

# Sustainability in the Wine sector

Sustainable Solutions Consulting - H-Farm, 12<sup>th</sup> December 2017



- **The concept of sustainability**
- **Sustainability in wine business**
- **International Sustainable programs**
- **Sustainability & Innovation**



# The concept of Sustainability

# The sustainability: concept

**“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”**

*Bruntland Report for the World Commission on Environment and Development (1992)*

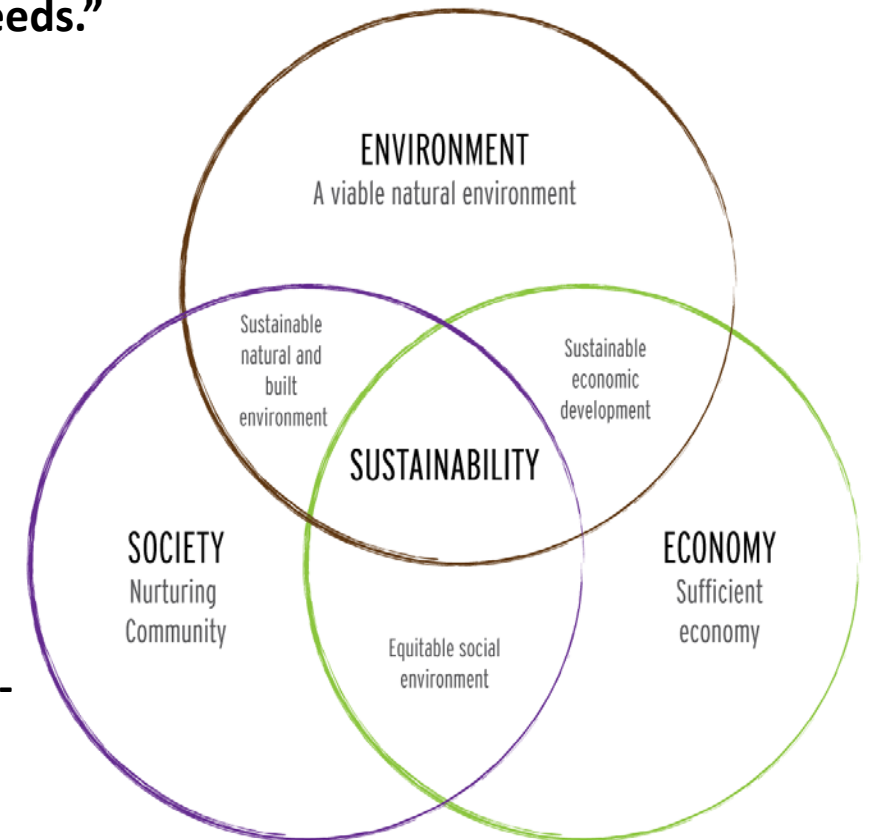
**“A process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations”**

*The World Commission on Environment and Development*

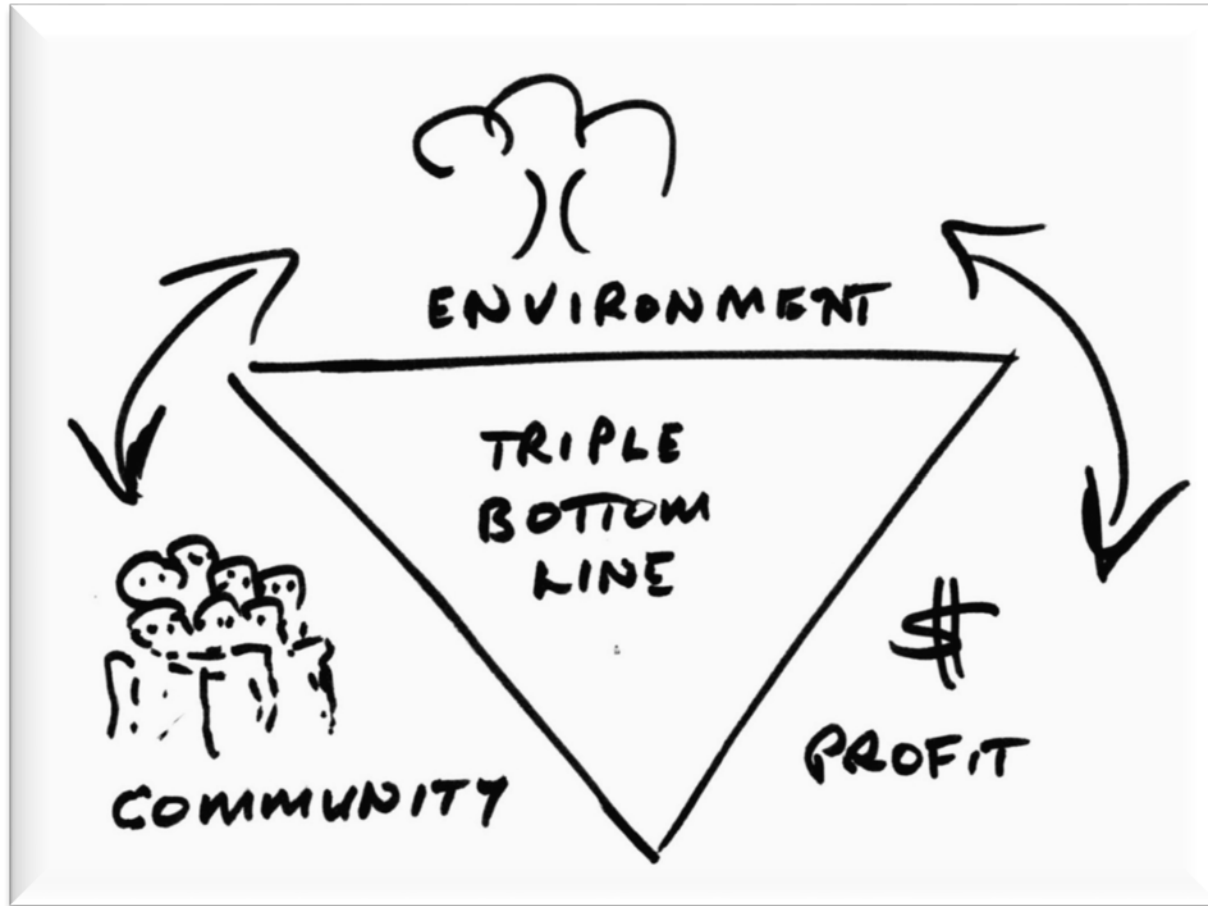
**“A sustainable future is one in which a healthy environment, economic prosperity and social justice are pursued simultaneously to ensure the well-being and quality of life of present and future generations.**

