Clare County Council

Fuel Supply

Fuel Silo

The subterranean fuel silo allows tipping fuel delivery from a tipping trailer fuel delivery vehicle. This is an efficient and effective method of delivery. The silo has a capacity of 130m_, which gives a usable volume of 85m_. At an average moisture content of 35% this is equivalent to 15 tonnes of woodchips when full. This amount of fuel equates to approximately 100 full load hours for the boiler. Therefore, during peak heating months the silo will require filling every 10 days. It takes about 10-15 minutes to fill the silo from a tipping trailer.

Heat Meter

The system operates with an electronic heat meter fitted 'on the user side' of the boiler. This device records the flow and return volumes of water and its temperature as it enters the building. It then coverts this data into 'kilowatt hours', as shown on a display panel. This allows Clare County Council and the fuel supplier to maintain an accurate record of how much energy the system has supplied. Using the heat meter the client will pay the fuel supplier only for the energy (in kWhs) they use.

Heat Supply Agreement

Clare County Council have entered into what is known as a Heat Supply Agreement, a contract which is currently held with Clare Wood Chip Ltd (April 2008). Clare County Council own the boiler but contract with a heat supplier, to purchase heat by the kWh or MWh, similar to an ESB electricity bill. The agreement sets out the specification for the woodchips, times of delivery and may also include maintenance of the wood energy system. The heat supplier/ chipping contractor supplies woodchips to the silo and the heat used is metered on the user's side of the boiler; Invoices are raised on a monthly basis.

Annual Fuel Requirement

The boiler will run on a seasonal basis and assuming a heat load of ten hours per day for 160 days the boiler will use up to 375 tonnes of conditioned woodchips per annum or circa 550m_ of round logs. This volume equates to an area of 27 hectares of woodlands thinned per annum. This material will be sourced from locally owned plantations. As the fuel supply is planned on a five year cycle, a total of 135 hectares will be required to ensure that the five year fuel cycle is met.

Moisture Content

The timber is harvested and drawn to a local drying yard. Here the logs are piled with the cut ends facing south, so that the prevailing wind can penetrate the piles. The piles will also be covered with a reinforced, recyclable paper cover to prevent rainfall wetting the piles. Fresh timber has a moisture content of 50 to 55%. The logs must be air dried down to an average moisture content of 35%, before they are chipped. The time required to achieve this is a minimum of 12 months. It is best if the logs can be dried to a low moisture content as the energy yield per tonne increases as the moisture content decreases. The moisture content of the round logs is monitored during the drying process.

Chipping

Once the desired moisture content is achieved, the logs are chipped using a fuel wood chipper. The logs are chipped into a storage shed, which in this case holds sufficient chips to meet all the suppliers current contracts for a period of three weeks. Chipping a large volume of logs ensures that there is always sufficient chip in storage to meet supply should the chipper break down. It also allows the chipping machine to be hired out on contract, which provides additional cash flow. Fuel wood chippers are designed to produce woodchips which conform to the standard set by the boiler manufacturers. These standards determine the cross sectional area of the chips and percentage of large or small pieces permitted in each load and the required moisture content.

Quality Control

Over sized chips can block the augers in the fuel feed system or too much dust can result in difficulties with ignition or the formation of clinkers on the grate.

To ensure that the chips comply with the specifications, Clare Wood Chip Ltd takes a sample of approximately 2.5kg from each load, which is sent for independent testing. The moisture content of the sample is determined using the oven dried method. The sample is then sieved using a grader. The proportion of over sized pieces and dust is determined as a percentage of the total weight of the sample. A hard copy of the results is provided to both the supplier and end user.

In addition, the moisture content of the fuel sample is regularly measured by CCWEP using a woodchip moisture meter. This meter uses microwave technology to determine the moisture content for a specified grade of woodchip and a set weight (2.5kg). The meter is accurate to +/-1% for woodchips up to 30%MC, for samples above 30%MC accuracy is in the range +/-3%. Once the moisture content of the sample has been recorded, the sample is then graded using a sieve to determine the physical properties of the wood chips. The proportion of over-sized pieces, under-sized particles and dust is determined and expressed as a percentage of the total weight of the sample and compared to the specified requirements of the boiler.

Local Benefits

By switching from fossil fuel to woodchips, Clare County Council have forged closer links with the local community, in that their suppliers are local growers, the material is harvested and processed by local contractors and a much larger proportion of the money spent on woodchips stays within the local community.

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County Clare Wood Energy Project