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D1.4: Evaluation Assessment

WP1. Project Management

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ECO-PROWINE - Life Cycle perspective for Low Impact Winemaking and Application in EU of Eco-innovative Technologies

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1 Introduction

The EU project ECO-PROWINE aims to provide wine producers a web tool for self-evaluation of their level of sustainability, to help them to identify the best technical solutions for its continuous improvement, and to establish a sustainability label – recognized at EU level – that identifies the wine producers engaged in this virtuous process.

The starting phase of the project is the creation of a database on the vineyard and winery process inputs and other vineyard and winery process details of the European wineries, which will allow the identification of the most critical points in terms of environmental, economic and social impacts for the whole wine industry, and will serve as a baseline benchmark to assess the performance of the single wineries interested in their self-evaluation through the web tool.

The recruitment of pilot wineries in the project is still ongoing, with the aim of reaching at least 105 in the next months; the missing data would come from Portugal, Bulgaria and other countries voluntary assessments signed interested wineries because of the sent e-mailings to the wine sector network; this process will be closed as soon the 105 wineries are reached eventually. Afterwards the rest of wineries interested in being included in the project would become clients for the Eco-prowine services offered.

2 European database on sustainability of wine production: Summary of preliminary results

2.1 Sample composition

Here are summarized the preliminary results obtained from the first sample of 84 pilot wineries from Italy, Spain, France, Austria, Germany, Greece, Bulgaria, Portugal and Switzerland.

The majority of pilot wineries are small family owned producers (< 20 ha of vineyard and < 100.000 bottles); although, biggest firms and cooperative wineries are represented.

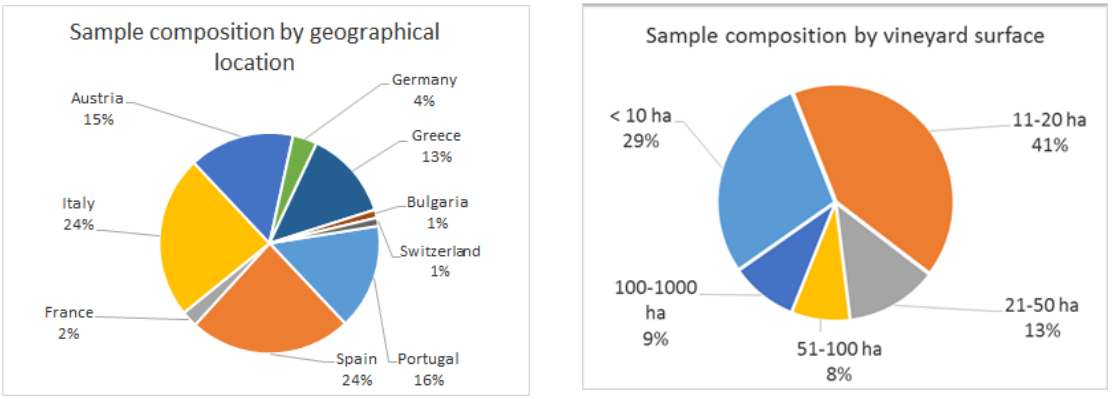

Figure 1 Sample composition by geographical location and by vineyard surface

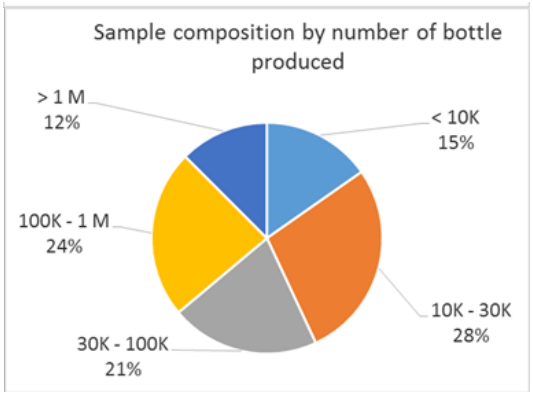

Figure 2 Sample composition by number of bottle produced

2.2 Input quantities

The database is conceived to collect the consumables involved in the grape and wine production processes: water, fertilizers, chemicals, fuel, electricity, additives and processing aids, packaging material etc. as well as different process approaches regarding i.e. tractor operation in vineyard or wine cooling in winery.

