Updated Canadian CCP Production & Use Statistics Reveal Evolution of Coal Ash Industry in Canada

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ABSTRACT:

Survey results will be discussed and their implications for Producers and Marketers of CCPs in Canada will be explored in the context of the Canadian regulatory landscape.

BACKGROUND:
Canada’s CCP Production & Use Survey began in 1997, under the auspices of CEA Technologies’ CCP Interest Group (pre-cursor to CIRCA’s incorporation (2002). Natural Resources Canada has since produced CCP statistics, offering:
- 3rd party objectivity,
- confidentiality of data to contributors and
- integrity of data/records government agency brings to process/results

These factors are important to the process because the Canadian market is so comparatively small, vertically integrated and as a consequence so competitive. The third party objectivity & confidentiality NRCan imparts to the survey means respondents are able to provide data with confidence that commercially sensitive information is safeguarded, in part by reporting only 3-year averages. And it means respondents are able to rely on the data as an unbiased indicator of market status.

Restructuring at NRCan instigated a data gap from 2008-2012, which has finally been addressed this year. In its Sept. 28th 2012 letter, NRCan acknowledged CIRCA support for resumption of survey and assured confidentiality of data. NRCan also defined motivations for survey, to:
- Measure domestic demand for minerals;
- Provide indicators on state of mining industry;
- Ensure gov’t policy decisions are fact based.

The resulting statistics are important to reveal not only the current status of Production and Use in Canada, but also how Production and Use trends over time. They will contribute to a better understanding of Coal Ash and I trust to an appreciation of the value Coal Ash brings to the Canadian economy and the sustainability profile of two.
major industries: coal-fired power generation and concrete manufacture, of course including cement production.

For example, the 1st substantial record of CCP Production and Use in Canada stretched from 1999 to 2007. Over this brief period, Coal Ash utilization increased by nearly 50% from a mere 21.4% in 1999 to 31% in 2007.

![Graph showing CCP Use in Canada, 1999-2007](image)

How, or perhaps why, did this happen so quickly? Well there’s a story here:

Back in 1996, NRCan established the Canadian Minerals & Metals Policy 1, in which the link between policy and sustainability was clearly outlined:

“...as we look ahead to the future of Canada’s minerals and metals industry, dramatic change is occurring. This change is brought on by several challenges:

- concerns about the state of our natural environment;
- rapidly growing competitive forces brought on by globalization and the emergence of new mineral producing countries in the developing world;
- a need for a more efficient and effective federation; and
- the need to achieve sustainable development.”

In 2000 Canada’s National Action Plan on Climate Change launched a 5-yr. program (a.k.a.: “AP2K”) whereby industry, government and NGOs collaborated to identify opportunities to reduce CO2 emissions.

Deliverables from the AP2K program impacted industry practice and government policy and continue to do so to the present time:

- in 2005 PWGSC had established Best Practices for the Use of Fly Ash and Slag in concrete; and
- in 2006 NRCan estimated actual and potential reduction of CO2 emissions attributable to the use of Coal Ash in concrete. 2


Both these initiatives effectively made the point that sought after emission reductions could be achieved even while addressing other, complementary goals, such as improving the durability and sustainability of the concrete construction that comprises such a huge slice of our built environment.

At the same time, perhaps predictably, pressure increased on industry to reduce emissions and the coal-fired generation, cement & concrete industries came under increasing scrutiny. By 2009, the International Concrete Sustainability Initiative had identified "clinker substitution" as 1 of 5 key strategies to reduce CO2 emissions related to the production of cement. They reasserted this point in their 2012 Report. ³

As to the present, updated figures for CDN Production and Use of CCPs (2008-2010 & 2009-2011) indicate we’re producing more Coal Ash than previously.

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³ IEA and International Concrete Sustainability Initiative “Energy Technology Perspectives 2012”, July 2012.

I admit that Canada's 2010 & 2011 Production & Use results were something of a surprise. With plant closures in various provinces over the last several years, I'd expected Production to be lower than it had been, I certainly didn’t expect to see more Ash being produced than in previous years. And the fact that use is declining, even while production is climbing seems a cautionary detail.

The profile of CDN electricity generation has changed significantly since 1999? Back in ‘99, coal-fired power generators supplied around 48% of Canadians’ electricity. By 2011, coal-fired power producers supplied only 16% of electricity generated in Canada.

Under these circumstances I expected to see more Ash recovered from disposal than recent numbers indicate. Over the 1997-2011 period, we could see between 577 and 653 thousand metric tonnes

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5  Canadian Electricity Association, “Electricity Generation in Canada by Fuel Type, 2011”.
of Coal Ash were “Removed from disposal”\(^6\); this averages out to 38.5 to 43.5 thousand metric tonnes/year recovered from landfill. As the demand for Coal Ash has increased over the last 15 years, it’s tempting to imagine Canadians’ Ash supply would be diminishing. However, this is to ignore 2 important considerations:

1) the degree of international trade between Canada and the US: Over the period 1999-2002, publications of the P&U Survey included data on international trade. Over these 4 years, volumes of Coal Ash imported/exported across the Canada/US border averaged out over ….approximately equal; in other words… the Canadian and US Ash industries are inextricably linked.

