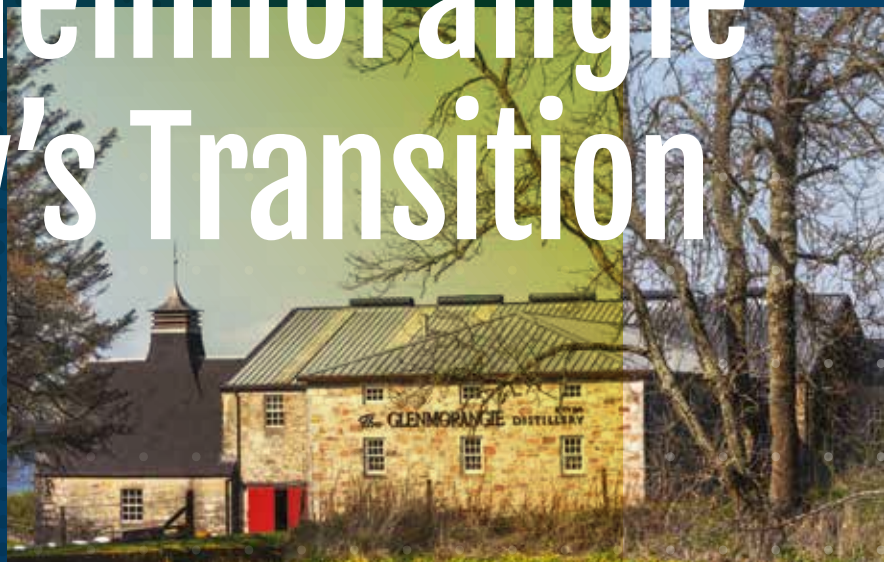


Case study

# Energy at the core of The Glenmorangie Company's Transition



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## THE SCOTCH WHISKY INDUSTRY IN SCOTLAND IS OF PARAMOUNT IMPORTANCE TO THE COUNTRY.



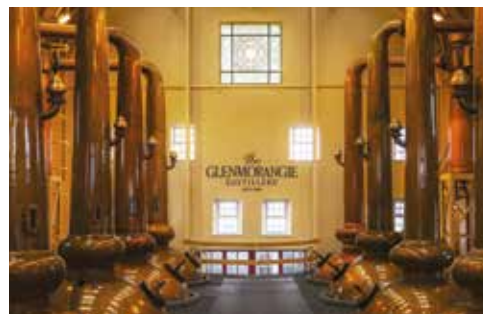
### Industry Context

## The Scotch Whisky Industry Pathway to Net Zero

The Scotch Whisky industry in Scotland is of paramount importance to the country. According to the Scotch Whisky Association (SWA) of which The Glenmorangie Company is a member, exports from the 134 operating distilleries in the country amounted to £3.8 bn in 2020 – 75% of all Scottish food and drink exports. Furthermore, the industry directly employs over 10,000 people in Scotland, with 7,000 located in rural areas, providing crucial employment opportunities and investment to local communities. Recognising its economic significance, the industry has pledged to put sustainability at its core by setting itself on a pioneering path: reaching net-zero by 2040 (-40% by 2030 relative to 2018) – 5 years before the Scottish Government’s already ambitious countrywide target to be carbon neutral by 2045. Identifying means to power the distilleries’ activities through clean and renewable energy is central to reaching the stated goals given the preponderance of these emissions in the overall environmental footprint.

Indeed, in order to properly end its reliance on fossil fuels, the biggest challenge the industry must tackle is that of industrial heat generation. Distilleries countrywide will need to set a clear focus on finding clean-energy alternatives for heat production, which was responsible for 82.7% of industrial fuel consumption in 2018. Delving deeper, it appears that distillation heat is the main source of the sector’s GHG emissions and is responsible for 91% of the industry’s heat-related fuel consumption (2018). Ideally, and as identified by the Scotch Whisky Association, the goal is to see more and more self-sufficient distilleries valorising their waste and by-products into energy, reusing the waste heat, continuing to improve energy efficiency and investing in renewable energy. Some of the principal technologies that have been identified to do so are heat pumps, biomass cogeneration plants, anaerobic digestion, hydrogen and energy efficiency solutions that can be retrofitted to optimise the energy management.

