RESOLUTION OIV-CST 431-2011

GENERAL PRINCIPLES OF THE OIV GREENHOUSE GAS ACCOUNTING PROTOCOL FOR THE VINE AND WINE SECTOR

THE GENERAL ASSEMBLY

Following the proposal of the Scientific and Technical Committee and after learning of the works of the ad hoc group “Carbon Dioxide Balance” and the opinions of Commission I "Viticulture", Commission II "Oenology" and Commission III "Economy and Law",

NOTING RESOLUTION AGE 1/2008 adopting the OIV 2009-2012 Strategic Plan that includes an item to develop a methodology for the calculation of the vine and wine industry greenhouse gases.

NOTING the urgent need of developing an international and harmonised system for the calculation of the greenhouses gases emissions (in carbon dioxide equivalents) specific for the vitivinicultural sector, as it is required by the OIV resolution 425/2010,

DECIDES to develop the general principles of an international greenhouse gas accounting protocol for the vine and wine sector adaptable to each country’s situation,

DECIDES that is indispensable to complete these general principles with the relevant Annexes, which will be developed at a later stage, in order to allow the complete and effective application in the OIV framework,

DECIDES that the modalities of communicating the results of the international protocol for calculating the greenhouse gases for the vine and wine sector will be evoked in the Annexes

PROPOSES to publish the General principles of the OIV GHG Accounting Protocol and urges/encourages member countries and the vine and wine sector to contribute to the elaboration of these Annexes and the improvement of this protocol.

REQUEST feedback for that purpose with the intention to review and publish an updated version, if necessary.

GENERAL PRINCIPLES OF THE

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OIV GHG ACCOUNTING PROTOCOL (GHGAP) FOR THE VINE AND WINE SECTOR

INTRODUCTION

Climate change has been identified as one of the greatest challenges facing nations, governments, business and citizens over future decades.

Past and current actions, including the release of carbon dioxide (CO2) and other greenhouse gases (GHG) through human activities will have an effect on future global climate.

International, national and regional initiatives are required in order to mitigate the concentration of greenhouse gases in the atmosphere. These initiatives are based in the quantification, the survey, the establishment of reports and the verification of GHG emission for enabling its limitation.

Within this context, the OIV has developed the GHGAP (Green House Gas Accounting Protocol) as a tool which establishes the principles for the calculation of the emissions and sequestrations of greenhouse gases, expressed in Carbon dioxide equivalents, in the vine and wine sector.

The OIV GHGAP is based on the "International Wine Carbon Protocol", on the ISO 14040, 14044 and 14064 Standards and on relevant international and national standards.

The OIV GHGAP provides to these international standards the specifications proper to the vine and wine sector.

The OIV GHGAP has two elements:

- Enterprise Protocol (EP)

The Enterprise Protocol is designed primarily as an enterprise tool for the international vine and wine industry in compliance with current international standards and practices for Greenhouse Gas accounting.

EP could be subdivided in 2 components:

- Direct emissions. Their study shall be carried out as a business-to-business assessment. The company accounts for primary GHG emissions, all the emissions from activities over which it has total control.
- Indirect emissions. Their study shall be carried out taking into consideration the

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dependence, of one enterprise, on the activities of another enterprise. All the emissions from activities which are not under the direct control of the company but on which the company retains an indirect control and depends for its normal activity are considered indirect emissions.

The EP is intended to benefit organizations, businesses and other stakeholders in the vine and wine sector by providing a clear and consistent method for the complete assessment of the GHG emissions associated with vine and wine companies' activities.

- Product Protocol (PP)

The Product Protocol will provide general guidance on the significant emissions associated with individual products in the vitivinicultural sector. It will help to define product level carbon emissions to the extent necessary to satisfy the expected international standards for lifecycle analysis.

PP is intended to be carried out as a business-to-consumer assessment, which includes all the emissions arising from the full life cycle of the product.

The PP is intended to benefit organizations, businesses and other stakeholders in the vine and wine sector by providing a clear and consistent method for the assessment of the whole life cycle GHG emissions associated with the final product.

The PP is a tool normally used by the producers and the companies in order to communicate information on the GHG emissions and removals associated to the life cycle of a product, that is, its carbon footprint.

TERMS AND DEFINITIONS

The terms and definitions applied in the OIV GHGAP are the same applied in the international standards it is based on (mainly the series of ISO Standards 14000).

Greenhouse Gases (GHG)

GHG are gaseous constituent of the atmosphere, both natural and anthropogenic, that absorbs and emits radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds.

The greenhouse gases covered by the OIV GHGAP are the six greenhouse gases considered under the Kyoto Protocol [carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6)].

The assessment of GHG emissions shall include the gasses listed in the IPCC reports.

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A list of recognised GHGs is provided in the Annexes.

Carbon dioxide equivalent (CO_2e)

Unit for comparing the radiative forcing of a GHG to carbon dioxide.

The carbon dioxide equivalent is calculated using the mass of a given GHG multiplied by its global warming potential.

Global warming potential

Factor describing the radiative forcing impact of one mass-based unit of a given GHG relative to an equivalent.

Global warming potentials considered are those published by the Intergovernmental Panel on Climate Change 4th Assessment Report.

Product

Within the OIV GHGAP, product is defined as the good in the form in which it is sold to the final consumer.

The vine goods concerned are:

- Grape

Fresh grape or raisins for human consumption.

