LIFE Project Number

<LIFE15 CCM/BE/000090>

Socio Economic Assessment

LIFE PROJECT NAME or Acronym

LIFE BEVERAGE PROGRAM

Data Project

Project location:	Leuven
Project start date:	01/07/2016
Project end date:	30/06/2018
Total budget:	1,558,510
EU contribution:	863,105
(%) of eligible costs:	60%

Data Beneficiary

Name Beneficiary:	AB InBev nv/sa
Contact person:	Mr. Han Vandenbroucke
Postal address:	Brouwerijplein 1, 3000 Leuven Belgium
Telephone:	+32-479-924987
E-mail:	Han.vandenbroucke@AB InBev.com
Project Website:	http://AB InBev.eu/beverage.html

LIST OF KEYWORDS AND ABBREVIATIONS

BEER PRODUCTION	Beer produced within a given country
BEER CONSUMPTION	Beer consumed within a given country
BEER CONSUMPTION PER CAPITA	Consumption per head in a given country
BEVERAGE	Brewing Energy saving pilot for an innoVative, Efficient, and enviRonmental beverage process
BREWERY	A plant or an establishment for beer production
BREWING COMPANY	A company which produces and / or sells beer, operating one or more breweries. These companies may also be involved in activities other than brewing beer, such as the production of soft drinks and bottled mineral water
CO_2	Carbon dioxide
DIRECT EMPLOYMENT	Employment directly by the brewing companies
DMS	Dimethylsulphide
EWB	External Wort Boiler
EXCISE DUTY REVENUE RELATED TO BEER	Government revenues generated from excise duties on the sale of beer
EXPORT - EXTRA-EU	Extra-EU exports of goods are goods which leave the territory of the European Union for a third country after being placed under the customs procedure for exports (for definitive export) or outward processing (goods for working, further processing) or repair or following inward processing
EXPORT - INTRA-EU	Intra-EU exports of goods are goods which leave a Member State of the EU for another Member State for definitive export, outward processing or repair or following inward processing
GHG	Greenhouse gas
HECTOLITRE (hl)	A hectolitre is a metric unit of volume or capacity where one hectolitre equals 100 litres
IMPORT - EXTRA-EU	Extra-EU imports of goods are goods which enter the territory of the European Union from a third country and are placed under the customs procedure for free circulation within the EU (as a general rule goods intended for consumption), inward processing or processing under customs control (goods for working, processing or repair) immediately or after bonded warehousing
IMPORT - INTRA-EU	Intra-EU imports of goods are goods which enter a Member State of the EU from another Member State for definitive import (as a general rule goods intended for consumption), inward processing or processing under customs

	control (goods for working, processing or repair) immediately or after bonded warehousing
MICROBREWERY	A brewery with yearly production up to 1,000 hectolitres
N_2	Nitrogen gas
OFF-TRADE SECTOR	Beer sales through wholesale and retail (shops, supermarkets and other outlets)
ON-TRADE SECTOR	Beer sales through (licensed) pubs, clubs, bars, restaurants, etc., also called the hospitality sector
PB	Pilot Brewery
SEA	Socio-Economic Assessment
SROI	Social return on investment
Wort	The liquid that is obtained after the mashing step. It contains all the converted starch to sugars that will be used by the yeast to produce alcohols and flavours

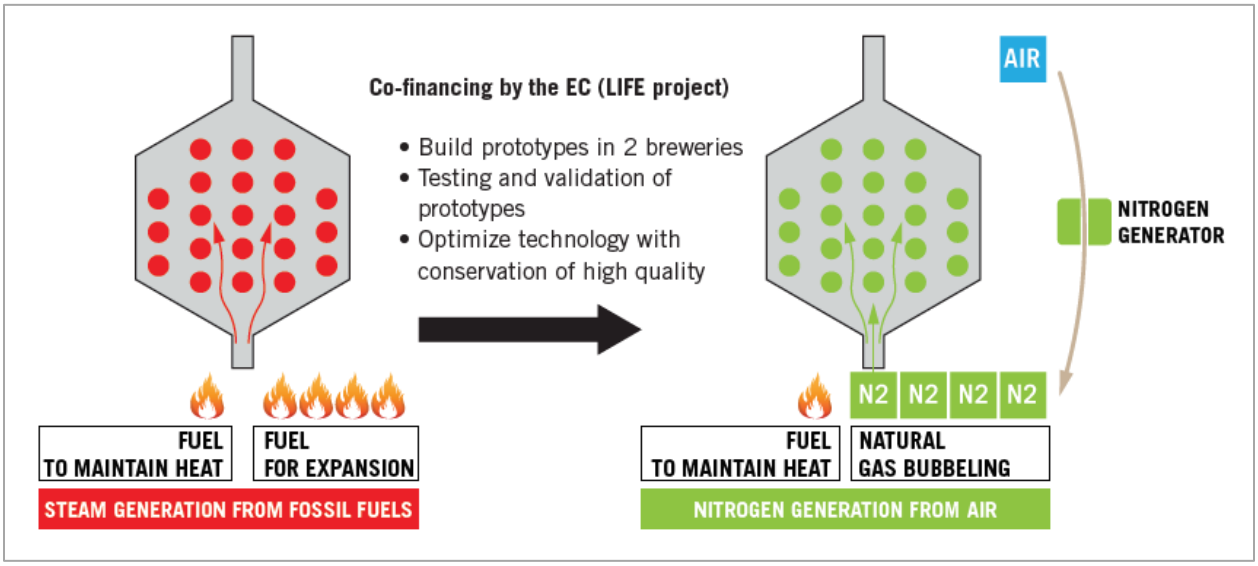
PROJECT SUMMARY

As the world's leading brewer, AB InBev has an important role to fulfil in addressing serious environmental changes such as water scarcity, resource depletion and climate change: with LIFE BEVERAGE the consortium aimed to reduce the emission of greenhouse gases caused by beverage production through a new process technology piloted at breweries in Belgium and UK.

