IMPORTANT NOTICE

This is only an exemplification of an application. It bases on a real case on which base AVEBIOM has prepared this example, using online info and inputs from the original developers. **Therefore the information bellow does not necessarily fully represent the original innovation idea or the developer position or vision**.

USE OF THIS EXAMPLE

This application form has been filled by AVEBIOM (as coordinator of the BioRural SW Regional Challenge) based on available information and in short contact with the original developers. The text bases on a real innovation as it were the initial point when the idea was elucidated.

Therefore this example is not a guide to follow, neither for the scope of each box, nor for the format or content. **Its aim is to inspire applicants by seeing how other form could look like**.

THIS EXAMPLE IS TO MOTIVATE YOU, NOT TO DISCOURAGE!!

The example below is well described as bases on mature info. It is **similar to a maximum what we expect. But we understand that applicants may have more immature info at this stage. Don't get discouraged!! If the idea is good it may pass and you will be able to improve it with some support of experts!!**

BIOLIZA – The original story		
Company	Bioliza https://bioliza.es/	bioliza ESTRATEGIAS EN BIOENERGÍA
About	BIOLIZA is a start-up consultancy of the University of Jaén, created by José Antonio La Cal in 2014 with the aim of serving as an instrument to provide consultancy, especially in the field of by-products, circularity and renewable energy for olive groves, and to promote new industrial facilities in olive mills.	
The innovation case	The idea for this innovation sparked 2013. At this moment José Antonio La Cal (current director of Bioliza) had been for years working in regional energy agencies. There he realised about the enormous potential of the by-products from the olive sector which were already partially utilised as source for renewable energy. Wet olive pomace was at that moment an issue as its management was involving more costs to olive oil mills. Contemporary the sector managing olive pomace was intensive in energy consuming fuel, mainly natural gas. Then the idea sparked: what if we produce fuel gas out of olive pomace? This idea drove José Antonio La Cal, who at that moment worked partially as associated lecturer at Jaén University, to orientate his undergoing PhD work towards olive pomace gasification. He defended the PhD thesis, published several papers and published a book. Afterwards he was awarded in a contest for innovations by the University of Jaén with an endowment of 3000 € to create a start-up. Bioliza was born, and from then onwards he, together with her wife, leaded the consultancy company. After multiple work on consultancy and knowledge transfer, 2017 they met Aceites Guadalentin manager, leading to a unique success story. Bioliza facilitated the scaled solution to build 2020 the first (worldwide) olive pomace gasification installed in an olive oil sector company. This story is, as a matter of fact, the result of the encounter of two visionaries with pioneering spirit and open for collaboration. The narrative of the case below in this application form is scoped from the perspective of Bioliza as facilitator of the bio-based solution, as were it ideated in 2013.	
Value obtained by participating	According to Bioliza, the award was a turning point, to pass from idea to implementation. In this case it helped to found Bioliza as a Start-up of the University of Jaén, and to be visualised and backuped to the eyes of potential clients.	
Other sources of info	The innovation story of Bioliza and Aceites Guadalentín [multiple languages] Bioliza success case page (pictures, videos, docs, summary) [ES] **VIDEOS:** the innovation story (BioRural); the problem and the plant built (AgroBioHeat)	

EXAMPLE OF FILLED APPLICATION FORM

South West Europe_ The Bioeconomy Challenge Application Form

Country *

Spain

Full Address OR Region of activity *

Southern Spain, Andalusia - Jaén

Name of applicant OR Contact person representing the candidature *

Note: Left blank (for the purpose of this example it is not relevant)
Here name

Contact Email *

Note: Left blank (for the purpose of this example it is not relevant)
Here contact email

Name of organisation / company / team *

Note: Responded as this application form was submitted to a contest in 2013 (Bioliza still not founded)
Since the group is myself, with some help of friends and family, I prefer naming the group OlivePomaceGas at this moment.

Legal status OR natural person / unofficial group *

Note: Responded as this application form was submitted to a contest in 2013
Unofficial group

Do you fall under the "Universities/Education Organisations/Training Organisations/Research Group" exception rule, as described in the Applicant Guide? *
Please, answer Yes or No.

In case your answer is Yes, place here the main information of your candidacy as individual or team, i.e.
number of participants, name and role of each participant

Note: Responded as this application form was submitted to a contest in 2013
Yes. I am assistant teacher (external associate) to University of Jaén. I am in the first stage of my PhD preparation for the degree of MSc. I am not involving any other person of the university. Composition of the group is myself.

URL

(If available)

Note: Responded as this application form was submitted to a contest in 2013
Not available. I am actually working on my own on this idea, not through a company

Name of your bio-based solution *

Gasification of dry olive pomace for power and heating an off-grid olive oil industry

Years of first ideation of your bio-based solution *

Note: Responded as this application form was submitted to a contest in 2013
8 months since the idea sparked

Description of your bio-based solution. [300 words] *

What it is, what problem it seeks to solve, how does it solve it.