The functional unit is 1 kilogramme.

- Wine or special wine

Wine or Special wine, as defined in the OIV International Code of Oenological Practices, including its final container (glass bottle, Bag-in-box, PET...) and the individual packaging.

The functional unit is 0,75 l.

Product Life cycle

Life cycle of vitivinicultural product refers to the following phases:

- Grape production
- Wine processing
- Distribution and retail
- End-life-phase (covering disposal and recycling)

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Functional unit

The functional unit is the basic amount of the product, in terms of which the GHG balance or carbon footprint is expressed.

Greenhouse gas Balance or Carbon Footprint (CF)

Weighted sum of greenhouse gas emissions and greenhouse gas removals of a process, a system of processes or a product system, expressed in CO_2 equivalents.

The assessment of all GHG emissions and removals covering the full life cycle of the product is also known as business-to-consumer or "cradle to grave".

GHG removals

Sequestration or absorption of GHG emissions from the atmosphere.

Consumables

Consumables include lubricating oil, tools and other rapidly wearing inputs to a process. Fuel and energy are not considered as consumables. Consumables differ from capital goods in that they have an expected life of one year or less, or a need to replenish on a one year or less basis.

Input

An input is a product, material or energy flow that enters a unit process.

Offsetting

A monetary investment in a project or activity elsewhere that abates greenhouse gas (GHG) emissions or sequesters carbon from the atmosphere that is used to compensate for GHG emissions from the company activities or from the production of a product. Offsets can be bought by a business or individual in the voluntary market (or within a trading scheme), a carbon offset usually represents one tonne of CO_2-e[1].

Primary and secondary boundaries

By primary boundaries, the text means all the operations for which the company is directly responsible or the operations of production and disposal which are not under the direct control of the company but on which the company retains an indirect control and depends for its normal activity.

By secondary boundaries, the text means all of the operations for which the company can not be considered responsible, which are out of the direct company boundaries but on which the company depends for its normal activity

Part I: Entreprise Protocol (EP)	**Part II: Product Protocol (PP)**
I. 1. Scope	**II. 1. Phases**

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The Enterprise Protocol (EP) will consider the GHG balance (in Carbon dioxide equivalents) inside a company activities system. Every GHG emissions or sequestration resulting from an activity undertaken by the company should be listed, analysed and accounted. In order to delineate between direct and indirect emission sources, and to help in the development of emission policies and business goals, the OIV GHGAP has defined three Scopes: 1. Scope 1 – Direct greenhouse gas emissions Direct Greenhouse Gas emissions, or Scope 1 emissions, occur from items directly controlled by and owned by the company. This "control" means that the company has the power to directly influence the GHG emissions of the activity. For the vine and wine industry, typical examples of Scope 1 emissions include: • on site fuel use (e.g. tractors, forklifts, etc), • onsite waste disposal (anaerobic digestion or incineration), • gas recharge of cooling systems (refrigeration, air conditioners etc), • CO_2 used in the winemaking process (dry ice, blanket tanks, pipe flushing's etc) and • Emissions related to the production of purchased grapes or must when, by contract, the winery directly controls the production system of the purchased grapes or must. • emissions of N_2O and CH_4 resulting from the nitrogen fertilization of the soil The majority of the scope 1 carbon footprint is typically fuel use. 2. Scope 2 - Purchased power utility Many companies are heavily reliant on electrical power. The emissions that occur from the production of electricity in facilities not owned by the company are categorised as Scope 2 emissions. They are regarded as indirect emissions because they occur in equipment owned by another company, generally a power station. Scope 2 also includes emissions generated from purchased steam or heat, but this has not been considered as important for the vine and wine industry. Purchased electricity is separated from other indirect Greenhouse Gas emissions as electricity generation is considered to significantly contribute to Global Warming. For many organisations purchased electricity is the largest component of Greenhouse Gas emissions and a necessary component of Greenhouse Gas management strategies. 