

FINAL MEETING SUMMARY

Note: This document is not a meeting transcript. It is a summary of key themes and some (though not all) background dialogue.

ATTENDEES

Please see the list at the end of the document.

MEETING HANDOUTS

- Final Agenda
- “Factoids on Key Streams...”
- National Center for Environmental Innovation (NCEI) Brochure
- Sector Strategies Division Brochure
- Contact List
- Code of Conduct
- Evaluation

INTRODUCTORY REMARKS

Jay Benforado, Director of EPA’s National Center for Environmental Innovation, set the stage for the meeting. He stressed EPA’s interest in voluntary partnerships and his view that the next generation of environmental protection will not be based upon command and control approaches. He discussed EPA’s new Resource Conservation Challenge (RCC), which brought together 70 disparate activities within EPA and utilizes flexible approaches to reduce resource use and encourage recycling. The Forum will take a sectors-based approach to the RCC.

In contrast to conventional environmental protection approaches, which look through the lens of a specific statute or media, sector approaches take a more comprehensive view, resulting in smarter, more effective regulation and improved performance by the regulated community. EPA expanded its Sector Strategies Program this year and is now working with twelve sectors, some represented here, to reduce regulatory burden while improving environmental performance.

Mr. Benforado explained that this Forum was designed to hear directly and exclusively from industry experts on barriers to resource conservation, and to identify and address crosscutting issues. NCEI was created to be a catalyst for change, a testing ground to build off existing innovation initiatives. For example, NCEI assists EPA Regions in trying new ideas in pursuit of improved environmental performance.

He outlined NCEI’s goal for this meeting as determining targets of opportunity for beneficial reuse of industrial by-products. A key criteria is “do-ability”.... will a suggestion require regulation or statutory change, or are there things that we can do quickly? He encouraged participants to think of other barriers besides regulations, such as state programs, liability, cost, international trade, public perception, etc. He also urged participants to focus on ease of implementation and on commonalities between industrial sectors.

FORUM OVERVIEW

The meeting facilitator, Adam Saslow of Consensus Solutions, Inc., reviewed the agenda and structure of the meeting. There were three clearly delineated segments:

1. Sector presentations on products, processes, residuals, and by-products
2. Barriers to reuse and beneficial recycling
3. Opportunities to overcome those barriers and an action plan

The ten industry sectors represented were: Aluminum, Cement/Concrete, Chemical Manufacturing, Coal Combustion, Copper and Brass, Foundries, Iron and Steel, Petroleum Refining, Pulp and Paper, Scrap Recycling. The individual participants representing the sectors are listed below.

PRODUCTS, PROCESSES AND RESIDUAL STREAMS

To provide background information on reuse potential, each participant gave a brief overview of his or her industry sector's products and by-products, and of uses for those by-products. The information provided is summarized by Sector in this section.

ALUMINUM

Products: All types of aluminum products

By-Products: Primary production spent pot liners (listed hazardous waste), approx. 50,000 tons per year. The recycling of aluminum is working very well with few barriers.

Uses: Currently they are testing the use of spent pot liners in cement kilns where the temperatures are high enough to destroy hazardous substances. The pot liners provide BTUs (heat energy represented by British Thermal Units) and contain 15% fluoride, as well as silica and aluminum. When injected into pre-calciner, the ground pot-liner material reduces the temperature needed for clinker formation, thus saving energy and reducing NOx emissions.

COPPER & BRASS FABRICATION

Products: Fabricated products such as bar, rod, tube, sheet, strip, etc., which go to other manufacturers. Their manufacturing process uses copper, zinc, nickel, and lead. 60% of their raw materials come from recycled sources/scrap, which is much less expensive than virgin metal. A lot of scrap metal is being shipped overseas, which limits the supply available to U.S. fabricators.

By-Products:

- Baghouse dust;
- Slag-like (dross & skimmings);
- Furnace refractories;
- Waste water filtercake;
- Treatment residuals and settling pond residuals.

CEMENT AND CONCRETE

Products: The primary product is concrete, which is produced by mixing cement with aggregate. The raw materials used to manufacture cement include limestone (90%), calcium, silica, and iron. Cement kilns use extremely high temperatures thus have a high energy demand and are able to reuse many types of high BTU by-products as fuel.