2) the hundreds of millions of tonnes Coal Ash in landfill; CIRCA produced a Fact Sheet on the subject in January, capturing the “Utilization of Coal Ash from Landfill” and highlighting the lengths to which ash producers now go to manage Coal Ash in order to capitalize on demand.

While the Canadian Ash industry is obviously modest compared to that of the US, it

\(^6\) Reviewing Canadian P&U Survey results for the years 1999-2007, then 2010 & 2011, we see that cumulatively 577 thousand tonnes of Coal Ash have been Removed From Disposal (landfill). For several years (2003-04) quantities “Removed from Disposal” were not reported. Factoring in an “average” value for these years, would increase estimations of Removal from Disposal by as much as 76,000 tonnes to between 577,000 and 653,000 tonnes were Removed from disposal (1997-2011).

\(^7\) “Utilization of Coal Ash from Landfill”, CIRCA 2013.
nonetheless offers an informative counterpoint to the US situation in terms of production, availability, government interest and the corresponding legislative or regulatory context.

According to the US Energy Information Administration, US coal-fired utilities still supply 42% of Americans' demand for electricity. Even so, a comparison of Canadian and US Production & Use Surveys reveals more similarities than differences:

Considering recent history, I think we can agree on a number of reasons for reduced utilization over the past several years: 2008 brought economic and political surprises with a global recession or correction, and TVA’s Ash spill. So construction activity was already being stifled by the time the US EPA decided to revisit it’s classification of Coal Ash as a non-hazardous material. I think we can also agree that the regulatory uncertainty EPA’s actions unleashed is still colouring the public’s perception of Coal Ash, and undermining greater use of this resource.

In discussion at the ACAA Winter meeting, Government Relations Subcommittee Chair, J. Ward suggested several achievements and challenges for the Coal Ash Industry. AECOM’s “Coal Ash Material Safety Study” & “Supplement” and the 2011 (US) CCP P&U Summary (all gratis on ACAA’s website) both indicate that Coal Ash is being

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produced and used in abundance, even despite the US EPA’s prolonged debate over its ruling on the hazardous/non-hazardous nature of this increasingly vast mineral resource.

While both Canada and the US are paying increasing attention to climate change & determining how best to reduce emissions, Canadian policy & legislation encourages recycling of secondary resources.

On the other hand, it seems the US landscape is salted with an ever-changing political & regulatory situation… including a new EPA administrator, new congress & senators and a well-funded opposition to all things Coal, preaching “toxic”, a term used repeatedly during the US House of Representatives’ Hearing of proposed Coal Ash Bill, held April 11th.


In this context, Canadian industry parameters offer an informative counterpoint to the US situation in terms of production, availability, government interest and the legislative or regulatory landscape in which our respective Ash industries operate in North America. This observation is not to be construed as criticism, but rather a simple fact that differentiates our 2 regulatory regimens.

Thanks in large part to Canada’s relationship to the Basel Convention, our regulatory situation is considerably more stable. It’s more stable because Basel does not define...

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Coal Ash as either hazardous or non-hazardous. Rather, it defines what is considered hazardous and thereby captures commodities according to scientifically verifiable criteria (relating to its physical or chemical constituents) as they occur.

So what does all this mean in terms of the Ash industry in Canada? As definitive answers in this Coal Ash industry are so rare, I'll answer this question Indirectly by relating an interesting day at the office recently....Doug Hooton (University of Toronto) was good enough to pass an article along to me, under the headline “Challenge is Finding a Prosperous Way to Be Green”. A few things really stuck out:

- “A third of carbon emissions come from power plants…”
- Obama administration “faces big decisions on climate policy. One is how to make the biggest dent in carbon emissions…”

and my personal favourite:

- “To economists, the best climate policies are those that allow market incentives to work.”

Our society’s concern with sustainable energy supply, resource management and reducing environmental impact all point to recycling Coal Combustion Products (CCPs). As we know, CCPs increase the strength, durability and cost effectiveness of our built environment even as they reduce its environmental footprint.

Talk about your market incentives.

So it does make me wonder why proponents of Coal Ash so often find themselves “digging out” from the latest “wham” be it regulatory, political or economic. I believe the answer is that push-back from competing agendas works to spin a cloud of uncertainty around Coal Ash, whether in terms of quality, supply or legal certainty, a concept C. Heidrich explored in his plenary paper. While I suppose this push-back is merely an unfortunate byproduct of a competitive market, I would suggest it is unnecessary and even counter-productive over the long-term. I think we can agree the US EPA isn’t the only agency to explore a 180 degree turn on Coal Ash, consequently repressing needed wins for resource conservation and industrial ecology [C. Heidrich] in a constrained economy.

In such cases, I rely on a technically-based, jurisdictionally broad understanding of Coal Ash to be an abundant (albeit secondary or “residual”) resource at our disposal. And again, it’s what we choose to do with it, how we manage this commodity that will determine its actual value and significance. As the Coal Ash industry continues to work in a global context:

“Based on data from contributing WWCCPN members, global trade of Coal Ash, equates to $101 million USD annually. The long term trend in trade and value is increasing.”

REFERENCES:

3. IEA and International Concrete Sustainability Initiative “Energy Technology Perspectives 2012”, July 2012.
5. Canadian Electricity Association, “Electricity Generation in Canada by Fuel Type, 2011”.
6. CIRCA “Utilization of Coal Ash from Landfill”, 2013