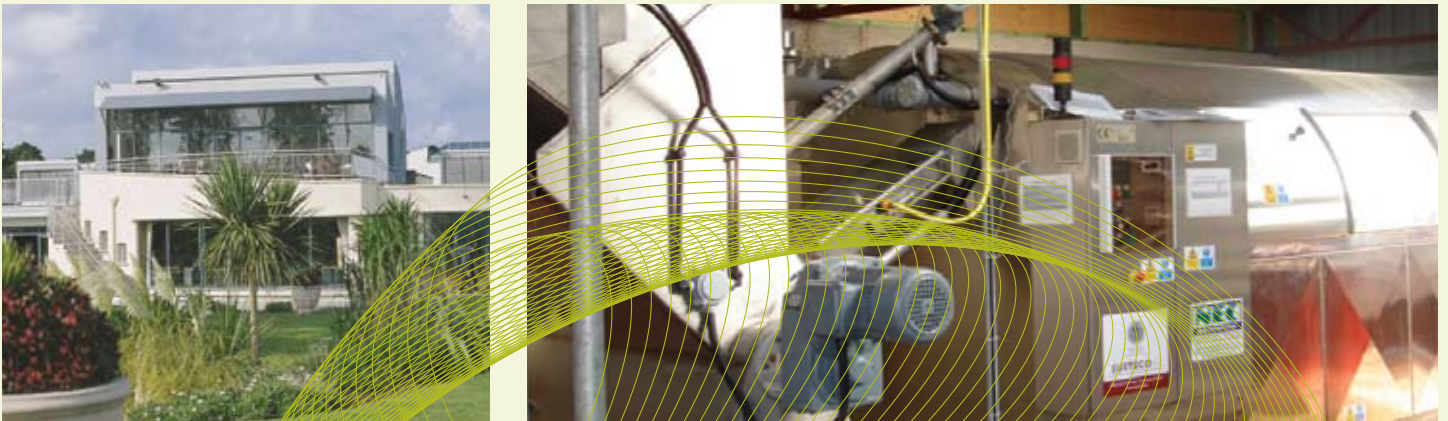


Kelly's Resort Hotel

WOODCHIP BOILER INSTALLATION



Introduction

Founded in 1895, Kelly's Resort Hotel and Spa in Rosslare, Co Wexford is one of Ireland's top four-star resort hotels. Facilities include 117 bedrooms and suites, three restaurants, two bars, an aqua club and fitness centre with two indoor swimming pools, steam room, sauna and outdoor Canadian hot tub. The hotel complex also incorporates a 15,000 sq ft (1400 m²) building housing the "SeaSpa" Complex containing various pools and treatment rooms.

Project Background

Between June 2000 and April 2006, the cost of oil, gas and electricity to small commercial users in Ireland rose significantly. For high-energy users, the impact of such increases on day-to-day operating costs was substantial. The existing heating system at Kelly's Resort Hotel consisted of three 150 kW oil fuelled boilers.

Utility	Domestic hot water and heating
Oil Consumption	143,238 litres/yr
Oil Cost	€76,229

By mid-2005 it was clear that Kelly's Resort Hotel was facing a number of challenges in terms of managing and budgeting its heating costs. When considering converting to a woodchip-fuelled system, Managing Director Bill Kelly had two key objectives in mind:

1. The need to reduce costs.
2. A desire to significantly improve the environmental impact of operations at the hotel.

The key benefits of a woodchip fuelled system for the hotel would be:

- A woodchip-fuelled boiler can operate at 90% efficiency; in contrast to the hotel's existing oil-fired systems which were capable of operating at only 80% efficiency - even when optimum maintenance levels were applied.
- The cost of woodchip fuel is 2 cent per kWh delivered, whereas the cost of oil fuel is 6 cent per kWh.
- Wood fuel is carbon neutral.
- Wood fuel is a sustainable energy supply whereas oil is a finite fossil fuel.

Project Development

A wood energy specialist company, ClearPower Ltd, was retained to design a solution for the hotel. The project commenced with a design study which analysed the heat requirements of the hotel and leisure facilities and how these requirements could be met through the use of a biomass boiler. The design study proposed the installation of a 350 kW boiler which would be fuelled by woodchips.

