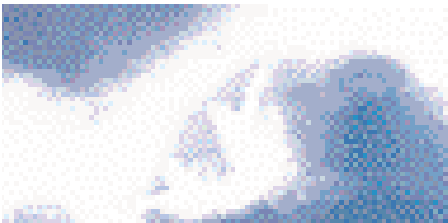


ScotAsh and the Environment

Quality Sustainable Construction Products

ScotAsh can help your business demonstrate its commitment to the environment through sustainable construction.



THE QUEEN'S AWARDS
FOR ENTERPRISE:
INNOVATION
2005

SCOTASH
A Lafarge - ScottishPower Joint Venture

About ScotAsh

ScotAsh is a business founded on the principles of sustainability. We take the ash from ScottishPower's coal-fired power stations and re-engineer it into quality construction products.

We produce a range of cements, grouts and waste stabilisation products, at our Longannet production plant, along with a range of specialised materials, such as concrete enhancers.

Our raw materials are coal combustion products including Furnace Bottom Ash (FBA) and Pulverised Fuel Ash (PFA) that would otherwise be landfilled to lagoons.

At ScotAsh we know that our customers demand high and consistent standards of quality. That is why we have invested in the most up to date ash beneficiation technology, which enables us to control the carbon content of the PFA.

This provides us with a highly versatile core material that has enabled our powder technologists to develop new products and innovative applications for PFA.

ScotAsh is an excellent example of an industrial ecosystem. The company received a Queen's Award in the Innovation Category in 2005 and was a national winner in the Vision in Business for the Environment of Scotland (VIBES) Awards.



- Our products are used in windfarms for the construction of turbine bases



Environmental Benefits

Recycling PFA in construction products has major environmental benefits.

- **Conserving Natural Resources:** It displaces primary aggregates, helping to conserve valuable natural resources.

Due to its low density, re-using ash in this way saves a greater weight of natural aggregates and reduces transportation impacts and costs. In the two years to March 2005, ScotAsh saved around one million tonnes of virgin aggregates.

- **Saving Energy and Carbon Dioxide:** The re-use of ash also saves energy (and CO₂ emissions) that is required to crush, grind and heat raw materials.

The manufacture of traditional Portland cement, widely used in construction, is one of the most energy intensive production processes – only materials such as aluminium and steel require more.

Making one tonne of Portland cement requires about 4Gj of energy.

This makes the process a



significant contributor of the greenhouse gas CO₂.

Each tonne of Portland cement results in emissions of 0.89 to 1.1 tonnes of CO₂ depending on the type of process used.

About half of the CO₂ emissions are due to the calcination of limestone, with the remainder due to the combustion of fossil fuels in energy production.

Each tonne of PFA re-used in cementitious products saves on average 900kg of CO₂ emissions.

During the last three years ScotAsh's use of PFA in cementitious products has

saved 100,000 tonnes of CO₂ – equivalent to taking 32,000 cars off the road for a year.

In addition, using processed PFA as an addition to concrete lowers the water demand, which in turn saves energy.

● **Reducing Landfill:**

And of course processing a by-product into quality products avoids the need to landfill substantial quantities of ash, either to ash lagoons or conventional landfill sites.

During the last three years ScotAsh has avoided the need to landfill around 1.3 million tonnes of ash.

● **Waste Stabilisation:**

PFA has a glassy structure with spherical particles, the result of pulverised coal being burned at extremely high temperatures.

At ScotAsh we have made use of the unique physical characteristics of PFA to produce cementitious binders that can immobilise contaminants within a solid matrix.

These specialised products provide an innovative and cost-effective solution to stabilising sludges, wastes or contaminated land.

Work continues on evaluating their suitability for sealing old landfill sites.

Durable Solutions

In addition to all the environmental benefits associated with using PFA-based products, customers buy ScotAsh products because of the performance benefits of using PFA-based materials.

The use of PFA increases

the strength and durability of concrete with time, making PFA-based products the first choice for major infrastructure projects that must stand the test of time. ScotAsh products are also resistant to sulphate attack and chloride ingress.



- Kirkwall Harbour contains 7,000 tonnes of Trojan cement

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