**Education is crucial to attaining that future.”**

*Learning for a Sustainable Future - Teacher Centre*



# The sustainability: the concept

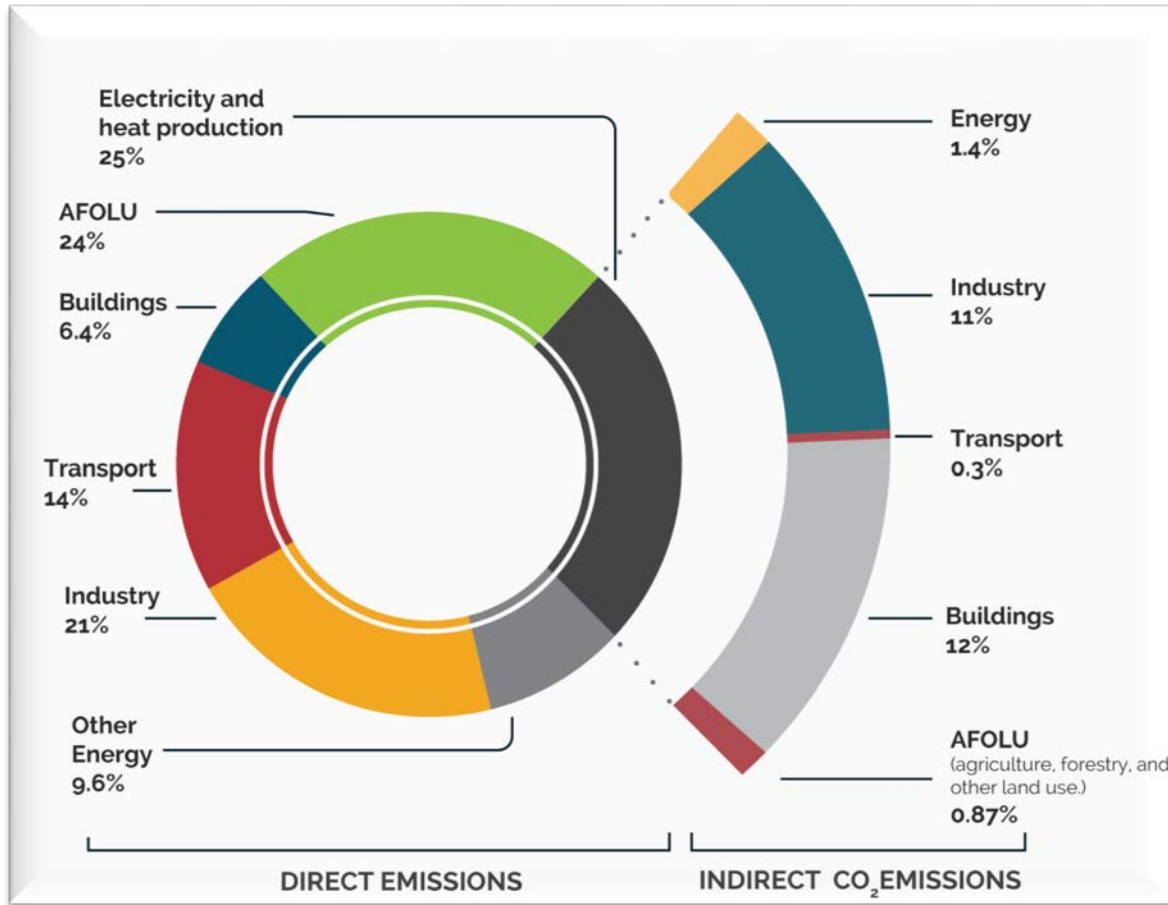


**Triple Bottom Line**  
(Planet – People - Profit)

# Sustainability in wine business

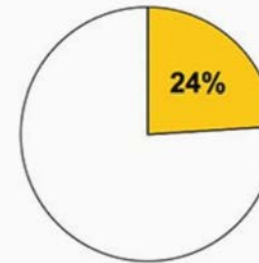


# Sustainability in wine business



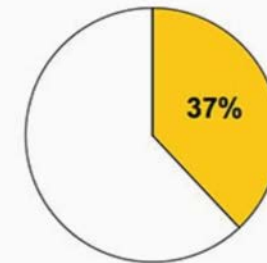
## Agriculture's Share of Global Environmental Impact (2010)

GREENHOUSE GAS EMISSIONS



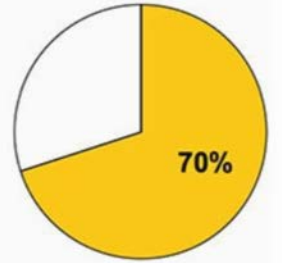
100% = 49 Gt CO<sub>2</sub>e

EARTH'S LANDMASS (EX-ANTARCTICA)



