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Meeting Report
Deliverable D.8 – WP1

Less-Water Bev.Tech
Contract ECO/13/630314

Reporting Date
29/11/2016

Project coordinator: **A DUE DI SQUERI DONATO & C. S.p.A.**

Project website: **www.lesswaterbevtech.com**

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Description of the Deliverable n. 8 of Work Package 1.

This deliverable, included in the Annex I of the Grant Agreement for the Project Less-Water Bev. Tech (ECO/13/630314), regards the "Project coordination meeting #7" that was held on November 29th 2016, at A DUE S.p.A. premises in Riccò di Fornovo Taro (PR) - Italy, as planned during the previous meeting.

Meeting Participants

- Eng. Simone Squeri, A DUE S.p.A., CEO, via teleconference;
- Eng. Alberto Dilda, A DUE S.p.A., COO and R&D director;
- Eng. Guido Marossa, A DUE S.p.A., project engineer;
- Mr. Marco Iasoni, A DUE S.p.A., project engineer;
- Eng. David Delmonte, A DUE S.p.A., automation engineering Dept. Director;
- Eng. Gian Paolo Pescini, A DUE S.p.A., mechanical engineering Dept. Director;
- Mr. Paolo Caselli, A DUE S.p.A., project designer automation;
- Mr. Guatelli Claudio, A DUE S.p.A., customer care manager;
- Mr. Paolo Ferrari, A DUE S.p.A., technical sales engineering
- Dr. Micaela Guerzoni, A DUE S.p.A., subcontractor;
- Eng. Maurizio Violi, A DUE S.p.A., subcontractor;
- Dr. Federico Cappa, A DUE S.p.A., in-house consultant;
- Mr. Craig Clayton, CVAR Ltd, CEO, via teleconference;
- Eng. Mauro Gamberi UNIBO, associate professor, via teleconference;
- Eng. Marco Bortolini, UNIBO, senior researcher.

Meeting Agenda

The points in the agenda were the following:

1. General overview on project implementation (A DUE);
2. State of the art of tests carried out to the water treatment system and next steps to perform (A DUE and UNIBO);
3. Summary of the promotional activities carried out so far (ALL);
4. Review of the deliverables to be produced by spring 2017 (ALL);
5. Schedule of the next meeting (ALL).

1. General overview on project implementation

The partners are carrying out the project activities according to the scheduled timetable, without significant problems in terms of deviations from the original Gantt. All the partners are fully committed in the tasks and give the needed contributions to its implementation, according to the indications of the coordinator.

As for the pilot plant start-up, no deviations, problems or corrective actions are to be highlighted, but there might be some corrective actions at the end of the current tuning phase that might led to a slight revision of initial plans, and this is usual in new plant installations.

Some of the scheduled deliverables are still in draft version, e.g. not finalised yet, since they are strictly linked to the conclusion of the testing phase which is still ongoing and depending on the production needs of the client (CCdP).

The partners participated to the 20th European Forum on Eco-innovation held in Tallinn, Estonia, on 26-28 October 2016 and organised two workshops in Dubai (UAE) and Bologna on two different dates in November 2016, to which more than 60 people were present in total.

The partners are approaching PR2 preparation, consisting in a technical report and an overview of the hours worked since the last IR issued on April 2016.

2. State of the art of tests carried out to the water treatment system and next steps to perform

The purpose of the entire work is to choose the type of processes to be implemented to recover waste water from the production of beverages and fruit juices, the construction of the pilot plant to recover this water to be installed at a beverage or juice manufacturing and bottling company, the recording of the operating parameters for the duration of the project and the final analysis of the data collected with the preparation of the necessary conclusions.

The recovery of water includes a series of chemical and mechanical treatments that allow water purification and make it suitable, both from the microbiological, chemical and physical points of view to be reintroduced upstream of the production chain or for other purposes.

The contaminants of industrial drink production waste water are different in nature: organic compounds used for production (fruit juices, sugar, flour thickeners, ascorbic acid, citric acid,…), chemical products for washing and disinfecting production equipment (caustic soda, nitric acid, peroxides, chlorine,…), salts and metals (normally present in water used for production, but in this case concentrated and discarded by the reverse osmosis plants).