By-Products of Cement Manufacturing:

Kiln dust is the primary by-product at a volume of 10 million tons/year (8 million are recycled back into the cement making process, 1 million go to beneficial reuse and 1 million go to landfills). In some areas old cement kiln dust (CKD) landfills are mined for raw materials. Cement manufacturing uses by-products from many other industries including: fly ash, foundry sand, iron/steel blast furnace slag, aluminum, spent pot liners, etc. Cement manufacturing also uses a wide range of alternative fuels for kilns, including: waste wood, bio-mass from pulp/paper, waste tires, scrap plastic, scrap carpet, etc. – anything with high BTU value.

Uses for cement kiln dust:

- Road base;
- Soil stabilizing agent;
- Soil amendment to adjust pH.

By-Products of Concrete Manufacturing:

- Concrete left over after a job (most people order more concrete than they need);
- Reclaimer output – the reclaimer separates water, aggregate and slurry (slurry is difficult to work with; re-use ideas are needed);
- Truck wash water – the water is 12.5 pH so is a Characteristic Waste under RCRA; the industry’s goal is total re-use after treatment;
- Baghouse dust – goes back into the production process.

Uses for concrete by-products (after crushing):

- Road base;
- Block;
- Sewer components;
- Decorative concrete items;
- Faux stone;
- Water treatment works would like to use high-pH water to neutralize excess acid, but industry has some concerns.

CHEMICALS

Products: There are two main types of chemical production plants: large organic and inorganic chemical manufacturers and smaller batch process facilities that produce specialty chemicals, intermediates, etc.

By-Products:

- Large manufacturers produce hazardous waste (liquid organic chemicals with high BTU content)
 - Spent Catalysts;
 - Metals;
 - Spent Solutions;
 - Wastewater Treatment Solids (Sludge);
 - Air Pollution Control Technology Residuals; and
 - High BTU Content Materials
- By-products from small batch process plants vary depending on what is being manufactured. Most are similar to the above and include spent catalysts, spent solvents, and packaging waste.

By-Product Uses: Energy production and metals recovery.

COAL COMBUSTION

Coal is combusted primarily to generate electricity. Coal combustion products (CCP) are what

remain after coal combustion. An increase in CCP is expected due to increase in air quality standards. Industry annually produces 117 million tons of CCP, of which 33% is presently reused. An industry representative stated that an EPA study found these materials to be non-hazardous.

Coal Combustion By-Products:

- Fly Ash;
- Bottom Ash;
- Boiler Slag;
- Fluidized Bed Materials; and
- Flue Gas Desulfurization (FGD) Material.

Uses:

- Cement/Concrete;
- Flowable Fill;
- Blast Grit;
- Wall Board; and
- Snow/Ice Control.

FOUNDRIES

Products: Solid cast metal products [not die cast process]. 60% of their product goes to automotive uses; the rest goes to a wide variety of industries.

By-Products:

- Green Sand [Foundries use approximately 100 million tons/year of sand. Of this, they recycle 90 tons within their own industry, leaving 10 million tons for other reuse];
- Slag;
- Baghouse Dust & Wet Scrubber Residuals; and
- Refractory Equipment.

Uses:

- Green Sand:
 - Flowable Fill;
 - Silica Source For Cement;
 - Hot Mix Asphalt;
 - Engineered Fills/Geotechnical Products;
 - Manufactured Products Such As Concrete Blocks; and
 - Manufactured Soil Products [Includes Land Application] – Green sand replaces mined sand in these products.
- Slag: Slag is similar to blast furnace slag, for which several reuse markets already exist. There is not much of a barrier to reuse of this material and regulators accept this reuse.
- Refractory Equipment: Low quantity makes finding a use for this material difficult; it currently goes to landfills.
- Baghouse Dust & Wet Scrubber Residuals: currently used in plastic extrusion products.

IRON AND STEEL

Products: Reinforced steel for concrete, structural, rod, bar, and rolled metal. There are two types of processes and plants, each producing about half of domestic steel: Mini-mills, use the Electric Arc Furnace (EAF) process to recycle scrap metal; Integrated Mills use the Oxygen Furnace Process to produce steel from iron ore and other raw materials, including scrap metal.