100% = 13.3 bn ha

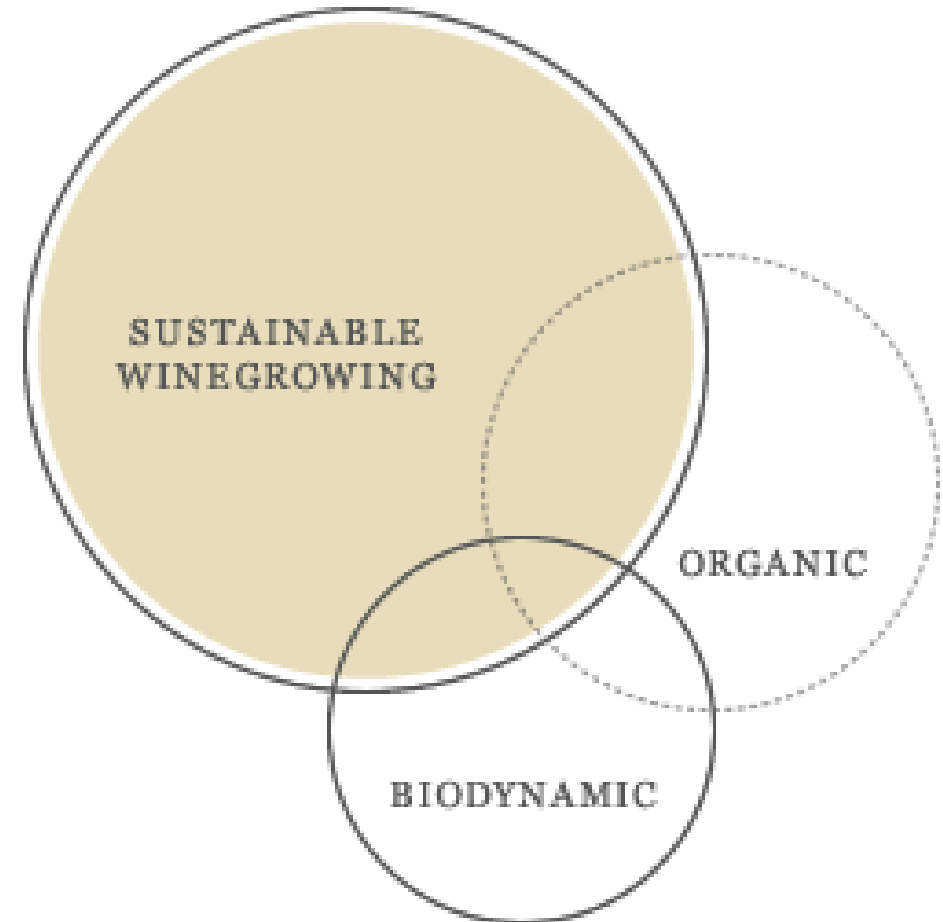
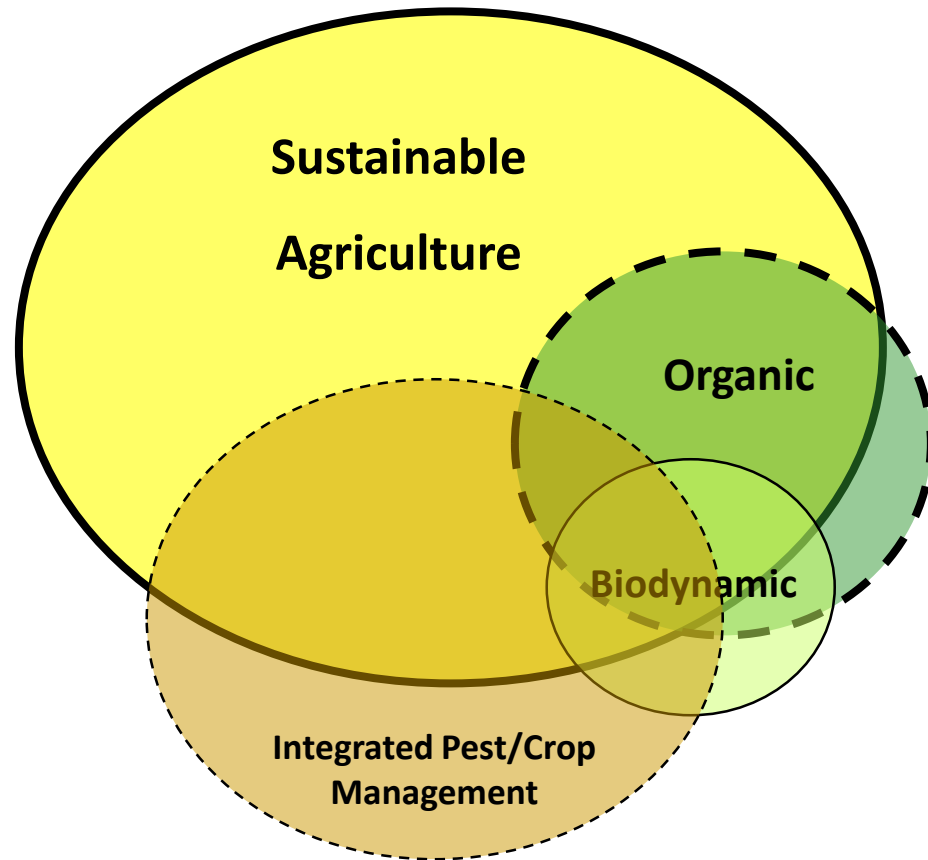
WATER WITHDRAWAL



100% = 3862 km<sup>3</sup> H<sub>2</sub>O

Source: World Resource Institute

# Sustainability in wine business





**Sustainable viticulture** is defined by the OIV as a  
*“global strategy on the scale of the grape production and processing systems, incorporating at the same time the economic sustainability of structures and territories, producing quality products, considering requirements of precision in sustainable viticulture, risks to the environment, products safety and consumer health and valuing of heritage, historical, cultural, ecological, and landscape aspects”.*

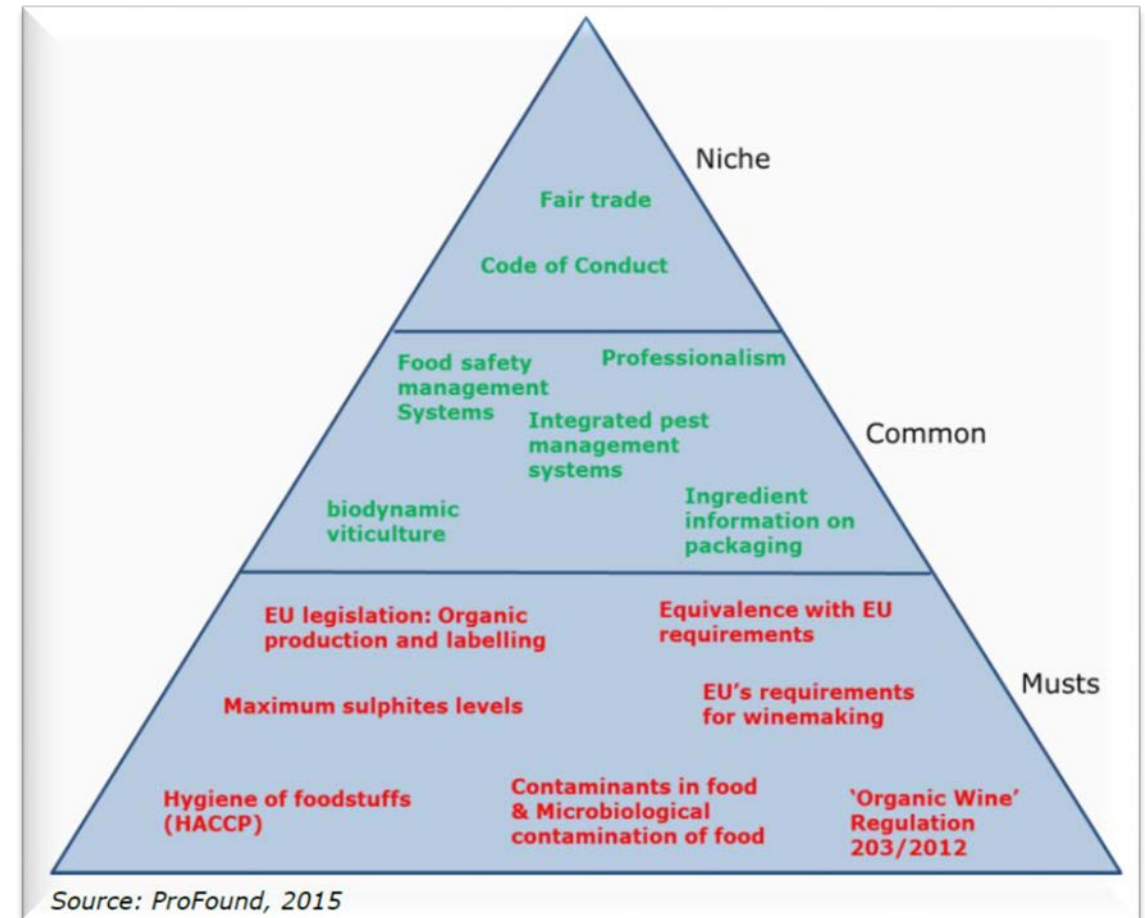
Source: International Organization of Vine and Wine. Resolution CST 1/2008. Guidelines for sustainable viticulture: production, processing and packaging of products.