As the boiling step is the most energy consuming step in the brewing process, which consumes up to 20% of the total heat required and generating high levels of greenhouse gases, AB InBev has been working on a "Method for treating a wort in a boiling kettle", that has been patented (EP 2871 227 A1)". in 07.11.2013. Through this method, fuel and water consumption can be drastically reduced by a disruptive innovation: the use of atmospheric air as ultimate green resource. Bubbling nitrogen gas into the liquid simulates the effect of boiling, without heat requirements.

LIFE BEVERAGE is therefore:

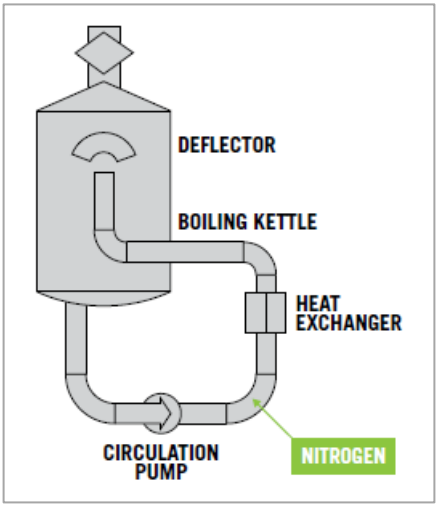
- using nitrogen bubbling as an alternative for extensive evaporation, hereby reducing usage of fossil fuels
- boiling without any heat requirements
- implementing the technology in two pilot breweries, Jupille and Magor with different design of boiling kettles
- rolling-out to other breweries in 5 other plants (2 in UK - Samlesbury and Mortlake; 2 in Germany: Bremen and Wernigerode; 1 in Ukraine Chernigiv), aligned with LIFE's replicability and transferability understanding. In addition, if this expansion also succeeds, then AB Inbev professionals may study the feasibility of its implementation in all applicable plants (already 66 plants, including the pilot and "rollouts", are eligible for the technology).



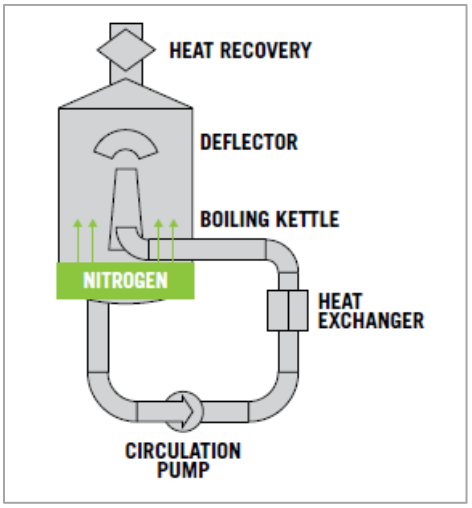
The engineering, design and realisation of the pilot line in the Jupille brewery was commenced in 2016. As per image below, the wort is taken out from the bottom and passed through the heat exchanger in the external loop. The wort then flows to the deflector, thereby spreading the wort onto the wort surface. This deflector was added to the brewhouse in order to reduce foam production. Nitrogen is

brought into the external loop of the boiling kettle and bubbled into the liquid. The pilot in Jupille is therefore an external sparging system. Nitrogen coming from nitrogen tanks is supplied to the dosing line and from here nitrogen flows automatically to the sparger/sprayball, installed in the external loop of the boiling kettle. The sparger or sprayball installed in the loop bubbles the nitrogen into the passing-by wort.

In Magor brewery, the implementation of the BEVERAGE technology is different (picture below). Similar to Jupille, however, the wort is taken out from the bottom and it is passed through the heat exchanger in the external loop. The wort enters the boiling kettle from the bottom and it is projected indirectly to the deflector, which spreads the wort on to the top wort liquid. In contrast to Jupille, the nitrogen is not brought into the external loop of the boiling kettle, but it is bubbled into the liquid by a ring of sprayballs, installed in the bottom of the tank. Therefore, Magor pilot is an internal sparging system.



Jupille brewery pilot



Magor brewery pilot

Expected environmental goals of LIFE project are:

- reduce water usage to a leading-edge 3.2 hectolitres per hectolitre of production
- reduce energy usage by at least 10% per hectolitre of production
- reduce global greenhouse gas emissions in beverage production by another 10% per hectolitre of production

With a successful realization of the pilots, we estimate the following impacts in the 2 breweries:

- reduction of water usage with 2% on top of the level achieved in 2014
- reduction of energy usage with 12%
- reduction of carbon footprint with 8%

LIFE BEVERAGE project contributes to the implementation and the development of the European Union climate legislation towards its contribution to a sustainable development of the beverage sector, principally the brewing process. LIFE BEVERAGE is also in line with:

- EU2020 Flagship initiative Sustainable Growth, that aims at achieving resource efficiency, green and competitive economy