At the beginning the project analysed discharges of three A Due's Italian customers,

producers of a wide range of beverages (CCDP: fruit juices, the, smoothies; Fruttagel: nectars and integrators; CC Sibeg: carbonated soft drink) in order to better understand their nature and recoverability.

After the engineering, integration, assembly and start-up of the water treatment pilot plant at the selected client's premises (the CCdP - Consorzio Casalasco del Pomodoro- Fontanellato, Parma-Italy http://www.ccdp.it/), several industrial tests were carried out and many different kind of water wastes were analysed.

The first results were presented on November 2016 during the two workshops organised by the partners in Dubai (UAE) and Bologna (Italy) and during the workshop "Eco-innovation project in the Water Sector" organised by the research team of ARTICA4NR (an European project also funded under the eco-innovation programme) at the international exhibition iWater in Barcelona (Spain).

Hereinafter the main conclusions:

Laboratory results «NIAGARA» vs bottlers requirements vs steam boiler requirements									
parameter	1.RO	2.FIL	3.SO	4.AC	5.	6.pe	7.to	PRO	S.B.
Total Hardness (CaCo3) (mg/l)	66	34	2	3,8	<2	<2	4,1	<250	5
Conductivity (µS/cm)	30,7	<20	274	67	20	20	23,3		
pH	7,8	7,2	10,9	4,1	5,9	5,9	5,5	>4,9	
Total Suspended solids (mg/l)	0,5	0,5	7,6	2,4	20	20	<5	<500	
Turbidity (NTU)	<0,4	<0,4	0,4	<0,4	0,6	0,6	<0,4	<0,5	
Total Alkalinity (CaCo3)(mg/l)	29,1	16,9	84,9	<5	18,7	18,7	35,4	<85	

Summarising the results of the seven series of industrial performed tests, one can note that the main recognised analytical data fall within the limits (as established by the main producers of beverages industries worldwide) of the water used for the production of beverages (PRO column). It should be also noted that, in five out of seven tests, the treated waters can be used to power the smoke-tube boilers, thus expanding the possibilities of reuse the treated waste water by Less-Water Bev.Tech project.

Almost all the parameters respect the clients' standards, demonstrating that the first test support the good functionalities of the water treatment system developed under the project. Further actions are envisaged to be carried out in the next months, in particular: some implementation on the pilot plant (installation of the self-cleaning filter), chemical/physical assessments, some microbiological tests and some analyses on the water potability, to be performed together with the client in order to get an official validation.

The water treatment system will be tested until December 2016, therefore running without any possibility to reintroduce the treated waters in the production processes, to give the client the possibility to assess the consistency and repeatability of the results obtained so far. In the meantime, A Due is organising some training sessions for the CCdP's operators in order to teach how to use correctly the system, especially on the possible warnings the same system may generate.

In January 2017, there will be an assessment on how reusing the recovered waters: a first possibility could be to connect the water treatment system with the storage tanks of softened waters that feed the client's boilers.

In February 2017, after the installation of the self-cleaning filter, the tests will be repeated by both A Due and UniBo, especially with those polluting inputs that gave the highest grade of difficulty, namely pear and tomato juices, including also the orange cells as a further input to test. UniBo will also investigate the causes of water haziness after the introduction of polluting inputs like sugar syrup, not removed by the Ultra Filtration action.

In March 2017, the water treatment system will be self-operating and all the parameters will be recorded for a deeper analysis by UniBo.

In the meantime, Cvar will implement a module for an automatic on-line upload of all the data (readable via remote systems) and explore the possibility to implement a panel indicating a synthesis of the main results achieved by the water treatment system.

It was agreed to verify if active carbons can remove also other oxidants such as ozone and hydrogen peroxide and the existence of an alternative system for the PPA and the other oxidants removal, further than the identification of alternative mechanical filtration systems (or other different systems) to solve the problem of the pre-filters clogging in case of pollutants like pear and tomato juices. Guidelines for this check are from A DUE, while UNIBO coordinates the survey.