- Organic viticulture
- Biodynamic viticulture
- Integrated viticulture
- Sustainable viticulture

## KEY AREAS OF WIDELY ADOPTED SUSTAINABLE PRACTICES:



What requirements should sustainable wine comply with to be allowed on the European market?



# Sustainability in wine business

Voluntary standards	Organic Biodynamic Fair trade
Management systems	ISO 14000 family, provides practical tools for companies and organizations looking to identify and control their environmental impact and constantly improve their environmental performance ISO 14001 and ISO 14004 focus on environmental management systems The other standards, eg. ISO 14040, ISO 14044, ISO 14046, and ISO 14067, focus on aspects such as life cycle analysis, communication, and auditing OHSAS 18001 (Occupation Health and Safety Assessment Series) is intended to help an organization to control occupational health and safety risks SA8000 (Social Accountability International) sets out the requirements to be met by organizations, including the establishment or improvement of workers' rights, workplace conditions, and an effective management system
Guidelines	ISO 26000 provides guidance on how businesses and organizations can operate in a socially responsible way. This means acting in an ethical and transparent way that contributes to the health and welfare of society
National programs	Integrity and Sustainability Certified (South Africa) California Sustainable Winegrowing Sustainable Winegrowing (New Zealand) Entwine Australia Certified Sustainable Wine of Chile
Programs in local areas or by groups of winegrowers	Wine Industry Ethical Trade Association (South Africa) FairChoice (Germany) Vignerons en Développement Durable (France) VIVA Sustainable Wine (Italy)

**Abbreviation:** ISO, International Standard Organization.

## Implementing sustainability: which tools and programs?

Source: Sustainable winegrowing: current perspectives (International Journal of Wine Research, 2015)

## Which is the best approach to sustainable wine program development?

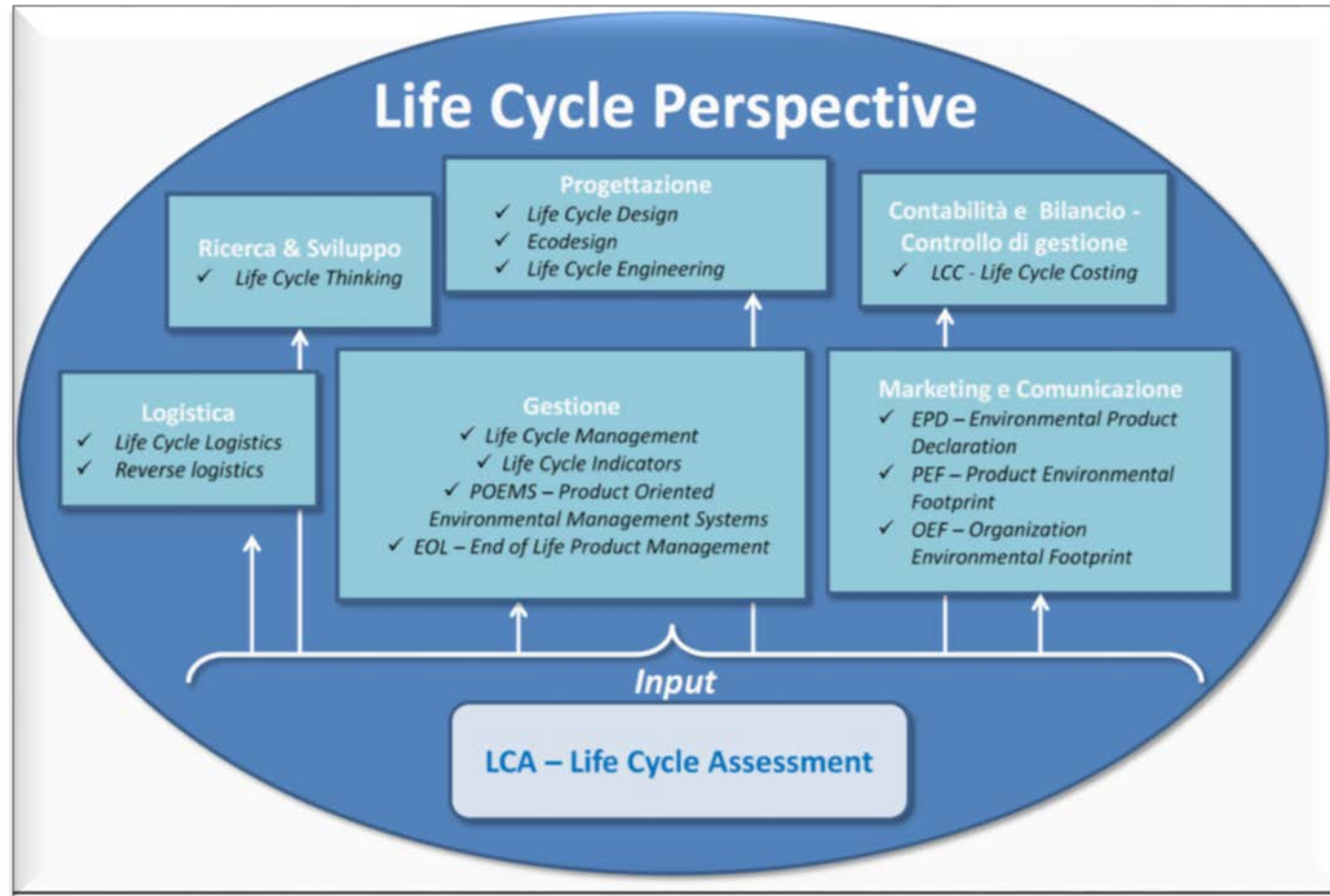
- In order to assess the environmental performance of the different stages of the wine supply chain, the methodology currently used most widely is LCA, given the multiple impact categories that can be considered
- LCA methodology is able to separate out the environmental impact and analyse the contribution of each stage with respect to the impact categories shown in table below.
- One critical choice for application of LCA methodology relates to system boundaries for defining which stages of the life cycle have to be considered and the relative data inventory needed to quantify the inflows and outflows of energy and relative emissions.

