The National Cleaner Production Center - Macedonia

CP Assessment Report

Company: **BOVIN Winery**

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Assessment methodology

Cleaner Production (CP) is defined as the continuous application of an integrated preventive environmental strategy to process, products and services to increase the overall efficiency and to reduce risks to humans and environment. A CP project follows a certain methodology and consists of the following elements: data collection, analysis of the collected data, option generation, feasibility analysis, implementation, controlling and continuation. This report follows the UNIDO CP assessment methodology but it is based on one company visit. Therefore the report should be assumed as basic CP assessment report.

Company profile

- Brief history, Ownership, Number of employees

BOVIN Winery was established in 1998 as a private enterprise to produce wine. It is located in the Tikves wine region, at the outskirts (industrial part) of the town of Negotino. The winery possesses 60 hectares of its own vineyards located in the Tikves region. Currently, approximately 80% of the entire amount of wine produced at Bovin is from own vineyards. The plan for the next year is that almost 100% of the entire amount of wine will be produced from their own vineyards. Winery's production capacity is about 1.2 million liters per year.
There are 30 permanent employees.

- Activities, Main production, Products

BOVIN Winery produces high-quality, bottled wines from the following grape varieties: Chardonnay, Rheine Riesling, Sauvignon Blanc, Pinot Noir, Merlot, Pinot Noir, Cabernet Sauvignon, Vranec and Chiraz; approximately 20 different types of products (wine varieties). The processing equipment (grape crusher, pneumatic press, cooling equipment, fermentation and stabilization tanks, etc) that is used is well advanced.

- Plans for production expansion, investments, new equipment

BOVIN winery is currently carrying out an investment project for expansion of its wine product assortment with barrique (oak-aged) wines. The project includes: building of infrastructure (annex to the existing production building), purchase of equipment, purchase of oak barrels, and personnel training. The building of the infrastructure is in final phase. The rest of the expansion plan will be finished by the beginning of the next season. The new equipment will be energy efficient and will improve the cleaner production in the company. The new equipment will include control of humidity and temperature control.
A drip-feed irrigation system is planned to be installed next year.

- Implemented standards, awards, certificates, permissions

The winery is certified under the HACCP standard since 2005. They implement ISO9000:22000 standard. The company has acquired all regular permits for its functioning, such as: building permit, fire-protection and workers health and safety permits, etc. BOVIN Winery holds several prestigious international and national awards for its wines (See Annex).

Material Flow Analysis

- Processes, process diagram

The production process in BOVIN Winery is classified as ‘standard’, and it includes the following operations (as indicated in Figure 1): Unloading of grapes in a separate unloading area. (2) Crushing of grapes in a mechanical crusher to remove the grapes from the stems and skins. (3) Grape pressing to separate juice or wine from grapes and grape skins. (4) Fermentation over about one week to convert sugar contained in the grapes to alcohol using yeast under anaerobic conditions. (5) Malolactic (or secondary) fermentation, which takes three to six months. The wine is kept under an airlock to protect the wine from oxidation. Proteins from the grape are broken down and the remaining yeast cells and other fine particles from the grapes are allowed to settle. (6) Wine stabilization and clarification (filtering) to achieve microbial stabilization of the wine. (7) Wine bottling. Bottles are firstly washed, and consequently filled bottles are sealed with a cork caps.