- Energy Efficiency Plan 2011 (COM (2011) 109 final of 8 march 2011), which forms part of the European Union's (EU) 20% target (aimed at reducing primary energy consumption) and the 2020 Energy strategy
- the resource efficient Europe COM (2011) 571 Communication aims at decoupling the economic growth from the overuse of resources (e.g. materials and water) and at making the EU-area a competitive and sustainable economy by 2050
- Directive 2012/27/EU, which requires each Member State to submit National Energy Efficiency Action Plans by 30 April 2014 and every three years thereafter
- Communication (COM (2014) 520 final of 23 July 2014) proposes an energy saving target of 30% by 2030 for the European Union. As the communication stands, energy efficiency plays a vital role in the transition towards a more competitive, secure and sustainable energy system, the cornerstone of which is the EU's internal energy market
- Greenhouse gas emissions', as stated at Decision No 406/2009/EC means the emission of carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6). On the effort of Member States to reduce their greenhouse gas emissions to meet the Community's commitments up to 2020, this Decision lays down the minimum contribution of Member States to meeting the commitment (For Belgium – 15%; for United Kingdom – 16%)
- The EU raised the aiming to reduce greenhouse gas (GHG) emissions by 80-95% by 2050 compared to 1990 levels according to the Communication - A Roadmap for moving to a competitive low carbon economy in 2050 (COM (2011) 112 final of 25 May 2011).

1. PROJECT PARTNERS

NAME	SHORT NAME	COUNTRY
Anheuser-Busch InBev nv/sa	AB InBev	Belgium
AB InBev UK Limited	ABI UK	UK

LIFE BEVERAGE Consortium composition

Anheuser-Busch InBev is a publicly traded company based in Leuven, Belgium, with secondary listings on the Mexico (MEXBOL: ANB) and South Africa (JSE: ANH) stock exchanges and with American Depositary Receipts on the New York Stock Exchange (NYSE: BUD). The company's portfolio comprises over 500 beer brands including global ones such as Budweiser®, Corona® and Stella Artois®; multi-country brands like Beck's®, Castle®, Castle Lite®, Hoegaarden® and Leffe®; and local champions such as Bud Light®, Jupiler® and Skol®. AB InBev brewing heritage dates back more than 600 years, starting from Leuven to the pioneering spirit of the Anheuser & Co brewery in St. Louis, US, to the creation of the Castle Brewery in South Africa during the Johannesburg gold rush and to Bohemia, the first brewery in Brazil. Geographically diversified with a balanced exposure to developed and developing markets, AB InBev leverages the collective strengths of approximately 200,000 employees based in more than 50 countries worldwide. For 2018, AB InBev's delivered consistent topline growth with margin expansion and EBITDA acceleration throughout the year. Revenue growth of 4.8% was driven by own beer volume growth of 0.8% (total volume up 0.3%) as well as continued premiumization and revenue management initiatives.

Revenue per hl growth on a constant geographic basis was 4.7%, of which we estimate more than 100 bps was driven by positive mix in line with the company's premiumization strategy.

EBITDA grew 7.9% on a full year basis with margin expansion of 118 bps to 40.4%, with consistent acceleration each quarter in line with our guidance.

In terms of sustainability, following the achievement of AB InBev 2017 Environmental Goals, in March 2018 the company launched its most ambitious set of goals: 2025 Sustainability Goals aim to deliver a measurable, positive impact on the environment as aligned with the UN Sustainable Development Goals, directly contributing to goals such as Climate Action, Renewables, Water Access, Waste and Access to Finance.

AB InBev key figures 2018. Source: AB InBev 2018 Annual Report

- Smart Agriculture: 100% of AB InBev direct farmers will be skilled, connected and financially empowered
- Water Stewardship: 100% of AB InBev communities in high stress areas will have measurably improved water availability and quality
- Circular Packaging: 100% of AB InBev products will be in packaging that is returnable or made from majority recycled content
- Climate Action: 100% of AB InBev purchased electricity will be from renewable sources and carbon emissions will be reduced by 25% across the company's value chain.

Metric		2018	2017
Total water use (in billion hl)		1.632 [A]	1.775 [A]
Water use by hectoliter of production (hl/hl)		2.95 [A]	3.09 [A]
Total GJ of energy (in millions)		61.1	61.4 [A]
Total GJ of energy purchased (in millions)		59.2 [A]	*
Energy usage per hectoliter of production (in Mj/hl)		110.1 *	111.6 [A]
Energy purchased per hectoliter of production (in Mj/hl)		106.8 [A]	*
Total direct and indirect GHG emissions (Scopes 1 and 2 in million metric tons of CO_2e)		6.03 [A]	6.18 [A]
Total direct and indirect GHG emissions (Scopes 1,2, and 3 in million metric tons of CO_2e)		31.21	32.35
Scope 1 and 2 GHG emissions per hectoliter of production (in kg CO_2e/hl)		8.04 [A]	8.55 [A]
Scopes 1,2, and 3 GHG emissions per hectoliter of production (in kg CO_2e/hl)		57.0	59.9
% Renewable Electricity		16% [A]	-
% Returnable Packaging		43.5% [A]	46%
% Recycled Content in primary packaging	Glass: Cans: PET:	41.4% [A] 64.7% [A] 15.7% [A]	37% 59% 21%
Direct farmers skilled, connected, and financially empowered**	Skilled: Connected: Financially Empowered:	5,000 10,000 2,000	

[A] Assured Metric (please refer to External Assurance Report on page 51)
· Our goals on water, GHG emissions per hectoliter of production and energy pertain to our beverage facilities only and do not encompass our vertical operations such as malt plants and packaging facilities.
· Total direct and indirect GHG emissions data encompass beverage facilities and most vertical operations, including malt plants and packaging facilities.
· Scope 1 accounts for 59% of our operational emissions and includes CO_2 equivalent (CO_2e) from fuel used in our manufacturing processes and in cogeneration plants that generate on-site electricity. Scope 2 accounts for about 41% and represents emissions from purchased electricity.
· Scope 3 emissions constitute estimates based on a mix of supplier-based numbers, global emission factors and assumptions. Data's main categories include, Purchased Goods and Services, Logistics, Product Cooling, and End of Life.
* In line with our new sustainability goals, energy reporting will shift to energy purchased versus energy usage. Energy purchased per hl aligns with our RE100 sustainability goal of offsetting 100% of our purchased electricity with electricity sourced from renewable resources. Energy purchased per hl was not reported for breweries acquired from SABM in 2017.
** Smart Agriculture data is based on up-to-date estimates.