Industry facts and figures came from the SWA. More information can be found on their website [scotch-whisky.org.uk](https://www.scotch-whisky.org.uk)



## Leading the Way

# The Glenmorangie Company's Ambitious Energy Journey

The Company is aligned with Moët Hennessy's commitment to reduce carbon footprints by 50% by 2030.

Sustainable solutions selected through the present collaborative effort between the Glenmorangie Company and the Solar Impulse Foundation may also contribute to the rest of the Scotch Whisky Industry in its strive for net zero. The Company has also joined forces with the SWA working on other aspects of the value chain such as, malted barley, packaging and transport.

The Company operates two Single Malt Scotch Whisky Distilleries: Glenmorangie Distillery located in Tain in the Highlands and Ardbeg Distillery on Islay.

In Tain, Glenmorangie will use 100% renewable energy in future. Today, part of the Distillery's energy requirement (c.15%) is already supplied on site by biogas from anaerobic digestion derived from distillation effluent. This complements the rest of the energy which is today mostly from compressed natural gas (CNG), used to create the steam which helps to power the Distillery. Additionally, the Company is transitioning to bio-CNG which is currently being implemented.

The use of hydrogen as a source of energy for the Glenmorangie Distillery is also under consideration. The Company is involved in the North of Scotland Hydrogen project, a collaborative partnership with other leading whisky companies and the Port of Cromarty which plans to develop a state-of-the-art energy hub from offshore wind that will produce, store, and distribute green hydrogen across Scotland.

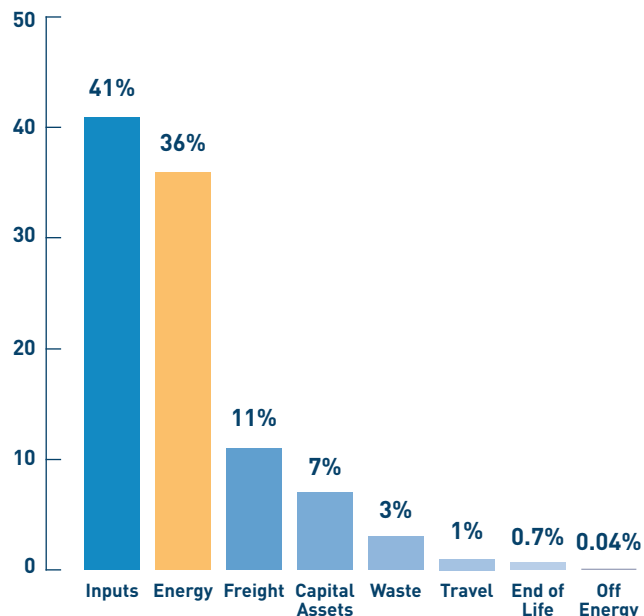
The Glenmorangie Company has also commenced an onsite methanation feasibility study with MAN Energy Solutions and the Mabbett consultancy, supported by seed funding from the Scottish Government

Industrial Energy Transformation Fund (SIETF). The purpose is to combine hydrogen and the CO<sub>2</sub> generated from fermentation to produce biomethane that can be used to part fuel the Distillery's activities.

On Islay, Ardbeg Distillery currently runs mainly on diesel. The Company's ambition here is to replicate what has already been fulfilled in Tain, in collaboration with other Islay Distilleries through switching to CNG and the creation of an anaerobic digestion plant. The smaller volumes of spirit created at Ardbeg and the lower amount of energy consumed make the transition more of a challenge. Despite this, the Company is working on solutions for its energy needs on Islay.

The Glenmorangie Company and the Solar Impulse Foundation are ready to work together to take sustainable innovation further. As such, the Company welcomes SIF's proposed solutions (see next section) and will investigate them as part of its overall Sustainability Strategy.

The Glenmorangie Company's carbon footprint data for 2019.