The data were provided by the wineries on the basis of their available documents (bills, invoices, registers), and are referred to the period May 1st, 2011 – Apr 30th 2012 i.e. the vineyard and cellar activity related to vintage 2011.

The table reports the basic statistical data for the main inputs. Data are expressed per bottle of wine (750 ml).

	unit	MAX	AVERAGE	STD	MEDIAN
FUEL	*g / b*	923,1	**63,0**	127,2	**27,3**
ORGANIC FERTILIZERS	*g / b*	133,9	**13,6**	26,5	**0,0**
INORGANIC FERTILIZERS	*g / b*	86,4	**9,4**	17,3	**0,0**
PESTICIDES (Active cmp.)	*g / b*	35,4	**2,1**	5,5	**0,6**
CUPPER	*g / b*	8,0	**1,2**	2,1	**0,3**
SULFUR	*g / b*	87,3	**10,3**	15,3	**4,6**
ELECTRICITY	*wh / b*	1058,3	**269,1**	244,6	**189,5**
TAP WATER	*L / b*	28,6	**4,3**	5,4	**3,0**
AMMONIA SALTS	*g / b*	1,8	**0,2**	0,3	**0,1**
PROTEIN PROCESSING AIDS	*g / b*	14,2	**0,4**	1,8	**0,0**
BENTONITE	*g / b*	2,1	**0,4**	0,6	**0,2**
ACTIVE DRIED YEASTS	*g / b*	3,2	**0,3**	0,4	**0,2**
PLASTIC CLOSURES	*g / b*	69,1	**3,1**	9,9	**0,1**
CORKS	*g / b*	40,0	**4,0**	5,9	**3,0**
METAL CAPSULES	*g / b*	18,5	**1,9**	3,2	**1,0**
GLASS BOTTLES	*g / b*	1000,0	**492,5**	144,8	**499,5**
CARDBOARD	*g / b*	122,7	**39,0**	22,5	**33,8**

Table 1. Basic statistical data for the main inputs

By comparing average and median values, it is evident that for many inputs the distribution is not bell-shaped: the majority of wineries use low quantities, although some declare much higher usage amounts. Some of these atypical data are still under verification. The distribution of data for some of the most relevant inputs is shown below.