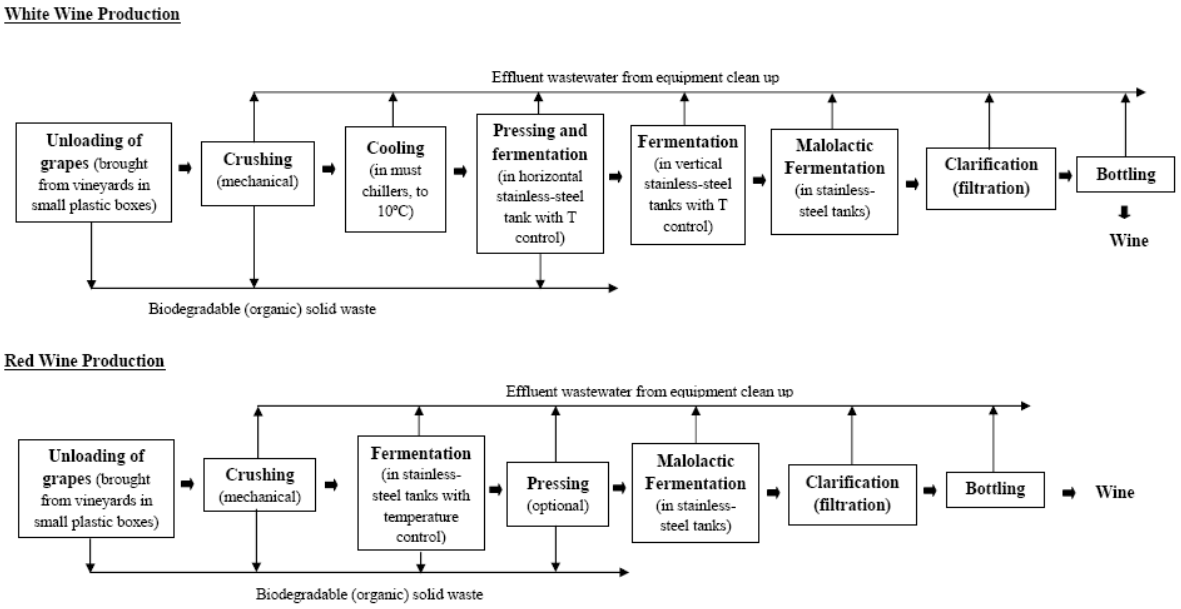

Figure 1 - Production process in BOVIN Winery

- Materials handling

All raw materials are visually tested for quality before being accepted from suppliers. The transferring activities follow proper procedure and are well documented. Practically there is no raw material with expired date since the supply of raw materials is on daily basis. Every material needed in production process (such as crates, palettes, packages, glass and containers) is inspected for damage before being accepted.

- Raw and waste materials, management of waste materials

Basic raw materials (grapes) are packed in returnable containers (boxes). According to the owner there are no hazardous raw materials according the requirements of HACCP and ISO standards. Disinfection detergents with biodegradable compounds are used in the cleaning process in very small quantities. There is a storage area for final products organized according to storage regulations (temperature, humidity, light). A responsible person is full time employed in the storage areas.

Bio waste is returned to the vineyards. Paper waste is stored and occasionally taken away by third parties. No glass waste if any it is reported to the supplier. The rest of the waste is taken by the communal company.

- Water in the technology processes, waste water treatment/management

BOVIN uses two sources of water: water for sanitary purposes and equipment washing is supplied through connection to the public water supply network of Negotino. The winery also has its own

water supply well, equipped with electric pump and pressure water tank (flow control unit). Water from the well is used for floor cleaning/washing and garden irrigation. The equipment is located outside of the winery building, in a special concrete duct. Wastewater from sanitary facilities (domestic) and from equipment and floor cleaning is discharged into the public sewage system for the town of Negotino.

BOVIN carefully uses the water although the region is rich in water. An example is the way they wash and rinse the tanks - the last rinsing water from a tank is reused for the first washing of another tank. Another example is the drip-feed irrigation system for watering the vineyards that is planned to be installed next year. All the necessary drip-feed irrigation equipment has been purchased.

Energy Management

There isn't an extensive energy use in the processes that are taking place in BOVIN. For the process purposes only electrical energy is used. The chillers use water cooling. The equipment for bottling and labeling is sophisticated, energy efficient and has self lubricant materials. Petrol is used for office heating. Small tanks of 500l are used. Care is taken to heat at almost constant indoor temperature of 20C.

