STAR-ProBio

Sustainability Transition Assessment and Research of Bio-based Products

Grant Agreement Number 727740

Deliverable D10.2
Data Management Plan
(Final version)

Version 3.0, 30/04/2020

This project is funded by the European Union's Horizon 2020 Research and innovation action under grant agreement No 727740 with the Research Executive Agency (REA) - European Commission. Duration: 36 months (May 2017 – April 2020).
Work Programme BB-01-2016: Sustainability schemes for the bio-based economy
www.star-probio.eu

REPORT

Deliverable identifier	D10.2
Document status	Final updated version
Authors (Organisation)	Sjors van Iersel, Sergio Ugarte, Monique Voogt (SQ Consult) Review by: Janice Lofthouse, Katy Brooke (University of York)
Lead Beneficiary	SQ Consult
Deliverable Type	Report
Dissemination Level	Public
Month due (calendar month)	Month 36 (April 2020)

DOCUMENT HISTORY

Version	Description
1.0	Final initial DMP
1.1	Inclusion of the key information tables of datasets in Annex I and Informed Consent form in Annex II
1.4	Further update to the datasets in Annex I
1.6	Final draft for review by selected partners
2.0	Final updated DMP
3.0	Final DMP

Abstract

The STAR-ProBio final Data Management Plan focusses on the supporting data that underlying the project deliverables and scientific articles. It aims at providing the consortium partners with a harmonized strategy to implement the Horizon 2020 data sharing principle "as open as possible, as closed as needed", while offering flexibility for deviations if properly justified. 30 datasets have been identified, are described individually in Annex I, and have been published on Zenodo where possible. 22 datasets have been published as open access. This document provides guidance on identifying and publishing datasets produced by the project and tracked the publication of datasets.

Suggested citation

STAR-ProBio (2020), STAR-ProBio Deliverable D10.2 Final Data Management Plan v3.0. Available from Internet: www.star-probio.eu.

Disclaimer

STAR-ProBio has received funding from the European Union's Horizon 2020 Program research and innovation programme under grant agreement No. 727740.

Table of Contents

Introduction

Projects participating in the Horizon 2020 Open Research Data Pilot are required to elaborate several versions of a Data Management Plan (DMP), with the aim to improve and maximise access to and re-use of research data generated by Horizon 2020 projects. This document fulfils this requirement and aims to provide the STAR-ProBio consortium members with a harmonized approach and guidance to data management. The DMP is intended to be a living document in which information can be made available on a finer level of granularity through updates as the implementation of the project progresses and when significant changes occur. The current document represents the final update in Month 36.

The initial version of the STAR-ProBio Data Management Plan (DMP) provided the members of the consortium with a unified approach to data collection, curation and publication, focusing on the supporting data that will be generated by implementing the various STAR-ProBio Work Packages and tasks. The Month 18 update built on the experiences so far to refine and improve the guidance and approach for the datasets. The primary focus of this final version is the description of the 30 completed datasets in Annex I.

The H2020 Online Manual provides key information on the scope of the DMP:

"Research data is information (particularly facts or numbers) collected to be examined and considered, and to serve as a basis for reasoning, discussion or calculation."

"The Open Research Data Pilot applies primarily to the data needed to validate the results presented in scientific publications. Other data can also be provided by the beneficiaries on a voluntary basis."

The STAR-ProBio project performed multidisciplinary research aimed at contributing solutions to real-life gaps and problems in sustainability certification of bio-based products. As such, the main sources of research data were existing literature and experts. The STAR-ProBio research data forms the basis for articles and deliverables such as reports. Most of these will be made public, as set out in the Grant Agreement. The main project outputs are in the form of scientific publications, reports and other project deliverables. The Data Management Plan focusses on the research data underlying these deliverables; the supporting data gathered in order to enable the elaboration of the STAR-ProBio deliverables.

This DMP follows the H2020 Template for the Data Management Plan v1.0, 13/10/2016 and draws on the Guidelines on FAIR Data Management in Horizon 2020 (v.3, 26/07/2016).

1 Data summary

1.1 Purpose of data collection and relation to the project objectives

The overarching objective of STAR-ProBio was to develop sustainability assessment tools for bio-based products, in order to support a sustainably growing market for these products. In order to reach the objective, a set of 7 work packages (WPs 1 to 7) provided in-depth literature research, expert consultations and interviews and other data collection, which fed into sustainability assessment toolbox development and recommendations for their implementation (WPs 8 and 9).

The multidisciplinary project STAR-ProBio integrated the scientific, engineering and social sciences approaches of fifteen consortium partners. The data generated during the project spanned a varied array of research fields. For this reason, a default STAR-ProBio data management approach was adopted as described in this document, which applied to all datasets generated in the project. However, deviations from the default approach were needed for some datasets, due to reasons such as confidentially of data or embargo periods related to IPR or scientific publication. Such deviations are possible, as long as they are well explained and documented in the DMP.

1.2 Types and formats of the data

The data that STAR-ProBio generated were primarily sourced from existing relevant knowledge from (scientific and non-scientific) publications and experts. In most cases, the collected data was organized in a spreadsheet, which besides some numerical data typically contained short or long text entries.

These spreadsheets have the .xlsx (Microsoft Excel) format.

Other data formats are text: documents (.pdf and .docx)

Some complementing formats for graphical and audio-visual data could also be generated. Some examples include but are not limited to:

- .jpg (images);
- .ppt (Microsoft PowerPoint);
- .avi (video).

