



# Sustainability Transition Assessment and Research of Bio-based Products

Newsletter Issue 2



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We hope you'll enjoy the second newsletter of our project on the sustainability assessment of bio-based products, [STAR-ProBio](#). For any questions or feedback please contact us at [communication@STAR-ProBio.eu](mailto:communication@STAR-ProBio.eu)

## Foreword by the project coordinator



**Prof. Piergiuseppe Morone**  
(Unitelma Sapienza - University of Rome)

This first year of STAR-ProBio has been hectic and very exciting. Having the honour and the privilege of leading this amazing group of researchers, experts and analysts, I've noticed a growing feeling of belonging among all partners. A strong collaborative attitude has characterised institutional relations in every single occasion, and personal links have grown stronger over the last 12 months!

STAR-ProBio's distinguishing feature is, by all means, the heterogeneity of its partners. Our big family is composed of researchers trained in hard sciences (chemistry, agronomy, engineering) as well as in social sciences (economics, management, policy analysis); this broad spectrum of academic knowledge is well complemented by more applied knowledge and skills coming from industries, NGOs, consultants and independent analysts.

This plurality of voices, far from being a problem, has proven to be very stimulating. A continuous cross-fertilisation of ideas has characterised our activities over the last 12 months. Being Italian, at first I was afraid this heterogeneity of sounds might have ended up like in Fellini's movie "Orchestra Rehearsal", where increasingly anarchistic bacchanal culminates in a loud and indistinguishable *crescendo*. On the contrary, I have the feeling that STAR-ProBio has so far succeeded in blending different voices in a harmonious and choral way!

## In this Newsletter:

- The STAR-ProBio project: **Who and What?** [Read more...](#)
- Please fill out our **survey**. [Read more...](#)
- Our project will now be able to directly **influence the European biobased sustainability standard**. [Read more...](#)
- We have made a lot of our original research **public**. [Read more...](#)
- This year the project helps organise an entire **circular economy pavillion** at the Maker Faire in Rome, and **you can present** your bio-based work there. [Read more...](#)
- One year passed, two more left. **Where do we stand?** [Read more...](#)

All work packages have productively conducted their research achieving all agreed targets. Just to mention a few key achievements - WP1 effectively identified relevant environmental, social and economic criteria and indicators associated with bio-based products, leading to a well-received gap analysis. Also, in conjunction with WP4, all relevant value chains and stakeholders were mapped (from "feedstock procurement" to "end of life" phase) and case studies to be performed identified. WPs 2 and 3 conducted a structured literature review, which led to the identification of system boundaries linked to the circular economy. WP6 completed a preliminary assessment with the identification of a broad list of value items pertaining to the social pillar of bio-based products' sustainability assessment. Under WP7, common goals with respect to ILUC were identified and under WP5 relevant acceptance drivers for consumers and producers of bio-based products were determined. WPs 8 and 9 launched their activities reaching some important, albeit preliminary, results. In particular, I would like to mention here that a first version of a modular and flexible *sustainability assessment tool* (labelled **BioSat**) has been developed and presented to all partners during the first annual meeting held in Lausanne in April.

STAR-ProBio networking activities have also been successful over this last year. Some key achievements in this regard include: the establishment of tight collaboration with the Climate and Environment Division at FAO, which has led to a fruitful ongoing discussion on indicators and methodologies to measure the sustainability of the bioeconomy; the participation in the BBI-JU stakeholder forum held in Brussels in December 2017; and the participation, as a founding member, in the European Bioeconomy Network. Moreover, STAR-ProBio established an official *liaison* with CEN TC-411.

Indeed, during this year partners have been actively communicating and disseminating STAR-ProBio activities, recording a growing interest among the international community in our work. Keeping up to these expectations is the big challenge for the next two years of activities. Let's go for it!

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## STAR-ProBio in brief:

- Aims to **formulate guidelines for a common framework** promoting the development of regulations and standards that support the adoption of business innovation models and market uptake in the bio-based products sector.
- Will develop a **blueprint for sustainability schemes and tools** applicable to a large spectrum of bio-products.
- Will make **recommendations** for a more efficient and harmonized policy regulation framework for the market-pull of bio-products.
- Outputs will be **new and revised assessment methodologies, criteria and indicators** developed by integrating scientific and engineering approaches with social sciences and humanities.
- Application to **selected case studies** to illustrate benefits and impacts for bio-based products.
- Case studies cover **extensive value chains** with several intermediate and final bio-based products.

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## STAR-ProBio Recent News

### 1st International STAR-ProBio Workshop

On 6<sup>th</sup> April 2018 the STAR-ProBio project hosted its first international workshop at the Climate Show in Geneva, Switzerland. The workshop was attended by 53 stakeholders from 15 countries representing a diverse range of backgrounds from research institutions to companies, industry associations and civil society organisations.

Presentations on the STAR-ProBio project from Prof. Piergiuseppe Morone of [Unitelma Sapienza](#) and on European Standards supporting the market for Bio-based Products from Maria Gustafsson of [CEN TC/411](#) were combined with a panel discussion to explore 'A vision for a bio-based economy: opportunities and challenges for bio-based products'. Chaired by Prof. James Clark of the [Green Chemistry Centre](#) of Excellence at the University of York, the panel fostered lively debate and discussion including significant audience participation on three key areas: Policy; Customer acceptability and future markets and Products. Panel members consisted of a complementary blend of industry (including SME), academia, trade association and NGO: Constance Ißbrücker, [European Bioplastics](#); Peter Jürgens, [REDcert](#); José María Gómez Palacios, [URBIOFIN](#) Project and [Biomasa Peninsular S.L.](#); Enzo Montoneri, [University of Torino](#); Francesco Razza, [Novamont](#) and Andreas Taglieber, [Firmenich](#).

