



Coal

Abundant/Secure, Economic, & Environmentally Sound American Energy

Learn more about the economic benefits of CCP recycling. Order your copy of the [ACC's 2010 Coal Ash Economic Assessment](http://americancoalcouncil.org/storelistitem.cfm?itemnumber=1) (<http://americancoalcouncil.org/storelistitem.cfm?itemnumber=1>)

Note: This fact sheet discusses how CCPs are used. For information on the environmental benefits of using CCPs, see our "Coal Ash: An environmental windfall" fact sheet.

The American Coal Council

The American Coal Council (ACC) is the pre-eminent business voice of the American coal industry. The Association is dedicated to advancing the development and utilization of American coal as an economic, abundant and environmentally sound fuel source.

What is "coal ash"?

Coal is not all carbon. Coal contains quantities of non-combustible minerals, chiefly aluminas and silicas. When coal is combusted to generate electricity these minerals remain as ash products.

"Coal ash," "coal combustion products," or "CCPs" are generic terms that refer to various materials remaining after coal is combusted to make electricity.



Top left to bottom right: 1) fly ash 2) bottom ash 3) FGD material 4) boiler slag

Source: ACAA & ACC 2010 Coal Ash Economic Assessment

How is ash used?

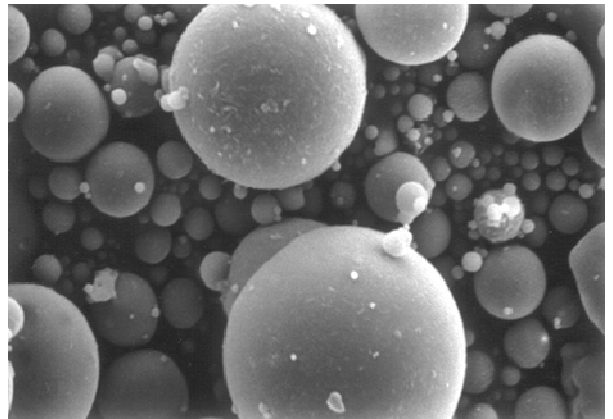
We've been using ash as a building material for thousands of years. In fact, ancient Romans used volcanic ash when constructing magnificent structures — like the Pantheon — that are still standing today.

In modern times, we began using CCPs as a cementitious product in post-war Europe. By the '50s and '60s U.S. power plants were collecting CCPs for beneficial use and recycling. Since its early use in the '60s has risen markedly. Beneficial use of CCPs has nearly doubled from 22% in 1989 to 43% in 2007.

The most common use of CCPs is in concrete. Concrete is a mix of sand and rock, cement and water. Cement reacts with water to form a type of glue that turns the sand and rock into a hard mass. However, fly ash can be added to the concrete mix as a substitute for cement.

The physical properties of fly ash — very small and spherical — allow it to fill voids and provide a "ball-bearing effect" that results in decreased water use. Fly ash reacts with lime in cement and creates more of the binder that holds concrete together. Concrete made with fly-ash:

- Has decreased permeability
- Increased long-term strength
- Reduced damage from heat of hydration
- Increased resistance to chemical attack





American Coal Council

Coal Ash: Beneficial Reuse

Web Resources

American Coal Ash Association
www.acaa-usa.org

American Coal Foundation
www.teachcoal.org

American Coalition for Clean
Coal Electricity
www.cleancoalusa.org

Coal Association of Canada
www.coal.ca

Energy Information
Administration
www.eia.doe.gov

National Energy Technology
Laboratory
www.netl.doe.gov

National Mining Association
www.nma.org

World Coal Institute
www.worldcoal.org



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Coal Combustion Products

In addition to fly ash, other CCPs are also being beneficially used across the country.

Fly ash is a fine powdery material that is light enough to “fly” out of a power plant’s stacks if not captured. Fly ash is not only used in concrete. It can also be used in many structural and low-strength fill applications, soil stabilization, and asphalt mixtures. It can be used as a mineral filler for paints, in shingles, in carpet backing, and in mortars and stuccos. Fly ash is even used in agricultural applications.



Bottom Ash

Bottom ash is a heavier ash particle that falls to the “bottom” of power plant boilers. Bottom ash is used in structural fill, as an aggregate for manufacturing concrete blocks, as paving base, for pipe bedding, and skid control on roads.

Flue gas desulfurization (FGD) material produced by equipment that scrubs sulfur dioxide emissions from flue gas is available as a direct replacement for mined gypsum in the manufacture of wallboard and other green building products. It is also used in structural fill, as a pavement base, and in backfills.

Boiler slag is a hard, dense, angular, glassy, crystalline substance that is formed in the bottom of some boilers when bottom ash becomes a molten liquid. Because it is so hard, it is used in asphalt to improve wear resistance. Smaller grains of slag are also used as sand blasting media, roofing granules, skid control and as a raw material in cement manufacturing

Will we continue to use CCPs?

As the 2010 CCP Economic Assessment demonstrated, we currently use approximately 40% of the CCPs which are produced in the country. 42% of the 72.5 million tons of fly ash we produced was beneficially used. 43.8% of the 18.4 million tons of bottom ash we produced was beneficially used. Approximately 35% of the 33.6 million tons of FGD material we produced was beneficially used. Because so little is produced and it is so useful a product, we use essentially all of the boiler slag that is produced.

American power plants have invested in equipment and programs to collect, store, and deliver CCPs to the markets that need them. American railroads are moving CCPs over long distances, making ash available across the country.

Despite the fact that the beneficial use of CCPs represents a \$6.4—\$11.4 billion industry, there are pending government regulations that could disrupt this valuable industry. Repeated university and government studies have shown no safety or environmental hazards associated with appropriate use and disposal of coal ash. However, pending regulations may classify this valuable resource as “hazardous.” Much of this push for regulation has been driven by sincere, but misdirected concern.

Last edited: March 29, 2010