Lastly, in case specific software or models such as for Life Cycle Analysis (LCA) will be used, it was noted that datasets may be stored in formats specific software or models. However only Excel spreadsheets are used for this type of data, except one dataset (Simapro data) published in .csv format.

1.3 Re-use of existing data and its origin

Literature research and expert consultations were the main origins for the research data generated in this project. This included scientific articles, other scientific and non-scientific reports, documentation of existing schemes and standards, databases for Life Cycle Analysis (LCA), interviews and other communication with experts. The data sources were primarily full-text rather than numbers, except for specific databases. The majority of types of source data were either gathered directly by the researchers or were publicly available, either for free or behind a pay wall. In some exceptional cases, the consortium received data confidentially from the data owners or are otherwise granted access to confidential data. Irrespective of the data source, the consortium ensured that all relevant licences were respected and maintained clear source referencing. Furthermore, some important source data, from for example FAOSTAT is freely available under a licence that does not allow commercial use. Some of the datasets foreseen for STAR-ProBio will be enrichments of selected FAOSTAT data, so will be published under a similar licence. STAR-ProBio datasets will provide clear references to its source data, whether and how the source data itself is made public is up to those who own the rights to this data.

1.4 Size of the data

STAR-ProBio did not generate large volumes of data in large experiments or models, or through data-intensive techniques or formats. So far, all datasets have been manually collated, large data gathering exercises were not required, and datasets have maximum file sizes in the ten megabyte (MB) range.

1.5 Potential users of published research data

Datasets generated by STAR-ProBio can be interesting for:

- Members of the scientific community;
- Professionals with a link to bio-based product sustainability;
- Those active in the specific research field to which the dataset contributes;
- Other research projects that can continue to build on or combine their work with STAR-ProBio datasets.

A distinction can be made between research datasets supporting peer reviewed academic publications and datasets forming the basis on which the project deliverables are elaborated. The research data underlying project deliverables requires a big investment in terms of human resources, therefore the main aim of making this data public is for others to use and build on this data, preventing duplication of work and improving efficiency, quality and speed of research. This also holds true for scientific publications, but for these validation and reproducibility are key consideration as well.

2 FAIR (findable, accessible, interoperable and reusable)

2.1 Making data findable, including provisions for metadata

2.1.1 Discoverability of data (metadata provision)

A multi-disciplinary project such STAR-ProBio required a broad, commonly used standard that was not restricted to a specific research area. The default option in STAR-ProBio was to apply the DataCite Metadata Schema. This standard compatible with the OpenAIRE platform (see sections 2.1.2 and 2.2) and the project's use of Zenodo as a repository.

However, some specific STAR-ProBio datasets may be of interest to a scientific discipline for which a dedicated metadata protocol exists. Usage of a dedicated metadata standard is preferred over the broad protocol, therefore for each dataset the Research Data Alliance's Metadata Standards Directory should be consulted, in order to determine the best metadata standard. At the end of the project, no such dedicated metadata standard was found for any of the project's datasets, therefore all published datasets will follow DataCite Metadata Schema. In case a dataset consists of multiple files a readme.txt is included explaining the intention of each included file and the relevant metadata. The selected metadata standard is recorded per dataset in the key characteristics tables in Annex I.

Similarly, data findability can in some cases be enhanced by depositing the dataset in a repository, which is specific to the discipline. Therefore, for each dataset the Registry of Reseach data Repositories (www.re3data.org) should be consulted, in order to determine most appropriate repository. At the end of the project no such dedicated metadata standard was found for any of the project's datasets. The selected repository is recorded in key characteristics table in Annex I.

2.1.2 Identifiability of data

The STAR-ProBio datasets (see section 2.2) that will be published as part of the data management approach form the supporting data for scientific manuscripts and project deliverables. In order to establish a clear link between the supporting data and the documents based on them, a broadly used identifier is needed. Each published STAR-ProBio dataset has a unique Digital Object Identifier (DOI) attributed to it. The DOI was generated using the OpenAIRE platform, and linked to the Zenodo repository.

2.1.3 File naming convention and versioning

In order to ensure transparency of file contents and versioning, the following naming convention was used for files generated during the project:

STAR-ProBio_D[x.y]_v[Version]_[Short Title]_[Type]_[Date]_[Status]_[Free].[extension]

It consists of:

STAR-ProBio	Project name, fixed
D[x.y]	Deliverable identifier, if relevant
V[Version]	Version number in x.y format, should match a version number with a short description inside the document, such as the Document History table in this document
[Short Title]	Short descriptor for easy identification, maximum 40 characters
[Type]	Describes the type of data (e.g. publication, inventory, etc.)

[Date]	Date in format YYMMDD
[Status]	Draft, Final, Public, Restricted, Confidential
[Free]	Free text field for internal communication purposes (e.g. initials of reviewer). This field should not be included in the name of published files.
.[extension]	File extension

For the completed individual datasets generated by the project, a specific file naming convention was used:

STAR-ProBio_[Short Title]_v[Version] _[Type]

It consists of:

STAR-ProBio	Project name, fixed
[Short Title]	Short descriptor for easy identification, maximum 40 characters
V[Version]	Version number in x.y format, should match a version number with a short description inside the document, such as the Document History table in this document
[Type]	Describes the type of data (e.g. publication, inventory, etc.)
.[extension]	File extension

2.1.4 Approach towards keywords

For each dataset, the responsible beneficiary had to indicate a set of selected keywords aiming to maximise findability. The default STAR-ProBio repository is Zenodo, which follows the DataCite Metadata Schema. The keywords are also included in the key characteristics tables per dataset, in the Annex I.