Note: Responded as this application form was submitted to a contest in 2013
Jaén, the province of Spain with the largest surface area of olive groves. The management of the main by-product, the olive cake (or also called olive pomace, alperujo in Spanish), which average annual production in Spain is about 1 million tons, is a concern in this olive oil producing area. The management of such amount of wet by-product has been an issue specially from the 90s, when the optimisation of olive mills process led to an olive pomace with less olive oil content. As result the olive pomace oil industry, which is the main (and necessary) user for the olive pomace, has switched from buyer of olive pomace, to manager of this product with lower value.

Correspondingly, olive oil mills, are undergoing economic losses for olive pomace management costs (transport, fees), specially in remote rural areas. The current management in year 2013 status implies the olive pomace drying in causes environmental impacts also smells and immissions in rural areas and towns. This drying process, necessary prior its valorisation as fuel or for olive pomace oil extraction, is an energy intensive process, usually consuming natural gas.

The idea proposed to this challenge is next: utilise part of the olive pomace to produce the energy needed for the drying and electricity for the operation of conveyor belts and physical extraction

machinery (centrifugation units). In contrast to exhaust olive pomace (after the olive pomace oil extraction), which is a solid biofuel of very low moisture, wet olive pomace obtained at olive mills is too wet to go for a direct energy conversion. Therefore the solution proposed incorporates the necessary drying, either in open ponds, or in forced rotary driers.

What makes your bio-based solution innovative? [200 words] *

Technologically/ socially/ environmentally/ operationally

Note: Responded as this application form was submitted to a contest in 2013

At the current status there are only few gasification plants in Spain, like IDERMA 2 MWe and TAIM-WESSER demo gasification plant (both on wood), the 500 kW gasification plant of ENAMORA (on almond shells), or the 2 pilot research gasification infrastructures of 2-3 MWth at CIUDEN plants.

These plants operate on dry and homogeneous fuels usually utilised for medium and large scale energy applications. The homogeneity and granular behaviour is a key for several gasification technologies like the fixed bed (updraft, downdraft, screw reactor) gasifiers.

In contrast olive pomace is wet, and requires drying. Its texture is not granular. And therefore gasification may require advanced fluidised bed reactors, or as proposed here, the previous pelleting of olive pomace into pieces of more constant shape.

All in all the innovations proposed are: (1) the utilisation of a feedstock that at the moment has never been utilised in medium sized commercial gasifiers; (2) the selection of appropriate technology, currently not available / used in Spain; (3) the proposal for pre-treatment as a necessary step to enable the viability of the gasification; (4) the coupling to the energy demanded by olive pomace oil extraction facilities

TRL (Technology Readiness Level) of your bio-based solution *

Note: Responded as this application form was submitted to a contest in 2013

5

If you have any comment on TRL, please place here

Note: Responded as this application form was submitted to a contest in 2013

The gasification technology is already present at commercial scale for large bioenergy plants, as for example for coal but as well for biomass in Europe and USA. There are as well several medium and small-sized plants, and a relevant amount of research and lab results. Even if some research works evidence the gasification process can be applied to dry olive pomace to obtain a gasification gas of good quality, there is however no scaled plant working on steady base using olive pomace, that demonstrate its applicability at small and medium scales.

What makes your bio-based solution circular? [200 words] *

Circular resource management, renewable energy production/use, regenerating nature, life-cycle extension, etc

Note: Responded as this application form was submitted to a contest in 2013

The current management cycle for most of the olive cake is as next:
Olive pomace (at mill) → transport → drying (forced driers) → olive pomace oil extracting → transport of exhaust olive pomace → energy conversion → use / disposal of ashes

This chain is not local, and implies several transport and final valorisation far from the area where the by-product is obtained. Circularity depends on the intend of final energy plant to use the ashes.

In contrast the solution proposed is more circular and linked to the local rural area where the by-product is produced:

Olive pomace (at mill) → local transport → open air drying → repass (mechanical extraction) of olive pomace oil → gasification at repass facility → use of energy for final drying and power generation → use of biochar locally as additive to traditional composts

The chain allows the by-product to produce the added value from valorisation locally. And to integrate the final organic by-product into the local olive groves, thus improving soil and reducing future use of chemicals.

Describe the feasibility/applicability of your bio-based solution for the operating environment and problem stated. [200 words] *

Currently or potentially, how effective is your solution in solving the problem it seeks to solve, how feasible is it to implement it.

Note: Responded as this application form was submitted to a contest in 2013

The applicability of this idea is suited to areas where olive oil production is a main activity. And specially in rural areas far from existing olive pomace oil extracting industries. The solution requires the utilisation of gasification technologies. These technologies are more extended in central and northern European countries, and several European technology providers can cover the technology delivery. This fact reinforces the idea that the idea is applicable.