3. Scope 3 - Indirect greenhouse gas emissions For the vine and wine industry, emissions categorised as Scope 3, are emissions that occur as a consequence of producing a finished saleable vitivinicultural product, emitted from equipment or plant owned and controlled by another company, but on which the enterprise retains an indirect control. By definition the classification of Scope 3 is dependent upon the operational boundary or ownership. For example, if a vineyard owns a harvester and uses it to harvest grapes, then the emissions generated from the harvester engine will be classified as Scope 1. If the vineyard does not own a harvester and instead utilises a harvesting contractor, rent or lease it, then the emissions from the contract harvester will be classified as Scope 3. Scope 3 for instance comprises emissions from activities which are part of the core process of the enterprise but have been outsourced to other companies. As a general rule, the Scope 3 emissions should be included depending on data availability. When calculating the GHG balance of a company using the EP, Scope 1, Scope 2 and Scope 3 emissions should be considered in the accounting.	The Product Protocol (PP) will consider the GHG balance related to the production of a vitivinicultural product. The PP is directly based in the Product Life Cycle and the emissions and removals related to it. Life cycle of vitivinicultural product refers and should be classified into the following phases: • Grape production • Wine processing • Distribution and retail • End-life-phase (covering disposal and recycling) When calculating the GHG balance or carbon footprint of a product using the PP, all the emissions and sequestrations related to each one of the four above mentioned phases should be accounted. Due to its negligible impact, the consumption phase is not considered in the PP.
I. 2. BOUNDARIES	**II. 2. Boundaries**
Boundaries for EP are based on a business-to-business approach. Two boundaries can be distinguished: • Primary boundaries All emissions classified as scope 1 or scope 2, are included inside the EP primary boundaries. The definition of a company or business is broad. It covers a wide range of organisational structures from large multinational conglomerates, to small family run organisations. The definition of primary boundary takes into account the identification of the emissions and sequestration of GHG associated with the operations of the company. The primary boundary defines the limits between direct emissions and indirect emissions. Under the "control" approach a company accounts for primary GHG emissions over which it has total control. For the vine and wine industry it has been assumed that 'control' refers to operational control and ensures that the reporting company is in a position of power to alter its emission habits and tendencies. A company with full operational control has the sole authority to introduce policy, technology or operational changes with the potential to reduce overall emissions. According to the "control" approach, all the activities which are not under the direct control of the company but on which the company retains an indirect control and depends for its normal activity are also included in the primary boundaries and classified as Scope 3 emissions. Examples of such emissions are: • Business travels • Fuel or energy used in rented or leased machinery (harvesting, bottling…) • Fuel or energy used by contractor in vineyard operations When defining the primary system boundary of a vine and wine company, special attention should be paid in order to avoid double emission or sequestration counting with other companies. A global approach is needed in order to avoid that any Scope 1 GHG emission or sequestration is accounted by 2 different companies. • Secondary boundaries According to the "control" approach, all the activities which are not under the control of the company but on which the company depends for its normal activity are included in the secondary boundaries. Examples of such emissions are: • Infrastructures (more details in point I.6) • Purchased consumables (more details in point I.7) • Waste (more details in point I.9) According to the "control" approach, the vitivinicultural companies are only responsible for the emissions that are included into the primary boundaries. The emissions classified into the secondary boundaries will be calculated in the case that the companies evaluate the global GHG emissions, related to their activities.	The boundaries for PP are based in the Life Cycle of the product (business-to-consumer or "cradle to grave"). The life cycle of a product includes all the production processes and services associated with the product through its life cycle, from the extraction of raw materials through production of the materials which are used in the manufacture of the product, over the use of the product, to its recycling and/or ultimate disposal of some of its constituents. Life cycle of vitivinicultural product refers to the following phases: grape production, wine processing, distribution and retail and end-life-phase (covering disposal and recycling). All emissions directly linked with the production process or life cycle of the vitivinicultural product should be included. Examples of included emissions in the vine and wine sector are: • Fuel and energy used (even from not owned machinery) in vineyard operations (ex. Harvesting, vineyard treatments, …) • Fuel and energy used (even from not owned machinery) in winemaking and processing (ex. bottling…) • Fuel and energy used in the product transport • Input production • Waste disposal Emissions related to business travels are not included in the PP as they are not directly linked with the wine or grape life cycle. Even if inside the wine life cycle boundaries, the consumption phase is not considered in the PP due to its negligible impact.