2.2 Making data openly accessible

2.2.1 Data to be made publicly available and rationale for keeping some data closed

As set out in the STAR-ProBio Consortium Agreement, each beneficiary has the right to publish the outputs it generates. This also means that partners have to explicitly agree to the publication of datasets to which they have contributed. The STAR-ProBio project complied with the open access clause in the Grant Agreement and used the H2020 principle of "as open as possible, as closed as needed". In practise, this meant that the default approach was to make datasets public.

Not publishing, or under embargo or other restrictions is allowed, but only if there are sufficient grounds to do so. An example of such a case may be confidential data received for case studies or data gathered through interviews. Via the STAR-ProBio letter of consent (see annex II), the project guaranteed anonymity to respondents. If anonymised data from an interview was to be made public via open access, each respondent would need to sign a second informed consent regarding this step.

A clear justification was needed for any deviations from the default approach. This justification is recorded in the dataset characteristics log in annex I; see Table 2 for the template of the key information per dataset.

Rather than being a pre-defined deliverable, the underlying research needed for the STAR-ProBio deliverables and goals will organically create datasets in which research outputs are organised. Table 1 lists the final table of 30 datasets that were generated throughout the project. It should be noted that the aim of Table 1 is to provide an up-to-date list of supporting data that STAR-ProBio has generated. It does not mean that all data sets will be made public. For instance, various STAR-ProBio tasks include interviews, questionnaires or Delphi exercises. The respondents are asked to sign an informed consent form in which is stated that their data will not be made public, therefore the resulting datasets will not be published at the level of individual responses. A specific justification for each dataset is included in Annex I. The majority of data sets, 22 sets, have been published as open access on Zenodo.

Table 1 List of 26 STAR-ProBio datasets

Dataset (table continues on next page)	**Reference**[1]	**Lead beneficiary**
A comprehensive collection of sustainability criteria and indicators included in current sustainability certification schemes	T1.1	5 - DBFZ
Existing schemes and standards gap analysis: expert interviews	WP1	3 - TUB
Inventory of existing sustainability standards	T1.2	3 - TUB
Inventory of the sustainability methodologies, indicators and criteria of research projects funded by the European Union	T1.2	3 - TUB
Bio-based product value chain and stakeholder map Matrix for the analysis and identification of the most promising bio-based value chains via two-tier multi-criteria decision analysis	T1.3	2 - UoY
Literature review on environmental sustainability indicators related to bio-based products	WP2 D2.1	10 - QUANTIS
Environmental indicators and impact categories for the life cycle assessment of bio-based products (data, tool, report)	WP2	10 - QUANTIS
Life cycle inventory for production and upstream processing of selected feedstocks	T2.4, D2.3	13 - USC
Life cycle impact assessment for production and upstream processing of selected feedstocks	WP2 D2.4	13 - USC
Literature review and life cycle inventory for LCA of case studies	WP3	2 - UoY
End-of-life (EoL) life cycle inventory for the case studies	WP3	2 - UoY

[1] WP: Work Package, T: Task, D: Deliverable, MS: Milestone

Dataset (table continues from previous page)	**Reference**[2]	**Lead beneficiary**
Expanding environmental sustainability criteria to address the manufacturing and other downstream processes for bio- based products	WP3 D3.1	10 - QUANTIS
Description of full chain Techno-Economic Sustainability Assessment (TESA) methodology	WP4 T4.1 to 4.4 D4.2	4 - AUA
Techno-economic sustainability analysis methodology on resources for bio-based products, conversion routes and end-of-life alternative valorisation options	WP4 T4.1 to 4.3 D4.1	4 - AUA
Definition of techno- economic sustainability criteria and LCC indicators for bio-based products	WP4 T4.4 to 4.5 D4.2	4 - AUA
Techno-economic sustainability analysis methodology for conversion routes of renewable feedstock resources to bio-based products – case studies	WP4 D4.2	4 - AUA
Delphi results of stakeholder sustainability preferences and expectations	WP5	3 - TUB
Field experiment on consumer preferences for bio-based products	T5.3	1 - UNITELMA
Social and economic criteria referred to the End of Life management. It reports both weights and values of these criteria.	D6.4	1 - UNITELMA
Stakeholder validation and integration of the identified list of social impact categories, subcategories and indicators	T6.2	1 - UNITELMA
Comprehensive review of existing key drivers, parameters and standards related to ILUC risk.	WP7	7 - UNIBO
SydILUC model semantics parameters for the calibrated model with "realistic" future projection of the data (for the validation part)	WP7	7 - UNIBO
FAOSTAT data used for the SydILUC model	WP7	7 - UNIBO
FAOSTAT data used for the SydILUC model, tier 2 (regional version)	WP7	7 - UNIBO
Bioplastic production pathways with yields, for the SydILUC model, by IfBB	WP7	7 - UNIBO
Results of SWOT/PESTEL analyses for selected bio-products	T8.1	8 - UWM
Inventory of principles and criteria in relation to SAT-ProBio blueprint	T8.2-3	8 - UWM
Inventory of relevant bio-based economy related policies, strategies and regulations	T9.1	5 - DBFZ
Overview of criteria and indicators for environmental, social and economic product characteristics in 42 eco-labels	T9.2	3 - TUB
Inventory of existing monitoring options of the socio-economic and environmental consequences of developing a bio-based economy	T9.4	5 - DBFZ

Key information was collected for each dataset, by the lead beneficiary responsible for the dataset. This key information is recorded for each of the 30 datasets in Annex I of this DMP. Table 2 provides the template of the key information per dataset.

