



## CLP Power's Case Sharing - Turning Coal Ash into Construction Materials

### Preamble

As a result of various marketing initiatives and through sound research, CLP Power has successfully recycled most of its coal ash for use in the construction industry, predominantly in construction projects, cement manufacturing and as an earth-filling material. Through these applications, a solid waste has now been recycled into a useful and marketable commodity. This has helped to reduce Hong Kong's reliance on imports of ash, relieved the pressure on finding new ash storage sites and improved the structural integrity of buildings.

### The Path to Success



Pulverized Fuel Ash (PFA) is a by-product of coal-fired electricity generation at Castle Peak Power Station

Pulverised Fuel Ash (PFA) is a by-product of coal-fired electricity generation at CLP Power's Castle Peak Power Station. Each year, Hong Kong produces around 700,000 tonnes of PFA of which CLP Power's Castle Peak Power Station accounts for around 50%.

Way back in the 1980s, CLP Power was already aware of the environmental and cost benefits associated with the reuse of this by-product in the building and construction industry. A series of studies on the benefits of PFA concrete using our coal ash was conducted since 1988 and findings of 10 years of study, unveiled in September 2002, confirmed that PFA can be successfully converted from a waste material into a useful product suitable for commercial and industrial use.

PFA was first used in Hong Kong by the Mass Transit Railway Corporation (MTR) when the underground railway was being built in the 1970s. Drawing on their international experience, engineers recommended the use of PFA in the MTR's structures to benefit from the many technical advantages offered – superior workability, durability, higher long-term strength, lower concrete placing temperature and lower water requirements. Today the benefits of PFA in Hong Kong construction are widely recognized and PFA usage forms part of the general specifications for the majority of Hong Kong's key infrastructure projects.



PFA has been used in the construction of many buildings and infrastructure projects in Hong Kong, including the Cultural Centre (right) and Tsing Ma Bridge



PFA cement is also recommended for its environmental and cost benefits. The utilization of PFA in the construction industry not only gives this by-product a second life, but also results in significant material cost-savings. Studies have shown that PFA cement can achieve savings in material cost of up to 15%. To further facilitate the reuse of coal ash as a commercially viable product, CLP Power has been operating the Ash Classification Plant since 1994 to produce classified ash for various usages.



Since its commissioning in 1993, the Ash Classification Plant has processed and sold around 3 million tonnes of ash to concrete producers and waste management companies

### Lessons Learned

The application of PFA in construction activities, cement manufacturing and earth-filling is well proven and has technical, economic and environmental benefits.

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