The workshop was live-streamed via the STAR-ProBio Facebook page and the recording is still available for viewing via this platform. The full programme of the workshop and biographies of the speakers and panel members can be downloaded [here](#).

### STAR-ProBio becomes a CEN/TC 411 Liaison Organisation

We are very pleased to announce that in February this year, the STAR-ProBio project was **accepted as liaison organisation of CEN/TC 411 'Bio-based products'**. This is of strategic importance as it will allow us to send representatives to the CEN/TC 411 meetings, present the findings of the project and expand our network. The main objective of the CEN (European Standardization Institute) Technical Committee 411 is to develop European standards for bio-based products covering horizontal aspects.

### European Bioeconomy Network (EuBioNet)

Star-ProBio is now a member of the recently launched European Bioeconomy Network (EuBioNet), which brings together EU funded projects that are communicating, promoting and supporting the Bioeconomy and amplify these efforts by working together proactively to maximise impact. This will be



achieved through increased knowledge sharing, networking, mutual learning, and coordination of joint activities and events. The network was initiated at a mutual learning workshop held in Brussels on the 28<sup>th</sup> March 2018, where STAR-ProBio was represented by Mathilde Crêpy of ECOS. 23 EU Bioeconomy related projects attended and discussed lessons learnt, shared best practises and discussed potential alignment of activities.

STAR-ProBio is looking forward to working together with the other EuBioNet members to increase the awareness of bioeconomy in Europe.

For more information on what the network is about or how to join, visit the network website <http://eubionet.eu/>



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## Invitation to participate in STAR-ProBio's Delphi survey

STAR-ProBio's work package on market assessment (WP5) includes the identification and overview of sustainability assessment factors from the point of view of consumers. The market assessment builds upon foresight methods, such as focus group activities and a three-round Delphi study to identify the demand for new sustainability criteria that are easily understood by the different consumer groups and relevant to their needs. The Delphi survey was implemented in May 2018. It addresses two main groups of stakeholders: professionals and end-consumers.

Your opinion is much appreciated. Therefore, we would like to invite you to **participate in our survey** on what kind of information is important to consumers when/if to buy biobased products

[Link](#) to the survey for professionals working with bio-based products, certification or sustainability

[Link](#) to the survey for the general public

We are looking forward to receiving your input. Your anonymized feedback will provide input into the final design choices of the tools, and anonymized survey results will be available to all interested respondents to strengthen and deepen the conclusions.

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## Read More about STAR-ProBio Research

### Recent Public Deliverables

With one year of our 3-year research project completed, we have recently published several interesting reports:

- [Deliverable D1.2](#): Mapping of the value chains and stakeholders of promising bio-based products
- [Deliverable D2.1](#): The environmental sustainability indicators in 83 scientific articles on bio-based products are assessed for usefulness and underexposure
- [Deliverable D7.1](#): Examination of existing iLUC approaches and development of a risk-based approach to iLUC applicable to bio-based products
- [Deliverable D10.3](#): First year report on communication, dissemination and publication activities + Appendix

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### Publications

P. Gullón, B. Gullón, I. Dávila, J. Labidi, S. Gonzalez-Garcia, **Comparative environmental Life Cycle Assessment of integral revalorization of vine shoots from a biorefinery perspective**, *Sci Total Environ.*, 2017, 624, 225; <https://doi.org/10.1016/j.scitotenv.2017.12.036>; written by Universidade de Santiago de Compostela relevant to the work of WP2.

S. González-García, L. Argiz, P. Miguez, B. Gullón, **Exploring the production of bio-succinic acid from apple pomace using an environmental approach**, *Chem. Eng. J.*, 2018, 350, 982; <https://doi.org/10.1016/j.cej.2018.06.052>; relevant to the work of WP2.

Two STAR-ProBio papers also feature in the **Special Issue of the Sustainability journal "Sustainability Transition Towards a Bio-Based Economy: New Technologies, New Products, New Policies"** with another to come shortly:

P.M. Falcone & E. Imbert, **Social Life Cycle Approach as a Tool for Promoting the Market Uptake of Bio-Based Products from a Consumer Perspective**, *Sustainability*, 2018, 10(4), 1031; <https://doi.org/10.3390/su10041031>; Open access; Written by Unitelma Sapienza relevant to the work of WP6.

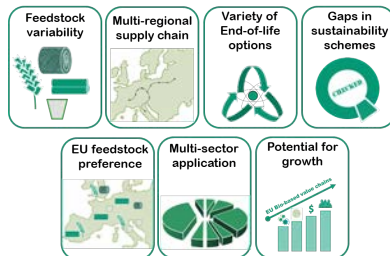
K. Lokesh, L. Ladu & L. Summerton, **Bridging the gaps for a 'circular' bio-economy: selection criteria, bio-based value chain and stakeholder mapping**, *Sustainability* 2018, 10(6), 1695; <https://doi.org/10.3390/su10061695>, Open access; Written by University of York and TUB relevant to the work of WP1.

