The Evolution of Waste: In case of Coal Combustion By-products (CCBs) in the U.S.

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ABSTRACT

With the right knowledge, discarded materials can be transformed into valuable resources. Coal combustion by-products (CCBs) are increasingly being utilized in various construction and mining applications rather than being landfilled. The driving force behind these changes are conscious efforts to find innovative ways to reuse CCBs. This raises the question of what drives this innovation, how it occurs, and its consequences. In considering the role of innovation in CCB reuse technologies, this study explores the evolution of CCBs as a usable resource with a wide range of uses. The specific focus of the study is to identify patterns of innovation as a way of determining its underlying causes and effects. Innovation is measured by examining more than 700 patents from the United States Patent and Trademark Office database; the resulting patterns are analyzed by type of CCB, use category, and the year of patent filing, type of inventor responsible for the innovation and the region in which the innovation took place. Some interesting patterns are found in the geographical and temporal distribution of patents. This study also reveals several potential effects of regulatory and institutional events on the number of patent filings, as well as discrepancies between patent filing and actual utilization of CCBs.