Table 2 Template for the key information log for each dataset

[2] WP: Work Package, T: Task, D: Deliverable, MS: Milestone

Topic	Description
Dataset identifier	STAR-ProBio_[Short Title]_v[Version] _[Type]
Dataset name	
Dataset description	
Dataset DOI	
Dataset version history	
Key contact [Beneficiary]	
Dataset file format and size	
Associated WPs/Tasks/Deliverables/Milestones	
Other contributing beneficiaries	
Dataset (to be made) public?	[Yes/No]
If No, justification:	
Published version(s)	
Repository(-ies)	
Keywords	
Licence	[Default: Attribution-ShareAlike (CC BY-SA)]
Useful for whom?	
Key data sources	

The default STAR-ProBio approach was to make datasets publicly available. However, making datasets public is not an aim in itself. Some datasets generated in the project may be so specifically geared toward a project task or deliverable that there is no apparent use outside the project. In that case, this should be clearly explained, and the dataset should not be published. For several project activities, such as expert consultations, questionnaires for professionals and individuals, field experiments with members of the public and requests for sensitive production process data from companies, agreements are made with the outside parties that their data will not be made public, or only in aggregated and anonymized form. For datasets that will be published, the intended audience is described in Annex I.

Publications of project outputs other than the Deliverables set as public in the grant agreement have to comply with the Consortium Agreement. The most relevant sections are included below:

8.4.2.1 During the Project and for a period of 1 year after the end of the Project, the dissemination of own Results by one or several Parties including but not restricted to publications and presentations, shall be governed by the procedure of Article 29.1 of the Grant Agreement subject to the following provisions. Prior notice of any planned publication shall be given to the other Parties at least 45 calendar days before the publication. Any objection to the planned publication shall be made in accordance with the Grant Agreement in writing to the Coordinator and to the Party or Parties proposing the dissemination within 30 calendar days after receipt of the notice. If no objection is made within the time limit stated above, the publication is permitted.

8.4.2.2 An objection is justified if: (a) the protection of the objecting Party's Results or Background would be adversely affected; (b) the objecting Party's legitimate interests in relation to the Results or Background would be significantly harmed. The objection has to include a precise request for necessary modifications.

8.5.1 Dissemination of another Party's unpublished Results or Background A Party shall not include in any dissemination activity another Party's Results or Background without obtaining the owning Party's prior written approval, unless they are already published.

10.1 All information in whatever form or mode of communication, which is disclosed by a Party (the "Disclosing Party") to any other Party (the "Recipient") in connection with the Project during its implementation and which has been explicitly marked as "confidential" at the time of disclosure, or when disclosed orally has been identified as confidential at the time of disclosure and has been confirmed and designated in writing within 15 calendar days from oral disclosure at the latest as confidential information by the Disclosing Party, is "Confidential Information".

10.2 The Recipients hereby undertake in addition and without prejudice to any commitment on non-disclosure under the Grand Agreement, for a period of 4 years after the end of the Project:

- **not to use Confidential Information otherwise than for the purpose for which it was disclosed;**
- **not to disclose Confidential Information without the prior written consent by the Disclosing Party; - to ensure that internal distribution of Confidential Information by a Recipient shall take place on a strict need-to-know basis; and**
- **to return to the Disclosing Party, or destroy, on request all Confidential Information that has been disclosed to the Recipients including all copies thereof and to delete all information stored in a machine readable form to the extent practically possible. The Recipients may keep a copy to the extent it is required to keep, archive or store such Confidential Information because of compliance with applicable laws and regulations or for the proof of on-going obligations provided that the Recipient comply with the confidentiality obligations herein contained with respect to such copy for as long as the copy is retained.**

2.2.2 Approach to providing public access to datasets

Until a dataset was fully finalised and ready for publication, the private area of the STAR-ProBio website was the default platform for data exchange. As long as there was consensus among all contributors to a dataset and any restrictions on sensitive data were respected, other forms of data exchange were also allowed, such as email or cloud services.

The default approach was to make fully finalized datasets publicly available, unless there was a clear reason not to. STAR-ProBio has created a community on Zenodo (https://zenodo.org/communities/star-probio/) which is used as the main repository for making datasets publicly available. Deviation from this approach was only allowed if sufficiently justified in line with the provisions in the relevant sections of this document, and recorded in the dataset characteristics log in annex I. Datasets should always include an explanation (either in the main file or in a separate readme.txt file) and relevant references to sources, methods used, metadata and other pertinent documentation.

Partners were encouraged to add the datasets that they (co)-author to their institutional repositories, and/or the STAR-ProBio website, as appropriate.

Zenodo is a repository created by CERN and the EU OpenAire project. Data in this repository can be searched and downloaded with any modern internet browser. Its key benefits to the STAR-ProBio project include:

- All research fields, all types of data;
- Open access;
- Free of charge;
- Publications and supporting data can be linked;

- A DOI is provided for effective and persistent citation;
- Offers various licencing options;
- If relevant an embargo date can be set, for instance to give the consortium time to publish or seek IPR protection. This way it will be accessible through Zenodo.org to consortium members only until the embargo expires.

In case of restricted data, the default access option was through uploading the data to the private area of the STAR-ProBio: http://www.star-probio.eu/wp-login.php

In case a restricted dataset can be shared outside the consortium under specific conditions, Zenodo was used. This platform provides a way for interested parties to request data access.

2.3 Making data interoperable

2.3.1 Data interoperability and used vocabulary

It is essential that published datasets are unequivocally interpretable by third persons without any link to the project. Therefore, each dataset needs to be accompanied with a description of the methodology, sources, definitions and scope of the data contained in it.