Additionally the following article was published in April 2018 in the DIN Mitteilungen "Förderung biobasierter Produkte durch Normung und Zertifizierung. Horizon-2020-Projekt STAR-ProBio - Bisher Erreichtes, Handlungsbedarf und Lösungsansätze" (<https://www.beuth.de/de/publikation/foerderung-biobasierter-produkte/288466441>)

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## Work Package Updates

**WP1: Screening and analysis of existing sustainability schemes for the bio-economy**



### Selection criteria for EU Bio-based value chains.

WP1 was completed in January 2018. Eighteen sustainability assessment gaps and related issues as well as recommendations to overcome them were specified based on analyses of current standards and sustainability assessment schemes, expert interviews, a gap analysis and a stakeholder webinar. Another key achieved objective aimed at identifying and selecting feasible value chains and case studies for evaluating the sustainability assessment scheme to be developed within the STAR-ProBio project. Selected results of its first tasks "Screening of existing certification initiatives" and "Screening of existing standards for sustainability assessment and existing technical database solutions; selection of interfaces within the entire chain of custody and the certification schemes" were shared with the public (see [Dissemination section](#))

The latest public report of WP1, Deliverable D1.2 Mapping of Relevant Value chains and stakeholders, can be downloaded [here](#). This deliverable reports the selection and mapping of promising value chains that are significant to the EU plans for the bio - economy, and in particular, to visualise the boundaries of STAR-ProBio's diverse exemplary bio - based products. This study entails a systematic review of 12 bio - based value chains that are prevalent in the EU. A preliminary list of EU - based value chains was subjected to a systematised two - tier evaluation and selection approach. Value chains identified and selected based on six selection criteria, were analysed further against a backdrop of EU - based bio - economy and sustainability initiatives, to ensure the selection of preferred value chains based on spatial feedstock relevance and technology maturity. The finalised list of eight value chains was mapped at each "supply - chain" stage for visualisation of the system dynamics, interconnections, chain actors, employed conversion routes and existing/ potential end - of - life options. The Deliverable provides useful input for various current STAR-ProBio activities.

### WP2: Upstream environmental assessment

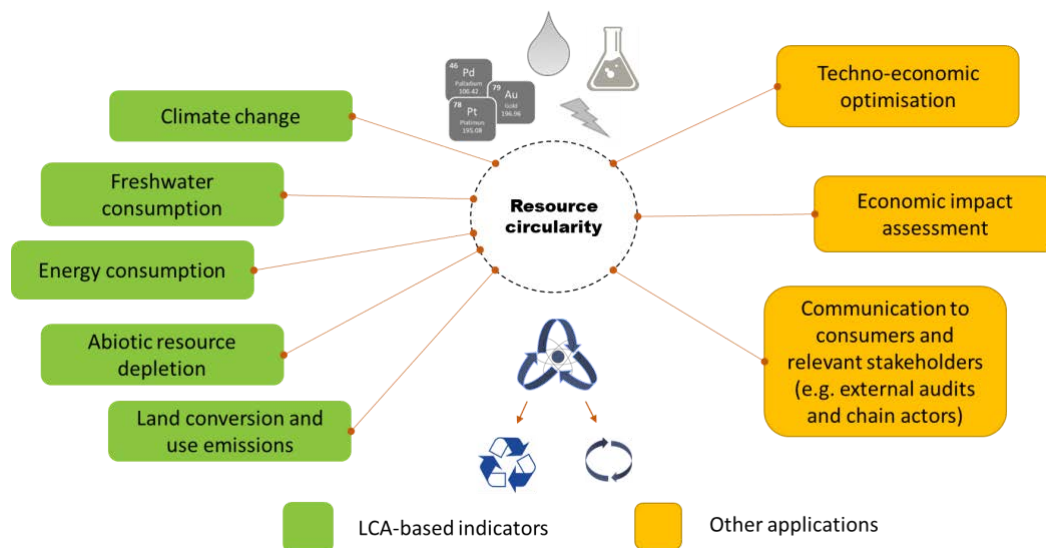
In work package 2, a literature review was performed on life cycle assessment (LCA) studies with emphasis on agricultural/forestry activities as well as their residues or by-products in order to determine the potential feedstocks and the most critical environmental indicators. Furthermore, system boundaries and functional units were defined for the upstream processing phases. Feedstocks were divided into five categories, mainly regarding their carbohydrate content: 1) Starch crops (e.g. wheat); 2) Sugar crops (i.e. sugar beet); 3) Lignocellulosic crops (e.g. wheat straw); 4) Oil crops (e.g. rapeseed) and 5) Industrial Side Streams (e.g. sugar beet pulp). These feedstocks will be the reference flow for the downstream environmental assessment in WP3. For instance, the production of wheat-based glucose from enzymatic hydrolysis will be studied as a substrate for the fermentation process. Within the next six months WP2 will produce a completed list of feedstocks and environmental indicators to be used in the life cycle assessment.

### WP3: Downstream environmental assessment

Life cycle thinking, integrated with appropriate quantitative approaches is a valuable cutting-edge approach to assessing the sustainability characteristics of any bio-based product (environmental, economic and social). Incorporation of approaches that highlight the circularity characteristics of such products would be useful in measuring the degree of the product's suitability for our long-term goal, circular economy. WP3, in further detail, has assessed the complementary nature of the non-LCA based indicators (conceived earlier) with LCA-based indicators and their effectiveness in capturing the "cradle-grave" environmental impacts of bio-based products employed as case study within this project. Material efficiency and energy efficiency will be the two main non-LCA indicators that emphasise and measure the circularity of materials/energy flow through the life cycle stages of any given product. By establishing the vital quantitative circularity data, this proposed approach demonstrates its flexibility to be applied to both environmental and techno-economic impact (See Figure).

The proposed approach could be applied to quantify the circularity of any given product which could also be useful for economic operators and businesses to draw and publish key sustainability information of the product (on the packaging), to improve their traceability and transparency to the consumers e.g. made from % of recycled/ recovered material or "zero-waste" product. This work was presented to the environmental experts at the SETAC 28<sup>th</sup> Annual meeting held between the 13<sup>th</sup> and 17<sup>th</sup> of May 2018 and was well-received, [read more here](#).

Our next steps are to identify the key methodologies that would be suitable for application within the environmental and techno-economic assessment of bio-based products, in order to improve the flexibility of the proposed approach for incorporation into the existing best industrial practice of sustainability assessment. Prior to this, the strengths, weaknesses and other uncertainties associated with the proposed approaches will have to be established. It will also be essential to ensure the proposed methodologies only bridge the gaps and do not overlap with any of the life cycle impact assessment methodologies as this could lead to double-counting.