Mini-Mill By-Products:

- Baghouse Dust – approximately 60% of the dust is Oxides of Iron and Zinc; also contains Other Metals (such as aluminum and magnesium); may also contain Lead, Chromium; EAF Dust is a listed hazardous waste because it may contain trace heavy metals;
- Electric Furnace Slag;
- Mill Scale – Iron oxide that comes off steel when it is cast;
- Shredder Fluff – the nonrecycled remainder from shredding automobiles and appliances; includes Automobile Shredder Residue (ASR); composition is highly variable and may contain low levels of polychlorinated biphenyls (PCBs); estimated to be 46% fabric and carpet, 9% foam, 8% wire, 6% plastics, 5% rubber, and 3% paper.

Furnace (Oxygen and Electric Arc) Process By-products:

- Slag; and
- Pickle Liquor (The acid solution used to remove oxides from the surface of steel).

Uses:

- Baghouse dust – recycled for zinc recovery, some used as micronutrient;
- Slag – road base, aggregate (is non-hazardous);
- Mill scale – used in cement manufacturing for iron and burned for BTU value;
- Shredder residue – the high BTU components are used for fuel.

PETROLEUM REFINING

Products: Fuels (90%), chemical products, and lubricants. Their goal is 100% use of hydrocarbons.

By-products:

- Oil bearing secondary materials (not from refineries, but from transportation, service stations, etc.);
- Clarified slurry oil tank sediments (also contain aluminum, silica);
- Spent catalysts (contain nickel, cobalt, molybdenum, and other metals).

Uses:

- Hydrocarbon recovery;
- Metals recovery.

PULP AND PAPER

Products: All types of paper products.

By-Products:

- Waste water treatment (WWT) residues. The industry reuses around 50% of the 5-6 million tons produced annually;
- Power production boiler ash – wood ash, coal ash, mixed fuel ash; all have high carbon content (up to 50%). Produce 3 million tons annually;
- Causticizing residues – lime mud, green liquor dregs, slaker grits; are high calcium & alkaline. Produce approximately 1 - 2 million tons annually.

Uses:

- WWT sludge – approx. 50% of these residuals are re-used in
 - Paper Production;
 - Land Application;
 - Cement Kiln Fuel;
 - Landfill Covers And Caps;
 - Animal Bedding;
 - Kitty Litter; and
 - Industrial Adsorbent.
- Ash
 - Soil Amendment/Land Application;
 - Ph Adjustment;
 - Earthen Construction;
 - Cement;
 - Compost Feedstock; and
 - Flowable Fill
- Causticizing Residues
 - Compost;
 - Manufactured Soil;
 - Landfill Cover;
 - Cement; and
 - Asphalt.

BARRIERS DISCUSSION

Participants were asked to describe the barriers they have experienced to reuse of the by-products described above. The barriers were placed into categories for discussion purposes. How items are categorized does not reflect analysis or prioritization.

One participant inquired as to how the results of the Forum will affect EPA's proposed rule modifying the Definition of Solid Waste. An EPA official responded that today's discussion will inform the rulemaking process but that there is no agreement with the Office of Solid Waste that the results of this meeting would be incorporated into the rule or processed as comments. Participants were encouraged to submit any comments they have on the proposed rule using the method described in the rulemaking documents.

ECONOMIC BARRIERS

- An economic carrot (an incentive) is needed to stimulate more reuse;
- Regulation as solid and/or hazardous waste results in a huge cost to industry and causes lost opportunity if they cannot get a permit/approval in time to deliver the by-product to the user;
- Regulatory agencies lack adequate resources to respond or to improve how they deal with re-use scenarios;
- The potential for liability creates increased costs;
- Industry needs to invest more money into activities that increase reuse;
- The cost of transporting by-products inhibits their reuse;
- Industry needs a continuous supply of a by-product to have effective reuse.

RCRA SUBTITLE D BARRIERS

- By-products are often regulated as a "waste" and not considered a resource;
- The term "discard" as used in RCRA creates barriers; if EPA would delete this term it will make reuse much easier (*all participants agreed on this point*);

- The stigma and perception of risk if a material is designated as a “waste”;
- The new proposed EPA regulation changing the Definition of Solid Waste is not adequate, especially the requirements that reuse remain within the same industry group;
- States lack any real incentive to be more consistent or to favor reuse;
- EPA does not send a clear message to the states that reuse is good;
- States lack useful state rules on reuse;
- Inconsistency in state requirements on how reuse is dealt with (*all participants agree this is a significant barrier*);
- In terms of state barriers, EPA’s definitional structure has clear and direct impacts on state regulations.

