of ash from industrial furnaces).
- ◆ Reduced operating costs (associated with landfill maintenance and management).
- ◆ Increased revenue from the sale of secondary products (as performance-enhancing materials for building and manufacturing industries).

Increased market value and demand for CCPs are now driving beneficiation operations to assure ash quality. Further operational benefits to utilities of beneficiating Fly Ash are detailed on the worldwide web: http://www.stiash.com/L1/power-managing_flyash.html

And while these benefits to coal-fired utilities are appreciable, their **significance to Canada’s sustainability objectives increases exponentially when one considers** the potential of CCPs to contribute similar benefits to related industries. **Recycling CCPs allows a spectrum of Canadian industries to maintain or increase their productivity and reduce their demands for energy and natural resources while achieving CO₂ emission reductions:**

- ◆ Reduced GHG emissions attributable to cement, concrete and wallboard manufacture.
- ◆ Reduced energy consumption (cement or concrete manufacture).
- ◆ Reduced consumption of natural resources (lime for cement & concrete production, gypsum for wallboard manufacture).
- ◆ Re-use of CCPs reduces the environmental footprints of many manufacturing applications (cement, concrete*, paints, plastics, wallboard, brick) as well as mining and agricultural applications.

** Coal Fly Ash extends the life of our built environment by enhancing the technical*

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characteristics of concrete to improve the performance and durability of concrete structures. Longer-lived infrastructure and reduced maintenance costs result from reduced cracking or corrosion in Fly Ash concrete construction. Built to last 100 years, the Confederation Bridge linking Prince Edward Island and New Brunswick is a world class structure which includes Coal Fly Ash as an integral component of its design.



Canada Green Building Council, the Federation of Canadian Municipalities and LEED Canada all recognize the sustainability and technical performance benefits attributable to the use of such

"supplementary cementing materials" as Coal Fly Ash, Silica Fume and Slag. The widely-recognized LEED (Leadership in Energy and Environmental Design) System quantifies these sustainable practice benefits through its life-cycle approach to building construction. Over the last several years, the Federal government's own Government of Canada buildings have been designed and constructed in accordance with LEED Gold and Silver level certification criteria.

International Context

CIRCA works with Natural Resources Canada to produce annual Production and Use Statistics reporting CCP quantities used in various applications across the country. Over the past 5 years, Canadians' CCP use has increased by 25%. We recycled 33% of the CCPs produced in 2005 (*Natural Resources Canada, Canadian Minerals Yearbook: <http://www.nrcan.gc.ca/mms/cmy/content/>*), while US use rates were 39%. By contrast, Europe boasts use rates of 88%.

The increased use of CCPs as a *Supplementary Cementing Material* has been fostered by collaboration between Industry & Government (Action Plan 2000 on Climate Change). Education, technical guidelines and specifications, prediction tools and increased experience with beneficial use are accomplishing a global perception change that is transforming CCPs and other materials from an industrial by-product or "waste" to a "Valued product" that can help us meet increasing market demand AND sustainability targets.

While some in Canada contemplate shutting down coal-fired facilities, others here and abroad are building coal-fired plants to capitalize on a secure, comparatively inexpensive, domestic energy supply.

Contact

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The CIRCA website www.circainfo.ca offers Fact Sheets, Videos, a web-based Learning Module and other resources at no cost: www.circainfo.ca/resources.htm/

*Recognized for improving the responsible use of CCPs
in Canada*