As discussed in section 2.1.1, whenever possible, datasets should be structured in such a way that it can, in full or in part, be combined with another dataset, from the project or any other data source. For some fields of research specific definitions, metadata and/or vocabulary exists to enable this (see RDA's Metadata Standards). For each dataset, the responsible beneficiary needs to determine if this exists for the relevant field(s) of research and comply with the relevant standards. At the end of the project no such dedicated metadata standard was found for any of the project's datasets.

In order to ensure good interoperability of datasets, it is imperative that standards and methods commonly used in the same field are used. Fairsharing.org is a valuable resource where researches can identify relevant standards, as well as databases and repositories. For example, all STAR-ProBio work on LCA methodology is ILCD/PEF-compliant.

2.4 Increase data re-use (through clarifying licences)

2.4.1 Data licensing

STAR-ProBio has chosen the Zenodo repository (https://zenodo.org/communities/star-probio/) for making datasets publicly and permanently available. Zenodo has a built-in mechanism to select the appropriate licence.

Creative Commons licences are used for every published dataset. The default licence is Attribution-ShareAlike (CC BY-SA), however the level of restriction was determined on a case-by-case basis. The chosen licence is recorded in the dataset characteristics log in annex I.

Possible Creative Commons licences:

- **Attribution (CC BY)**

This license lets others distribute, remix, tweak, and build upon your work, even commercially, as long as they credit you for the original creation. This is the most accommodating of licenses offered. Recommended for maximum dissemination and use of licensed materials.

- **Attribution-ShareAlike (CC BY-SA)** ***[STAR-ProBio default option]***
  This license lets others remix, tweak, and build upon your work even for commercial purposes, as long as they credit you and license their new creations under the identical terms. This license is often compared to "copyright" free and open source software licenses. All new works based on yours will carry the same license, so any derivatives will also allow commercial use. This is the license used by Wikipedia, and is recommended for materials that would benefit from incorporating content from Wikipedia and similarly licensed projects.

- **Attribution-NoDerivs (CC BY-ND)**
  This license allows for redistribution, commercial and non-commercial, as long as it is passed along unchanged and in whole, with credit to you.

- **Attribution-NonCommercial (CC BY-NC)**
  This license lets others remix, tweak, and build upon your work non-commercially, and although their new works must also acknowledge you and be non-commercial, they don't have to license their derivative works on the same terms.

- **Attribution-NonCommercial-ShareAlike (CC BY-NC-SA)**
  This license lets others remix, tweak, and build upon your work non-commercially, as long as they credit you and license their new creations under the identical terms.

- **Attribution-NonCommercial-NoDerivs (CC BY-NC-ND)**
  This license is the most restrictive of the six main Creative Commons licenses, only allowing others to download your works and share them with others as long as they credit you, but they cannot change them in any way or use them commercially.

2.4.2 Reusability during and at the end of the project

Final datasets have been uploaded to the Zenodo repository (https://zenodo.org/communities/star-probio/), which ensures long-term archiving of the final research data. Dataset published on Zenodo will be retained for the lifetime of the repository, which is currently indicated as indefinitely. Uploaded data files and metadata are backed up on a 12-hourly basis, as well as replicated in multiple copies in the online system.

Where relevant, datasets are made available through the STAR-ProBio website, which will remain online for at least three years after the end of the project.

During the project, the lead beneficiary in charge of a dataset aimed to make the dataset public as early as possible, while adhering to the restrictions of consent of all contributing beneficiaries and sufficient time for pre-publication quality control. Publishing to Zenodo meant a DOI was obtained, which could be used in the scientific publications and project deliverables. Hence if possible datasets were published ahead of the documents for which the dataset provide the supporting data.

Beneficiaries provided repository address and basic access instructions as part of any dissemination related to the datasets.

The same quality assurance performed on the STAR-ProBio Deliverables specified in the grant agreement should be performed on its datasets, including extensive review by contributing partners. In order to ensure that the individual datasets contain clear instructions (either directly in relevant dataset files or in a readme.txt file) at least one senior reviewer who was not involved in the preparation of the dataset will review the dataset. The Data Manager (see section 3 can take this role.

2.4.3 Re-usability duration

Given the fast-changing nature of both bio-based product development and sustainability certification, the useful lifetime of the majority of STAR-ProBio datasets is likely to be limited. This is especially true if the data sources used are subject to change, such as the rules guiding existing sustainability schemes. Inventories using scientific publications are more stable over time; future research can use published STAR-ProBio data and build on it by updating and completing such data.

The default STAR-ProBio approach was for its datasets, once published, to remain on Zenodo indefinitely. No exceptions to this have been identified.

3 Allocation of resources

Work Package 10 leader SQ Consult's Sjors van Iersel acted as Data Manager for the STAR-ProBio project. In cooperation with the project's CoDNOC (University of York), he oversaw data management under STAR-ProBio. Sjors van Iersel was the primary contact point regarding data management and supported partners regarding implementation of the Data Management Plan.

The leaders of the task(s) generating each dataset had the ultimate responsibility of the correct implementation of the provisions in the DMP.

Public project deliverables and datasets were published on the STAR-ProBio website and the Zenodo repository. There was no additional cost for publication on the website because this was included in the cost of operating the website as a whole, including the public and private parts. In addition, Zenodo is free of charge for H2020 projects. No financial resources for storage, cloud, hosting, IT infrastructures etc. were required.

