

World Customs Organization's Harmonized System can put Coal Ash in a Class of its Own

Anne Weir

Association of Canadian Industries Recycling Coal Ash, 4611 Sherbrooke St. W., P.O. West Hill #24506, Montréal, CANADA H4B 3A5

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BACKGROUND:

The World Customs Organization's *Harmonized System* (HS) is a product nomenclature, with legal status, comprised of about 5,000 commodity groups; each identified by a six digit code.¹ Over 98 % of the merchandise in international trade is classified in terms of the HS.

HS codes are used by more than 200 countries as a basis for Customs tariffs and the collection of international trade statistics. Developed through many iterations since 1931², the HS has become “a universal economic language and code for goods, and an indispensable tool for international trade” used by governments, international organizations and the private sector for a variety of policy, legislative and economic purposes. This paper evaluates the place Coal Ash holds in the HS and explores opportunities to amend the HS in order to establish a classification better suited to Coal Ash's mineral origin and “product” status. A rationale for industry collaboration to champion revision of the HS is presented to reflect consensus on the value of Coal Ash to international policy makers and legislators .

Recent developments in industry specifications, regulation & legislation affecting Coal Ash in Canada and the US indicate a better understanding of Coal Ash is needed, particularly if Coal Ash is to receive the recognition commensurate with worldwide demand and the technical/environmental benefits of recycling this mineral resource.

HARMONIZED SYSTEM STRUCTURE

The HS describes internationally traded commodities in strictly factual terms, agglomerating those considered to be alike under Headings and Subheadings. This is a logical approach to organizing the information, given the quantity and diversity of commodities addressed: more than 200,000 commodities, listed under 5,000 commodity groups. The following HS excerpt illustrates relationships between sequential Headings:

- 26.18 GRANULATED SLAG (SLAG SAND) FROM THE MANUFACTURE OF IRON OR STEEL.
- 26.19 SLAG, DROSS (OTHER THAN GRANULATED SLAG), SCALINGS

¹ “Nomenclature Overview: What is the Harmonized System (HS)?” : World Customs Organization: www.wcoomd.org/home_hsoverviewboxes_hsharmonizedsystem.htm

² Customs Tariff Nomenclature Classification (Harmonized System)”, United States Agency for International Development:: http://pdf.usaid.gov/pdf_docs/PNADL092.pdf

- AND OTHER WASTE FROM THE MANUFACTURE OF IRON OR STEEL.
- 26.20 ASH AND RESIDUES (OTHER THAN FROM THE MANUFACTURE OF IRON OR STEEL), CONTAINING ARSENIC, METALS OR THEIR COMPOUNDS.
- 26.21 OTHER SLAG AND ASH, INCLUDING SEAWEED ASH (KELP); ASH AND RESIDUES FROM THE INCINERATION OF MUNICIPAL WASTE.**

The list also exemplifies the limitation of some Headings to identify all commodities to which they apply. Qualification for Heading or Subheading recognition in the HS is decided in accordance with the value of annual, international trade volumes of \$100M and \$50M respectively. It is important to note that “Coal Ash” is not specified in the title of either the Heading (26.21) ³, or Subheading (2621.90) under which it is presently classified.

As the HS lists only Headings and Subheadings, an HS user must search beyond the legal text to discover more detail of a Subheading’s constituents. These are listed, defined and thereby differentiated in an Appendix to the HS, known as the “Explanatory Notes”.

EXPLANATORY NOTES

The “Explanatory Notes” *do not enjoy the same legal status as the HS itself*. In most nations the “Explanatory Notes” are not legislated, but only “recognized as authoritative” ⁴. Further, an entry’s listing in “Explanatory Notes” infers a commodity’s comparatively modest international trade, i.e.: of a value less than \$50M annually.

Subheadings under Heading 26.21, provide additional detail:

Subheading 2621.10 addresses “Ash and Residues from Incineration of Municipal Waste”

Subheading 2621.90 covers “Other”

“Other” includes Coal Ash among the first of five commodities listed, materials with which it has little in common:

“**Ash and clinker of mineral origin (e.g., coal, lignite or peat ashes)**”

“Kelp and other vegetable ash”

“Bone ash”

“Crude potassium salts”

“Ash and residues resulting from the incineration of municipal waste”.

³ “This heading covers slag and ash **not falling in headings 26.18, 26.19, or 26.20**, derived from the working of ores or from metallurgical processes, as well as those derived from any other material or process. Although many of the products are used as fertilisers they are classified here and not in Chapter 31 (**except** in the case of basic slag)”, World Customs Organization, Harmonized System: http://www.wcoomd.org/home_online_services_hs_online.htm.