3. Summary of the promotional activities carried out so far

Some gadgets and promotional materials have been produced and distributed during the main events organised or participated in.

UniBo participated to the 20th European Forum on Eco-innovation held in Tallinn (Estonia) on 26-28 October 2016 in the name of the partnership, during which some interested investors have been met. The partners could be interest in those investors who can finance with debt the possible future development/commercialisation of the water treatment system. There is no interest on equity investors.

There was also the occasion to talk with other participants, running different projects, and to share ideas on possible future cooperation.

In addition to that, the partners organised two workshops: the first one during the Gulfood Manufacturing Exhibition in Dubai (UAE) on November 7th 2016, to which more than 30 persons participated, in order to take the occasion to present the technology implemented in the project to some possible and interested clients from the MENA region (http://www.gulfoodmanufacturing.com). The event was promoted also on the exhibition website and through a dedicated advertisement on a technical editorial in a specialised magazine (Italian Food & beverage Technology - http://www.chiriottieditori.it/it/italian-food-beverage-technology.html) shared during the exhibition.

The second workshop was organised in Bologna (Italy) on November 14th 2016 to which more than 30 persons participated, with the aims to bring together professionals and researchers in order to discuss and validate the results achieved so far in the project. The topic was on both the results of tests and the project technology benefit demonstration.

Further to that, the project was present to the "Eco-innovation project in the Water Sector" during the international exhibition iWater in Barcelona (Spain) on November 16th 2016 (http://www.iwaterbarcelona.com/).

Finally, the partners are starting planning the project presence during the World's leading trade fair for the beverage and liquid food industry (Drinktec in Munich on September 11-15th 2017 - http://www.drinktec.com/), during which a Clustering Event will be organised together with other funded projects.

4. Review of deliverables to be produced by spring 2017

Hereinafter, the next deliverables to be produced are listed by deadline. Even if every partner is involved in the deliverable production, the partner responsible for its finalisation is indicated, as agreed during the meeting.

#	Deliverable Name	Type	Resp.	Due to
D5.3	Technology benefit demonstration and measurement. Technology adaptation. (EU market).	Report	UniBo	*Jul-16* Dec-16
D5.2	Final Business Plan formal definition (MENA market)	Business Plan	A Due	*Sep-16* Dec-16
D1.14	Second Progress Report (PR2), coordination and timing control	Report	A Due	Dec-16
D6.4	Project information updates (pre-defined) - http://ec.europa.eu/environment/eco-innovation/projects	Text, pdf	A Due	Dec-16
D5.4	Technology benefit demonstration and measurement. Technology adaptation. (MENA market)	Report	UniBo	Jan-17
D4.1	Plant start-up and operating parameters tuning	Report	A Due	Mar-17
D4.2	Performance & energy analysis, environmental and economic	Report	UniBo	Mar-17

#	Deliverable Name	Type	Resp.	Due to
	indicator assessment			
D4.3	Plant Life Cycle Assessment (LCA)	Report	UniBo	Mar-17
D5.5	Patents registration and/or extension (*TBD*)	Patent demands	OA	Mar-17
D5.7	Capabilities & Human Resources	Report	A Due	Mar-17
D5.8	Economies of Scope & Technology Collaboration	Report	A Due	Mar-17
D6.11	Scientific paper redaction (x2)	Scientific report	UniBo	Mar-17
D1.9	Project coordination meeting/sub-meetings #8	Meeting minutes	A Due	Mar-17

D6.16	Public events participation (x3)	Event	ALL	n.a.
D6.13	Conference attendance (x4)	Event	ALL	n.a.
D6.7	Project presentations (x2)	Event	ALL	n.a.

The delays in the finalisation of the tests (due to the fact of being compliant with client's needs) obviously led to a delay in issuing both D5.2 and D5.3 that are expected to be produced by December 2016, when the tests results are analysed and the quantitative indicators correctly interpreted. The other deliverables will be produced as planned.

5. Schedule of the next meetings

The next project coordination meeting (D1.9) is scheduled on April 2017.

Partners agreed to have a technical sub-meeting in the last week of January 2017 in order to review the status of the art of all the project activities.

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