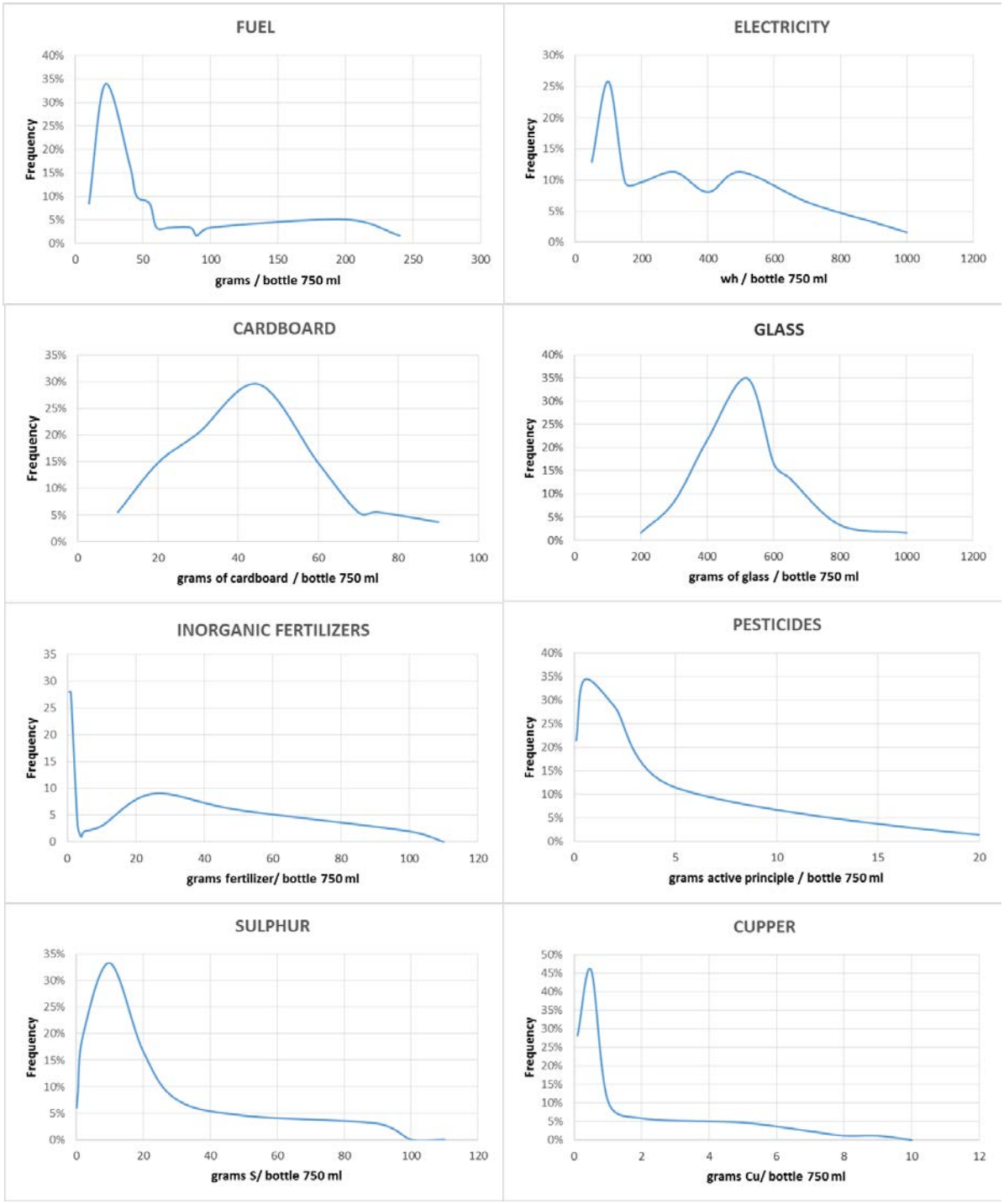

Figure 3 Distribution data for some relevant inputs

Statistical analysis is ongoing, to identify correlations among quantities of the major inputs and variants or specific steps of the production process which can influence the sustainable performance.

2.3 Contribution to emission of Green House Gases

One of the parameters – but not the sole - useful to assess the environmental impact of a production process is the evaluation of the GHG emissions in the atmosphere, usually expressed in CO_2 equivalents.

By multiplying the quantity of each input used in the grape and wine process per the emission factor of the specific substance, we obtain the figures of CO_2 eq. shown below.

Even by taking into account the huge variability among wineries for most of the inputs, it results evident that glass, fuel, electricity and cardboard are by far the major responsible of GHG emission in a winery.