AB InBev 2018 performance in terms of sustainability. Source: AB InBev 2018 Annual Report

Last, in terms of innovation, AB InBev has dedicated research labs and technology centres across the globe that are driving innovation and helping to ensure we stay ahead of the curve when it comes to commerce, solutions and supply chain. The company is scaling its solutions in enterprise technology to build a more sustainable business by developing capabilities that are globally scalable, secure, integrated and future-ready. Lastly, technology is transforming AB InBev supply chain, allowing them to distribute fresher beer more efficiently and contribute to the partners' business growth, while serving evolving consumer needs.

2. SOCIO-ECONOMIC ASSESSMENT (SEA)

2.1 Aim

The overall objective of the LIFE BEVERAGE project is to reduce the use and also the emission of greenhouse gasses due to beverage production in brewhouses. The proposed technology will allow the two pilots - Jupille (BE) and Magor (UK), that together produce a volume of 8,382,000 hectolitres – to reach an annual energy saving of at least 19.4 GWh according to initial KPIs.

This report is a deliverable for Action D.2 "Socio-Economic Impact Evaluation" and it will cover:

- the development of a set of criteria for the assessment of socio-economic impacts
- a baseline assessment of socio-economic and environmental impacts
- a comparison between *ex ante* and *ex post* data

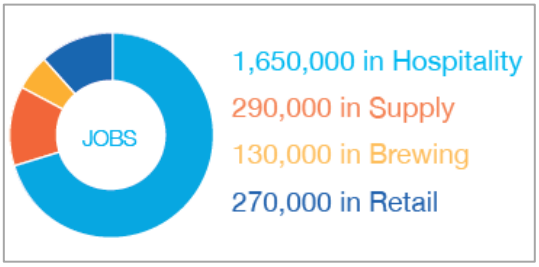
The aim of this report is to serve as documentation for the existing knowledge base with respect to the socio-economic impact of brewhouses emissions and to provide new information on how to proceed towards socio-economic assessment. This includes especially:

- an overview on existing data and applied methodology
- the identification of criteria for assessment
- the development of assessment methodology
- the formulation of recommendations for future approaches towards socio-economic assessment of beverage production impacts

2.2 Socio-economic baseline

Beer is deeply rooted in European agriculture, heritage and communities. With around 80 styles and 50,000 brands, including non-alcoholic, the diversity of flavours and richness of choice means there can be a beer for every occasion. As a true European success story, the brewing sector's expertise and leading role in research and scientific development are recognised throughout the world and, alongside the increased beer exports and external investment, beer still remains primarily a local product, brewed in every single EU Member State. Entrenched in their local communities, Europe's brewers spend around €1 billion a year supporting sports, the arts, charities and conservation activities. This therefore implies a successful mix of more than 9,500 world-leading multinationals, deeply-rooted regional breweries and thriving SMEs breweries that in 2017 generated[1]:

- around 2.3 million jobs, equating to 1% of all EU jobs
- around €51 billion in value-added every year
- around €42 billion in tax revenues every year