ADP	Abiotic depletion potential
AETP	Aquatic ecotoxicity potential
AP	Freshwater acidification potential
CED	Cumulative energy demand
EP	Eutrophication potential
GWP	Global warming potential
HTP	Human toxicity potential
ODP	Ozone depletion potential
POCP	Photochemical ozone creation potential
POP	Photo-oxidant formation potential
TETP	Terrestrial ecotoxicity potential
WD	Water demand

### Main environmental impact categories of life cycle assessment

Source: Sustainable winegrowing: current perspectives (International Journal of Wine Research, 2015)

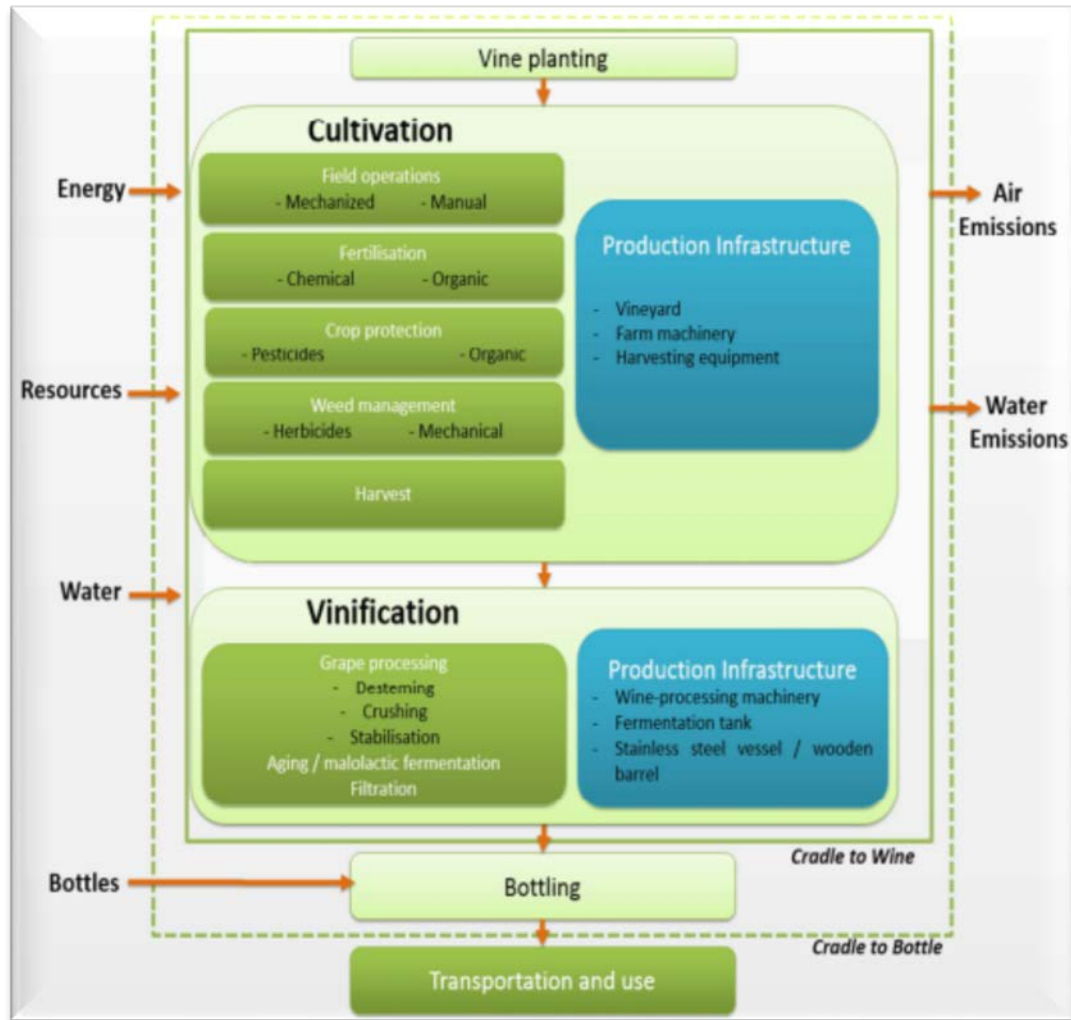
# Sustainability in wine business



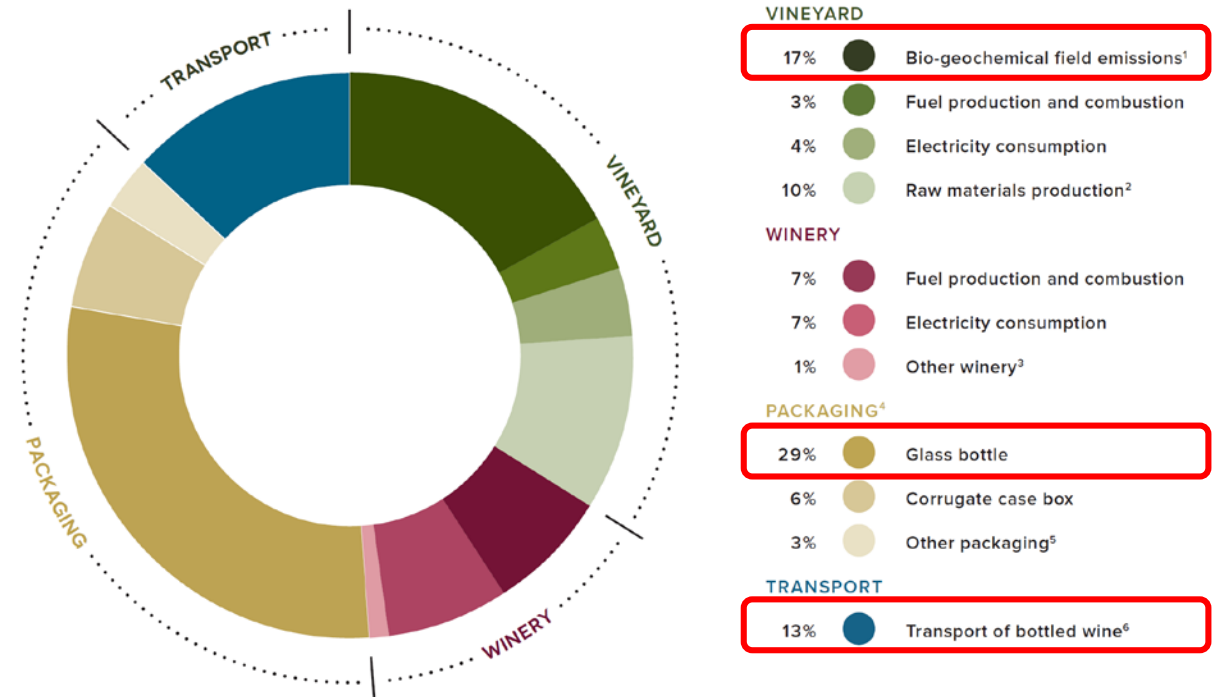
source: ISO 14001:2015 I Sistemi di Gestione Ambientale a un punto di svolta - Assolombarda (2015)



# Sustainability in wine business



source: Wine production chain and system boundary (European Commission,2015)



source: relative impacts for the carbon footprint of packaged wine, cradle-to-retail gate (CSWA,2011)



