

Coal Combustion Products Partnership (C²P²)

Fly ash concrete was used to construct this bridge section connecting I-15 and I-80 in Salt Lake City, Utah. Over 40,000 tons of coal combustion products were used in the reconstruction of I-15, the largest design/build highway project in history.



What are coal combustion products?

Coal combustion products (CCPs) are the byproducts generated from burning coal in coal-fired power plants. These byproducts include fly ash, bottom ash, boiler slag, and flue gas desulfurization gypsum.

What are the benefits of using CCPs and why did the Environmental Protection Agency (EPA) create the Coal Combustion Products Partnership?

There are numerous environmental, economic, and performance benefits that result from using CCPs which is why EPA formed the C²P² program.

Environmental benefits can include reduced greenhouse gas emissions, reduced land disposal requirements, and reduced utilization of virgin resources.

Economic benefits can include reduced costs associated with coal ash and slag disposal, increased revenue from the sale of CCPs, and savings from using CCPs in place of other, more costly materials.

Performance benefits can result from the physical and chemical characteristics of CCPs and include greater resistance to chemical attack, increased strength, and improved workability. For instance, high fly

ash-content concrete can be used for high performance, long-life pavements which are designed to last 50 years—twice the lifetime of conventional pavements.

Note: Specific benefits may vary depending on the properties of CCPs and the applications for their use.

What is the C²P² Program?

The Coal Combustion Products Partnership (C²P²) Program is a cooperative effort between EPA and the American Coal Ash Association (ACAA), Utility Solid Waste Activities Group (USWAG), Department of Energy (DOE), Federal Highway Administration (FHWA), and the United States Department of Agriculture (USDA) to promote the beneficial use of CCPs and the environmental benefits that result from their use.



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Through the C²P² program, EPA works with federal and state governments and industry organizations to address legal, institutional, economic, market, informational, and other barriers to the beneficial use of CCPs. Specifically, C²P² aims for the following goals:

- Reduce adverse effects on air and land by increasing the use of coal combustion products to 50 percent in 2011 from 32 percent in 2001.
- Increase the use of CCPs as a supplementary cementitious material (SCM) in concrete by 50 percent, from 12.4 million tons in 2001 to 18.6 million tons in 2011, thereby decreasing greenhouse gas emissions from avoided cement manufacturing by approximately 5 million tons.

The C²P² program aims to accomplish these goals by working with C²P² Partners, supporting research and technical assistance activities, and conducting outreach and education.

C²P² Partners

Like EPA's WasteWise Program, C²P² promotes and recognizes participants for their voluntary efforts. By joining the C²P² program, organizations agree to work to increase the beneficial use of CCPs, and in return are eligible for awards recognizing their activities and achievements, such as documented increases in CCP use and success stories in CCP promotion and utilization.

Note: C²P² Program Registration Forms can be obtained from the C²P² Web site, EPA, ACAA, or USWAG.

Research & Technical Assistance

- **C²P² Web site** with comprehensive information on the C²P² program and a wide variety of resources (located at: <http://www.epa.gov/c2p2>).
- **Case studies** demonstrating how CCPs have successfully been used and identifying barriers to CCP utilization.
- **Fly Ash Facts for Highway Engineers** booklet prepared in collaboration with the FHWA and ACAA.
- **Using Coal Ash in Highway Construction** booklet outlining the benefits and impacts of using CCPs in highway applications.
- **Building Resources Web page** providing guidance on the use of CCPs in building construction applications and the associated environmental effects and benefits.
- **State reviews** of CCP utilization practices in Florida, Texas, and Pennsylvania. A summary report is planned for late 2007.
- **Construction Initiative** with DOE, FHWA, states, trade associations, and other parties to facilitate the beneficial use of industrial byproducts in large construction projects.
- **Green Highways Initiative** with FHWA and other stakeholders to help enhance stewardship and sustainability in transportation planning, design, construction and maintenance.

Education & Outreach

One of the most important functions of C²P² is to support educational and technical outreach about the safe and beneficial use of CCPs. This outreach may be in the form of workshops, conferences, public appearances, conference calls, networking, and other means of information sharing, and often combines information from FHWA, EPA, DOE, ACAA, USDA and other sources to provide a comprehensive look at the beneficial use of CCPs. Information on upcoming events and activities are available on the C²P² Web site.



This project is part of EPA's Resource Conservation Challenge

For more information about the C²P² program, visit the C²P² Web site at <http://www.epa.gov/c2p2>, or contact C²P² Coordinator, John Sager, at sager.john@epa.gov.

Fly ash cement was used to construct the external walls and foundation of the Ronald Reagan Building in Washington, DC—home of EPA's national headquarters.