RCRA SUBTITLE C BARRIERS

- Once a material is defined as solid waste and hazardous waste it is extremely hard to get it out of that regulatory system, which discourages reuse and recycling;
- The term “discard” as it is used in RCRA is problematic and draws in undiscarded materials;
- The RCRA terms “energy recovery”, “land application”, and “reclamation” define by-products as hazardous waste, yet other regulations already address these issues and risks;
- The definition of solid waste regarding “use to produce fuels” is problematic;
- It is too hard to fit under the exclusion in the regulations; the regulations are too prescriptive and the variance process takes too long (for both Subtitle C & D);
- Regulations give industry too short a time frame to store by-products on site and accumulate enough for effective reuse;
- Moving materials/by-products between industry sectors/segments is precluded or very difficult under the rules;
- The Toxics Release Inventory poses problems for materials under both Subtitles D & C;
- Problems related to commingling Subtitle C & D materials.

CULTURAL BARRIERS

- The use of the term “waste” is a problem – use “by-product” instead;
- EPA lacks clear goals for reuse;
- There is a lack of interstate cooperation;
- The mindset of “we have always used virgin material”; we need new ASTM standards which assist re-use;
- Industry internal culture change is needed, some view landfills as the only option for “wastes”. Industry needs to seek new opportunities for reuse;
- Uninformed public opposition to reuse;
- Unified nongovernmental organization (NGO) opposition to reuse;
- Environmental NGOs believe everything is hazardous;
- There is a need for correct material specifications;
- Inflexible regulations and inflexible interpretation of regulations;
- Lack of trust and credibility in by-products and reuse.

DATA/INFORMATION BARRIERS

- Need to use existing information/data, don’t reinvent the wheel;

- Current data is inadequate to assess the opportunities for additional reuse;
- Lack of knowledge about reuse opportunities;
- Little actual data on reuse opportunities can be found in the public domain, especially when compared with virgin material data. Case studies and analytical data are needed;
- Lack the research and development activities needed to make reuse work; R&D is costly and the fear of regulatory barriers and potential liability blocks R&D;
- During the de-listing process the agency keeps raising the bar as a company proceeds through the process, and asks for higher and higher quality data;
- Lack of resources to conduct R&D for reuse.

INSTITUTIONAL/REGULATORY BARRIERS

- ASR reuse is blocked by the Toxic Substances Control Act regulations for PCBs, unless you can *prove* there are no PCBs in your product;
- Outdated, conflicting, old agency guidance needs to be cleaned up and updated and broadened to cover more than one industry;
- Inconsistent enforcement;
- Potential liability and fear of liability prevent reuse;
- Need a greater EPA budget allocation for reuse related programs.

OTHER BARRIERS

- The Clean Air Act Title V permit program creates uncertainty regarding reuse;
- The hazardous waste permit program creates uncertainty regarding reuse;
- Need to include other stakeholders in the development of solutions to these barriers;
- EPA needs to consider the “global” effects of its rules, guidance, and policies – and lack thereof;
- Read the Department of Energy (DOE) study on barriers to reuse – covers institutional, regulatory/legal and technical barriers.

AN AGENDA FOR ACTION

In the final segment of the meeting, participants were asked to focus on the potential solutions to barriers and opportunities to increase reuse. The authors of this summary have, again, grouped the opportunities by category. NCEI agreed to take these suggestions back to the Agency, to conduct internal analysis, and to target and strategically undertake efforts to implement them.