All partner institutions budgeted dissemination costs supporting publication of scientific articles to Open Access Journals. The CoDNOC maintained an overview of all Green and Gold publications from the project, including any embargo period and when it ends. The project coordinator and the CoDNOC coordinated the strategy on which publications should be published in a Green access journal.

Open access publications in peer-reviewed journals was a vital part of STAR-ProBio dissemination activities. In line with the STAR-ProBio Communication and Dissemination Strategy, part of the project funding was made available for gold access – particularly for major results or breakthroughs, which was preferable as they avoid embargo periods, enabling faster dissemination and subsequently increased visibility of the research. Along with gold access, green access will be utilised for disseminating projects' outcomes, which, though relevant, are not considered major results or breakthroughs.

4 Data security

4.1 Prevention of data loss and data recovery

Significant human resources were allocated to building the various STAR-ProBio datasets. Once published, datasets are protected from data loss. For each file of each dataset the MD5 checksum of the file content is generated. This allows checking if all files remain fully unchanged.

Once datasets were finalised, they were stored safely in the same cloud infrastructure as research data from CERN's Large Hadron Collider. All files uploaded to Zenodo are stored in CERN's EOS service in an 18 petabytes disk cluster. Each file copy has two replicas located on different disk servers with 12-hourly backup cycle with one backup sent to tape storage once a week.

While work was still in progress, measures were needed to prevent data loss due to equipment failure, digital or physical theft, ransomware etc. Each person working on the STAR-ProBio project had a backup system in place within their organisation. The maximum time that only one copy of any research data existed was 48 hours. Within that period, the data must be backed up somewhere, even while working outside office or while traveling. STAR-ProBio does not impose any specific backup or cloud solution to its partners, but an automated backup system with maximum 48 hour intervals is mandatory.

4.2 Secure storage and transfer of sensitive data

For storage and transfer of sensitive data, the private area of the STAR-ProBio website was used.

The majority of STAR-ProBio's research was based on public information, was meant to be made public and IPR were not sought. In such cases, no specific security measures other than the backup requirement described in section 4.1 were needed.

For any data listed in annex I as not made public or under embargo, as well as any sensitive information received via interviews or case studies, the following restrictions applied:

For information in digital format:

- Must be stored only on hard drives with encryption, such as BitLocker;
- Transfer of sensitive data to occur uniquely via the private area of the STAR-ProBio website or by encrypted email.

For information in paper format:

- To be stored in a locked cabinet or office, where only a restricted, known number of people have access to it;
- Once the information has been processed and the raw data is no longer needed, appropriate long-term storage or destruction measures need to be taken.

5 Ethical aspects to data management

STAR-ProBio collected expert knowledge and opinions by means of interviews, questionnaires and Delphi exercises. The focus was on the participants' views related to standards, labels, policy, and bio-based product issues, collecting non-personal information. Sensitive issues were carefully avoided and, if any personal information was given, researchers ensured that the opinions cannot be directly associated to individuals. In general, individual names and organisations were not identified in the research. In the specific case of interviews, the minutes of each of them did not mention names but were labelled with an identifying code to allow easier consultation of documents. If individuals agreed to be quoted, researchers first verified the accuracy of quotes with the respondent before they were used.

Respondents were asked to sign an informed consent form, see Annex II. The template for this form, as well as other STAR-ProBio's ethical considerations of personal data can be found in STAR-ProBio's POPD (Protection of Personal Data, Deliverable 12.1, Version 1.0, 28 July 2017) and is included as Annex II to this document.

Annex I: Key information per STAR-ProBio dataset

This annex lists all 30 datasets identified in the project, providing an overview of their key characteristics, including whether or not they are public and tracking if and where each dataset is published.

See Table 1 for a summarised list of all datasets

For the completed individual datasets generated by the project, a specific file naming convention is used:

STAR-ProBio_[Short Title]_v[Version] _[Type]

It consists of:

STAR-ProBio	Project name, fixed
[Short Title]	Short descriptor for easy identification, maximum 40 characters
V[Version]	Version number in x.y format, should match a version number with a short description inside the document, such as the Document History table in this document
[Type]	Describes the type of data (e.g. publication, inventory, etc.)
.[extension]	File extension

Topic	Description
Dataset identifier	STAR-ProBio_CertificationCriteria_v1.0 _Spreadsheet
Dataset name	A comprehensive collection of sustainability criteria and indicators included in current sustainability certification schemes
Dataset description	Inventory of ~50 BIO-BASED ECONOMY policy documents including a brief characterisation and analysis regarding their potential impact on sustainability assessment activities
Dataset DOI	10.5281/zenodo.2546404
Dataset version history	V1.0 (final)
Key contact [Beneficiary]	Stefan Majer [DBFZ]
Dataset file format and size	Spreadsheet: STAR-ProBio_certification_criteria.xlsx (1.2 MB)
Associated WPs/Tasks/Deliverables/Milestones	T1.1
Other contributing beneficiaries	TU Berlin, UNITELMA, SQ Consult, ECOS, UWM, Unibo
Dataset public?	Yes
Published version(s)	Version 1: 10.5281/zenodo.2546405 Dec 22, 2017
Repository(-ies)	STAR-ProBio website, Zenodo
Keywords	bio-based economy; sustainability; policy framework; standardisation; sustainability criteria; gaps; sustainability assessment; indicator; criteria; SDGs
Licence	Creative Commons Attribution 4.0 International
Useful for whom?	Stakeholders from industry and science who are interested in the current EU BIO-BASED ECONOMY policy framework
Key data sources	The analysed documents are the main source