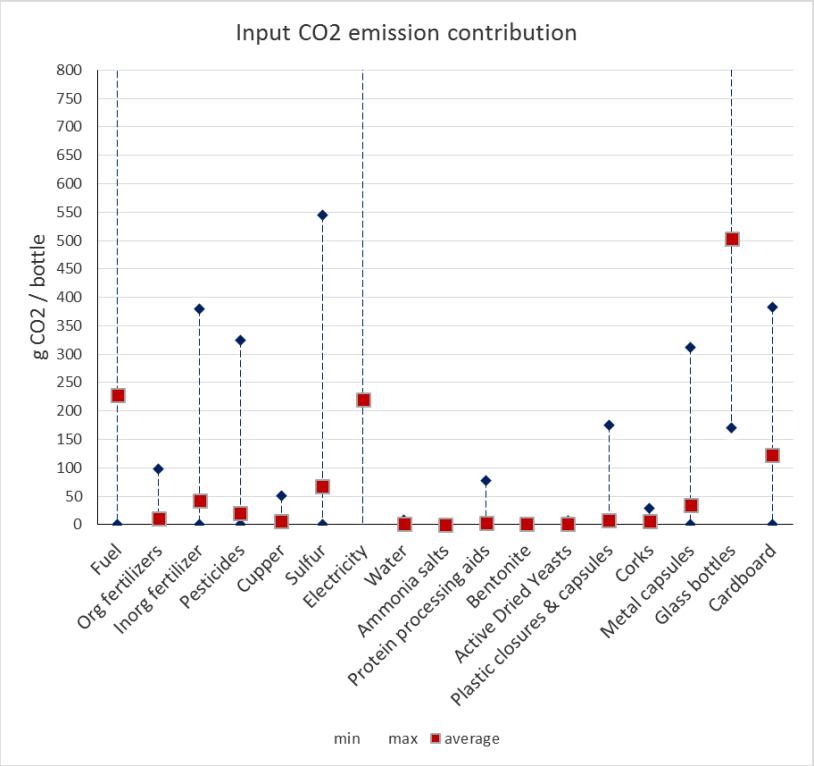

Figure 4 Input CO_2 eq. emission contribution

Nevertheless, it must be reminded that this evaluation does not include plantings, building, equipment, internal transportation, and marketing activities, production factors that can have a very significant weight in a complete carbon footprint.

2.4 Environmental impact

The ECOPROWINE self-assessment tool considers the impact of the different production factors not only on GHG emission, but also on many other parameters related to air, water and soil (for instance, respectively: particulate matter formation, ozone depletion, etc.; freshwater eco-toxicity, marine eutrophication, etc.; agricultural land occupation, natural land transformation, metal depletion etc.).

The 18 parameters can be grouped in three indicators, respectively related to water, air and soil. The graph shows the overall environmental impact of the different inputs, by considering the median values of the whole database.

Glass, cardboard, fuel and electricity confirm their predominant role in producing an impact on air, water and soil.

Use of tap water and spraying of cupper have a minor but significant effect on water indicator.