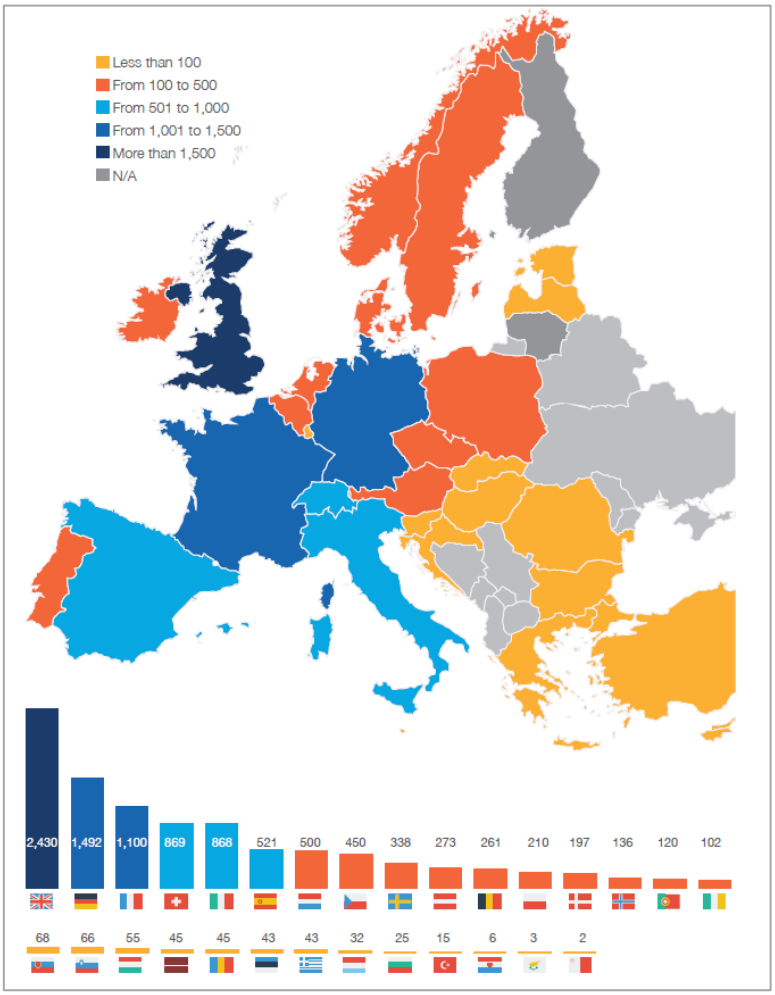


EU breweries-related jobs

[1] Source: The Brewers of Europe

According to "Beer statistics - 2018 edition" edited by The Brewers of Europe in December 2018, whilst consumption has stabilised after three years of growth, beer exports have been steadily increasing, hitting an all-time high that has also helped to ensure the continued buoyancy in Europe's beer market. **Nearly 22% of European beer production is now exported** beyond national boundaries, with **one third of this beer benefitting from Europe's reputation for quality beer and being shipped to all corners of the globe**.

Whilst beer production volumes are still a good way off their level prior to the economic crash nearly one decade ago, this same period has coincided with an unprecedented boom in the numbers of SMEs and new microbreweries springing up all across the continent. In one year alone, the number of breweries active in the EU grew by nearly one thousand. In the last five years the number of microbreweries has doubled, and the European Union now counts an estimated 9,500 breweries.



EU active breweries. Source: Beer statistics - 2018

With regards to Belgium, the Country was (in 2016, last available data) the sixth producer, after Germany, UK, Poland, Spain and Netherlands.

KEY FIGURE	BELGIUM (2017)
# of active breweries	261
direct employment	5,800
excise duty revenue (million €)	201
production (hectolitres)	20,616,000
consumption (hectolitres)	7,567,000
exports (hectolitres)	10,241,000 (intra EU) 5,568,000 (extra EU)
imports (hectolitres)	1,001,000 (intra EU) 157,000 (extra EU)
consumption	on-trade 43% - off-trade 57%

Belgium beer and breweries market (2017). Source: Beer statistics - 2018 edition

Considering the above-mentioned data, up-to date, if we define AB InBev market limiting the analysis to Belgium, it covers 2% of active breweries.

If we analyse UK's market, the situation is radically different, as production numbers are higher. With 40,480,000 hectolitres beer produced in 2017, the Country is the second EU producer after Germany (that counts over 93,000,000 hectolitres produced in 2017).

KEY FIGURE	UK (2017)
# of active breweries	2,430
direct employment	15,000
excise duty revenue (million €)	4,449 (2016)
production (hectolitres)	40,480,000
consumption (hectolitres)	44,051,000
exports (hectolitres)	3,211,000 (intra EU) 2,391,000 (extra EU)
imports (hectolitres)	8,743,000 (intra EU) 1,324,000 (extra EU)
consumption	on-trade 47% - off-trade 53%

UK beer and breweries market (2017). Source: Beer statistics - 2018 edition

2.3 Procedure

The content of this report is based on inputs from all partners. The overall coordination of the impact assessment was handled by AB InBev and regular meetings have been used to update all participants about Action D progress. Final findings were discussed among the partners and recommendations have been formulated in order to identify an approach how to proceed in future towards assessment of the socio-economic impacts of beverage production. The report was reviewed by all partners.

As this report describes the results of a socio-economic impact assessment that has been carried out by LIFE BEVERAGE, it also aims to enable both the companies' management and their many stakeholders to analyse the broad socio-economic impacts of their business decisions and to discuss these decisions based on facts and a realistic interpretation of them.

The economic results presented herein have been obtained by using an economic model which is based on input-output analysis and which distinguishes between direct (i.e. directly related to LIFE BEVERAGE's operations), indirect (i.e. related to that portion of the operations of the consortium's suppliers and distributors) and induced impacts (i.e. related to the incomes earned because of the project and spent throughout the whole economy).

The model used to evaluate the social impact of LIFE BEVERAGE was instead based on the evaluation of quantitative and qualitative questionnaires to allow a proper understanding and to manage the impacts of the project. This evaluation accounts for stakeholders' views of impact. The aim of the analysis is to include the values of people that are often excluded from markets, in order to give people a voice. The five principles followed to measure the evaluation were[2]:

[2] *A guide to Social Return on Investment*, 2012, The SROI Network

1. Stakeholders involvement
2. Changes evaluation (for those stakeholders)
3. Valorisation of what matters (also known as the “monetisation principle”)
4. Transparency (demonstration of the basis on which the analysis may be considered accurate and honest)
5. Results verification

2.4 Stakeholders’ analysis and indicators to be assessed

Industry

Industry is fundamental for the EU leadership, competitiveness and climate changing at the global scale. For instance, the BIER members, over the last 4 years, had an 11% improvement in energy intensity, but they are still responsible for 0.42% of the CO2 total global emissions. This highlights the importance of collaboration within the sector to develop capacity and solutions that have a broader impact in the supply chain of products and in the resilience of society to the impacts of Climate Change.

Consumers

It is a fact that citizens, from all over the world, are gradually becoming aware of the environmental issues caused by high energy consumption, overuse of water resource, disposal of wastewater, and GHG emissions. Actually, business customers are showing a preference to purchase from companies that are actively pursuing corporate sustainability initiatives because they understand that the future depends on how they are acting today. As the market is facing a rising demand for green products, or friendly environment productions, the LIFE BEVERAGE project is one of the Company answer to this demand. The project partners, in compliance with this, will aim at raising the awareness of beer consumers on the aforementioned topics (energy usage, GHG and water consumption) and at showing the benefits brought by the LIFE BEVERAGE project.