### Applicability of the proposed resource efficiency indicators to environmental, techno-economic and its application for communication within the social module.

#### WP4: Techno-economic assessment

WP4 member Demetres Briassoulis recently participated in the NAXOS 2018 6th International Conference on Sustainable Solid Waste Management presenting an inventory review of alternative end-of-life routes of bio-based products. The LIFECAB-Summer School was also organised by WP4 members AUA and held in Athens from 28-29/5/2018 on the "Valorization of agro-industrial residues and side streams for the development of a sustainable bio-economy".

WP4 successfully established connection with Natureworks to support the work on STAR-ProBio case studies and join the Advisory Board of the project. Additional recent work includes the preparation of a peer-reviewed publication regarding the perspectives of industrial side streams and other agro-residues for developing a modern circular bioeconomy leading to bio-based chemical production. Further publications are at preliminary stage of preparation.

In the next six months WP4 expects to produce two initial draft lists of:

- Technoeconomic sustainability principles, criteria and indicators tested in different processes (gate to gate) and;
- Technoeconomic sustainability principles, criteria and indicators tested in different End of Life routes (gate to gate).

#### WP5: Market assessment

STAR-ProBio's first Focus Group Webinar on Sustainability Assessment Factors for Bio-Based Products took place on January 29, 2018.

The discussion was moderated by Luana Ladu (TU Berlin) and comprised experts with a EU perspective and representatives from various stakeholder groups from Belgium, Germany, Italy, Spain and The Netherlands.

Five questions built the foundation for the discussions:

- Which sustainability parameters/criteria should be considered by a sustainability assessment scheme for bio-based products?
- Which factors should be mandatory in such a scheme and which ones should be voluntary?
- Are particular parameters/criteria needed to assess specific bio-based products/product groups?
- How should the compliance of these parameters be communicated to consumers?
- Which particular needs regarding sustainability assessment parameters/criteria does your specific stakeholder group have?

The key conclusions of the event were summarized as follows:

1. Fossil-based products should be subject to the same sustainability criteria as bio-based products.
2. The only main difference for bio-based products is that the raw material is biomass. Therefore, additional criteria regarding the production of biomass could/should be added.
3. Sustainability criteria for biomass for bio-based products should/could be similar to those applying to biomass for energy applications where binding criteria exist.
4. Regarding whether there should be a minimum percentage of bio-based content, different influencing factors have to be considered; in particular technology issues and consumers' expectations.
5. Environmental criteria are more obvious than social and economic criteria.
6. The origin of biomass is also of importance (as shown by the bioenergy discussion).
7. Criteria that were explicitly referred to included: GHG emissions, bio-based content, and health-related aspects.

The results enriched the sources for the preparation of STAR-ProBio's [Delphi survey](#) and also support various other project activities.

More Focus Group activities on specific stakeholder- and product-related topics will take place within the duration of the project.

**Our survey** on the needs and preferences of the market for sustainability information about biobased products and how certification and labelling can influence purchasing decisions **is almost ending**, if you haven't yet, **please participate now!**

You can find the survey for the general public here: <https://inno.limequery.com/773451>

The version aimed at professionals buying or working with bio-based products can be found here: <https://inno.limequery.com/999623>

#### WP6: Social assessment

In recent months WP6 has begun work on 'stakeholder mapping and analysis' and 'value items validation', carrying out the following activities:

- reviewing peer reviewed literature on the Stakeholder analysis in the context of the bioeconomy;
- complementing our review with information from the so-called "grey literature" (e.g. dissertations, reports, etc.) in order to deepen our understanding about the Stakeholders analysis applied to S-LCA studies;
- proposing a preliminary approach (power/interest matrix) able to categorise the stakeholder involvement in terms of power and interest towards the development of bio-based products;
- circulating among task partners a first draft of our deliverable (D6.2), that included the power/interest matrix that will be employed to determine the involvement of relevant stakeholder categories and classify them as passive and active according to their level of power/interest.

In the upcoming months, the stakeholders identified through the matrix will validate and integrate the value items list provided by Deliverable 6.1, through three small workshops to be held in Rome, Santiago de Compostela (July) and Berlin (early September).

The preliminary findings from the first round of small workshops, will be then deepened during a second workshop to be held in Turin, as a side event of the 8th edition of IFIB - International Forum on Industrial Biotechnology and Bioeconomy (<https://ifib2018.b2match.io/>).

### **WP7: ILUC risk assessment for bio-based products**

The WP7 researchers of the STAR-ProBio project developed a causal-descriptive model based on a system dynamics methodology to show that bio-based products run the risk of accelerating land use change with negative effects on the environment. In some simulations the changed land extension is comparable to the one caused by biofuels of first generation. However, it was found that the results are sensitive to patterns such as the adopted agricultural practices, the use of different raw materials and residues and on the reference markets; indeed, many production patterns and related production choices would lead to consumption of a very small amount of land. As an example, land efficiency strategies and use of wastes bring to a reduced land use. The pathway to make earth-friendly biobased products is open!

Background research addressing land use change due to bio-based products is lacking. The few studies on this topic are focused on the analysis of the biofuel market, whose specific characteristics differ widely from bio-based products. Namely, while biofuels are made from few feedstocks and lead to few similar products, the range of feedstocks and articles in biobased products introduces a variety of variables when accounting for land use. Therefore, this study can be considered the first of its kind. Preliminary results on this study have been shared and presented at the conference of the Society of Environmental Toxicology and Chemistry held in Rome, May 2018.