The woodchip boiler was sized to meet the base heat load for the site with two of the existing 150 kW oil boilers remaining in place to meet additional demand. In the new configuration, the 350 kW woodchip fuelled boiler acts as the lead boiler. The two remaining boilers only become operational if the woodchip boiler is offline or if additional heat is required during peak loads in extremely cold weather. A capital investment grant of €26,220 for the project was secured from Sustainable Energy Ireland, through the Bioheat Boiler Deployment Programme.

Operation

Installed in February 2006, the woodchip-fuelled boiler generates a heat output of 226,800 kWh per month which provides 90% of all heating and hot water demand throughout the year. Between February and December 2006, 323 tonnes of woodchip was consumed at an average cost of €80/tonne.

The boiler system is fully automatic, augers transfer the woodchip to the boilers and if for some reason the woodchip flow stops an alarm is activated. Kelly's Resort Hotel have entered into a long-term agreement with their installer for both wood fuel supply and maintenance.

One of the main considerations that faced Bill Kelly, Managing Director of Kelly's Resort Hotel, when considering the change to the wood chip fuelled system was the requirement for sufficient space to store the woodchip fuel. The site at Kelly's Resort Hotel is very tight on space. This challenge was overcome by locating the fuel store in a raised position. A 70m³ prefabricated shed was constructed above a flat roof, as a fuel store for the woodchips, at a cost of €8,000. On delivery, the woodchip is blown up to the store rather than dropped down from the delivery truck, as would normally be the case. To generate the required heat for the hotel, it is estimated that the yearly woodchip demand for the hotel will be 488 tonnes/year. The fuel store constructed can hold approximately 14 tonnes of woodchips.

Bill Kelly, MD, Kelly's Resort Hotel commenting on the woodchip boiler project:

The decision

"a fantastic move both financially, because the hotel no longer has to worry about fluctuating oil prices and environmentally, because the hotel now has a carbon-neutral energy source".

The fuel supply

"The woodchip fuel is being delivered from a saw mill in Clonroche, about 20 km from the hotel. There is a weekly delivery which ranges from six tonnes to twelve tonnes – depending on the time of year. During the summer, our fuel consumption runs at about four tonnes a week; during the very coldest part of the winter it runs at about twelve tonnes a week."

Day to day operation

"The main maintenance task is the cleaning out of the woodchip burner; that's done about every two weeks. Surprisingly little ash is generated – over a period of eight months we would have collected as little as four wheelbarrows full. We mix the ash with compost, which is in turn used in the gardens around the hotel."

Bill Kelly estimates that the water-heating bills for the hotel have been reduced by over 50% as a result of switching to a woodchip-fuelled boiler, which has been an extremely positive experience for his business. The hotel has managed to reduce its carbon emissions by 252 tonnes in 2006 compared with 2005 emissions. Investing €104,880 in the project, Kelly's Resort Hotel are expecting a 3 year payback period when the SEI grant of €26,220 is taken into account.

Environmental Impact

2005 Heating Fuel Consumption

Fuel Consumption from Heating Fuel	Fuel Type	Total Emissions
143,238 litres	Oil	382 tonnes CO ₂ /yr

2006 Fuel Consumption

Fuel Consumption from Heating Fuel	Fuel Type	Total Emissions
323 tonnes	Woodchip	0 tonnes CO ₂ /yr
48,762 litres	Oil	130 tonnes CO ₂ /yr

Reduction in CO₂ Emissions 252 tonnes CO₂/yr

Project Economics

2005 Heating Fuel Costs

Fuel Consumption	Fuel Type	Total Fuel Cost
143,238 litres	Oil	€76,229 ¹

2006 Heating Fuel Costs

Fuel Consumption	Fuel Type	Total Fuel Cost
323 tonnes	Woodchip	€25,840
48,762 litres	Oil	€25,356
	Total	€51,250

Annual Fuel Cost Savings €24,979

Payback Analysis

Total Project Cost	€104,880
SEI Grant	€26,220
Annual Fuel Cost Savings	€24,979
Payback Period	3 years ²

¹ At 2006 oil prices.

² 50% of oil usage for 2006 was in the 1st quarter of the year before the biomass boiler was fully operational, so an actual payback of closer to 2 years is expected.