Policy Makers

Policy makers are responsible for the national and common EU policies, regulations and medium to long-term strategies. For such a reason it is important to make them aware of the importance of new sustainable advances able to reduce GHG emissions, water and energy consumption in the Beverage sector. In this way policy makers, also thanks to the pressure coming from the wide public awareness on environmental factors, will be able to update strategies and policies with more stringent and well-targeted actions. Among the policy makers, the pilot will target the EU Climate Action and EU Energy. The first one leads the European Commission's efforts to fight climate change at EU and international level, and one of their main mission is to promote low-carbon technologies & adaptation measures; and the second one main objective is to ensure that Europe has secure, affordable, climate-friendly and wiser energy consumption, while fighting climate change. So, these two entities have a significant importance to the success of the Pilot, regarding that they defend that a wiser consuming of energy, or a less energy usage, in order to reduce pollution and preserve domestic energy sources, will reduce the EU's need for energy imports.

Organizations

Given the importance of the main objectives of the Pilot, the Company seeks to involve, and get involved, with some important organizations related to Environmental impacts. Below are the main groups that AB InBev already took part, and that the Company intends to involve in the assessment:

- United Nations Global Compact
- UN Environmental Programme (UNEP)
- Beverage Industry Environmental Roundtable (BIER, AB InBev is already a member of the Roundtable

Academia

University and research centres are pivotal for research and innovation. In fact, they have a level of comprehension, depth of knowledge and expertise that can allow companies to reach important advances in technology and science through technology transfer activities. For such a reason the consortium targeted key universities and research centres related to the chemistry and chemical engineering sectors.

LIFE BEVERAGE key economic and social indicators analysed by this SEA

INDICATOR #	INDICATOR DESCRIPTION	INDICATOR TYPE
1	# of breweries, units and country impacted by LIFE BEVERAGE	Economic
2	# of suppliers impacted by LIFE BEVERAGE, country and type	Economic
3	Added value (€) produced through LIFE BEVERAGE system	Economic
4	# of new employees (direct)	Economic
5	# of new employees (indirect)	Economic
6	Interest in buying sustainably produced beer	Social
7	Willingness to pay more (and up to €..) to buy a sustainably produced beer	Social
8	Interest in working at a sustainable company	Social
9	Interest and willingness in introducing sustainable production system	Social
10	Interest and willingness to sell hops to a sustainable production company	Social
11	Interest in the project in terms of expected EU impact	Social
12	Interest in using the project's results as means to communicate and disseminate about sustainable productions	Social
13	LIFE Beverage as a mean to develop innovative research	Social

KEY STAKEHOLDERS ADDRESSED BY THE ASSESSMENT				
STAKEHOLDER	TYPE	REASON FOR INCLUSION	INDICATOR TO BE ASSESSED[3]	N. OF QUESTIONNAIRES
Industry – Breweries and beer related (hops, bottles, etc.) employees	Direct stakeholder	Managers are interested in introducing more energy efficient beverages production systems. Employees are affected by the	1 – 2 - 3 – 4 – 5 – 6 -7 – 8 -9 -10	Total submitted: 10 Answers: 8

[3] Numbers refer to table above "LIFE BEVERAGE key economic and social indicators analysed by this SEA".

		companies changes in the production system.		
Consumers	Target audience	As final users, they may be willing to buy sustainable products	6 - 7	Total submitted: 195 Answers: 57
Policy makers and sector organizations	Indirect stakeholder	They are responsible for the national and common EU policies on Energy and Climate	11 – 12 - 13	Total submitted: 4 Answers: 2
Academia	Indirect stakeholder	Interested in R&I within the beverage sector	12 - 13	Total submitted: 15 Answers: 10

3. THE ASSESSMENT

3.1 Industry

10 questionnaires were submitted to employees from:

- Super Bock Group[4] (PT): it is the largest Portuguese soft drinks company with a multi-brand, multi-market strategy, whose core business is based on its operations in the Beer and Bottled water businesses. Super Bock Group collaborates with Ab InBev as members of the Brewers of Europe Association. Brewers of Europe represents 29 national brewing associations in Brussels;
- Briggs of Burton[5] (UK): the company specialises in delivering high-quality process engineering for the Brewing industry worldwide. Main sectors are: raw material handling, mashing and lautering, wort boiling, hop handling, yeast propagation, cold block, energy recovery, keg racking. Briggs of Burton collaborates with Ab InBev in supplying engineering services to our UK breweries. They were part of the company that supported the installation of the Simmer & Strip in Magor;
- Blonc Consultants[6] (NL): the company investigates and explains sustainability issues in the agri-food sector. Blonk Consultants was established to throw light on the environmental issues and to help public and private organisations make balanced and well-considered policy and business decisions. Blonc Consultants collaborates with Ab InBev collaborates with Ab InBev in the preparation of LCA analysis including the Simmer and Strip environmental impacts of the technology;
- Toye Brouwerij[7] (BE): it is a small-scale brewery based in Kortrijk Belgium producing the Goedendag family of beers. Toye brewery is one of the breweries interested in applying the Simmer and Strip technology into their operations through a free license agreement;
- Magor Brewery (UK): it is an AB-Inbev brewery located in Magor, Wales, UK. Magor is a recipient of the S&S technology.

