

The Role of LPG in Food & Beverage Production



Single Malt Whisky Production in Scotland

WLPGA Member and Industry Council Member Flogas embarked on a fascinating cooperation with the award winning Knockdhu distillery in Scotland. The project aimed to help the distillery improve their production processes by using LPG to meet sustainability targets.

This Exceptional Energy success story looks at the story behind the distillery, the challenges faced and how the Flogas solution was put in place.

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1. The Knockdhu Distillery - A Little History

The Knockdhu distillery is an award winning whisky distillery in Knock Aberdeenshire in the Scottish Highlands and is owned by Inver House Distillers Ltd.

The distillery was founded in 1892 when, after several springs were discovered on the nearby hills, John Morrison purchased the estate to produce whisky for Haig's. Not only was the site conveniently close to the railway network it was also close to a district noted for its barley and peat source. The distillery was built using local granite and could produce 2,500 gallons of spirit per week. Production began in 1894 and Knockdhu was regarded as the perfect embodiment of a modern distillery. The distillery was sold to Inver House, the International Beverage's wholly owned Scotch Whisky subsidiary, in 1988 and today the distillery has a capacity of 1,700,000 litres per annum. The Inver House Distillers Scotch Whisky portfolio boasts five distilleries - Pulteney, Balblair, Knockdhu, Speyburn and Balmenach - each producing its own distinctive, individual single malt whisky.

The whisky is a fine single malt was originally named Knockdhu, after the distillery but was renamed anCnoc (a Gaelic name meaning the hill) in 1994. The whisky is a light and modern whisky which re-reflects the modern image. Various bottling ages are available, the most popular being 12 years old and also 16, 22 and 35 years old.

The methods used to make anCnoc have hardly changed in over 100 years. Ooriginal style copper pot stills and worms are still used to condense the vaporised alcohol (which is very rare these days). Ironically, it's these traditional techniques which help to create the distinctive, modern flavour. The whisky is aged in American and Spanish oak barrels, previously used to mature either bourbon or sherry. The casks are rested quietly in dunnage warehouses. Here, the thick granite walls make for a stable temperature, which helps to give a nice consistent dram.



2. The Financial Challenge - Increased Operating Costs

Whilst the whisky distilling process has changed very little since the distillery was founded in the 19th Century, the financial and environmental costs of producing the product today have changed immeasurably. Meeting sustainability targets affects production-focused businesses across a wide range of sectors and energy consumption continues to represent a significant proportion of a distiller's operating costs.

The industry has been nimble in its efforts to meet Government targets, by setting its own tough environmental requirements and incentive schemes, as well as developing a series of energy assessment resources such as The Scotch Whisky Association's 2012 Renewables Tool. Innovation and investment in distillery by-product schemes has also been widely adopted across the industry.

LPG - an Exceptional Energy that can help food producers meet sustainability targets whilst maintaining traditional food and beverage production methods.

3. The LPG Solution

Typically found around natural spring sources, many distilleries are located in remote parts of the country, away from the gas grid and therefore rely on costly fuel oil as an energy source. LPG is the cleanest, most cost effective, off mains fuel and perfect for commercial heating and commercial boilers, offering considerable economic and environmental advantages. So when Knockdhu distillery manager Gordon Bruce took a look at his site's energy use as part of the business' ongoing commitment to sustainability, he enlisted the help of Flogas Britain's Energy Services team.

And by switching to Flogas LPG from heavy fuel oil, Gordon has been able to substantially improve efficiency, making considerable energy reduction savings through enhanced heat recovery and changes to the plant operation.

The combination of a new boiler, enhanced heat recovery and the switch to LPG has ultimately led to significant annual savings to the distillery's fuel costs, and has cut carbon emissions by 18%.



4. The Flogas Solution

The new Flogas system combines with a host of energy saving and heat recovery improvements made at the distillery over the last few years, meaning that it now produces whisky using almost 35% less energy per litre than it did in 2006.

The distillery now operates using a shell and tube condensing system to try to extract as much heat energy as possible during both the condensing and cooling phases.

Unlike standard condensing systems, Knockdhu uses a horizontally mounted system which is fed with hot water from the wort cooler as opposed to a cold spring supply, with the pre-existing worm coil retained to pick up any stray alcohol vapour. This system extracts as much heat energy as possible; energy which historically, was simply wasted. Now the heat is converted into other sections of the system and used as a preheating tool.



5. Sustainability Results

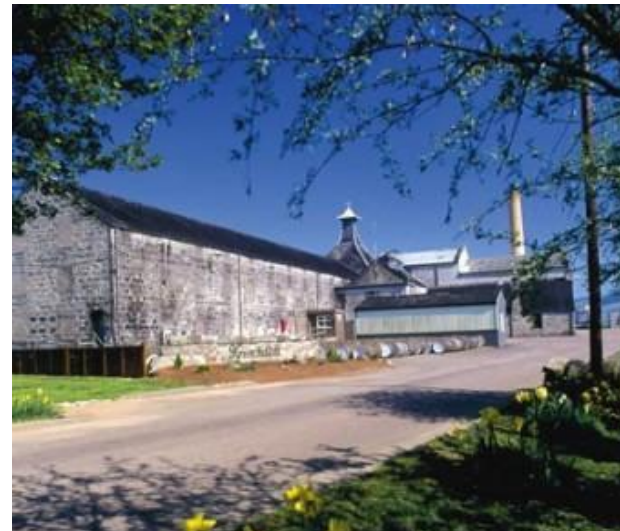
The business has also further extended its commitment to sustainability by developing wetlands adjacent to the distillery to maximise usage of the washing waters and spent lees. Including six separate cells, the wetlands have a surface area of 2000m² and are home to just under 21,000 plants comprising 17 different species. The system, which has full support and a license from SEPA, works entirely on gravity. Eight to 10 bulk tanks, with a 25,000 litre capacity each, are taken off the road weekly resulting in a carbon reduction of approximately 40 tonnes per annum.

Ensuring that any energy switch is quick and easy is equally commercially critical. Flogas helped the Knockdhu team with all aspects of the fuel switching process, such as planning approval and pipe work. It also funded and facilitated a temporary energy supply whilst planning approval was being secured.

Rob McCord, head of Bulk Sales at Flogas Britain explains:

“Many distillers and brewers are keen to address their current energy levels, but are often understandably nervous about making any capital investment into energy plant equipment when switching fuels. We pride ourselves on acting as a business partner for energy, not merely a supplier of LPG, working closely with the commercial, operational and technical teams to assess their current energy levels and future growth targets. This means that businesses like Inver House are better armed with the economic case, detailing the long-term benefits and a robust payback plan.”

Adoption of LPG by the Knockdhu Distillery has cut carbon emissions by 18% and led to significant reductions in their overall fuel costs.



6. Acknowledgements

Flogas
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