Topic	Description
Dataset identifier	STAR-ProBio_Schema&Standard gaps_v1.0_interviews
Dataset name	Existing schemes and standards gap analysis: expert interviews
Dataset description	Protocols of 20 expert interviews based on a detailed interview guide
Dataset DOI	Not applicable
Dataset version history	V1.0 22/12/2017
Key contact [Beneficiary]	Simone Wurster and Luana Ladu [TU Berlin]
Dataset file format and size	Part of a 3 MB .pdf text file
Associated WPs/Tasks/Deliverables/Milestones	WP1 Tasks 1.1 and 1.2 D1.1: Report on identified environmental, social and economic criteria/indicators/ requirements and related "Gap Analysis"
Other contributing beneficiaries	DBFZ, Unitelma, UoY
Dataset public?	No
If No, justification:	Consent form provided to experts explicitly says that responses will be treated confidentially. Part of a confidential deliverable. The results in an anonymous way are included in an annex to the deliverable (not publicly available).
Published version(s)	V1.0 (submission to the EU: 22/12/2017)
Repository(-ies)	STAR-ProBio non-public area
Keywords	sustainability assessment, sustainability criteria, standards, certification schemes, legislation
Licence	Not applicable
Useful for whom?	STAR-ProBio project: specification of the SAT-ProBio blueprint and development of a standardization document, foundation for recommendations in Deliverable 9.2 addressing target groups of all life cycle stages of bio-based products (e.g. industry, procurement, standardisation, certification, policy and science)
Key data sources	Interviews of experts

Topic	Description
Dataset identifier	STAR-ProBio_Existing standards_v1.0_inventory
Dataset name	Inventory of existing sustainability standards
Dataset description	European, national and international standards in the bio-based economy
Dataset DOI	Not applicable
Dataset version history	V1.0 22/12/2017
Key contact [Beneficiary]	Simone Wurster [TU Berlin]
Dataset file format and size	xlsx spreadsheet, 2 MB
Associated WPs/Tasks/Deliverables/Milestones	WP1 Task 1.2 D1.1
Other contributing beneficiaries	-
Dataset public?	No
If No, justification:	Sourced from database with restricted publication rights, results used for confidential deliverable. Text of standards is subject to copyright.
Published version(s)	NA (submission of D1.1 to the EU: 22/12/2017)
Repository(-ies)	TU Berlin
Keywords	Standards, bio-based, sustainable, life cycle assessment, recyclability
Licence	Not applicable
Useful for whom?	STAR-ProBio project: specification of the SAT-ProBio blueprint and the development of a CWA
Key data sources	Perinorm database

Topic	Description
Dataset identifier	STAR-ProBio EC sustainability research projects_v1.0_inventory
Dataset name	Inventory of the sustainability methodologies, indicators and criteria of research projects funded by the European Union
Dataset description	Detailed overviews for the results of 16 projects and summary. One of the datasets underlying Deliverable 1.1 of the STAR-ProBio project
Dataset DOI	10.5281/zenodo.3766456
Dataset version history	V1.0 (22/12/2017)
Key contact [Beneficiary]	Simone Wurster [TU Berlin]
Dataset file format and size	STAR-ProBio_Report_D1.1_annexes 5&6 (pdf, 0.4 MB)
Associated WPs/Tasks/Deliverables/Milestones	WP1 Task 1.2 D1.1
Other contributing beneficiaries	DBFZ, Unitelma, UoY, Novamont
Dataset public?	Yes
Published version(s)	V1.0 (22/12/2017)
Repository(-ies)	Zenodo
Keywords	sustainability assessment, sustainability criteria, standards, certification schemes, legislation
Licence	Creative Commons Attribution 4.0 International
Useful for whom?	STAR-ProBio project – various WPs involved in the development of sustainability methodologies, indicators and criteria
Key data sources	CORDIS database, deliverables of the relevant projects

Topic	Description
Dataset identifier	STAR-ProBio_Bio-based product value chain and stakeholder map v1 _Inventory
Dataset name	Bio-based product value chain and stakeholder map Matrix for the analysis and identification of the most promising bio-based value chains via two-tier multi-criteria decision analysis
Dataset description	A preliminary list of bio-based value chains was drawn partially from literature review and from the initial review of the value chain coverage by the sustainability and certification schemes, drawn from the analysis in T1.1 and T1.2. This preliminary list, drafted for analysis and knowledgeable contributions from consortium experts, on a secured Google spreadsheet, had been considered for selection and analysis towards T1.4: Identification of case studies and stakeholders. STAR-ProBio consortium partners were allocated to specific selection criteria based on their expertise to provide their recommendation (*yes/maybe/no*) to adopt a specific value chain towards the selection of an appropriate case study and provide sufficient information to support their decision. A second round assessment initiated with the collation of information, analysis and identification of national policies, bio-economy initiatives and growth plans established by individual EU member states. Owing to the direct contributions and viewpoints of consortium members in the selection of value-chains within this task, the appropriate documents with raw data were not published, respecting the affiliated confidentiality protocols.
Dataset DOI	Not applicable
Dataset version history	V1
Key contact [Beneficiary]	Kadambari Lokesh [UoY]
Dataset file format and size	Google drive .xlsx spreadsheet
Associated WPs/Tasks/Deliverables/Milestones	WP1 T1.3
Other contributing beneficiaries	UNITELMA, TUB, SQ Consult, DBFZ, Unibo, UWM and Novamont
Dataset public?	No
If No, justification:	The dataset contains raw data entailing the expert comments, recommendations and suggestions from consortium members, consent for publication was not acquired
Published version(s)	Not applicable
Repository(-ies)	UoY, Google drive
Keywords	Value chains, Weighting, Multi-criteria decision analysis
Licence	Not applicable
Useful for whom?	Researchers, Bioeconomy experts
Key data sources	Scientific peer reviewed literature, EC publications