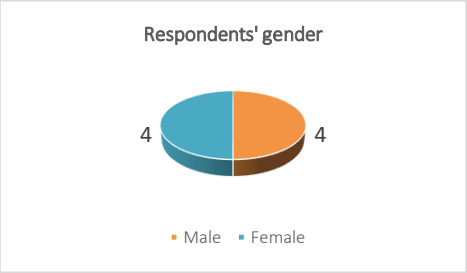
8 answered (80%). Here the list of questions:

What is your gender?
What is your age?
How often do you drink beer?
What does your company do?
What is your role in the Company?
How did you hear about LIFE Beverage project?
How much is the project topic of your interest?
Were you directly impacted by the project?
Did your everyday work change after LIFE project?
Were new employees hired as a consequence of LIFE project?
What is the role of newly hired people?
Did your products' prize change or will it change as a consequence of LIFE Beverage?

[4] https://www.superbockgroup.com/
[5] https://www.briggsplc.com/
[6] http://www.blonkconsultants.nl/
[7] https://www.goedendagbier.be/

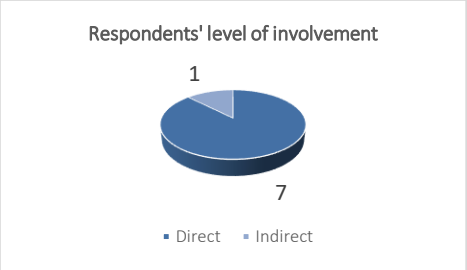
If answer was "Yes", please specify how
Did you start new commercial/industrial partnerships thanks to LIFE Beverage?
Did you experiment selling variations as a consequence of LIFE Beverage? If answer was "Yes", please specificy
Any other comments?

Questionnaires analysis showed the same "gender" involvement (4 male and 4 female). Respondents were aged mostly under 30 (50%), followed by age 31-40 (25%) and >50 (25%). Their role in companies is technical and they are highly-skilled (1 Technical Director, 3 Engineers, 2 Technical Managers and 2 Process Engineers). Respondents' beer drinking habits show a 50% "once a week" and 50% "3 to 5 times a week".



100% respondents claimed the project topic is very much of their interest and 75% of them (6 out of 8) claimed they were directly impacted by the projects' activities as they were involved in its implementation through the whole LIFE Beverage duration.

According to the questionnaires, 1 person was newly hired to as a consequence of LIFE Beverage project.



3.2 Consumers

195 questionnaires were sent to consumers selected among the partners' employees and personal contacts. 57 of them (29.2%) answered. Here the list of questions:

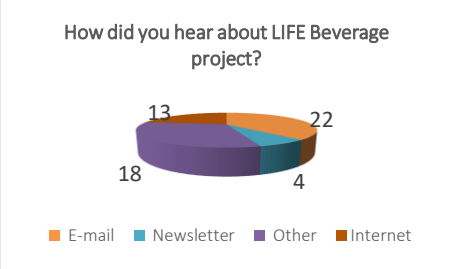
What is your gender?
What is your age?
How often do you drink beer?
What do you do for a living?
How did you hear about LIFE Beverage project?
How much is the project topic of your interest?
Would you pay more to buy a beer that was produced in a sustainable way?
Up to how much more would you pay?
Have you ever tasted a beer that was produced in a sustainable way?
If answer was "Yes", did it taste differently?
Any other comments?

Respondents were largely male (41 out of 57, i.e. 72%) and characterized as it follows:

AGE	# RESPONDENTS AND %	BEER-DRINKING ATTITUDE
18-25	10 / 17.5%	• No respondents under 25 claimed they drink beer every day • 6 of them (60%) drink beer 3-5 times a week • 1 (10%) drinks beer only on weekends • 2 (20%) drink beer once a week • 1 (10%) drinks beer only on special occasions
26 -30	11 / 19.5%	• 1 (9%) drinks beer every day

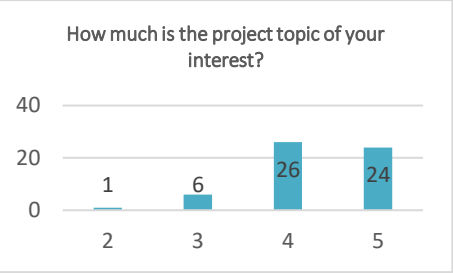
		• 5 of them (45%) drink beer 3-5 times a week • 2 (18.5%) drink beer once a week • 1 (9%) drinks beer only on weekends • 2 (18.5%) drinks beer only on special occasions
31 - 40	19 / 33%	• 1 (5.2%) drinks beer every day • 9 of them (47%) drink beer 3-5 times a week • 6 (32%) drink beer once a week • 2 (10.6%) drinks beer only on weekends • 1 (5.2%) drinks beer only on special occasions
41 - 50	13 / 23%	• 0 drinks beer every day • 8 of them (61.5%) drink beer 3-5 times a week • 3 (23.5%) drink beer once a week • 2 (15%) drinks beer only on weekends • 0 drinks beer only on special occasions
>50	4 / 7%	• 2 respondents drink beer every day (50%) • 1 respondent drinks beer 3-5 times a week • 1 respondent drinks beer only in the weekends
	57 / 100%	

Data shows a tendency in older people (mainly male) in drinking beer more frequently while, in general (29 respondents, 51%) respondents tend to drink beer 3 to 5 times a week.

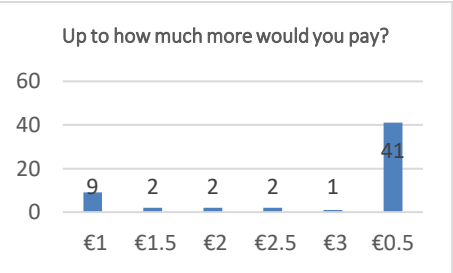


38 respondents (67%) are Professionals (Engineers and Scientists), followed by 11 managers (19%), 6 students (11%), 1 Officer (1.5%) and 1 Biochemist (1.5%).