Furthermore other world areas like India are well known by having promoted the rural and industry electrification based on gasification technologies. These technologies are a complementary source that could inspire for new gasifier designs or could be contracted as technology providers in case the economic factors or the technical suitability of the European technologies are inadequate.

Furthermore several Spanish R&D centres have already worked on gasification at lab scale tested multiple biomass and non-biomass feedstock with promising results. The existing Spanish technologies could also be explored.

Olive cake pelleting after drying is feasible, as stated by several research works. And as fuel for gasification the composition and properties of dried olive pomace is as good or better than other biomass or residues being already object of gasification, like RDF or peat.

Is your bio-based solution (currently or potentially) scalable and/or replicable? Describe. [200 words] *

Note: Responded as this application form was submitted to a contest in 2013

Olive pomace production in Europe reaches circa 1.6 Mt per year, with an average of circa 1 Mt/yr in Spain, 0.3 Mt/yr in Greece, 0.2 in Italy and 0.1 in Portugal. Handling such huge seasonal amounts year after year in specific olive producing areas is an issue.

The solution proposed can be applied to scales of 0.5 to more MW, meaning that they can be installed in cooperatives or more costs. This may allow scales of 1500 t/yr or more. The size is adequate for olive cooperatives and small / medium olive oil producers or solve pomace oil producers.

In terms of smaller scales, the solution may be as well technically feasible, but the scale costs may not be adequate. Notwithstanding the most suitable model to be reproduced seems to be a local facility, using the by-products of the olive mills in the area. For example in a dense olive producing area the olive pomace of 1,500 t/year could be obtained in an area of 15 km^2 (less than 3 km radius circle). Similarly, a plant of 2 MWe would consume circa 7,500 t/year of wet olive pomace produced in 75 km^2 (less than 5 km radius). This exemplifies how the scale of the proposed solution is applicable at local scale, and as well can be built on plants with sufficient scale for economics.

What is the (current or potential) social impact of your bio-based solution? [150 words] *

Note: Responded as this application form was submitted to a contest in 2013

The proposed solution is an alternative solving the current unstable conditions for olive mills. For example in years when olive pomace produce revenues to others that imply relevant costs for olive mills. In years when the olive pomace industry, for example, does not foresee high demand, the olive pomace is only accepted at zero cost (transport paid by olive mills) or even a small fee can be added. The situation is affordable for some olive mills, but more remote areas the situation may lead to no management, thus accumulating, and finding no use. In some cases causing local effects in the environment.

This situation brings stress to olive mills and local inhabitants, as authorities are not able to facilitate alternatives.

The solution proposed may relax the local stresses, and help for better environmental impacts. Furthermore reaching a sufficient scale require the union of several farmers, or mills, thus triggering the regeneration of the collaboration on the common interest.

How can your bio-based solution be financially sustainable? Describe the different types of revenues or savings that it could create/attract once put in practice. [150 words] *

Note: Responded as this application form was submitted to a contest in 2013

Olive mills in rural areas consider olive pomace management as a cost. Thus it could be acquired at zero cost (transport costs to be assumed by the gasification plant).

A 1 MWe plant, handling circa 4,000 t/year of wet pomace, would require an investment of 1.5 M€, and operational cost would sum 60,000 €/yr (40 k€ from gasification plant and engines and 20 k€ from olive pomace transport and handling).

The revenues would b come from electricity produced (2,400 MWh/yr) and savings in natural gas (eg 1,500 MWh). With average prices from 2013 (55 €/MWh for power sold to grid and 30 €/MWh for natural gas), revenues could be more than 200,000 €/yr.

The recovery would be circa 10 years, which could be improved by accessing to innovation funds for agro-industries. If feed-in tariff for biomass were available (feed-in tariff group b8, the incomes from electricity would be double, and recovery period less than 5 years).

Why are you interested in participating in the regional workshop/challenge in Valladolid? [100 words] *

Note: Featured as it was responded in 2013, before Bioliza was founded
The intend to participate is to share the ideas and explore the real feasibility of the proposed idea. This idea could be put in practice, but for this purpose the connection with other innovators may be a key issue. Additionall as we have interest in utilisation of by-products for energy, we are looking forward to participate and capture ideas from other applicants. They could lead to synergies. For example to apply gasification process to other by-products. We are also interested to other added value for olive pomace, so we may also identify other ideas applicable to it. All in all as consultant we are interested to gather knowledge and share knowledge.

If you are selected to participate in the regional workshop/challenge in Valladolid, how many people would travel to represent your bio-based solution? *

Note: Featured as it was responded in 2013 by the applicant
One or two persons would participate. We also could involve a third person, from our university collaborator.

How did you hear about the Bioeconomy Challenge? *

Note: Featured as it was responded in 2013 by the applicant
We hear about the announcement in a start-up incubator speech in Jaén University.