Environmental Performance of the Company

There are no significant environmental concerns. Wastewater is discharged to the Negotino public sewage system. While wastewater is generated from equipment cleanup during the year, larger amounts of wastewater with organic loadings are generated during the grape crushing period in September. There are very few emissions as result of the process. The area where emissions occur is appropriately ventilated.

Waste materials handling

Wastewater is generated from cleaning the grape crusher and press. Other wastewater is generated during cleanup of fermenters and stabilization tanks after they are emptied. The amount of wastewater is limited, and it is discharged into the public sewer system for the town of Negotino. Organic solid waste including pressings is used as fertilizer in the winery's own vineyards.

Current Operating Practices

- Good operating practices

There are formal personnel training programs on raw material handling, proper storage techniques, and waste handling procedures. Records are kept for each waste, documenting sources of origin and eventual disposal. The operators are provided with detailed operating manuals or instructions sets. All operator job functions are well defined. Management is permanently on the site and supervising the process. Company doesn't have specific goals for waste minimization but they are trying to minimize every waste and they are aware of direct loss of materials.

- Good housekeeping

BOVIN is a relatively small, family company, so the maintenance of a clean, orderly work environment is implemented as much as possible. The work environment is almost clean. Spillage is moved occasionally. The floors are cleaned by brooms and water under pressure. The walkways are free of containers. The employee interest in good housekeeping is stimulated.

- Partnership with other stakeholders

Most of the supply of raw material and production is from their own vineyards. The rest is planned ahead according to signed agreements with suppliers which are scheduled by quantity, day and hours of delivery. Organic solid waste is brought back to the vineyards. The recyclable waste is occasionally taken away by third parties.

Identification of CP Opportunities

- Technology processes improvement

Technology process improvement is currently done by investing in the new project for expansion of its wine product assortment with barrique (oak-aged) wines. The new equipment will be energy efficient and will improve the cleaner production in the company. The new equipment will include control of humidity and temperature control.

- Energy saving and energy efficiency measures

In near future BOVIN plans to purchase and install photovoltaic that will supply electrical energy for the lightning. Also they plan to completely replace the standard lights with energy efficient lights. The estimated savings are 600-700 euros per year.
The region of Negotino is rich in solar energy so BOVIN plans to install solar panels to provide hot water for process, sanitary purposes and for the pool.

- Water

The company uses the municipal water supply system and ground wells. BOVIN is generally not big consumer of good drinking water. Water savings could be taken in consideration, mostly by using good house keeping measures.

The vineyards owned by the winery are irrigated using water taken from a public irrigation system and flooding over cropped areas. However, a drip-feed irrigation system is planned to be installed next year. This activity is an example of CP activity that reduces water consumption.

Concluding Remarks and Recommendations

The owner and the management of the company have a clear vision about the concept of Cleaner Production. They are already implementing some standard CP options and they are committed to implement more CP principles in the near future. The plan is to improve the good house keeping practices, and to minimize water and energy consumption.

The owner of BOVIN Mr. Kiro Bogevski, the technical manager Mr. Borce Necev and the designer Mrs. Vesna Bogevska (all being members of the management team) participated in all the phases of the company assessment.

The company management is aware that training is needed also for the rest of the employees, so the company organizes trainings and also hires outside company/persons to conduct environmental assessment for different purposes (HACCP application, ISO application).

The national experts from the National Cleaner Production Center (NCPC-MK) explained the goals and the aims of the cleaner production. During the audit the owner showed big interest to learn more and to cooperate in the future. An example of his awareness of the CP principals is the fact that the management of BOVIN considers renewable energy sources (photovoltaic and solar panels) in near future.

Further cooperation with the NCPC-MK if needed was recommended.

Skopje, 24.10.2008

Director of the NCPC-MK

Atanas Kocov

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Annex

Photo documentation

Fig. 2 – Rewarded awards

Fig. 3 - Wine cellars

Fig. 4 – Packaging and labeling equipment

Fig. 5 – Wine cellar