



Advanced systems for the enhancement of the environmental performance of WINERIES in Cyprus



The **WINEC project** (LIFE08 ENV/CY/000455) is co-financed by the LIFE financial instrument of the European Commission and aims at identifying the major environmental problems specifically associated with the operation of wineries and establishing environmentally friendly and effective solutions in order to effectively deal with those problems.

Beneficiaries:

- ◆ GAIA- Laboratory of Environmental Engineering, University of Cyprus
- ◆ Technical University of Crete
- ◆ RTD Talos Ltd
- ◆ S.K. Euromarket Ltd
- ◆ Department of Environment, Ministry of Agriculture, Natural Resources and Environment
- ◆ Tsiakkas Winery

Newsletter

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WINEC PROJECT

The research team of GAIA- Laboratory of Environmental Engineering of the University of Cyprus created a questionnaire adapted to the situation of Cyprus wineries in order to collect information on the effects of wine production on the environment and the various environmental actions implemented by the wineries in Cyprus.

In order to get a more comprehensive view on the implementation of environmental practices in wineries, all project beneficiaries participated in a number of site visits to wineries in Italy that took place in January 2011. In specific, the wineries visited, have successfully implemented Environmental Management Systems and applied wastewater treatment systems. The information gathered through these site visits was proved useful for all the partners, particularly with regard to the EMS implementation at Tsiakkas winery and for the design of the winery wastewater treatment plant that is currently undertaken within the framework of the WINEC project.

The first internal audit of the EMS at Tsiakkas winery took place on January 3, 2011 in close cooperation with RTD Talos Ltd and the University of Cyprus. In this first audit, which took place six months after the start of the EMS at the winery, an evaluation of the implementation of the environmental actions that were originally established was conducted and a number of corrective actions were proposed.

The currently implemented actions within the framework of the WINEC project include experimental work and the comparison of two different advanced oxidation processes for winery wastewater treatment, the design of the pilot winery wastewater treatment plant for Tsiakkas winery as well as the optimization of the environmental operations of the winery and preparation for the second internal audit that will be conducted in April 2011.

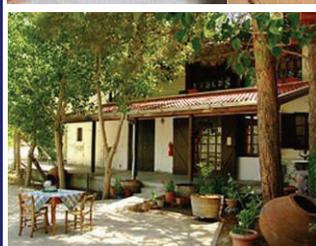
Environmental impacts related to the wine production process

Sub-Action 1.4 of the project aimed at the identification of the exact environmental impacts related to the wine production process in Cyprus and the various actions implemented by the Cyprus wineries in order to minimize or eliminate those impacts. This took place through a telephone questionnaire survey targeting all 54 wineries in Cyprus.

Out of the 54 wineries contacted, 46 participated in this survey (42 small wineries receiving less than 1000 tonnes of grapes per year and 4 larger wineries receiving more than 1000 tonnes per year).

Based on the answers of the questionnaire review the following conclusions on the environmental impacts resulting by the operation of wineries in Cyprus were drawn:

1. Larger wineries pay more attention on the environmental impacts resulting by their produced wastewater as evidenced by the monitoring of their produced wastewater and the operation of a private wastewater treatment plant by most of them. In addition all 4 large wineries are aware of the relevant local legislation while only 60% of small wineries are. The questionnaire review evidenced that most of the small wineries dispose their wastewater with no or minimal treatment either for irrigation or in fields, water receivers and waste disposal sites resulting in the pollution of sensitive mountainous areas, groundwater and soil resources.
2. The use of solid organic waste produced by the operation of wineries as a fertilizer, as reported by the majority of wineries participating in this study, if utilized appropriately, may significantly reduce the impacts resulting from the extensive use of synthetic fertilizers. With regard to the packaging waste produced most of the wineries do collect them for recycling (especially glass and paper).
3. The air emissions produced by the wine production process are minimal.
4. Noise produced by the operation of wineries is minimal, however, their noise levels should be frequently measured.
5. Wineries consume a lot of water in their everyday cleaning practices and only a 33% of the smaller wineries and 75% of the larger wineries implement water saving measures. The use of treated wastewater for irrigation, reuse of water for cleaning purposes, use of drop systems for irrigation, collection and reuse of rainwater and introduction of economic systems are significant measures to be implemented, especially in Cyprus, where water resources are particularly scarce.
6. Most of the wineries in Cyprus implement a number of energy saving measures mainly related to insulation, pumping of outside cold air for cellar cooling, utilization of energy released by the chiller for heating and introduction of renewable energy sources (e.g. solar panels and wind turbines).