# **Sustainability** in wine business: international standards overview

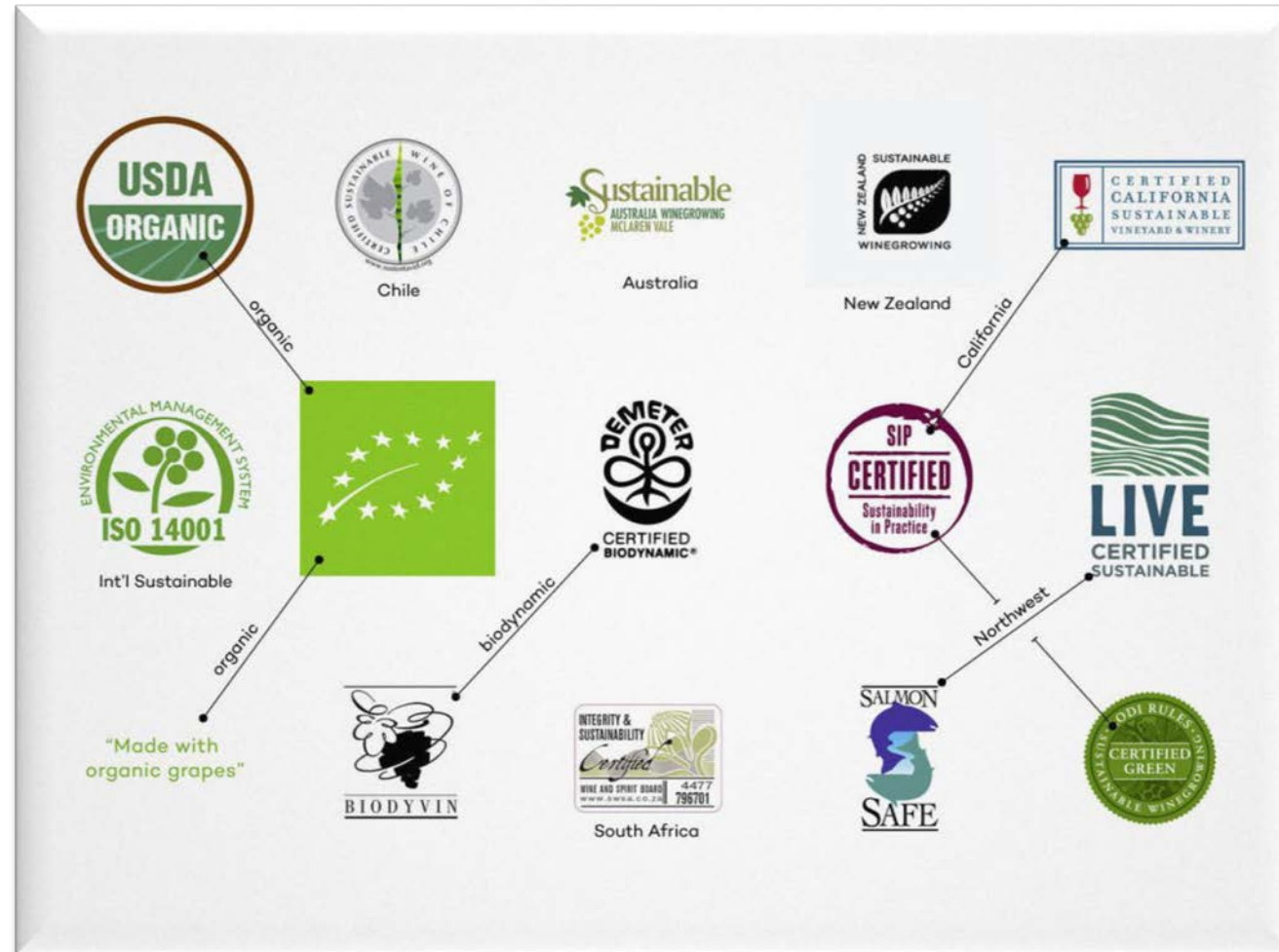
# Sustainability: international standards overview

## International

Organisation	Topic	from
<b>OIV</b> – International Organisation of Vine and Wine	<b>Guidelines for sustainable Viti-viniculture: Production, processing and packaging of products</b>	2011
<b>FIVS</b> – International Federation of Wines and Spirits	<b>Global Wine Producers Environmental Sustainability Principles (GWPESP)</b>	2014

Organisation	Topic	from
Sustainable Wine South Africa	<b>Integrated Production of Wine (IPW)</b>	2000
Winemakers' Federation of Australia	<b>Entwine Australia – supporting a sustainable wine industry</b>	2002
California Sustainable Winegrowing Alliance	<b>Sustainable Winegrowing Program (SWP)</b> <b>OIV compliance</b>	2002
New Zealand Winegrowers	<b>The Sustainable Winegrowing New Zealand programme</b>	2002
Vinos de Chile	<b>Certified Sustainable Wine of Chile</b> <b>OIV compliance</b>	2013

# Sustainability: international standards overview



# Sustainability: international standards overview



- Wineries and vineyards in New Zealand can expect an audit every 3 years for **Sustainable Winegrowing NZ**
- This program focuses on a wide range of factors including crop biodiversity, soil, water and air standards, energy use, chemical use, vineyard and winery waste, social impact, and sustainable business practices
- The program also recognizes other environmental-based certification programmes, including ISO 14001, organic, and biodynamic wine production
- Wineries and vineyards must have a plan and metrics for each of the 7 areas listed with a goal to continually improve and perhaps adopt organic/biodynamic certification
- Joining any SWNZ programmes is voluntary, but in 2012 about 94% of all NZ vineyards were SWNZ certified



- **Chile** also adopts the three “E’s” of sustainability—economic viability, environmental stewardship, and social equity
- Wineries and vineyards are reviewed every 2 years and given scores for their compliance standards where they must meet or exceed the baseline standards given that year
- Chile has several certifying bodies that are used to verify whether a winery is compliant including BioAudita, NSF, SGS (which uses the IMO 14001 standard), IMO Chile, and DQS Chile

# Sustainability: international standards overview



- **Sustainability in South Africa** means vineyards and wineries have health and safety requirements for their workers, reduced usage of chemicals and pesticides, use natural predators to combat pests, and reduction in water usage and creation of waste water systems
- Vineyard farms and wineries are audited every 3 years and if they pass the minimum requirements they are allowed to use the Integrity Sustainability seal on their wines
- Wines of South Africa intends to support this sustainability measure across 100% of their wines and, in 2011, 85% had passed the minimum compliance



- In 2002, members of the **Wine Institute and the California Association of Winegrape Growers (CAWG)** introduced a practical self-assessment workbook for both winemakers and wine growers that encompasses three areas of sustainability: Environmental Soundness, Economical Feasibility and Social Equality
- The metrics for CCSW include over a hundred criteria which are ranked from 1–4 in water use, energy use, greenhouse gas emissions, and nitrogen use
- This means a winery can become CCSW certified with a lower rank (with plans to improve). Today, to become fully certified with CCSW, a third party is required to audit the assessments.

# Sustainability: international standards overview

## European

Organisation	Topic	from
<b>FRANCE:</b> network of several hundred vinegrower-winemakers	<b>Terra Vitis - environmental certification (Ministry of Agriculture)</b>	2001
<b>SPAIN:</b> Spanish Wine Federation (Federación Española del Vino - FEV)	<b>Wineries for Climate Protection (WfCP)</b>	2011
<b>GERMANY:</b> FAIR'N GREEN	<b>System for sustainable viticulture</b>	ND
<b>AUSTRIA:</b> Austrian Winegrowers Association	<b>Sustainable Austria</b>	2015
.....		