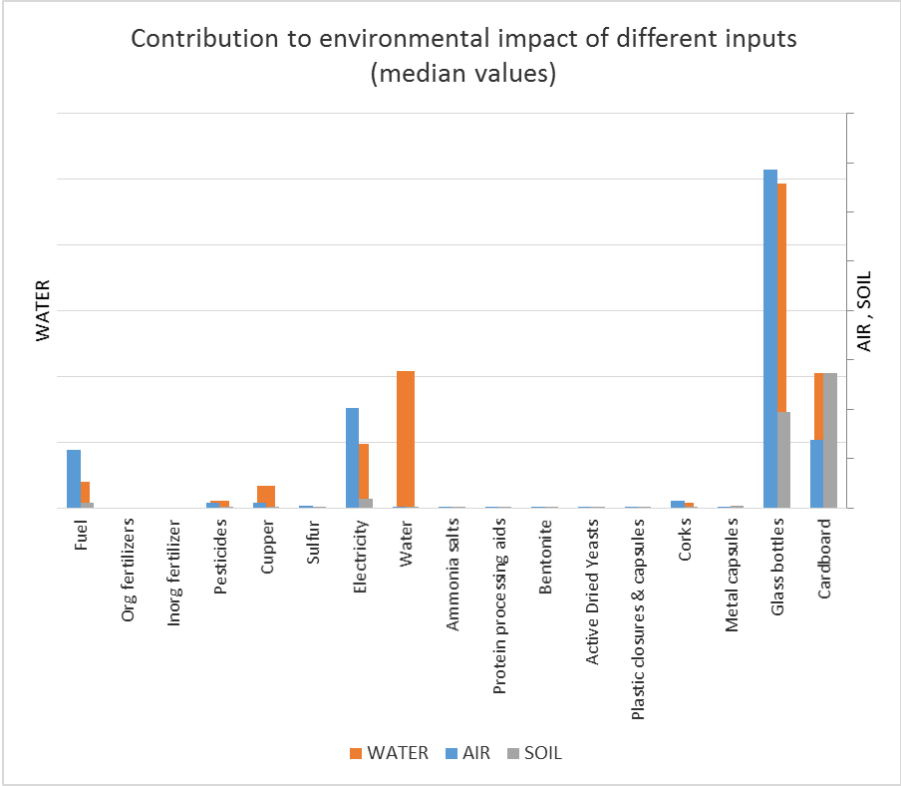

Figure 5 Contribution to environmental impact of different inputs (median values)

2.5 Cost analysis

Sustainability is composed by three pillars: environmental, social and economic, all considered by ECO-PROWINE approach. Together with the assessment of the impact on environment, an analysis of the cost of each production factor can be done.

The graph below shows that the packaging materials (glass, closures and capsules, cardboard) represent the great majority of cost for consumables, with a median of about 0,5 €/bottle.

All inputs needed for vineyard cultivation usually have a cost of less than 0,1 €/bottle.

Electricity is the winery input of greater cost impact, although limited to about 5 €cents/bottle.

Overall, winemaking consumables accounts only for 2-3 € cents.

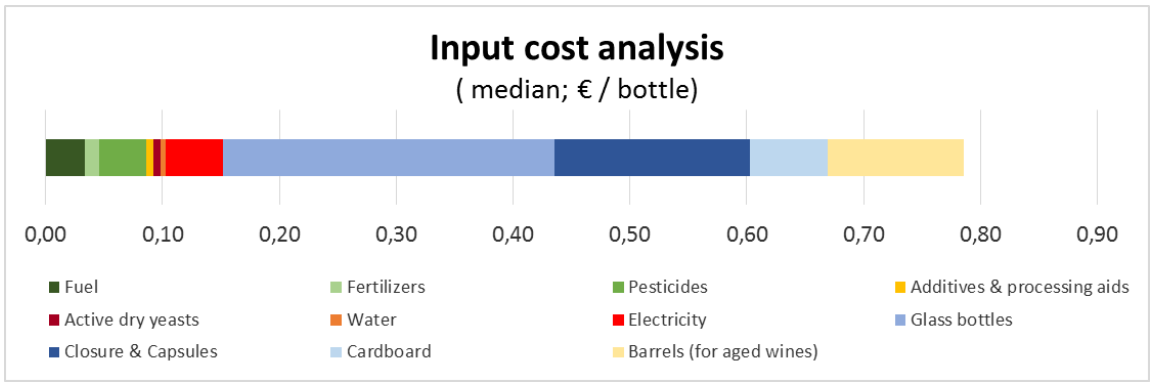

Figure 6 Input cost analysis

2.6 Social role

Feminine employment represents 32% of this sample of the wine sector.

The 70 % of the producers have at least one woman in the manager or supervisor position.

About 62% of the enterprises are involved in initiatives aimed to the promotion of the territory where thet are placed and/or the support of the inhabitant community; the related charity averages 1.4% of total turnover.

Specific actions in favour of health and safety of inhabitants and bystanders have been implemented by the 82% of the grape and wine producers, and the percentage raises to 89% in case of implemented strategies in favour of health and safety of the consumer.

More than 75% of the respondents declare to have involved company's employees in training activities on sustainability principles and best practices.