# INCREASING MICROALGAE BIOMASS FEEDSTOCK BY VALORIZING WINE GASEOUS AND LIQUID RESIDUES

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**Abstract:**
Global warming due to greenhouse gases (GHG) has become a serious worldwide concern. The new EU Green Deal aims t0 achieve GHG emissions reduction by at least 55% by 2030 and a climate neutral EU economy by 2050. The deal strongly encourages GHG reducing measures at local, national and European levels. The REDWine project will demonstrate the technical, economic and environmental feasibility of reducing by, at least, 31% of the CO2 eq. emissions produced in the winery industry value chain by utilizing biogenic fermentation CO2 for microalgae biomass production
REDWine concept will be realized through the establishment of an integrated Living Lab demonstrating the viability of the system at TRL 7. The Living Lab will be able to utilize 2 ton of fermentation off-gas/year (90% of total CO2 produced in the fermenter) and 80 m3 of liquid effluent (100% of the liquid effluent generated during fermenter washing) to produce 1 ton (dry weight) of Chlorella biomass/year. This biomass will be processed under a downstream extraction process to obtain added-value extracts and applied in food, cosmetic and agricultural end-products and to generate a new EcoWine. REDWine will focus on the recovery of off-gas from a 20.000L fermenter of red wine production existing in Adega Cooperativa de Palmela (ACP, located in Palmela, Portugal).
REDWine will result in the demonstration at an operational environment (TRL 7) of a new business model that will create an optimal synergy between two biobased industries, the wine industry and the microalgae industry. This has the potential to reduce the CO2 eq. emissions of the winery industry and treat its waste waters while creating the optimal conditions for microalgae farming for the wine, food, cosmetics and agricultural markets. This unique combination will optimize microalgae cultivation technologies to achieve high yields while keeping OPEX up to 20% lower than today's most suitable technology for microalgae cultivation. Breaking the costs barrier will boost microalgae supply by allowing European wine producers to invest in microalgae cultivation technologies and subsequently unite efforts in a cooperative business model for microalgae processing and commercialization. This will result in a major increase in microalgae supply.

**Keywords:** CO2 sequestration, Sustentability, wine fermentation, circular economy