⁴ T. MacDonald, Senior Program Advisor, International Nomenclature Development, Tariff Policy Division, Trade Programs Directorate, Admissibility Branch, Canada Border Services Agency, July 2005.

Finally, the commodity definition for Coal Ash instructs an HS user's understanding of the material and its uses, under "Ash and clinker of mineral origin (e.g., coal, lignite or peat ashes)":

"Coal ash is produced primarily from the burning of pulverised coal in utility boilers. It occurs as a fine powder and as a sand sized granular material. Its principal uses are as a raw material for cement manufacture, as a supplement to cement in concrete and mine backfill, as a mineral filler in plastics and paints, as a lightweight aggregate in block manufacture, and in civil structures such as highway ramps and bridge abutments. It includes:

- a) Fly ash – finely divided particles entrained in furnace flue gases and removed from the gas stream by bag or electrostatic filters;
- b) Bottom ash – more coarse ash removed by settlement from the gas stream immediately after leaving the furnace;
- c) Boiler slag – coarse residues removed from the bottom of the furnace;
- d) Fluidized bed combustor ash (FBC-ash) – inorganic residues from burning coal or oil in a fluidised bed of limestone or of dolomite.”⁵

The problem with this classification is that it fails to distinguish Coal Ash from other ashes or wastes under the same "Other" Subheading, effectively ranking Coal Ash among commodities of *comparatively* little value and/or wastes with hazardous properties. Despite a lack of commonality in terms of market demand, valuation of that demand, or the applications that underpin them, Coal Ash is listed among byproducts of industries processing vegetable, bone and sugar wastes, along with ashes from municipal waste incineration. To those well acquainted with Coal Ash, the "Other" Subheading is an inadequate label that unfortunately groups Coal Ash with materials that do not fit under other Subheadings.

Further, as "Explanatory Notes" entries suggest no valuation of trade volumes their inclusion of Coal Ash effectively understates the importance of Coal Ash trade. In terms of product identification in a global market, these crucial shortcomings undermine the international community's appreciation of our product.

There are, however, means to rectify such shortcomings and raise the profile of Coal Ash in HS documentation, by invoking the value of international trade:

Quantification of international trade in Coal Ash can qualify "Ash and clinker of mineral origin" for Heading or Subheading status in the HS, in essence resetting the context in which Coal Ash is understood. Such an effort would also confer legal status of Coal Ash as an internationally traded commodity.

Annual international trade of \$100M would qualify "Ash and clinker of mineral origin" for inclusion in the HS Heading, removing it from its present company under Subheading 2621.90 "Other". Annual international trade of \$50M would qualify "Ash and clinker of mineral origin" for a *dedicated* Subheading to clearly distinguish Coal

⁵ "Explanatory Notes" to the Harmonized System, World Customs Organization, V-2621-1:
http://www.wcoomd.org/home_online_services_hs_online.htm

Ash from other commodities presently listed under 26.21 Subheadings (i.e.: "Ash and Residues from the Incineration of Municipal Waste").

Proposed changes are presented in blue typeface:

ASH AND CLINKER OF MINERAL ORIGIN

26.21 OTHER SLAG AND ASH, INCLUDING [^] SEAWEED ASH (KELP);
ASH AND RESIDUES FROM THE INCINERATION OF MUNICIPAL
WASTE.

Subheading 2621.10 "Ash and Residues from Incineration of
Municipal Waste"

**Subheading 2621.20 "Ash and clinker of mineral origin (e.g.,
coal, lignite or peat ashes)"**

Subheading 2621.90 "Other"

~~"Ash and clinker of mineral origin (e.g., coal, lignite
or peat ashes)"~~

"Kelp and other vegetable ash"

"Bone ash"

"Crude potassium salts"

"Ash and residues resulting from the incineration
of municipal waste".

In either case, input from the international Ash industry stipulating the value of annual, international trade in Coal Ash can be sufficient to revise HS classification of this mineral resource. It is to be determined, however:

- whether National Production and Use statistics capture international trade data;
- if international trade data identifies a valuation.

In the event international trade data is not readily available, national governments and/or ash associations may be prevailed upon to provide it in order to pursue an amendment to the HS.

WILL CHANGING INTERNATIONAL TRADE DOCUMENTATION BE EFFECTIVE?