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I. 3.Assumptions	II. 3. Assumptions

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• **Short-term carbon cycle (biogenic) other than the vine** The short-term cycle includes the rapid exchange of carbon between plants and animals through respiration and photosynthesis, and through gas exchange between the oceans and the atmosphere. As a general rule, the short term carbon cycle (other than the vine) is excluded from the OIV accounting protocol, and only the vine short term carbon cycle is included in the EP. Emissions of CO_2 that arise directly from the combustion or degradation of biomass are treated as part of the short-term carbon cycle. This includes burning wood and other biomass as a fuel. If carbon sequestration in biomass is accounted, the carbon emissions related with the use and degradation of that biomass must be included. • **Vine Long-term and Short-term carbon cycle (biogenic)** Long-term carbon cycle in the vine includes the retention of carbon into semi-permanent vineyard growth (roots and wood structures). The vine short-term carbon cycle extends into the wine industry to include fermentation, emissions of CO_2 from waste water and landfill and sequestration into non-permanent structures and sources within the vineyard. Emissions of CO_2 that arise directly from the combustion or degradation of biomass are treated as part of the vine short-term carbon cycle. It is acknowledged the important role which plays the agriculture in general and the viticulture in particular in the global balance of GHG. Because of this, all the carbon cycle (long-term and short-term) inside the vineyard is included in the EP. The following emission sources and sinks are included on from reporting: • Emissions and sinks part of Long-term carbon cycle: - Carbon sink inside semi-permanent vine structures (roots and wood structures) • Emissions and sinks part of Short-term carbon cycle: - Non-permanent vine growth; - Grape growth; - Fermentation; - Emissions and sink of carbon from the biodegradation of vine structures in the soil; - GHG emissions from aerobic waste treatment both solid and liquid of vitivinicultural origin; - GHG emissions from the combustion or gasification of biomass fuels. Annexes establish the default figures to be used when calculating the vine carbon cycle. • **Other Greenhouse Gases (all plants including vine)** Emissions of other Greenhouse Gases from the combustion and degradation of biomass are included in the Protocol. This means that the generation of methane within waste systems (such as landfills without gas recovery) is part of the Protocol. If carbon sequestration in biomass is accounted, the emissions of other GHG related with the use and degradation of that biomass must be included. • **Land use changes** In compliance with international standards, the GHG emissions arising from direct land use change (conversion to a vineyard) shall be assessed and the GHG emissions arising from the direct land use change shall be included in the assessment of GHG emissions of the company. The GHG emissions occurring as a result of direct land use change shall be assessed in accordance with the relevant sections of the IPCC Guidelines for National Greenhouse Gas Inventories (Clause 2). The assessment of the impact of land use change shall include all direct land use change occurring on the 20 years prior to the assessment being carried out in accordance with OIV GHGAP. The total GHG emissions arising from direct land use change (conversion to a vineyard) shall be included in the GHG emissions of the company. One-twentieth (5%) of the total emissions arising from the land use change shall be included in the GHG emissions of the company in each year over the 20 years following the change in land use. Annexes establish the default figures to be used when calculating the land use change impacts. • **1% emission rule** Components that contribute less than 1% to the total emissions (in CO_2e) can be discarded from calculations, nevertheless, those emissions should be estimated and included in the emissions report if possible. Some emissions or sequestrations may be excluded when applying the rule but these exclusions must be identified and justified through relevant data. • **Offsetting** GHG emissions offset mechanisms, as defined in this document, including but not limited to, voluntary offset schemes or nationally or internationally recognized offset mechanisms, shall not be used at any point in the EP accounting in order to claim reduction in the emissions associated with the company activities. Communication of offsetting is out of the scope of the EP. • **Data relevance and accuracy** Other emissions or sequestrations could be listed but excluded from the calculator due to the lack of knowledge or data. These exclusions must be also explained and justified in detail.	• **Short-term carbon cycle (biogenic) other than the vine** The short-term cycle includes the rapid exchange of carbon between plants and animals through respiration and photosynthesis, and through gas exchange between the oceans and the atmosphere. As a general rule, the short term carbon cycle (other than the vine) is excluded from the OIV accounting protocol, and only the vine short term carbon cycle is included in the PP. Emissions of CO_2 that arise directly from the combustion or degradation of biomass are treated as part of the short-term carbon cycle. This includes burning wood and other biomass as a fuel. If carbon sequestration in biomass is accounted, the carbon emissions related with the use and degradation of that biomass must be included. • **Vine Long-term and Short-term carbon cycle (biogenic)** Long-term carbon cycle in the vine includes the retention of carbon into semi-permanent vineyard growth (roots and wood structures). The vine short-term carbon cycle extends into the wine industry to include fermentation, emissions of CO_2 from waste water and landfill and sequestration into non-permanent structures and sources within the vineyard. Emissions of CO_2 that arise directly from the combustion or degradation of biomass are treated as part of the vine short-term carbon cycle. It is acknowledged the important role which plays the agriculture in general and the viticulture in particular in the global balance of GHG. Because of this, all the carbon cycle (long-term and short-term) inside the vineyard is included in the PP. The following emission sources and sinks are included on from reporting: • Emissions and sinks part of Long-term carbon cycle: - Carbon sink inside semi-permanent vine structures (roots and wood structures) • Emissions and sinks part of Short-term carbon cycle: - Non-permanent vine growth; - Grape growth; - Fermentation; - Emissions and sink of carbon from the biodegradation of vine structures in the soil; - GHG emissions from aerobic waste treatment both solid and liquid of vitivinicultural origin; - GHG emissions from the combustion or gasification of biomass fuels. Annexes establish the default figures to be used when calculating the vine carbon cycle. • **Other Greenhouse Gases (all plants including vine)** Emissions of other Greenhouse Gases from the combustion and degradation of biomass are included in the Protocol. This means that the generation of methane within waste systems (such as landfills without gas recovery) is part of the Protocol. If carbon sequestration in biomass is accounted, the emissions of other GHG related with the use and degradation of that biomass must be included. • **Land use changes** In compliance with international standards, the GHG emissions arising from direct land use change shall be assessed for any input to the life cycle of a product originating from agricultural activities, and the GHG emissions arising from the direct land use change shall be included in the assessment of GHG emissions of the product. The GHG emissions occurring as a result of direct land use change shall be assessed in accordance with the relevant sections of the IPCC Guidelines for National Greenhouse Gas Inventories (Clause 2). The assessment of the impact of land use change shall include all direct land use change occurring on the 20 years prior to the assessment being carried out in accordance with OIV GHGAP. The total GHG emissions arising from direct land use change (conversion to a vineyard) shall be included in the GHG emissions of products arising from this land. One-twentieth (5%) of the total emissions arising from the land use change shall be included in the GHG emissions of these products in each year over the 20 years following the change in land use. Annexes establish the default figures to be used when calculating the land use change impacts. • **1% emission rule** Components that contribute less than 1% to the total emissions (in CO_2e) can be discarded from calculations, nevertheless, those emissions should be estimated and included in the emissions report if possible. Some emissions or sequestrations may be excluded when applying the rule but these exclusions must be identified and justified through relevant data. • **Offsetting** GHG emissions offset mechanisms, as defined in this document, including but not limited to, voluntary offset schemes or nationally or internationally recognized offset mechanisms, shall not be used at any point in the life cycle of the product in order to claim reduction in the emissions associated with the product. • **Data relevance and accuracy** Other emissions or sequestrations could be excluded from the calculator due to the lack of knowledge or data. These exclusions must be also explained and justified in detail. • **Data availability** The final agent in the supply chain, the retailer, is in charge of the compilation of the information. All the supply chain agents, shall produce and communicate the relevant emission data.