22 of them (39%) heard about LIFE Beverage project by e-mail (corporate communication), 18 (31%) heard about it talking to colleagues/friends, 13 (23%) through the project website and 4 (7%) through the project newsletter.



On a scale 1 to 5 (where 1 is "not interested at all" and 5 is "very interested"), 26 respondents (46%) are interested in the project "4", followed by 24 "5" (42%). No one answered "1".



To the question "Would you pay more to buy a beer that was produced in a sustainable way?", 9 people (16%) answered "No", while 48 (84%) answered "Yes" and most of them (41 respondents, 85%) said they would pay up to €0.5 more. Out of all respondents, 35 (61%) have already tested a beer that was produced in a sustainable way and, among these, only 5 (14%) claimed it tested differently, i.e. fresher, tastier and crispy.

3.3 Policy Makers & Organizations

4 questionnaires were submitted to representatives from:

- European Parliament – Ms. Helene Loncol, Nathalie Loiseau MEP staff
- European Brewery Convention – Mr. John Brauer, EBC General Secretary
- Wales MP in the UK Parliament (contacted by AB InBev UK Corporate Affairs Office)
- Wales Assembly bureaucrat (contacted by AB InBev UK Corporate Affairs Office)

2 answered (50%). Here the list of questions:

What is your gender?
What is your age?
How often do you drink beer?
What does your company do?
What is your role in the Company?
How did you hear about LIFE Beverage project?
How much is the project topic of your interest?
Were you directly impacted by the project? If answer was "Yes", please specify how
Did you use the project as best practice during events or presentations? Please specify when and in what occasions
Is LIFE Beverage the first project about beer sustainable production you've run into?

Both respondents claimed they drink beer only on special occasions and they are aged 31-40. Thy both new LIFE Beverage project from their job experience and claimed they are interested in its results and outputs "4" on a scale 1 to 5 (where 1 is "not interested at all" and 5 is "very interested").

Both respondents claimed they were directly impacted by the project as it was a way to attract policy makers' attention on the topic and it was used as a best practice during presentations.

3.4 Academia

15 questionnaires were submitted to Professors, Researchers, post-docs and PhD students from:

- KU Leuven[8] (BE): according to international rankings, KU Leuven is among the best 100 universities in the world. Moreover, KU Leuven was ranked as most innovative university of Europe by Reuters four years in a row (2016, 2017, 2018 and 2019). All of KU Leuven's disciplines proudly belong to the top 100 of their field. Scholars and researchers, teachers and visionaries, thinkers and makers all have their place in KU Leuven's fertile intellectual habitat. KU Luven collaborates with Ab InBev in research and development collaboration programs in the area of yeast and fermentation and cereal sciences;
- University of Nottingham[9] (UK): it is a public research university founded as University College Nottingham in 1881, and granted a royal charter in 1948. Nottingham's main campus (University Park) with Jubilee Campus and teaching hospital (Queen's Medical Centre) is organised into five constituent faculties, within which there are more than 50 schools, departments, institutes and research centres. Nottingham was ranked #11 overall in the UK by the 2019 QS Graduate

[8] https://www.kuleuven.be/english/
[9] https://www.nottingham.ac.uk/

Employability Rankings. University of Nottingham collaborates with Ab InBev sponsoring the Chair of Brewing sciences of the university. AB Inbev also has a research pilot brewery on campus where R&D collaborations are happening on an ongoing basis.

10 answered (66%). Here the list of questions:

What is your gender?
What is your age?
How often do you drink beer?
What does your research team do?
What is your role?
How did you hear about LIFE Beverage project?
How much is the project topic of your interest?
Were you directly involved in the project activities? If answer was "Yes", please specify how
Is LIFE Beverage the first project about beer sustainable production you've run into?
Was LIFE Beverage useful for your institution to develop innovative research or new technologies? If answer was "Yes", please specify
Will you replicate LIFE Beverage actions/objectives in other projects? If answer was "Yes", please specify how
Did you have to hire new staff to follow the project? If answer was "Yes", please specify what role/s

8 out of 10 respondents were male (80%), of which 1 older than 50 (10%), 1 aged 18-25 (10%), 2 aged 26-30 (20%), 3 aged 31-40 (30%) and 3 aged 41-50 (30%).

6 respondents drink beer 3 to 5 times a week (60%), followed by 4 “Once a week” (40%).

Surveyed researchers work on:

- cereal-based processes and their implications on human health
- brewing and beverage technology, process development and analysing methods
- genetics and physiology of yeasts analysis to generate superior industrial yeasts
- brewing process innovation
- yeast microbiology

5 respondents are Full Professors (aged 41-50), 2 are Post-docs, 1 PhD, 1 Researcher and 1 Thesis Student.

Most of them (7, 70%) heard about LIFE Beverage project by e-mail or project website and their specific sources were:

- meetings with AB Inbev (in the framework of a master dissertation)
- at conferences
- company website
- personal contacts
- LinkedIn article

While just 2 respondents (20%) were directly involved in the project, all of them had previously been involved in other LIFE projects related to brewing and microbial.

4. CONCLUSIONS

LIFE Beverage project was highly appreciated by all stakeholders and respondents involved in the survey. Most of them, in fact, when questioned about their interest about the project's topics answered with a "4" or "5", showing sustainable productions are on the agenda both of the "insiders" and of the final consumers. Also, among final consumers age doesn't impact on the level of interested, which is transversal to all age-ranges and gender.

The most appreciated communication system is the e-mail/newsletter, but also word of mouth was highly used.