REGULATORY OPPORTUNITIES

- By-products should not be regulated as solid waste when they are beneficially reused;
- If EPA cannot change the Definition of Solid Waste, then it should address more of the specific barriers related to the definition and the program (such as land application, reclamation, fuels, etc.);
- Refine the regulations so moving a material into another “product” is not precluded by the definition of solid waste;
- EPA rulemaking needs to include reuse in a positive way as opposed to the current negative approach (e.g. the NAICS codes);

- Develop standards for end uses (e.g., If 3 products are combined, need an end-use standard so that commingling is acceptable), may need more data/testing to support these standards;
- Develop a standard EPA regional interpretation on reuse, give reuse guidance to the Regions and states, help them with implementation;
- Create a special EPA permit for commingling of materials (blending Subtitle D wastes with other Subtitle D wastes, or commingling of Subtitle D and C wastes), give pre-approval with conditions;
- Limit future hazardous waste identifications so EPA doesn't block beneficial reuse of those substances;
- Need a favorable RCRA Subtitle D determination for used CCPs in mine applications.
- In the TRI context, EPA should develop a less restrictive definition;
- Find out which like materials can be used in like end uses, then promote/allow it (see the Southeast By-Products Beneficial Use Summit industry breakout list for ideas).

INSTITUTIONAL OPPORTUNITIES

- EPA should set national re-use goals by by-product (short & long-term) and EPA should take ownership of these goals;
- Use the EPA MOU on reduction of brownfields liability as a model (and include insurance);
- Create a "Project XL like" program by sector as experiment for change:
 - Conduct targeted pilot or demonstration projects by sector,
 - Design into the demonstration project process a means to expand successful demonstration projects,
 - Consider ASR for a demonstration project (ASR is useful across many sectors),
 - Agree to a rule change if demonstrations are successful;
- The RCC's Coal Combustion Products Partnership should promote cross-sector reuse; for example, help DOT promote fly ash and foundry sand use in road building;
- "Jobs through MSW recycling" program was a success – why not do a similar program for non-MSW and do it on a Regional level;
- NCEI should create a workgroup of federal agencies that have applications for reuse [USDA, DOE, DOD, DOI, etc.];
- The Interstate Technology Regulatory Council and its permit reciprocity model could be duplicated/expanded upon to include reuse;
- Industry should cost share a research program with DOE, DOD, and EPA, similar to DOE's "energies for the future" program. Form an "industrial by-products coalition" to contract and cost share with federal agencies (might help reduce uncertainty, fear, & liability);
- Need an EPA 'Office' level for reuse programs;
- Need dedicated EPA staff/budget for increasing reuse;
- Enforce procurement guidelines regarding reuse; establish new Comprehensive Procurement Guidelines.

STATE PROGRAM OPPORTUNITIES

- EPA should ask states to set numerical goals for increased use of by-products in Performance Partnership Agreements and Performance Partnership Grants and review them annually for progress;
- Tie state revolving grant funds to increasing reuse within the state;

- Work with States on future rule changes favorable to reuse (or else they will view it as deregulation);
- EPA should study and compare different state regulatory programs related to reuse.

CULTURE CHANGE OPPORTUNITIES

- Develop trust-building programs (e.g. staff exchanges between industry and agencies);
- Focus on the inherent ‘value’ of by-product materials, present them as a potential benefit to the economy (how to define ‘value’ especially regarding transportation costs is an issue);
- Conduct a meeting like this with high level officials from EPA’s Office of Solid Waste;
- Change the Pollution Prevention Program staff’s fears that creating an incentive for reuse will result in a reduced incentive for pollution prevention.

INFORMATION/DATA OPPORTUNITIES

- Industry accepted specifications (such as ISRI specifications) for materials should be used by EPA to define what is acceptable reuse;
- On the EPA website move reuse information to one location and make it more consistent;
- EPA needs a consistent communication platform/approach across types of materials, (e.g., on the EPA website you see a very different approach to how data is presented on different materials (some make the material seem more threatening even when it is not));
- Incorporate the results and opportunities identified in the Chicago by-products (and SWIX) re-use summit;
- EPA should develop a compendium of guidance related to reuse.

NEXT STEPS AND ADJOURNMENT

Jay Benforado closed the meeting by offering to send in one month a refined list of barriers and opportunities to the participants in today’s meeting. Next, he agreed to take the list of opportunities into the agency to see where we can get traction for change or new initiatives. He also agreed to come back to the participants with proposed action items and projects by mid-January.

ACKNOWLEDGEMENTS

This summary was prepared by the Forum facilitator, Adam Saslow, Consensus Solutions, Inc., and his staff, and by EPA staff in NCEI’s Sector Strategies Program.



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