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I. 4. STORED CARBON	II. 4. STORED CARBON
As a general rule and in compliance with international standards, for products containing carbon of biogenic origin, the impact of carbon storage shall be included in the assessment of GHG emissions of the enterprise where: 1. the product is not for human or animal ingestion (i.e. not a food or feed); 2. the material containing the biogenic carbon is obtained from either: 1. an input that is the result of human actions that cause its formation for the purpose of using it as an input to a process (e.g. managed forestry); or 2. a recycled or re-use input that contains material that is demonstrated to comply with point (i) above. The assessment of the impact of GHG sequestrations shall be the CO_2e impact of the GHG emissions over the 20-year period following the formation of the product. Where atmospheric CO_2 is taken up by a product, the impact of this carbon storage over the 20-year assessment period shall be included in the assessment of the emissions. In the vine and wine sector, atmospheric CO_2 can be taken up in: • **Vineyard** It is acknowledged the important role which plays the agriculture in general and the viticulture in particular in the global balance of GHG. Because of this, all the carbon cycle (long-term and short-term) inside the vineyard is included in the EP. The relative long term permanence of vines in the vineyard (in average more than 25 years) confers an important role for storing carbon to these plants. This storage role is amplified when considering the quasi permanent presence of vineyards over the years in a territory. The amount of stored CO_2 in permanent structures of the vine (stem and roots), can be calculated, provided that for each year, following the 20 years after each of the company's uprooted vineyard, one-twentieth (5%) of total emissions arising from the change in the intended use of the land, to be included in GHG emissions of the company.) In the case of replanting vineyards on land previously planted with another vineyard of which the sequestrations have already been calculated, the new vineyard will not benefit from the calculation of this sequestration. • **Cover crop** They are considered, in theory, only part of the short term carbon cycle and its effect on the global carbon cycle in the soil is acknowledged. Because of this, the accounting of its effect is included in the soil carbon cycle calculation. • **Forest** Managed forests are an important sink of carbon and they are included in the long term carbon cycle. Only the carbon sequestration in forest owned or managed by the company will be included in the EP, under the conditions defined in the Annexes. • **Soil** Soils play an important part in the carbon cycle, both as a source and sink for carbon. There is considerable uncertainty regarding the impact of different techniques in agricultural systems and further knowledge needs to be developed. It is well acknowledged the influence of viticultural practices in the balance of carbon content of soils. Annexes present the default data values of the global carbon balance, emissions and removals, within the soil system. These default data take into account the vitivinicultural practices, including the use of pesticides and fertilisers, and the influence of the use of cover crop. In the vine and wine sector, atmospheric CO_2 can be taken up in products, inputs, capital goods or infrastructures such: • **Oak barrels** Oak barrels could represent one of the biggest capital good equipments in a winery and its use has an important impact in the sustainable conservation of oak forest. Because of this important role, carbon stored in oak barrels may be taken into account when applying the EP. Annexes establish the default figures to be used when calculating the oak barrels contribution. • **Vineyard wood posts (vertical and horizontal ones)** The sequestration of atmospheric CO_2 in vineyard wood posts may be included in the calculator, always taking into account its relative contribution to the total global GHG balance of the company. However if the GHG balance of the production of wood post is included in the accounting, the carbon sequestration must be taken into account. • **Wood infrastructures** The sequestration of atmospheric CO_2 in wood structures may be excluded from the calculator due to its relative low contribution to the total global GHG balance of the company. • **Sequestration of carbon emissions during fermentation** In the vine and wine industry, if an effort is made to sequestrate the carbon emissions during fermentation, this positive effect should be included in the calculator. • **Cork closures** Cork closures represent a specificity of the wine sector and its use has an important impact in the sustainable conservation of forest. Because of this important role, carbon balance of corks may be taken into account when applying the EP. When accounting the GHG emissions related to natural cork closures, the cork production system should be considered from a holistic approach. The final figures of the GHG emissions due to the cork production should consider the managed forest it comes from and its carbon sink effect.	As a general rule and in compliance with international standards, for products containing carbon of biogenic origin, the impact of carbon storage shall be included in the assessment of GHG emissions of the product where: 1. the product is not for human or animal ingestion (i.e. not a food or feed); 2. the material containing the biogenic carbon is obtained from either: 1. an input that is the result of human actions that cause its formation for the purpose of using it as an input to a process (e.g. managed forestry); or 2. a recycled or re-use input that contains material that is demonstrated to comply with point (i) above. The assessment of the impact of GHG sequestrations shall be the CO_2e impact of the GHG emissions over the 20-year period following the formation of the product. Where atmospheric CO_2 is taken up by a product the impact of this carbon storage over the 20-year assessment period shall be included in the assessment of the emissions. In the vine and wine sector, atmospheric CO_2 can be taken up in: • **Vineyard** It is acknowledged the important role which plays the agriculture in general and the viticulture in particular in the global balance of GHG. Because of this, all the carbon cycle (long-term and short-term) inside the vineyard is included in the PP. The relative long term permanence of vines in the vineyard (in average more than 25 years) confers an important role for storing carbon to these plants. • **Cover crop** They are considered, in theory, only part of the short term carbon cycle and its effect on the global carbon cycle in the soil is acknowledged. Because of this, the accounting of its effect is included in the soil carbon cycle calculation. • **Forest** Managed forests are an important sink of carbon and they are included in the long term carbon cycle. However as forests are not directly linked with the wine elaboration process, the carbon sequestration will not be included in the PP. For example, only the first rows of trees would be considered in the PP when they have a vineyard protection role against wind. • **Soil** Soils play an important part in the carbon cycle, both as a source and sink for carbon. There is considerable uncertainty regarding the impact of different techniques in agricultural systems and further knowledge needs to be developed. It is well acknowledged the influence of viticultural practices in the balance of carbon content of soils. Annexes present the default data values of the global carbon balance, emissions and removals, within the soil system. These default data take into account the vitivinicultural practices, including the use of pesticides and fertilisers, and the influence of the use of cover crop. In the vine and wine sector, atmospheric CO_2 can be taken up in products, inputs, capital goods or infrastructures such: • **Oak barrels** Oak barrels could represent one of the biggest capital good equipments in a winery and its use has an important impact in the sustainable conservation of oak forest. Because of this important role, carbon stored in oak barrels may be taken into account when applying the PP. Annexes establish the default figures to be used when calculating the oak barrels contribution. • **Vineyard wood posts (vertical and horizontal ones)** The sequestration of atmospheric CO_2 in vineyard wood posts may be included in the calculator, always taking into account its relative contribution to the total global GHG balance of the product. However if the GHG balance of the production of wood post is included in the accounting, the carbon sequestration must be taken into account. • **Wood infrastructures** The sequestration of atmospheric CO_2 in wood structures may be excluded from the calculator due to its relative low contribution to the total global GHG balance of the product. • **Sequestration of carbon emissions during fermentation** In the vine and wine industry, if an effort is made to sequestrate the carbon emissions during fermentation, this positive effect should be included in the calculator. • **Cork closures** Cork closures represent a specificity of the wine sector and its use has an important impact in the sustainable conservation of forest. Because of this important role, carbon balance of corks may be taken into account when applying the PP. When accounting the GHG emissions related to natural cork closures, the cork production system should be considered from a holistic approach. The final figures of the GHG emissions due to the cork production should consider the managed forest it comes from and its carbon sink effect.
I. 5. ENERGY	**2. 5. ENERGY**