In the next 6 months efforts will be put in making the prediction of land use changes more robust and to broaden the scientific acceptance. The researchers will study in particular the strategies to cope with undesired land use changes and will measure their effects. To do so they have organised a specific meeting to be held in Ravenna in July. Furthermore, in the coming months a list of conditions and actions which can reduce significantly the extent of involved land will be delivered.

### **WP8: Sustainability scheme blueprint for bio-based products**

The present activities of WP8 are focused on development of recommendations concerning current sustainability standards for bio-based products. Hitherto, seven gaps in the current regulations have been identified from which the traceability of sustainability and certificates along the supply chain is among the most important ones. The traceability systems for bio-based product attach the stamp "bio" to a given material flow throughout the supply chain. Implying traceability to standards is important because it enables companies managing risks, authenticates the product along with providing reliable information to consumers, and improves efficiency of processing and quality of products. The form of traceability systems can differ depending on the existence of legal requirements and mandatory or voluntary applications. In the face of the lack of legal regulations many companies protect their brands by pre-emptive actions and develop voluntarily their own traceability regulations. Besides, some non-profit organisations recognised internationally develop standards, certification procedures and labelling systems. They constitute a specific link between the present bio-based product markets and future uniform traceability regulations on standards and auditing.

The role of WP8 is to develop the outputs from other WPs. Thus, only a small number of tasks of WP8 have been initialised to date. In the process of making recommendations concerning current sustainability standards for bio-based products, a methodological approach has been progressed to collect data and to combine them in SWOT/PEST tables. One of the seven identified gaps, i.e. related to traceability, has been presented in the context of legal and responsible biomass sourcing, including selected criteria and the aspects of legality connotation, protection of ecosystem, minimal negative impact, good practices, protection on biodiversity and social and work-related rights. The crucial issues discussed in relation to traceability standards such as legality, verification, accreditation and the chain of custody are summarised in the SWOT.

### **WP9: Analysis of regulations, (eco)labelling and policy initiatives**

Over the last months WP9 has been focussing mainly on the identification and assessment of potential gaps in the regulatory framework of the biobased economy. Based on this activity, five key messages and observations have been formulated (and will be included in a forthcoming public deliverable). These observations will be an input into other WP9 tasks but also to WP8 which will develop the STAR-ProBio blueprint. Furthermore, TUB has prepared an inventory of relevant Ecolabels in the biobased economy. The analysis of these ecolabels will give important insights and implications for the development of the STAR-ProBio blueprint. WP9 is also looking for opportunities to feed STAR-ProBio criteria, indicators and tools into existing Ecolabels.

The next steps for our activities in WP9 are the finalisation of the gap assessment regarding the regulatory framework and the ecolabel analysis. The main findings of this study will be presented to a broader audience via a webinar, details of which will be confirmed in due course.

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## **STAR-ProBio Dissemination & Communication**

### **Conferences and Events**

STAR-ProBio researchers have been out and about in recent months promoting our work at a range of different conferences and events via oral presentations, posters and acting as panellists, including the following:

Several partners disseminated STAR-ProBio results in 2 presentations and a poster at **SETAC 28th Annual meeting 13th -17th May 2018, Rome**.

SETAC (Society of Environmental Toxicology and Chemistry) is dedicated to research and innovation towards understanding and improvement of environmental quality and ecosystem integrity. This is a non-profit organisation with establishments in 80+ countries with a wide network of multi-disciplinary research clusters, besides undertaking environmental research and analysis, are also involved in environmental education. This event was attended by 2600 delegates including academics, students, businesses, governmental administrations and others from over 65 countries. UoY and UNIBO from STAR-ProBio were privileged to present their findings from WP3 and WP7 in oral presentations as part of the session "LCA and beyond - integrating sustainability and/or other dimensions to improve decision support". The findings presented were welcomed and appreciated to bridge the gaps within the LCA impact indicators. In addition to capturing the inventory impacts via straight forward approaches, some follow-up correspondence from the conference participants and attendants demonstrated that these non-conventional indicators were also "a need" for development, assessment and establishment of bio-based concepts within the context of circular economy. Feedback from the audience resulted in the start of cooperation with other projects, institutes and universities.

For **WP3 (Downstream Environmental Assessment)** Kadambari Lokesh of the University of York presented "[Development of non-conventional LCA indicators for circular characteristics of bio-based products](#)". The findings of the project involved the identification of key "unconventional" indicators that demonstrate the sustainability and circular characteristics of promising bio-based products, complementing conventional life cycle analysis. Some of the new LCA complementary indicators proposed as a part

of this study emphasise and capture resource circularity within bio-based processes, particularly capturing the recoverability, reusability and recycleability of those resources within those value-chains.

For **WP7 (ILUC risk assessment for biobased products)** Diego Marazza of the University of Bologna presented "[A risk evaluation approach for indirect land use change associated to biobased products](#)". In this contribution the authors presented the conceptual model and the results of the identification of risk factors obtained from the analysis of economic models and a sensitivity analysis performed over one selected case study.

Serena Righi of the University of Bologna presented a poster entitled "[Environmental, social and economic challenges towards a bio-based economy: the STAR-ProBio project, Sustainability Transition Assessment and Research of Bio-based Products](#)", as part of the session "Integrating life cycle approaches towards a sustainable circular economy".

**Kadambari Lokesh** of the University of York and **Luana Ladu** of TU Berlin both attended and presented at the **ECO-BIO Challenges in Building a Sustainable Biobased Economy 2018 conference** held on 4th-7th March 2018 in Dublin, Ireland. Kadambari's presentation '*Bridging the gaps for a 'circular' bioeconomy: selection criteria, bio-based value chain and stakeholder mapping*' showcased some of the key outputs of WP1 while Luana's '*Forecasting innovations and technological trends in the European bio-based industry: Experts view and patent analysis*' highlighted work from both the STAR-ProBio and STAR4BBI projects. The conference had ca. 250 global participants from research, industrial and policy backgrounds.