# Sustainability: international standards overview



442 vineyards & 1,200  
types of grapes



637.634ha of which  
73.362ha for organic



384.000 wineries



49.3mhl (2015)  
or 6.52bn bottles

Organisation	Topic	from
<b>VIVA – Sustainable Wine</b> (MATTM / Opera-UNICATT / Agroinnova )	<b>Sustainability national standard of the winegrowing sector</b>	2011
<b>SOSain</b> (Ass. Alleanza per la Sostenibilità in Viticoltura / OPERA-UNICATT, Univ. di Milano)	<b>Sustainable Program called “SOSain”</b>	2011
<b>TERGEO</b> (Unione Italiana Vini)	<b>Best practices and software applications for vineyards</b>	2011
<b>ITA.CA</b> (Univ. di Milano, Studio Agronomico SATA, Consorzio Franciacorta)	<b>Italian wine carbon calculator</b>	2011
<b>VinNatur</b> (Associazione di aziende vitivinicole)	<b>Technical production specification called “vino VinNatur”</b>	2013
<b>EQUALITAS</b> (Federdoc, Unione Italiana Vini, CSQA, Valoritalia, ...)	<b>Sustainability standard of the winegrowing sector</b>	2017
.....		

Italian



# Sustainability: international standards overview



- **VIVA is the Italian voluntary program** that, through 4 scientifically recognized indicators (**Air, Water, Vineyard and Territory**), aims at assessing and improving the vineyards and wine production sustainability performances.
- **it is promoted by the Italian Ministry for the Environment, Land and Sea**, and verified by an independent third organization. It applies common rules through the use of technical specifications, based on the current main standards on the issue
- a **pilot phase, 2011-14**, involved a number of major Italian wineries and led to the definition of technical specifications for sustainable wine production, that now serve as a reference for companies who want to achieve the validation foreseen by the project.
- at the end of 2016 a revision of the previous **technical specifications** (disciplinare 2.0) was published and from January 2017 all national wine growing companies can join the VIVA Sustainable Wines program and be certified by organisation or/and by product
- a collaboration agreement have been signed in 2017 between **FTA and VIVA** with the aim of improving the wine product by privileging the chain traceability, quality production and social local engagement (**BSCI**)
- In September 2017 the **Ministry of the Environment, Land and Sea Protection and the Ministry of Agriculture, Food and Forestry Policies** have signed a decree establishing the start of administrative procedures for the preparation of a **unique national operational standard** for implementing sustainability in the viticulture sector (GLIS - Gruppo di Lavoro Interministeriale sulla Sostenibilità)

# Sustainability: the hidden social issue in Italian wine sector



Workers in vineyards are exposed to pesticides and injuries caused by mechanical tools and machinery.



1.25m people employed in the sector



30% of employed workforce are women



+ 200,000 workers in the grape harvesting season

*Caporalato* has been forbidden under Italian law since 2011 and is recognised as a criminal offence for which recruiters and producers can be convicted. However, in 2016 an **estimated 430,000 workers** were recruited through this process.



Workers in wineries incur health risks that derive from working in confined spaces with low oxygen and high carbon dioxide levels.



Low-wage levels, substandard housing conditions, a lack of social protection and job insecurity affect seasonal and migrant workers across the industry.

## The BSCI standard

### Business Social Compliance Initiative



to improve working conditions in the global supply chain.

BSCI is a business-driven initiative for companies committed

BSCI unites some 1,300 companies, many of them being SMEs, around one common Code of Conduct and supports them in their efforts towards building an ethical supply chain. BSCI provides participants with a step-by-step development-oriented approach, applicable to all sectors and all sourcing countries.

[www.bsci-intl.org](http://www.bsci-intl.org)

Source: the BSCI Sustainable Wine Programme (2017)

# Sustainability: SDGs & wine sector



# Sustainability: positive market factors

We use data from three leading wine rating publications (*Wine Advocate*, *Wine Enthusiast*, and *Wine Spectator*) to assess quality for 74,148 wines produced in California between 1998 and 2009. Our results indicate that eco-certification is associated with a statistically significant increase in wine quality rating (+4,1 average).\*



“Demand for natural wines in [Japan](#) is extremely high and many top restaurants in Tokyo serve them. Some wine drinkers have never even tasted a wine containing sulphites! After the earthquake and Fukushima, the people were even more careful about what they ate and drank. Honesty in labelling has become very important to the Japanese who are also more demanding than ever when it comes to quality.”\*\*

\* source: DOES ORGANIC WINE TASTE BETTER? AN ANALYSIS OF EXPERTS' RATINGS, UCLA – Institute of the Environment and sustainability/ Magali A. Delmas, Olivier Gergaud, and Jinghui Lim - 2016

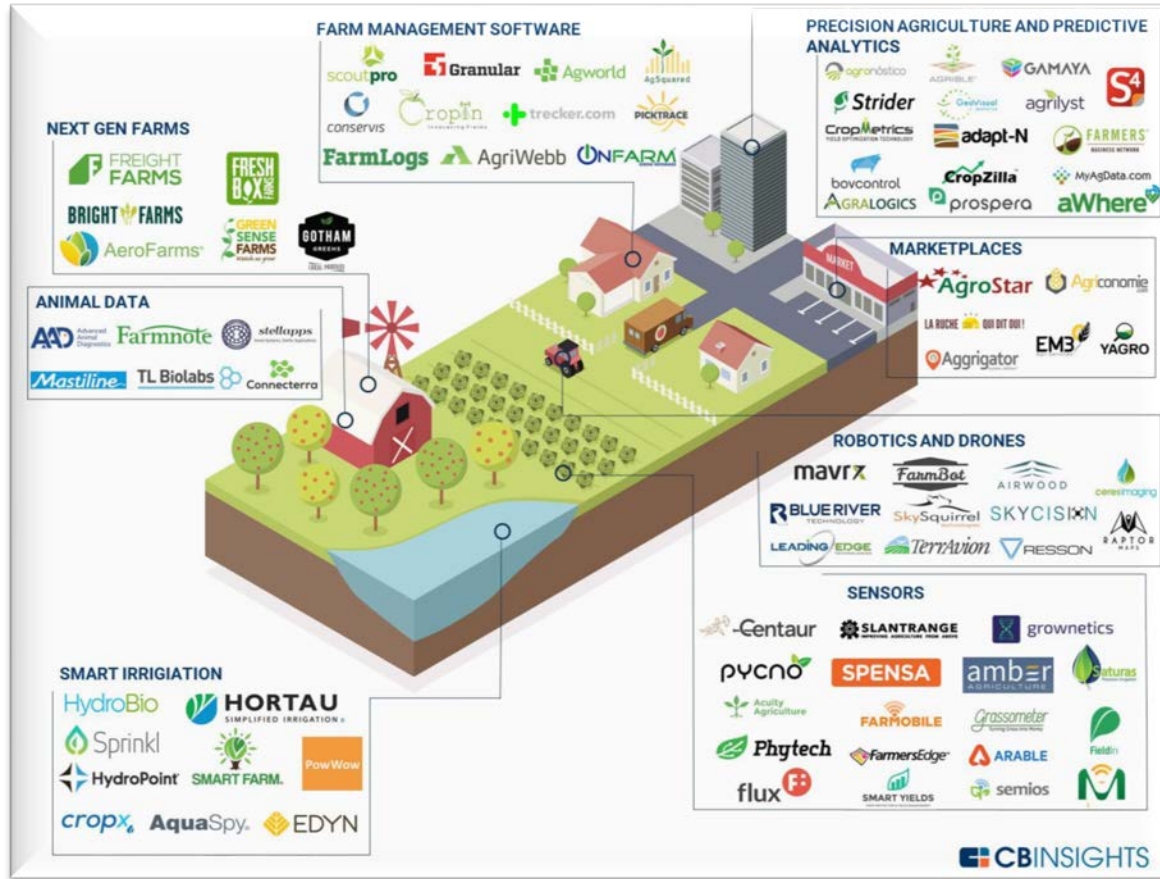
\*\* source: 2016 WINE TRADE MONITOR Sopexa (2017)



