# Fletcher Insulation: recycling glass into insulation

**Introduction**
Fletcher Insulation use glass from the waste stream in a glass cullet mix for the production of glass wool insulation. Up to 74 per cent of the total raw materials input is from post-consumer waste sources, such as glass from scrap cars, C&D waste, off-cuts from the glass manufacturing industry and bottle glass from the packaging industry and recycling stream.

Fletcher Insulation has been refining their manufacturing process to be able to input as much recycled glass as possible. The production of glass wool insulation relies on a precise mix of inputs to create the correct conditions in the furnace. The formulation of the raw materials is critical and ultimately dictates the proportion of recycled input that the process will tolerate.

**Use of recycled and re-used material**
It is estimated that the glass wool insulation industry in Australia produces 80 000 tonnes of insulation per year. Up to 70 per cent of this can be recycled glass, and therefore the industry has the capacity to recycle over 50 000 tonnes of glass per year from the C&D waste stream, bottle glass, scrap car-windscreen glass and glass industry production waste.

**Drivers and benefits**
Drivers:
The main driver for re-use is economics—using post-consumer waste glass is less expensive than virgin glass material and has the added benefit of reducing the process energy for manufacturing glass wool insulation (as described below).

Benefits:

- Fletcher's corporate social responsibility—the ability to deliver a product to the construction industry that is produced from a high proportion of post-consumer material
- Process efficiency—the energy efficiency gain from the use of recycled glass reduces the energy required in the furnace. The production of glass from raw materials requires temperatures of 1600 degrees Celsius. Cullet melts at 800–900 degrees Celsius and is therefore less energy intensive to use.
- Materials cost—the cost of post-consumer glass is less expensive that using virgin material.

**Problems and challenges**
Only up to 33 per cent of bottle glass can be used in the production of glass wool insulation. Above this percentage, off-white discolouration may occur. This causes problems in the kiln, as the process relies on refraction to spread heat through the glass mix. If the mix is contaminated with too much coloured glass, refraction is inhibited and the kiln will not operate efficiently, increasing the risk of a sub-standard product. There are several types of kiln that can be used to produce glass wool, including electric arc furnaces. Electric arc furnaces have been known to fail in manufacturing due to contamination of the input material.

**Solutions**
Fletcher Insulation has developed relationships with the recycling industry and has worked with them to create a regular supply of post-consumer glass material that is consistent in quality.

**Opportunities for other projects**
More research and development is needed into a glass wool product that itself can be recycled at the end of life. The current product contains acrylic material as a binder that inhibits the ability of the product to be infinitely recycled. It may be possible to develop binders that allow reclamation of glass from glass wool insulation.

**Contacts and links**
Fletcher Insulation Green Manufacturing website
http://www.insulation.com.au/sustainability/green-manufacturing

**Consultation**
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