**Valentina Tartiu** of Unitelma Sapienza gave a presentation on 'How can we shape circular bioeconomy in a Multi-Level Perspective' at the 3rd edition of the **NEST-conference, "New Frontiers in Sustainability Transitions"** in Utrecht, the Netherlands, 15th & 16th March 2018. NEST – the Network of Early Career Researchers in Sustainability Transitions – events attract PhD students and Early Career researchers as well as senior researchers.

**Doreen Fedrigo** and **Mathilde Crêpy** of ECOS and **Sergio Ugarte** of SQ Consult represented STAR-ProBio at "Innovation in the bioeconomy: overcoming barriers for sustainable bio-based products & biofuels" - the **final event of the European Research and Innovation project ButaNext** on 12th April in Brussels, participating in the panel discussion on *Barriers to the uptake of products derived from sustainable biomass* and presenting a poster. The event attracted ca. 80 scientists, researchers, industries, NGOs and policy makers from across Europe.

Our project coordinator **Piorgiuseppe Morone** of Unitelma Sapienza attended the **International FAO workshop** on "Measuring the Sustainability of the Bioeconomy: Where do we stand/What gaps/What next?" as a panellist. The event took place on 17<sup>th</sup> & 18<sup>th</sup> April in Berlin and was attended by 42 scientists, researchers and policy makers from across the world.

At the **IEA Bioenergy Task 43: Biomass Feedstocks for Energy Markets conference** entitled "Governing sustainability of bioenergy, biomaterial and bioproduct supply chains from forest and agricultural landscapes" held on 17<sup>th</sup>-19<sup>th</sup> April in Copenhagen, Denmark, **Sergio Ugarte** of SQ Consult presented the results from WPs 1, 5 and 9 in his presentation on '*Gaps in sustainability tools and schemes for bio-based products and stakeholders preferences and expectation*'. The event was attended by ca. 100 people from across the world including researchers, producers of biomass for bioenergy, bio-chemicals and biomaterials, and other stakeholders from the forest, agriculture, biogas and bioenergy sectors.

**Janusz Gołaszewski** of University of Warmia and Mazury in Olsztyn gave an oral presentation on '*Biorefinery processes in circular economy*' at the **BioBIGG conference - "Business potentials for SMEs within the bioeconomy"** in Gdańsk, Poland on 24<sup>th</sup> May 2018. The BioBIGG project focusses on the bioeconomy in the South Baltic area and 60 policy makers, scientists, researchers, students attended the event from Sweden, Denmark, Germany and Poland.

**Stefan Majer** of DBFZ presented on '*Gaps and Research Demand Analysis from Current Certification and Standardisation in a Sustainable Biobased Economy*' covering outputs of WP1 and initial results from WP9 at the **European Biomass Conference and Exhibition** held in Copenhagen, Denmark on the 16<sup>th</sup> May 2018. The event was attended by ca. 100 scientists, researchers, industrialists from across Europe.

At the **BIOVOICES Mobilization and Mutual Learning (MML) Workshop** entitled "Boosting circular bio-based economy in cities, Lessons learnt from EU funded projects and local stakeholders" held on 22nd May in Brussels, Belgium, **Piorgiuseppe Morone** of Unitelma Sapienza was a panellist. Local and regional governments, biobased industries, research institutions, consumer organizations, the European Commission, and other relevant European funded projects were all in attendance to share ideas and experiences in working towards a sustainable circular bioeconomy.

STAR-ProBio organised the **Bioeconomy Village** as part of the "**Festival dello sviluppo sostenibile 2018**" on the 24th May in Rome, Italy alongside the European BIOWAYS, BIOVoices and EXCornSEED projects, with the aim of raising awareness, improving knowledge on products of renewable origin and promoting the applications and benefits of Bioeconomy, the circular economy and the sustainability between the general public, researchers and companies. Bio-based products, research and applications of the bioeconomy were all showcased in a practical and engaging way.

**Piorgiuseppe Morone** of Unitelma Sapienza also took part as a speaker at the **Fatti di plastica** event on 5th June 2018 in Rome, Italy attended by ca. 80 scientists, researchers, ecologists and members of the general public.



The event was organised in the context of World Environment Day for the year 2018 "Beat Plastic Pollution".

At **NAXOS 2018 6th International Conference on Sustainable Solid Waste Management** held on 13<sup>th</sup> – 16<sup>th</sup> June in Naxos, Greece, **Demetres Briassoulis** of the Agricultural University of Athens presented an inventory review of alternative end-of-life routes of bio-based products, an output of WP4. The event attracted approximately 1500 global participants including scientists, researchers, policy makers, students, conservationists and ecologists.



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## Call for bio-based organisations, projects and researchers: showcase your work at the Maker Faire

[Maker Faire](#) is one of the most important science exhibitions in Europe. After the success of the Bioeconomy Village we co-organized last year at the Maker Faire, we have been contacted together with BIOWAYS to organise an entire pavillion dedicated to Circular Bioeconomy.

### Are you a researcher, a start-up or an organization that works in the Bioeconomy field? Show your work to the public for free!

The **BIOWAYS and STAR-ProBio projects**, funded by the European Commission and BBI-JU to promote European research and the bioeconomy give you the opportunity to showcase your work to the general public, demonstrating **bio-based products** in a practical and engaging way and their application in the everyday life.

In particular, we will organize, in the context of Maker Faire (Rome, 12-14 October 2018), the [BIOECONOMY VILLAGE](#), which will promote bio-economy to the general public, hosting universities, research centers, industries and start-ups including ENEA, CNR, University of Rome La Sapienza, University of Tor Vergata, University of Campus Biomedico, University of Turin, University of Bologna, etc.