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Electricity generation is considered to significantly contribute to global warming and many companies are heavily reliant on electrical power. • Emissions related to energy can be classified into: - Purchased power utility Fuel and energy data shall include the amount of energy used and the average emission factor of the energy input based on the source of energy used. • Onsite generation of electricity Where electricity and/or heat are generated and used onsite, the emission factor shall take into account the reduced size of the transmissions system and its consistent losses. • Considering the origin of the energy generation, the emissions can be classified into: - Emissions from fossil sources All the emissions of GHG arising from the combustion of fossil sources are included in the Enterprise Protocol. • Emissions from biomass and biofuels Emissions arising from the use of biomass shall include the GHG emissions arising from the production of the fuel, and, when the biomass is not made from vine (and included in the vine carbon cycle), shall exclude the carbon emissions arising from the biogenic carbon component of the biofuel. The emissions arising from the production and transport of the biofuel shall be included whether or not the production is made onsite or under the company control. • Emissions from methane combustion from waste No GHG emissions shall be incurred where the methane being combusted is derived from the biogenic component of the waste.	Electricity generation is considered to significantly contribute to global warming and many companies are heavily reliant on electrical power. • Emissions related to energy can be classified into: - Purchased power utility Fuel and energy data shall include the amount of energy used and the average emission factor of the energy input based on the source of energy used. • Onsite generation of electricity Where electricity and/or heat are generated and used onsite, the emission factor shall take into account the reduced size of the transmissions system and its consistent losses. • Considering the origin of the energy generation, the emissions can be classified into: - Emissions from fossil sources All the emissions of GHG arising from the combustion of fossil sources are included in the Product Protocol. • Emissions from biomass and biofuels Emissions arising from the use of biomass shall include the GHG emissions arising from the production of the fuel, and, when the biomass is not made from vine (and included in the vine carbon cycle), shall exclude the carbon emissions arising from the biogenic carbon component of the biofuel. • Emissions from methane combustion from waste No GHG emissions shall be incurred where the methane being combusted is derived from the biogenic component of the waste.
I. 6. INFRASTRUCTURE AND CAPITAL ITEMS	**II. 6. INFRASTRUCTURE AND CAPITAL ITEMS**
According to the control approach, infrastructures, and, in general, capital items are included in the secondary boundaries, when they make a material contribution. Repair and maintenance work to capital items are included in the secondary boundaries. A non exhaustive list of capital items proper to the vitivinicultural sector, , includes: • Tractors • Wires • Harvesters • Metal tanks • Pipes • Pumps • Wine making equipment (press machine, filters, bottling line…) • Forklifts • **Oak barrels** Oak barrels could represent one of the biggest capital good equipments in a winery and its use has an important impact in the sustainable conservation of oak forest. Because of the important role of this capital good in the vine and wine sector, emissions and removal of GHG related to its transport and use may be taken into account when calculating the GHG balance of a company applying the EP. Annexes establish the default figures to be used when calculating the oak barrels contribution.	Due to the long term permanence of wine sector infrastructure such as roads and buildings (cellars, warehouses…), and their consequent relative small contribution to the product carbon footprint, they should be, in general, excluded from the Product Protocol. For the same reasons, GHG emissions related to the production of a capital good are, in general, excluded from the PP. Only the emissions arising from its use (energy consumed) shall be listed and accounted. Capital items that contain embedded carbon such as metal tanks, tractors, forklifts, pipe work, vineyard posts, wires and bottling lines have been excluded from the calculations. Repair and maintenance work to capital items has also been excluded from the Protocol. A non exhaustive list of capital items proper to the vitivinicultural sector, and excluded from the accounting PP includes: • Tractors • Wires • Vineyard posts (if not included as carbon stock) • Harvesters • Metal tanks • Pipes • Pumps • Wine making equipment (press machine, filters, bottling line…) • Forklifts • **Oak barrels** Oak barrels could represent one of the biggest capital good equipments in a winery and its use has an important impact in the sustainable conservation of oak forest. Because of the important role of this capital good in the vine and wine sector, emissions and removal of GHG related to its production, transport and use maybe taken into account when calculating the GHG balance of a product applying the PP. Annexes establish the default figures to be used when calculating the oak barrels contribution.
I. 7. INPUTS	**2. 7. INPUTS**