Recent developments in industry specifications, regulation and legislation affecting the management of Coal Ash the world over indicate a better understanding of Coal Ash is sorely needed. Despite its inclusion in national specifications/programs over the last decade and despite corresponding increases in demand and use, the public perception of Coal Ash remains vulnerable to technical ignorance, regulatory barriers and political impulse.

Despite repeated declarations (in 1988, 1993, 1999 & 2000 ⁶) that Coal Ash is not a hazardous waste and years pursuing increased beneficial use, the US EPA is now:

- re-evaluating the classification of Coal Ash (as a non-hazardous, hazardous, or "special" waste);

⁶ J. Latta, T. Grady Barbaccia and M. Anderson, "Changes coming Thick and Fast from "Activist" EPA", Better Roads, November 2010: <http://www.betterroads.com/roadworks-7/?pg=2>

- considering prohibition of Coal Ash in mining applications, and
- stigmatizing Coal Ash in the process.

These actions have spawned political debate on the viability of environmentally sustaining and scientifically-defensible practice.

The Ash industry's ability to advocate that Coal Ash is an environmentally sustainable alternative to more emission-intensive materials depends on an educated understanding of this mineral resource; how it is effectively used; and the magnitude of benefits attributable to its recycling and use. At this point in time, it is clear that North American efforts have been insufficient to overcome challenges to the integrity of Coal Ash products or to support lasting appreciation of their value.

Coal Ash is not classified as a Hazardous Waste in Canada. However, efforts to reduce emissions and "harmonize" national regulation with international legislation continue to expose the Ash industry to continual change:

- Canada is legislating CO₂ emission reductions from coal fired boilers and Mercury emissions from all industry sectors, and
- Negotiating a legal binding Treaty on Mercury;
- Environment Canada updates to the "Export/Import of Hazardous Waste and Hazardous Recyclable Materials Regulations" and its "Domestic Substances List" may potentially affect Coal Ash use;
- Quantified environmental benefits of Coal Ash use ⁷ have not been effectively linked to national utilization statistics ⁸, which have not been collected since 2007.

Clearly, Canadian efforts have been insufficient to persuade our national policy makers to prioritize Coal Ash as a mineral resource significant to achieving our environmental goals.

Thankfully, observance of international Conventions/legislation and regulation carries weight in Canadian deliberations. More progressive approaches to the management of Coal Ash present practical protocols that support Coal Ash as a recyclable mineral resource in the international arena:

- Europeans have registered their Coal Ashes as products under REACH ("Registration, Evaluation, Authorization and Restriction of Chemicals" Regulation). REACH has required CCP producers or importers to register marketed or imported substances (with the European Chemicals Agency (ECHA)) in order for them to be produced and placed on the market.
- European Coal Combustion Products Association (ECOBA) has, together with the European association of the electricity industry, EURELECTRIC, prepared a "Joint Briefing on The Classification of Coal Combustion Products under the Revised

⁷ "If Fly Ash were used as an SCM (Supplementary Cementing Material) at the prescribed limit, about 1.2 Mt of GHG emissions would be displaced. If the prescribed maximum were surpassed by 25 or 50%, associated impacts would be 1.6 or 1.9 Mt CO₂e, respectively." R. Sinclair, "Analysis of Resource Recovery Opportunities in Canada and the Projection of Greenhouse Gas Emission Implications", Natural Resources Canada, 2006, p. 266: <http://www.rcbc.bc.ca/files/u3/RR-opport-data-report.pdf>

⁸ "CANADA, PRODUCTION (1) AND USE (2) OF COAL COMBUSTION PRODUCTS (CCPs), 2004-06 AVERAGE": <http://www.nrcan-rncan.gc.ca/mms-smm/busi-indu/cmy-amc/content/2006/17.pdf>

Waste Framework Directive (2008/98/EC)".⁹ The Briefing:

- establishes CCPs as the preferred term for “ashes and desulphurization products produced following the combustion of coal for power and steam generation”¹⁰ and
 - asserts CCPs’ value in accordance with “quality criteria, standards, regulations or user-imposed technical requirements through which their value is clearly acknowledged.”
 - indicates CCPs “have no negative impact on the environment or on human health when put to beneficial use” and
 - includes a flow chart describing production and recovery operations that yield By-Products.
- The European “Waste Framework Directive” distinguishes wastes, by-products and products, and the evolution of a material from one status to another.
 - One outcome of these efforts is that CCPs have been assigned a new number in a European Union classification system, in recognition of their “Product” status.