The exhibition space will be subdivided into thematic areas, each represented by one or more universities, research centers, industries and Start-ups that will show the different applications and potential of Bio-based products through exposition of products, examples, laboratory themes and demonstrations.

Do you want to join us?

Participation will be **free of charge**. Drop us an email at [info@fvaweb.it](mailto:info@fvaweb.it) telling us about your work and the bio based products you will showcase.

The thematic areas in which the exhibition area will be divided are:

1. European Projects
2. Games Area
3. Cleaning and Hygiene Personal Care & Cosmetics Health, biomedical
4. Textile products, clothing, sport and toys
5. Food Packaging, Disposable Products for Catering and Events
6. Biofuels and Bioenergy
7. Environmental bioregulation and biological sensors
8. Building, Construction and restoration; paintings, decorations and furniture
9. Agriculture, Food, nutraceutical and Fishing

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## STAR-ProBio Researcher Interviews

### Sara Bello Ould-Amer



#### What is your role in the project and how does your work help to reach STAR-ProBio's desired impact?

I am involved in the project tasks related to the upstream environmental assessment of processes in the STAR-ProBio project. As member of the Life Cycle Assessment research team of Santiago de Compostela, we participate in WP2 as work package coordinators. We participate as well in WP3, WP6, WP8, WP10 and WP11.

#### What is the most interesting part of your job?

The most interesting part of my job is being able to transform a series of data and values into meaningful conclusions that may hopefully change the performance of a process. Analysing a process environmentally allows me to be in contact with the most avant-garde technologies in the sector of bioprocessing, but to also be aware of how potential processing opportunities compare to more traditional developments and the importance of establishing a benchmark which will be very relevant for the sustainable future envisioned by Europe's sustainability goals.

**Tell us a bit about your background/career path**



I obtained my degree in Chemical Engineering in the University of Santiago de Compostela in 2015 and MSc in Chemical Engineering in Universidad Rovira i Virgili (Tarragona) in 2017. I am currently working as a research assistant at the University of Santiago in the topic of Life Cycle Assessment methodology.

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**"I believe that the sector of bio-products has the potential to evolve and introduce a new era in which people will be far more conscientious and aware of what the bioproducts market may involve"**

Sara Bello Ould-Amer, Universidade de Santiago de Compostela (USC)

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**What is your view of the bio-based products sector/market?**

I think the bio-products sector has been in a rising tendency lately. However, there is still much misinformation on what the 'bio' prefix means and what it represents. I believe that the sector of bio-products has the potential to evolve and introduce a new era in which people will be far more conscientious and aware of what the bioproducts market may involve. Bio-products are promising options to lead us towards a sustainable bioeconomy not dependant on petroleum exploitation. However, I do think that there is still a long way until the bio-products market can be comparable to nowadays petroleum-based economy. For this, research and development activities are essential. Projects like STAR-ProBio make a great effort towards standardisation, research and education goals which will make a difference when the time comes.

**In your opinion, what would success look like for the project?**

Success for the STAR-ProBio conveys, in my opinion, a result deriving in a useful and realistic outcome to stakeholders. This will be achieved when the theoretical conclusions from the project can be successfully applied to real case studies hopefully to result in positive consequences for society, economy, industry, consumers and/or any other stakeholder.

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**David Moosmann**

**What is your role in the project and how does your work help to reach STAR-ProBio's desired impact?**

I work as a research associate in different tasks and work packages. As part of the team at DBFZ, we conducted so far two gap analysis on sustainability certification and assessment schemes as well as on the current regulatory framework, relevant for the sustainability assessment within the upcoming bioeconomy. Since I could gain some professional experience in the certification business in the past, I try to make use of this and bring my knowledge and experience in the project.

**What is the most interesting part of your job?**

It is really interesting to approach and evaluate the major sustainability issues linked to new products and sectors which are just arising and how relevant the bioeconomy can be for the sustainable development. Moreover, I like to work with project partners from all over Europe having different backgrounds and expertise.

**Tell us a bit about your background/career path**

I studied the program "biobased products and bioenergy" at Hohenheim University in Stuttgart, including a semester abroad at SLU in Uppsala, Sweden. After graduation I stayed for almost one year at the Institute for Biomass and Resource Efficiency in Windisch, Switzerland working as a scientific assistant. There, I focused mainly on the fuel quality of biomass fuels. In order to gain professional experience besides research, I joined the certification body DIN CERTCO mbH in Berlin in 2015 for a product manager position in the field of sustainability certifications for biomass and forest products, being responsible for ISCC, REDcert, PEFC. During the two years at DIN CERTCO, I also became an auditor for the wood pellet certifications DINplus and ENplus. Still I conduct some audits in wood pellet plants besides my job at DBFZ, which I started one year ago.



**What is your view of the bio-based products sector/market?**

In the past, I mostly dealt with all kinds of rather technical topics associated with the generation of energy from biomass. Since biomass potentials are limited, we need to exploit them in the most efficient and sustainable way. That needs preference of the material use over the energetic use or in other words the energetic use after the material use in order to progress towards an economy characterised by cascading use and closed loops. For that reason, I believe in an increased growth of biobased products in various sectors of our economy.

**In your opinion, what would success look like for the project?**

From my point of view the project would be successful, if results of the project will be relevant beyond the end of the period. This could be the uptake of developed tools for the assessment of sustainability within the bioeconomy, eventually in a sustainability certification context. Furthermore, a contribution in the overall understanding of the assessment of sustainability of bioenergy and biobased materials and products would make the project favourable.