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As a general rule, all inputs are included in the secondary boundaries. When assessing the GHG emissions for an input, the EP establishes that all emissions that have occurred from the point where the input is placed under the control of the company, including storage and use (energy consumed and others), shall be included as scope 1 (if direct control) or scope 3 (if indirect control) emission, inside the primary boundaries. The GHG emissions related to the input production are included in the secondary boundaries, when the production process is done outside the company boundaries. In order to ascertain the relevance of including each input, companies should carefully: • Apply the 1% emission rule, • Analyze the existence of relevant data concerning its production When an exclusion is decided, it should be justified. A non exhaustive list of inputs proper to the vitivinicultural sector includes: • Fertilisers • Phytosanitary products • Water for irrigations purposes • Yeast and bacteria • Oenological aids • Wine additives • Heat-transfer gases • Bottles and containers: - Glass - PET - Tetra Pack - Aluminium cans - Wine bags • Closures - Aluminium screw caps - Natural cork - Agglomerate cork - Glass stoppers - Synthetic corks • Label • Packaging products • Wooden products (pallets) • Plastic films • Paper for brochures, posters, publications, etc. When accounting the GHG emissions related to natural cork closures, the cork production system should be considered from a holistic approach. The final figures of the GHG emissions due to the cork production should consider the managed forest it come from and its carbon sink effect.	As a general rule, all inputs are included in the PP. When studying the emissions related to each one of the inputs, the following emissions should be accounted: • The emissions due to its production • The emissions due to its transport from purchase point until the place of use • The emissions due to its storage and use (energy consumed and others) • The emissions related to the end-life of the input In order to ascertain the relevance of including each input, companies should carefully: • Apply the 1% emission rule, • Analyze the existence of relevant data concerning its production When an exclusion is decided, it should be justified. A non exhaustive list of inputs proper to the vitivinicultural sector includes: • Fertilisers • Phytosanitary products • Water for irrigations purposes • Yeast and bacteria • Oenological aids • Wine additives • Heat-transfer gases • Bottles and containers: - Glass - PET - Tetra Pack - Aluminium cans - Wine bags • Closures - Aluminium screw caps - Natural cork - Agglomerate cork - Glass stoppers - Synthetic corks • Label • Packaging products • Wooden products (pallets) • Plastic films • Paper for brochures, posters, publications, etc. When accounting the GHG emissions related to natural cork closures, the cork production system should be considered from a holistic approach. The final figures of the GHG emissions due to the cork production should consider the managed forest it come from and its carbon sink effect.
I. 8. TRANSPORT	**II. 8. TRANSPORT**