7. The amount of chemicals used in the wineries for cleaning and disinfection purposes can be reduced by the introduction of environmentally friendly methods such as the use of only water and steam and biodegradable cleaning products. In addition, all the wineries should examine whether spraying is required in order to reduce it to the minimum. Wineries also need to be aware of the fertilizers used and the increased use of organic fertilizers should be endeavoured.
8. The environmental impacts of a winery can be significantly reduced through the relevant training of the personnel on environmental and safety issues. While 17 out of the 46 wineries reported that they do train their personnel on environmental issues, the amount of wineries that are aware of the various environmental issues and legislative provisions is still very small.

Site Visits to Italian Wineries

Within the framework of Action 1 a number of site visits took place in **January 2011** to a number of wineries in Italy that have implemented successful environmental practices. In specific, three EMAS certified wineries were visited in Sicily, while a winery operating a wastewater treatment plant with a membrane bioreactor was also visited in Trento at the north of Italy. Representatives of all the WINEC project beneficiaries participated in these visits.

Driven mostly by marketing purposes and having implemented a number of environmental practices since the beginning of its operation, “Feudo Arancio” winery in Sambuca di Sicilia became EMAS certified in 2003. Carlo Pellegrino & C. S.p.A. is operating two wineries in Sicily, “Historical Cellars” in the town centre of Marsala and “Duca di Castelmonte” a brand new winery in Cardilla. The EMAS certification benefited both wineries in terms of compliance with legislation, better management practices as well as acceptance of the Historical Cellars operation by the nearby residents of Marsala. The EMAS certified wineries visited, implement practices related to wastewater and solid waste management, have significantly reduced water and energy consumption, frequently monitor their noise levels while they also provide for the frequent training of their employees for the successful implementation of their environmental practices. Transparency on the implemented practices is also evident through the acknowledgement of their EMAS certification through the wineries webpages as well as through the provision of information to the general public and nearby communities.

“Cantine Ferrari” winery, located in Trento operates a wastewater treatment plant with a membrane bioreactor (MBR), a system considered very efficient for winery wastewater treatment especially with regard to the operational characteristics of wineries (i.e. seasonality and significant load fluctuation). During the visit, the operation of the specific plant was discussed and the benefits of the MBR system were outlined. The system is able to use two different routes for wastewater system, one for Low Load operation and one for High Load operation.



PROJECT BENEFICIARIES



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WINEC PROJECT

1st Internal Audit for Tsiakkas Winery

The first internal audit for Tsiakkas Winery (Action 3) took place on January 3, 2011 and the progress of the various environmental actions since June 2010 (Environmental Management System launch) was assessed by the winery EMS manager in close collaboration with RTD Talos Ltd and the University of Cyprus. Based on the audit conducted, a number of solutions and corrective actions were proposed. RTD Talos will conduct the second internal audit at Tsiakkas winery around end of April 2011 in order to reassess the System and so that the EMS implementation progress is more evident.

The main issues addressed during the first internal audit included the assignment of an environmental manager for Tsiakkas winery, the conduct of analyses on pesticide residues in grapes, the obtainment of the relevant specifications by the winery suppliers, measures for energy reduction as well as issues related to water consumption and quality.

FUTURE ACTIONS

Regarding the progress of the project the following actions are either ongoing or planned to take place within the next time period:

- * Experimental research is currently implemented by the research teams of University of Cyprus and Technical University of Crete in order to identify the most efficient Advanced Oxidation Process between the Fenton and Fenton-like processes.
- * The design of the pilot winery wastewater treatment plant for Tsiakkas winery has already started by S.K. Euromarket Ltd.
- * The second internal audit of the Environmental Management System for Tsiakkas winery is scheduled to take place in April 2011, by RTD TALOS Ltd.

For further information on the WINEC project
please visit our website:

www.eng.ucy.ac.cy/winec

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