# **Sustainability & Innovation:** **a mutual beneficial integration**



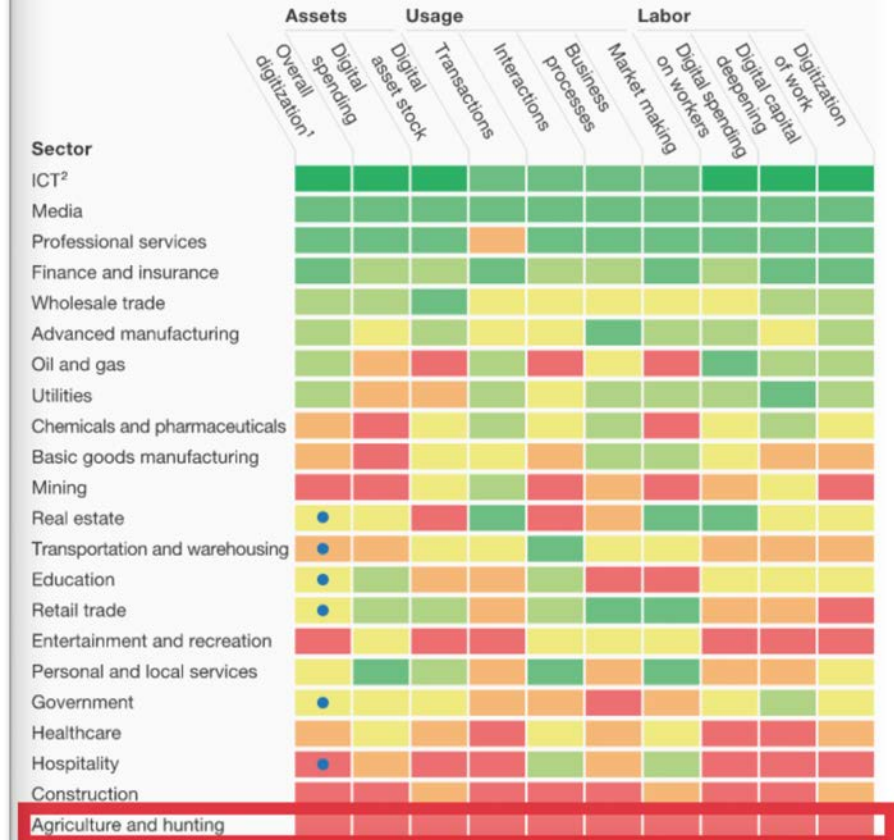
# Sustainability & Innovation: IoT and agrifood sector



McKinsey Global Institute industry digitization index; 2015 or latest available data

Relatively low digitization Relatively high digitization

● Digital leaders within relatively undigitized sectors



# Sustainability & Innovation: IoT and wine sector

## Sizing the IoT market opportunity



**300 million**  
utility meters



**83.1 million**  
millennials in the US<sup>6</sup>



**100 million**  
street lights



**150 million**  
unconnected  
passenger cars



**1 million**  
vineyard acres



**\$75 billion**  
counterfeit drugs

Source: Verizon data



# Sustainability & Innovation: IoT and wine sector

## Which IoT applications and benefits?

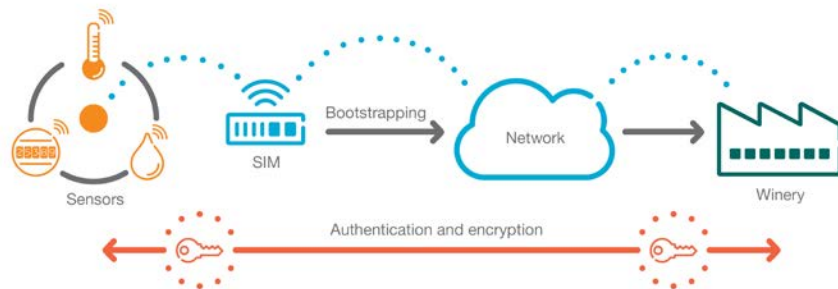
IoT applications	positive outcomes
Measure and data analysis of sustainability indicators (e.g. water, air, nutrients, chemicals, biodiversity, etc.)	Risk reduction of grapes illness, improve grapes quality, reduce environmental footprint, remote control equipment's, decrease health and safety workers incidents
Predictive maintenance and process control	Increase production continuity and efficiency, boost traceability and supply chain management
Product information and tailor made promotions	Improve customer experience and client loyalty
Knowledge Based Model (KBM)/Decision Support System (DSS)	Reduce cost, improve savings and stimulate better planning
.....	.....

# Sustainability & Innovation: IoT and wine projects

## The TracoVino project

- Maximized output and optimized management  
Predicting the optimum time for harvest to plan the allocation of resources and specify the precise necessary actions in advance
- Improved wine quality  
The data collected to assess vineyard conditions in order to define the optimal time and location for fertilization, irrigation and use of fungicides
- Remote monitoring of the vineyard  
real-time access to their vineyard, data anytime and anywhere using the mobile network
- Eco-friendly operations  
to predict how and when to use resources to minimize impact

Generic Bootstrapping Architecture



## Hahn family Verizon AgTech project

- the vineyard needs to reduce the use of materials, labour, energy and water, as well as increase crop quality and yield
- to gather data at every stage of the growing process throughout vineyard sensors, data modelling, and customized dashboard
- Now they can understand what's happening with their crops in real time and provide what's needed, when it's needed and where it's needed



Weather station transmitters that update every 15 minutes



Sensors that measure temperature, wind, rainfall, global radiation and humidity



Drip-line flow sensors at each block in the field



Modeling to display plant stress



A single-pane-of-glass dashboard, providing a simple prescription for irrigation



thank you!



**Sustainable Solutions Consulting**

<https://stefanomaneri.it/>