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Transport of persons or goods is a significant contributor to the overall industry impact. As a general rule, all movements within the company boundaries are included in the Enterprise Protocol. The emissions related should be modelled in two separate ways, either by a quantity of fuel consumed approach or a distance travelled approach. Transport can be classified in two categories: I.8.1. Movement of Product GHG emissions from transport of products include the emissions arising from transport associated with individual processes, such as the movement of inputs, products and by-products within the company boundaries. In the vine and wine industry, different origins of emissions related to good transport activities can be distinguished and shall be accounted: *I.8.1.1. Transport activities during the wine making process* For example, taking into account the control approach, all emissions generated from mobile equipment, owned or not by the enterprise for the transport of inputs and products inside the company boundaries shall be accounted. *I.8.1.2. Transport of the wine from the winery to the customer or the consumer* The company boundary will fix the limit of the inclusion of emissions. In general, the final point is the retailer or the tax warehouse. In the case of internet wine selling, the transport/mailing of the wine until the consumer will be included. *I.8.1.3. Transport of waste, residues or by-products (grape marc, pruned canes...)* Included when within the company boundaries. I.8.2. Movement of People Concerning travel emissions, not all of them will be included in the protocol. Apart from the movement of employees during the wine making process inside the company, which shall be accounted, different origins of emissions related to the transport of people can be distinguished: *I.8.2.1. Travels of employees to their place of work within the company* Excluded from the EP. The employee is normally free, by law, to live wherever he/she wants, and is also free to choose the transport facility he wants to use to go to the place of work. In consequence, these emissions cannot be attributed to the company. *I.8.2.2 Communication of actions undertaken by the company in order to reduce the GHG emissions related to the travel of employees to the place of work are out of the scope of the EP.* *I.8.2.3. Business travel* Included in the EP. Business travel cannot be directly related to the production process of a wine, but they are part of the company activities. *I.8.2.4. Transport of consumer to and from the point of retail purchase* Excluded from the EP.	Transport of persons or goods is a significant contributor to the overall industry impact. As a general rule, all movements are included in the Product Protocol. The emissions related should be modelled in two separate ways, either by a quantity of fuel consumed approach or a distance travelled approach. Transport can be classified in two categories: II.8.1. Movement of Product GHG emissions from transport of products include the emissions arising from transport associated with individual processes, such as the movement of inputs, products and by-products within the boundaries of the product life cycle. In the vine and wine industry, different origins of emissions related to good transport activities can be distinguished and shall be included: *II.8.1.1. Transport of inputs from their purchase point to their place of use* *II.8.1.2. Transport activities during the wine making process* For example, all emissions generated from mobile equipment for the movement of inputs or products. *II.8.1.3.Transport of the wine from the winery to the consumer* In general, the final point is the retailer or the tax warehouse. In the case of internet wine selling, the transport/mailing of the wine until the consumer will be included. *II.8.1.4.Transport of waste or residues to a disposal centre* *Included in the PP.* *II.8.1.5. Transport of by-products* Transport for reuse purposes, as grape marc for distillation or pruned canes (for compost or biomass) are included, if under the direct responsibility of the company producing the by-product. If not, they are excluded, as they are part of a new product life cycle. *II.8.1.6. Transport to a recycling centre* Transport of waste or residues until the recycling centre is included in the PP. II.8.2. Movement of People Concerning travel emissions, not all of them will be included in the Protocol. Apart from the movement of employees during the wine making process inside the company, which shall be accounted, different origins of emissions related to the transport of people can be distinguished: *II.8.2.1.Travels of employees to their place of work within the company* Excluded from the PP. The employee is normally free, by law, to live wherever he/she wants, and is also free to choose the transport facility he wants to use to go to the place of work. In consequence, these emissions cannot be attributed either to the life cycle of the product. *II.8.2.2. Business travel* Business travel cannot be directly related to the production process of a wine, and are in consequence excluded from the PP. *II.8.2.3. Transport of consumer to and from the point of retail purchase* Excluded from the PP.
I. 9. Waste disposal, reuse and recycling	**II. 9. Waste disposal, reuse and recycling**
I.9.1. Waste disposal GHG emissions from aerobic waste treatment, both solid and liquid, (arising from the biogenic carbon fraction of the waste) are considered part of the short term carbon cycle and are excluded from the EP. The emissions arising from the vine biogenic carbon fraction are included as part of the vine carbon cycle. Energy consumed in the disposal, if outside the company boundaries, is included in the secondary boundaries. I.9.2. Direct Reuse Emissions related to the reuse of wine byproducts or waste, are included in the EP if inside the boundaries of the company. In the vine and wine industry, examples of reuse included in the EP when inside the company boundaries are: • Pruned canes ground for soil amendment • Preparation and burning of wood residues or grape marc for energy purposes • Compost preparation • Distillation of wine or grape marc I.9.3. Recycling Emissions related to the recycling of wine by-products or waste are included in the primary boundaries of the EP , when the company is responsible of the recycling process. If the company is responsible of the recycling of glass bottles, the recycling emissions should be carefully studied due to its importance when applying the EP. Taking into account that glass from bottles can be recycled *infini*, and in order to simplify the calculation, the recycling GHG emissions used could be the upstream ones (recycling figures of the bottle before the company use it) Annexes present default values for the emissions related to the recycling of glass bottles. When glass bottles are treated or washed, no recycling emissions should be attributed to the bottle.	II.9.1. Waste disposal GHG emissions from aerobic waste treatment, both solid and liquid, (arising from the biogenic carbon fraction of the waste) are considered part of the short term carbon cycle and are excluded from the PP. The emissions arising from the vine biogenic carbon fraction are included as part of the vine carbon cycle. Energy consumed in the disposal is included in the PP. II.9.2. Direct Reuse Emissions related to the reuse of wine byproducts or waste, are excluded from the PP and should be integrated in the life cycle of the new product in which it is integrated as an input. In the vine and wine industry, examples of reuse are: • Pruned canes ground for soil amendment • Preparation and burning of wood residues or grape marc for energy purposes • Compost preparation • Distillation of wine or grape marc II.9.3. Recycling Emissions related to the recycling of wine by-products or waste are included in the PP. A special case in the vine and wine industry is the recycling of the glass bottles. In order to avoid double accounting, and taking into account that glass from bottles can be recycled *infini*, the recycling GHG emissions are already included in the glass production emissions figures. If this rule is not applied, the cullet production emissions would be assigned twice: first as glass recycling (of the previous bottle) and second as raw material use for the production of the successive bottle. Annexes present default values for the emissions related to the production and recycling of glass bottles.

[1] Environment Protection Authority Victoria. 2008-09-02. Retrieved 2010-08-28: “a

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monetary investment in a project or activity elsewhere that abates greenhouse gas (GHG) emissions or sequesters carbon from the atmosphere that is used to compensate for GHG emissions from your own activities. Offsets can be bought by a business or individual in the voluntary market (or within a trading scheme), a carbon offset usually represents one tonne of CO_2-e"

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