

Client: Investment Recovery Association (Group365 Marketing Agency)

Project: Write/edit industry articles for the Association's trade Journal ASSET2.0, published six times a year. This is just one example.

## Cashing in on Fly Ash

Most Americans today are in the dark about how we make electricity. If asked what powers up those turbines to produce electricity, most would say wind or running water...lots of it. And they would be right. But if they were told that the largest fuel source for generating electricity was coal, they might be surprised.

Coal, really?

Yep.

As the utilities, sustainability and environmental sectors know all too well, burning coal creates by-products – namely fly or coal ash. And it's been in the news for all kinds of reasons.

### ***Fly ash? A quick primer...***

After combustion, coarse particles (bottom ash and boiler slag) settle to the bottom of the combustion chamber. The fine portion (fly ash) "flies up" into the stacks with flue gases and is removed through a filtering process. It is here that ***fly ash turns into ash cash***. It is estimated that 40% of coal ash produced every year is recycled for what the EPA and industry call "beneficial use." In a nutshell, fly ash conserves natural resources, saves energy and significantly reduces greenhouse gas emissions from the manufacturing of products that are replaced.

In many cases, products made with coal ash perform better than products made without it. For instance, coal ash makes concrete stronger and more durable. The American Road and Transportation Builders Association estimates use of coal fly ash in concrete roads and bridges saves highway builders more than \$5 billion per year.

It can be also be found in gypsum wallboard, "cinders" spread on snowy streets, school running tracks and yes...even bowling bowls. So while manufacturing is cashing in on fly ash for business, the environment is cashing in for a different kind of green altogether.

So far a win-win scenario, or is it?

### ***In and out of the cross-hairs***

But fly ash has recently been under environmental and regulatory scrutiny, as in the U.S. Environmental Protection Agency (EPA) threatening to declare it a hazardous waste. In Kingston, Tennessee 2008, a containment pond ruptured at an electric generating plant spilling more than 5.4 million cubic yards of coal ash slurry into the Emory River and beyond. This was an epic environmental disaster causing the EPA to take serious action. Is this stuff hazardous ...or not?

Fast forward to February 2014, where the EPA released its final ruling; fly ash was non-hazardous. A major victory was won on two fronts, for industry and the environment alike.

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QUOTE: Tom Adams, with the American Coal Ash Association, says, “Millions of tons of coal ash will continue to be generated in the U.S. every year. With disposal regulations finally settled, we can refocus energy on productively using those large volumes of materials rather than throwing them away.”

[call out quote option]

**“Production of coal combustions products, particularly fly ash is forecast to exceed future demand”...** ACAA, Key Findings 2015 – Coal Combustion Products Utilization

[call out quote option]

**“Every ton of coal fly ash used in concrete reduces carbon emissions by one ton”...**ACAA, Key Findings 2015 – Coal Combustion Products Utilization

[call out quote option]

**Over the last 40 years, 1.2 billion tons of CCPs have been reused, rather than disposed”...** ACAA, Key Findings 2015 – Coal Combustion Products Utilization

[call out quote option]

**“U.S. economic growth, new housing starts, and demand for ready mixed concrete is forecast to increase CCP utilization by 48%”...** ACAA, Key Findings 2015 – Coal Combustion Products Utilization

## ***Fly ash in the face of fewer plants***

But there’s a fly in the fly ash story. The count of coal-fired electric power plants has been reduced by about 18% since 2003—from 629 in 2003 to 218 in 2013. But even with the plant closings, coal still represents the majority of electricity production.

Why the phase-out? There are two main reasons: 1.) compliance with the EPA’s new and proposed regulations and 2.) competition from natural gas. With fewer plants producing fly ash, where will it come from? This was a major concern to the concrete industry, who amped up its ash usage since EPA’s non-hazardous declaration. A new report however from the American Coal Ash Association states that even under the most aggressive phase-out, there would still be plenty of coal power producing plenty of ash. Despite the retirement of coal-fueled capacity, power generation from coal is expected to remain relatively steady through 2033 due to electric demand growth, according to the U.S. Energy Information Administration (EIA). As a result, fly ash production is forecast to increase by five (5) percent over the next twenty years, from 114.7 million tons in 2013 to 120.6 million tons in 2033.

[call out quote]

**“[IR] is involved in the sale of fly ash for our company...The quality of the fly ash and the coal that it came from is important.”...**Kelly May

## ***Higher quality ash and the high cost of transport***

Fly ash is not exactly flying off the shelves due to some residual contaminants. Unburned carbon and mercury in fly ash have long been the most common barriers for its use in high value concrete applications. The good news is that new technologies are being developed to remove carbon and mercury from fly ash.

Luckily, with the increasing use and value of fly ash, the electrical utilities and others are finding ways to scrub the stuff that's already in use. For example, old ash in landfills is being excavated and prepared for use in concrete. However, this may involve additional shipping costs depending on regional variations in availability. Of course none of this is free, but with the improved performance of concrete with fly ash, the benefits could outweigh the costs.

### **[call out quote]**

*"Transportation costs are a factor, so the farther the concrete plant is from the coal plant - the less attractive an option this is."...*

David R. Halicks

Senior Manager, Investment Recovery, Distribution, & Fleet Services

Tennessee Valley Authority

### **[call out quote]**

*"Duke Energy already reuses more than half of the year it produces in North Carolina, but we continue to look for additional options to recycle this valuable material..."*

Catherine Butler

Duke Energy | Corporate Communications

## ***Fly ash and the future***

Fly ash isn't right for every application or budget, but for the majority it's proving to be an economic and environmental boon. And this is where the disclaimer comes in; as long as fly ash can be properly contained and encapsulated, EPA has given its beneficial use blessing. However, we must be vigilant about ground water seepage at legacy sites. It's happened before and it can happen again. Bottom line though, when you consider that an alternative future for this glorified coal dust was just landfill, cashing in on fly ash could make a brighter future for all of us.

### **Sources:**

*"Coal Ash Reuse and Recycling," southeastcoalash.org*

*"Coal Ash Association Welcomes EPA Final Rule Regulating Ash as Non-Hazardous' Material," www.aaa-usa.org*

*"ACAA - Key Findings 2015 – Coal Combustion Products Utilization," Ash at Work, Issue 2, 2015*

*"There's Fly Ash in Your Future," by William (Bill) Palmer Jr., P.E., FACI, Editorial Director, Commercial Construction Group concreteconstruction.net*

*"Fly Ash Forever," by William (Bill) Palmer Jr., P.E., FACI, Editorial Director, Commercial Construction Group concreteconstruction.net*

*"Planned Coal-fired Power Plant Retirements Continue to Increase," eia.gov/todayinenergy*

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