



LIFE Project Number
LIFE08 ENV/CY/000455

FINAL Report
Covering the project activities from 01/02/2010 to 31/10/2012

Reporting Date
20/03/2013

LIFE+ PROJECT NAME or Acronym
**“Advanced systems for the enhancement of the
environmental performance of WINeries in Cyprus”**

Data Project

Project location	Cyprus
Project start date:	01/02/2010
Project end date:	31/10/2012 Extension date: -
Total Project duration (in months)	33 months Extension months 0 months
Total budget	€ 1371357
EC contribution:	€682954
(%) of total costs	97.02%
(%) of eligible costs	49.99%

Data Beneficiary

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Instructions:

Please refer to the Common provisions Articles (administrative and financial article) for the legal basis on what a final Report must contain.

The final Report must be submitted to the Commission not later than 3 months after the project end date.

One electronic version of the Report is sufficient. It must be sent in identical versions to the Commission and to the monitoring team. If relevant, it must also be sent to the national authority.

1. Executive Summary

1.1. Project objectives

The WINEC project was initiated in February 2010. The Inception Report which covered the period February - September 2010 was submitted in October 2010. The Mid-term Report of the project covers the period February 2010 - July 2011 and the current Final Report covers the whole period of the project February 2010 - October 2012. The main project objectives included the following:

- Analyse the wine industry in Europe and in Cyprus.
- Become aware of the operation of wineries, their main environmental impacts and the actors involved in the wine production sector in Cyprus.
- Become familiar with the relevant EU and local statutory provisions related to the operation of wineries.
- Identify, analyse and present selected wineries in Europe that have established successful Environmental Management Systems (EMS) in order to exploit best-practices and know-how.
- Conduct an Environmental Analysis for wineries in Cyprus.
- Conduct a detailed Environmental Review for a specific winery in Cyprus (Tsiakkas winery - pilot study).
- Identify specific environmental objectives, exact Actions and a set of indicators in order to achieve the set objectives in Tsiakkas winery.
- Set up an environmental policy for Tsiakkas winery.
- Launch an EMS and train the relevant personnel in order to achieve the above mentioned objectives and gradually improve the environmental performance of the specific winery.
- Produce relevant design data and identify specific parameters in order to develop and commission a pilot unit for advanced Winery WasteWater Treatment Plant (WWWTP) with consideration to practical aspects (e.g. cost, materials, components and process controls).
- Develop mechanisms for the frequent internal control (audit) and Reporting of the wineries' environmental performance including the operation of WWWWTP.
- Investigate the potential of further exploiting the project's results (possible users, benefits, costs and possible constraints).
- Suggest solutions to overcome the constraints identified regarding the establishment of an EMS and units for WWWWTP.
- Develop a Best Practice Guide for the improvement of the environmental performance of wineries and specifications for WWWWTP to be disseminated to a number of stakeholders (wineries, wastewater engineering companies, environmental consultants, authorities etc).

- Further disseminate and communicate the project's results and methodology to those stakeholders that may best make use of it (project's newsletter, relevant publications, guided tour, workshop, technical conference etc.).

1.2.Key Deliverables and Outputs

Action 1 - Wine industry in Cyprus and Europe Deliverables have been successfully completed. In specific a review of the wine industry in Cyprus and in Europe was conducted, the actors involved in the wine sector in Cyprus have been identified, the relevant environmental legislation to the wine production process has been collected and reviewed while a questionnaire telephone survey, targeting wineries, took place between July and August 2010 for the identification of the exact environmental impacts related to the wine production process in Cyprus. In addition, the organisation of site-visits to four wineries in Italy in January 2011 (3 EMAS certified wineries in Sicily and a winery operating an advanced winery wastewater treatment plant in Trento – north Italy) along with internet and literature work in order to identify wineries with successful environmental practices, allowed for the completion of the last Deliverable of Action 1 in April 2011.

With regard to **Action 2 - Environmental Review/Environmental Action Plan**, the initial environmental review for Tsiakkas winery and four more wineries was conducted through the “ecomapping” procedure at the end of May - beginning of June 2010. An additional visit to a sixth winery took place on September 5, 2011 following the request of the Commission in the letter dated 13 June 2011. The first Actions carried out by Tsiakkas winery within the framework of the EMS were also identified. The Environmental Policy Statement for Tsiakkas winery was prepared in June 2010 and revised in March 2012 after the EMAS inspection. All Action 2 Deliverables related to the Initial Environmental Review and Environmental Action Plan of Tsiakkas winery have been completed on schedule, but were later revised due to the above mentioned additions.