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**"Since biomass potentials are limited, we need to exploit them in the most efficient and sustainable way. That needs preference of... energetic use after the material use in order to progress towards an economy characterised by cascading use and closed loops"**

David Moosmann, Deutsches Biomasseforschungszentrum (DBFZ)

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## STAR-ProBio first annual meeting

The STAR-ProBio 1st Annual Meeting (4 to 5 April 2018) was hosted by project partner Quantis in Lausanne, Switzerland and attended by 13 other partners. During two productive days of meetings, first the results and upcoming work of the different Work Packages (WPs) were discussed, and synergies with related WPs were sought. The first day was wrapped up with a discussion on how to further optimize the alignment of the different tasks and WPs towards the overall goal of driving market adoption of bio-based products by developing tools to prove product sustainability and develop a blueprint for a sustainability assessment scheme for bio-based products.



During the second day, plenary sessions were held on topics cross-cutting the entire project: the development of the sustainability assessment tool (methodology, criteria and indicators) for bio-based products, the in-depth case studies that are being performed and will serve to guide and validate this process, the combined dissemination and communication efforts and a General Assembly

The following day the successful 1st International STAR-ProBio Workshop was held at the Climate Show, [read more here](#).

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## Related H2020 Projects

STAR-ProBio has cultivated synergistic cooperations with many related Horizon2020 projects. Below we introduce two of the most important projects.

### [BIOVOICES \(H2020-BBI-PPP-2015 - CSA 720762\)](#)

BIOVOICES overall aim is ensure the engagement of all relevant stakeholder groups and tackle BIO-based related challenges by establishing a multi-stakeholder platform, involving a plurality of actors (voices) with different perspectives, knowledge and experiences, and animating open dialogue and Mutual Learning between the different stakeholders. BIOVOICES will organise 70 MML workshops, at local, national and international level, involving the Quadruple Helix stakeholder groups (policy makers, researchers, the business community and the civil society) in order to address societal, environmental and economic challenges related to bio-based products and applications. The project will launch the BIOVOICES multi-stakeholders community and social platform to support and enable discussion, workshops, mobilisation and mutual learning events and transform the experience of the BIOVOICES community in Actionable Knowledge for the different stakeholders, publishing recommendations and policy briefs (at least four) to address the challenges related to bioeconomy. The BIOVOICES Consortium merges a variety of complementary expertise, aiming to build a consistent multi-actor approach integrating 13 partners from 10 EU Member States from Baltic Sea to the Mediterranean area to central and eastern European countries.



**BIOVOICES**

CONNECTING BIO-BASED FORCES  
FOR A SUSTAINABLE WORLD



### [BIOWAYS \(H2020-BBI-PPP-2015 - CSA 720762\)](#)

BIOWAYS is a two year project aiming at promoting the socio-economic and environmental benefits of bio-based products and applications among citizens, seeking to enhance the societal confidence on bio-based products and industries. BIOWAYS, together with STAR-ProBio is promoter of the Bioeconomy Village, involving researchers, industries, start-ups and projects to demonstrate "hands-on" the different application fields of bioeconomy, through the showcase of Bio-based products. The Bioeconomy Village was organised in the context of the Researchers' Night, Maker Faire, the European Sustainable Week, engaging around 20.000 citizens interactive sessions. In addition to the Bioeconomy Village, BIOWAYS organised several thematic workshops, surveys, informal events, speeches at international conferences and activities in collaboration with EU funded research projects, significantly contributing to raising large public awareness and acceptance of Bioeconomy and Bio-based products.

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## Future activities

Come along and hear our STAR-ProBio colleagues talk about their results at one of these future conferences and events:

[Annual Congress on Plant Science and Bio Security](#), 11th -15th July 2018 in Valencia, Spain

[Sustainability Metrics: Tracking, Measuring and Reporting Responsible Innovation](#), 10<sup>th</sup> September 2018 in York, UK

[6th Social Life Cycle Assessment conference](#), 10<sup>th</sup> – 12<sup>th</sup> September 2018 in Pescara, Italy

[2nd International Conference on Bioresource Technology for Bioenergy, Bioproducts & Environmental Sustainability \(BIORESTEC\)](#), 16<sup>th</sup> -19<sup>th</sup> September 2018 in Sitges, Spain

[4th Iberoamerican Congress on Biorefineries \(4-CIAB\)](#), 24<sup>th</sup> – 26<sup>th</sup> October 2018 in Jaen, Spain

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**STAR-ProBio in brief:**

**STAR-ProBio Partners:**

- Aims to **formulate guidelines for a common framework** promoting the development of regulations and standards that support the adoption of business innovation models and market uptake in the bio-based products sector.
- Will develop a **blueprint for sustainability schemes and tools** applicable to a large spectrum of bio-products.
- Will make **recommendations** for a more efficient and harmonized policy regulation framework for the market-pull of bio-products.
- Outputs will be **new and revised assessment methodologies, criteria and indicators** developed by integrating scientific and engineering approaches with social sciences and humanities.
- Application to **selected case studies** to illustrate benefits and impacts for bio-based products.
- Case studies cover **extensive value chains** with several intermediate and final bio-based products.

- [Unitelma Sapienza University of Rome](#)
- [University of York](#)
- [Technische Universitaet Berlin](#)
- [Agricultural University of Athens](#)
- [Deutsches Biomasseforschungszentrum](#)
- [SQ Consult](#)
- [University of Bologna – Alma Mater Studiorum](#)
- [Uniwersytet Warmiński Mazurski w Olsztynie](#)
- [ChemProf](#)
- [Quantis](#)
- [NOVAMONT](#)
- [Swedish Environmental Protection Agency – Naturvårdsverket](#)
- [Universidade de Santiago de Compostela](#)
- [agroVet GmbH](#)
- [European Environmental Citizens Organisation For Standardisation](#)



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STAR-ProBio geographical distribution of partners

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***Our newsletter and other news:***  
[www.star-probio.eu/news/](http://www.star-probio.eu/news/)



Sustainability Transition Assessment  
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