

# Optimizing a biomass supply portfolio with variation & uncertainty

### **Summary**

This method will allow users to find the optimal blend of materials to meet their specific technical requirements

### **Potential feedstock**

- Refuse derived fuels (RDF)
- Virgin & Waste wood
- Energy Crops
- Agricultural wastes

# Any other organic material

#### **Techno-economic constraints**

- Moisture content
- Ash content
- Pollutants

- Energy content
- Price
- Total amount of material

### **Material characteristics**

- · Temporal or seasonal variation
- Price fluctuation
- Changing chemical

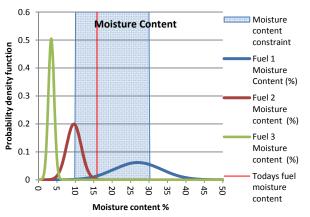
composition

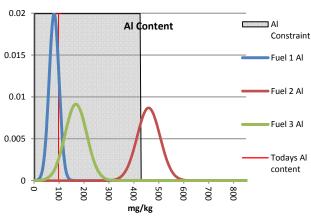
Changing ash, moisture and energy content

## **Problem**

To make best use of the available biomass resources facility operators must blend many sources of fuels to generate a homogenous material stream. The optimal blend is that which meets the property constraints whilst having lowest possible cost.

The solution is a recommended portfolio of suppliers from which the optimal blend can be chosen and mixed





Above example uses a recommended fuel blend of: Fuel1: Untreated wood waste = 1% Fuel2: construction wood waste = 62% Fuel3:Logging residues=37% of blend

express energy







The properties of most biomass sources vary and fluctuate due to uncontrollable environmental circumstances and conditions. For purchasers represents an uncertainty and a risk that the supplied fuel will be outside of specification. Treating this problem using stochastic optimisation methods gives the purchaser confidence and reduces risk associated with contracting for materials.