Solar Impulse Foundation's recommended solutions for The Glenmorangie Company

## Clean and Efficient Technologies for Glenmorangie's Distilleries

Below are examples of 5 Solar Impulse Labelled Solutions identified to tackle the challenges of Glenmorangie's Distilleries' energy efficiency, high-temperature clean steam production, processes' thermal losses and finally sludge management.

### Qpinch

Through a physical-chemical reaction on a cyclic closed-loop system requiring no additional water or chemical input, Qpinch captures waste heat and converts it back into reusable higher temperature heat for the production process. Applicable on a megawatt scale by all industries that use industrial heat, it requires only marginal electrical energy consumption and can pay for itself in less than five years.



- Up to 2,200 tons of CO<sub>2</sub> savings per year per MW of thermal energy output

### MEVA – Renewable gas for industrial burners

MEVA is a gasification module which creates renewable gas from biomass residues to be used directly at the plants, enabling a local circular system. The biomass residues used include fine fraction biomass such as sawdust, rice husks and wood fibre, which many industries currently struggle to dispose of.



- Process heat is 19% cheaper
- Cost of combustion from 25EUR/MWh 50EUR/MWh depending on feedstock

### METRON EVA

This platform aims to create energy efficient plants by detecting the types of energy used in real time (electricity, steam, etc.). Using this data, the platform simulates the factory by creating digital models allowing it to predict (through machine learning) the energy behaviour and continuously identify opportunities for optimisation and to reduce energy bills and environmental footprint.



- ROI in 1 year
- -15% energy consumption

### Aqua assist

The Aqua Assist biocatalyst accelerates microbial activity and the degradation of organic matter through biological digestion – both aerobic and anaerobic. Biosolids reduction between 30% and 70% has been repeatedly observed along with nuisance odours and hydrogen sulphide reduction by up to 43% and 50% respectively.



- Up to 10% reduction in chemical costs
- Reduced methane emissions at landfills (0.43 kg/ton of sludge)

### HP2 Steam Generation

HP2 is an integrated steam generator to prepare, condition and combust biomass and can be integrated with the rest of the power plant to produce renewable energy. Compared to conventional furnaces technologies, HP2 presents an optimal complete combustion (+99%) and its burner reaches up to 92% efficiency compared to 80% for conventional fuel burners.



- 30–40% less raw material consumption
- Up to 98% CO<sub>2</sub> emissions reduction compared to fossil fuels



## A shared vision

# The LVMH & Solar Impulse Foundation Partnership

Bertrand Piccard and the Solar Impulse Foundation have identified and assessed over +1000 clean and profitable solutions that can be implemented today to address environmental challenges without compromising economic growth.

The selected solutions are products, processes, or services coming from companies ranging from start-ups to large corporations. They benefit both the environment and the economy, and cover the sectors of water, energy, construction, mobility, industry, and/or agriculture.

Since 2019, LVMH and the Solar Impulse Foundation have partnered to find and promote innovative and clean technologies to build a more sustainable world.

Concretely, the Solar Impulse Foundation provides LVMH and its Maisons with certified solutions regarding diverse topics such as energy consumption, renewable energy, alternative ways of transport and more.

**LVMH AND THE SOLAR IMPULSE FOUNDATION HAVE PARTNERED TO FIND AND PROMOTE INNOVATIVE AND CLEAN TECHNOLOGIES TO BUILD A MORE SUSTAINABLE WORLD.**

**This present document is a representative example of that joint effort.**

In the context of the COP26 in Glasgow, the Solar Impulse Foundation (SIF) is producing a Solutions Guide whose overarching purpose is to propose a selection of SIF-labelled solutions to support Scotland as it tackles its various environmental challenges.

The Glenmorangie Company, the Single Malt Scotch Whisky company within the LVMH group, is based in Scotland. It makes for an ideal case study for assessing how an environmental transition within this industry can effectively take place.

To this end, the Glenmorangie Company and Solar Impulse teams have worked together and identified a selection of technologies that could potentially contribute to the Company reaching its environmental objectives, in line with the Scotch Whisky Association's *Climate Strategy*.

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