

## **Solar Energy and Wine Making**

### **Summary**

Research into solar energy is a core theme of Ulster University's Built Environment Research Institute and its Centre for Sustainable Technologies (CST).

This study concerns the long-term energy sustainability of emerging winemaking regions. Its impacts are seen through the adoption and application of benchmarks by winemaking associations, direct influence on policy, and energy expended in winemaking.

### **Impact**

Ulster research on solar energy has created a unique understanding of energy synergies in the wine industry involving the use of energy audit, modeling, evaluation and monitoring techniques.

This has subsequently been applied to the North Carolina wine industry and more recently in the UK, where Ulster University's expertise has been used to determine a benchmarking standard and to develop a framework to support guidelines and policy.

The research has also impacted on the building of new wineries in the UK, the wider supply chain and professionals involved in their construction. The UK wine industry is set to expand significantly in the next decade and the building of energy sustainable wine facilities is crucial.

Ulster University research has already been used by a number of producers with impact apparent through changes in the design of their wineries to reduce the energy requirements in their processes and operations. Ancre Hill Estates is an example of how the research has directed the design (and energy use) of a proposed new winery and how it was used by their design consultants.

Evaluating energy demand of winemaking facilities through specific auditing procedures developed by the university has resulted in significant cost saving and environmental benefits.

The research has contributed to the development of a patented solar water heater that has particular application to the winemaking industry. The heater is now being commercialised through a university spin-out company.

Energy audits carried out by the university's researchers have directly impacted on the strategy, operations and management practices of individual wineries in the UK and elsewhere.

For example, senior management at Domaine Carneros in California used our findings to evaluate and compare their systems, processes and plant against accepted Californian benchmark values.

This enabled the winery to analyse energy consumption patterns and instigate improvements in usage. In the UK, a number of English wineries saw an immediate impact from their participation in the study, leading to reduced energy usage and economic savings.

The study also has relevance beyond winemaking. Through an Intertrade Ireland Fusion project, the research team provided expertise to Errigal Seafood. Using the transferable skills, knowledge and expertise developed in the wine study, the university team was able to streamline Errigal's production processes by 15%, equating 42.3 tonnes of CO<sub>2</sub> through the application of solar energy.