The United Kingdom Quality Ash Association has also accomplished Coal Ashes’ transition from “waste” to “product” for specific applications, in collaboration with its national “Waste & Resources Action Programme” (WRAP). The UK “Quality Protocol” defines “criteria when coal fired ash products, PFA or Fly Ash and FBA can be used without the necessity of obtaining waste exemptions/permits and licences.”¹¹

Australians too have taken progressive action to effect regulatory exemptions for specific (encapsulated & unencapsulated) uses of Coal Ash. The Ash Development Association of Australia’s close work with regulators addressed domestic Ashes, in the context of applications in demand, to clear the way for increased beneficial use.

Such accomplishments are vital, where not all input to the international arena is supportive of Coal Ash recycling and use. Such accomplishments light the way for the international Ash Industry to articulate a clear appreciation for the value of Coal Ash. It is very possible that a concerted effort to communicate such accomplishments will persuade Harmonized System administrators to update the HS in a manner that supports the progress the Coal Ash industry has worked so hard to effect.

In 2010, the US EPA’s reconsideration of Coal Ash as “hazardous” prompted international Ash Associations from Canada, the United Kingdom, Europe and Australia to communicate with the US EPA in defence of a science-based approach to Coal Ash management and use.¹² ACAA’s international colleagues now await the result of deliberations in hope that

⁹ “The Classification of Coal Combustion Products under the Revised Waste Framework Directive (2008/98/EC)” ECOBA/EURELECTRIC Joint Briefing: http://vliegasonie.nl/engels/downloads/EURELECTRIC_ECOBA.pdf

¹⁰ The Harmonized System classifies FGD Gypsum separately from Coal Ash, under HS 25.20 “Ores”.

¹¹ “The Waste Framework Directive (WFD) and the Quality Protocol for PFA & FMA (England & Wales and Northern Ireland”): <http://www.ukqaa.org.uk/QualityProtocol/index.html>

¹² Utility Solid Waste Utilities Group, “CCB Letters”: <http://www.uswag.org/ccbletters.htm>

reason will prevail over EPA's proposed reclassification of Ash and the stigma it engenders. It appears, however, our wait will be protracted¹³ while EPA weighs science alongside public comment. In the meantime, the Ash industry's need to defend Coal Ash as an environmentally responsible resource has taken on an urgency that temporarily eclipses the magnitude of sustainability benefits attributable to its use.

Here the significance of the Harmonised System comes into focus as an effective means to communicate international consensus on the value of Coal Ash to policy makers and legislators. Explicit mention of Coal Ash at HS Heading or Subheading levels would raise the profile of Coal Ash in international trade and tariff literature to a level more commensurate with its recognized value and increasing demand. Proper recognition among HS commodities will clarify and monetize Coal Ash, serving to authenticate its status and reflect its significance as a mineral resource. Improved representation in the HS will better inform the governments, international and private sector organizations that reference it, potentially encouraging development of policy and legislation that supports Coal Ash use.

With explicit mention of Coal Ash in the HS accomplished, the Ash industry can more effectively communicate the magnitude of technical, environmental and economic benefits Coal Ash offers as a sustainable alternative to more emission-intensive materials.

HOW AND WHEN

Harmonized System Committee Members represent 138 Contracting Parties to the HS Convention. The HS Committee is charged with maintaining the HS, examining policy matters and deciding on questions of classification to amend the HS and "Explanatory Notes" every 5 years. Only HS Committee Members can initiate Proposals to amend the HS. National HS Review Committees are presently reviewing proposals for HS Committee consideration.

As proposals to amend HS Headings or Subheadings must be supported by multiple, national proponents and global trade statistics, international participation is essential. CIRCA is conferring with the Canadian administration to submit a proposal to the HS Committee. If it is clear that other national administrations also support revising the classification of Coal Ash, HS Committee Members will be persuaded their intervention is merited. This would involve preparation of proposals by other national customs administrations, outlining rationales in support of HS Committee review.