Action 3 - Building the system for environmental performance optimization started in June 2010 following the endorsement of the Environmental Policy statement and the identification of the environmental impacts and the first Actions to be followed by the winery staff. These included Actions that were taken later on for the waste and wastewater management, control of air emissions, reduction and monitoring of energy and water consumption, elimination of soil and groundwater contamination, reduction of impacts on the society, etc. In addition, the initial EMS training by UCY, TALOS and DoE took place in Tsiakkas winery in June 25, 2010 and employees, suppliers and collaborators participated. The first internal audit for Tsiakkas winery was conducted in January 2011 within the framework of Action 3 in order to assess the progress made on the EMS and examine whether the winery was ready to proceed with the EMAS certification. An additional internal audit (May 2011) and the EMAS inspection (March 2012) took also place before the second internal audit which was carried out on September 2012. All Deliverables have been prepared in time except the 2nd internal audit that was delayed by 3 months due to the additional audits that took place.

Action 4 - Design for pilot WWWT included the characterisation of wastewater, engineering and technological parameters development, preliminary design of WWWT and sizing of individual components, procurement and outsourcing of various components of the plant, review of site conditions, available area and services for the operation of the unit and finally the detailed design that led to the fabrication of the WWWT. In addition solar Fenton

experiments in the two prototype solar photocatalytic reactors in UCY and TUC took place from January 2012 to October 2012. The WWWT unit needed to be much bigger due to higher flows and the biological process was changed from SBR (Sequencing Batch Reactor) to MBR (Membrane Bioreactor) as this was a novel technology and more suitable to the wastewater characteristics and seasonality in loads. All Deliverables and one additional (Deliverable 37) which was requested from EC (letter 23 April 2012) had been completed by September 2012.

Action 5 - Construction and commissioning of WWWT plant included the fabrication of the WWWT, testing of the unit, the commissioning of the WWWT and the long-term operational tests for WWWT. The fabrication of the WWWT started early in June 2011 and was completed in August 2011 and started its normal operation in October 2011. From September 2011, the characterization of the influent and effluent of the WWWT started and continued until the end of the project. In addition, in relation to the long-term operational tests the UCY scientific team examined the solar Fenton oxidation after the MBR treatment in the period August - September 2012. All Deliverables had been completed by the end of the project.

Action 6 - Project results exploitation - guidelines and specifications for improved environmental performance in the winery industry Deliverables discuss the potential exploitation of establishing an EMS, advanced WWWT in wineries and the potential of commercialising the advanced solar treatment process. In addition, a best practice guide for the improvement of the environmental performance of wineries and specifications manual for WWWT have been developed and disseminated to a number of stakeholders. All Deliverables had been completed by the end of the project.

With regard to **Action 7 - Dissemination / Communication** the website of the project became available online in September 2010 and had also been provided in the Greek language since the beginning of April 2011. In addition, six issues of the project's newsletters and three leaflets were produced and distributed to a number of wineries and additional stakeholders. A poster was produced and placed at the offices of all beneficiaries, many articles were published on newspapers and internet news portals and a presentation on WINEC was given in an event organised by the Columbia Alumni association and the Cyprus Technical Chamber related to Corporate Environmental Responsibility, in Nicosia (June 2010). One scientific paper has already been published; one more is already submitted to another scientific journal and a third one is at the moment in preparation for submission. UCY representatives participated in an environmental course related to the decontamination and disinfection of wastewater by solar advanced oxidation in Madrid, Spain (October 2011). A poster and an oral presentation of the project results have been presented at the 7th European Meeting on "Solar Chemistry and Photocatalysis: Environmental Applications", SPEA7, in Porto, Portugal (June 2012). Additionally the LIFE Communication team visited Cyprus on 29 November 2012 and selected WINEC as a project to be presented through the LIFE portal. On 25 January 2013 a video about the project was posted on <http://lifevideos.eu/videos/> and an article is expected to be published in the coming months.

Regarding **Action 8 - project management and monitoring** activities, the organisation of the Kick-off meeting took place in February 2010, the preparation and signing of the partnership agreement in April 2010, and the five more steering committee meetings took place throughout the project duration. The EC and the monitoring team of the LIFE projects visited WINEC four times during the project implementation period; the project's monitoring responsible Dr. Katerina Raftopoulou also participated at the final conference of the project.

A number of internal and technical meetings were also conducted among the project beneficiaries in order to discuss a number of specific issues related to the construction of the pilot wastewater treatment plant, financial issues and additional issues related to the progress of the project.

For more information about the complete deliverable please send an email to lioann01@ucy.ac.cy or toumazis@ucy.ac.cy