We are advised that environmental impacts of Coal Ash use and development of new technologies furthering Coal Ash's use will provide additional impetus to any proposal presented for HS Committee consideration. There is ample evidence of environmental benefit to support explicit recognition of Coal Ash in HS Headings/Subheadings, be it in terms of reduced energy demand, global CO₂ emission reductions or the resource

¹³ K. Ward Jr., "EPA won't complete coal-ash rules in 2011", The Charleston Gazette, March 4, 2011: <http://wvgazette.com/News/201103040756>

conservation enabled through the superior technical performance Coal Ash imparts to cement and concrete:

- The International Energy Agency & World Business Council for Sustainable Development's "Cement Sustainability Initiative" cites clinker substitution as a key strategy for the global Cement sector to achieve significant (18%) CO₂ emission reductions.¹⁴
- Natural Resources Canada asserts the significance of Coal Ash to CO₂ emission reductions.¹⁵
- Canada's "National Master Specification" recommends:
Fly ash...be considered as partial replacement of cement in concrete in order to reduce GHG emissions...to conserve raw materials, energy, increase resource recovery and reduce waste requiring disposal.¹⁶
- The (US-based) Recycled Materials Resource Center established "that recycling ash saves enough energy every year to power 1.7 million households and reduces greenhouse gases equivalent to taking 2 million cars off the road for a year."¹⁷
- The US EPA has quantified significant "Avoided Impacts" attributable to each ton of Coal Ash used to replace Portland Cement in concrete¹⁸:
- Industry literature compares avoided emissions and "embodied energy content" of HVFA concrete and steel construction, to illustrate how just 4 projects can save approximately 800 t CO₂ emissions and energy¹⁹:
1.31 MJ/kg for 30 MPa concrete
vs.
9 MJ/kg for recycled steel & 32 MJ/kg for new steel
- The Portland Cement Association, has cited the "critical" role Coal Ash plays in durability of concrete infrastructure:
"...cement and concrete industries rely on fly ash to enhance the performance and durability of concreteIncreasing the longevity of concrete infrastructure has huge positive implications for natural resource conservation and energy savings....Fly ash is a critical tool"²⁰

¹⁴ "Cement Technology Roadmap 2009: Carbon emissions reductions up to 2050":
http://www.iea.org/papers/2009/Cement_Roadmap.pdf

¹⁵ R. Sinclair, "Analysis of Resource Recovery Opportunities in Canada and the Projection of Greenhouse Gas Emission Implications", Natural Resources Canada, 2006, pp. 266-7:
<http://www.rcbc.bc.ca/files/u3/RR-opport-data-report.pdf>

¹⁶ Public Works & Government Services Canada, "National Master Specification": <http://www.tpsgc-pwgsc.gc.ca/biens-property/sngp-npms/tech/ddn-nms-eng.html#a3>

¹⁷ "Wisconsin could become coal ash model", Milwaukee newsbuzz.com, Nov. 22, 2010 Aggregate Research <http://www.aggregate-research.com/article.aspx?ID=20845>

¹⁸ "Benchmark Report: Waste and Materials-Flow Benchmark Sector Report: Beneficial Use of Secondary Materials (CCPs)", US EPA, Feb. 2008, p. ES-4:
<http://www.regulations.gov/#!documentDetail;D=EPA-HQ-RCRA-2009-0640-2086.26>

¹⁹ P. Kumar Mehta, PhD & Mason Walters, SE, "Roadmap to a Sustainable Construction Industry", The Concrete Specifier, V. 61, No. 1, Jan., 2008, pp. 48-57.

²⁰ Portland Cement Association, Nov., 2009

These facts support a more considered view of Coal Ash recycling and use than the HS currently offers. It is possible then, the HS presents an opportunity to educate policy makers and legislators.

HISTORY OF SUCCESS

History suggests promise: a 2004 proposal to the HS Committee successfully championed the expanded definition of Coal Ash in the HS Explanatory Notes (cited on page 3). In this case, CIRCA collaborated with the Coal Association of Canada, ACAA and ECOBA to augment the Explanatory Note entry “Ash and clinker of mineral origin (e.g., coal, lignite or peat ashes)” under Subheading 2621.90 “Other”, with information to enlighten HS users’ understanding of the material and its uses. Prior to 2004, no detail on Coal Ash properties or applications was included with the “Ash and clinker of mineral origin (e.g., coal, lignite or peat ashes)” title.

EPA’s reconsideration of Coal Ash suggests the time has come for another international effort to encourage a clearer appreciation of Coal Ash as a mineral resource, valued the world over for its significance to environmental stewardship, technical performance merits and economic benefits. Recent regulatory and legislative developments have tremendous potential to inform HS Review Committees’ consideration of a classification more commensurate with Coal Ash’s merit. CIRCA will propose international collaboration on this effort to Members of the Worldwide Coal Combustion Products Network on May 11th, 2011.

CONTACT

For more information, please contact CIRCA Executive Director, Anne Weir,
tel.: (514) 482-1220 e-mail: anne_weir@sympatico.ca