Topic	Description
Dataset identifier	STAR-ProBio_D2.1_v1.4_Report
Dataset name	Findings of the literature review of 83 scientific articles on environmental indicators related to bio-based products
Dataset description	Dataset with review of 83 scientific articles assessing bio-based products, selected for their relevance to the framework of the STAR-ProBio project, it's synthesis and report of the results The review presents in quantitative terms the environmental indicators used by this sample of literature, grouped by "clusters", which are groups of similar indicators.
Dataset DOI	10.5281/zenodo.2545284
Dataset version history	1.4: FINAL VERSION (13/12/2017)
Key contact [Beneficiary]	Xavier Bengoa [Quantis]
Dataset file format and size	Full review annex (pdf, 34 MB) Review synthesis (pdf, 0.1 MB) Report (pdf, 2.1 MB)
Associated WPs/Tasks/Deliverables/Milestones	WP2 D2.1
Other contributing beneficiaries	Leader: Quantis, Partners: USC, AUA, Unibo, UWM, ChemProf
Dataset public?	Yes
Published version(s)	Version 1.3 10.5281/zenodo.2545285 Dec 13, 2017 History:0.1 First draft 0.2 Second draft 0.3 – 0.6 Draft content inclusion 0.7 Final draft 1.0 Submitted document 1.1 Submitted document with 2 additional annexes 1.2 Submitted document in pdf version 1.3 Change in title formulation 1.4 Correction in report information
Repository(-ies)	STAR-ProBio website, Zenodo
Keywords	Bio-based product; environmental indicator; life cycle impact assessment (LCIA); life cycle assessment (LCA)
License	Creative Commons Attribution 4.0 International
Useful for whom?	For all the Work packages, specially WP2, 3 and 4
Key data sources	Scientific peer-reviewed literature

Topic	Description
Dataset identifier	STAR-ProBio_D2.2_v1.2_Report
Dataset name	Selection of environmental indicators and impact categories for the life cycle assessment of bio-based products
Dataset description	This report describes the outcome from STAR-ProBio Task 2.3 which objective is to select the life cycle impact assessment (LCIA), standardised environmental indicators and impact categories that are relevant for the environmental life cycle assessment (E-LCA) of bio-based products. Indicators are made of impact categories (e.g.: eutrophication) coupled with impact assessment methodologies, or models (e.g.: how to quantify eutrophication on an impact scale)
Dataset DOI	10.5281/zenodo.2545342
Dataset version history	V1.2, FINAL VERSION This version is a revision of version 1.1 because of minor presentation bugs. It also contains additional annex files. Version 1.1 was a revision after identification of errors, notably in table 15.
Key contact [Beneficiary]	Xavier Bengoa [Quantis]
Dataset file format and size	SIMApro Dataset: STAR-ProBio method 0.5b.CSV (4.1 MB) GWPbio calculator : Guest_carbon_calculator_2019-01-31.xlsx (209 kB) Instructions: STAR-ProBio D2.2 method instructions.docx (16.1 kB) Report (deliverable 2.2): STAR-ProBio_D2.2_v1.2.pdf (1.1 MB) Explanatory slide deck: STAR-ProBio_T2.3_Indicators description.pptx (1.0 MB)
Associated WPs/Tasks/Deliverables/Milestones	WP2 D2.1
Other contributing beneficiaries	Leader: Quantis, Partners: USC, AUA, Unibo, UWM, ChemProf
Dataset public?	Yes
Published version(s)	Version 1.2: 10.5281/zenodo.3735831 Jul 24, 2018: This version is a revision of version 1.1 because of minor presentation bugs. It also contains additional annex files. Version 1.1 10.5281/zenodo.2545343 Jul 24, 2018: Revised version, clarifying that the biodiversity indicator relates to potentially affected species. Corrections are brought to table 15. A clarification on the choice of freshwater eutrophication is added.
Repository(-ies)	STAR-ProBio website, Zenodo
Keywords	Bio-based product; environmental indicator; life cycle impact assessment (LCIA); life cycle assessment (LCA)
Licence	Creative Commons Attribution 4.0 International
Useful for whom?	For all the Work packages, specially WP2, 3 and 4
Key data sources	Scientific peer-reviewed literature, European Commission's ILCD and PEF frameworks

Topic	Description
Dataset identifier	STAR-ProBio_LCI upstream processes _vFINAL _report
Dataset name	Life cycle inventory for production and upstream processing of selected feedstocks
Dataset description	Evaluation of the environmental impacts of maize, maize stover and sugar beet pulp production using life cycle assessment methodology. These products are the reference flows for the downstream environmental assessment (the final product).
Dataset DOI	10.5281/zenodo.3727771
Dataset version history	Final
Key contact [Beneficiary]	Iana Salim [USC]
Dataset file format and size	MS Word doc, STAR-ProBio D2.3 Final.docx (1.2 MB)
Associated WPs/Tasks/Deliverables/Milestones	WP2 D2.3
Other contributing beneficiaries	Leader: USC Partners: AUA, UWM, Unibo, ChemProf, Quantis
Dataset public?	Yes
Published version(s)	Version FINAL: 10.5281/zenodo.3727772 Aug 25, 2019
Repository(-ies)	STAR-ProBio website, Zenodo
Keywords	Life cycle inventory assessment (LCIA), upstream assessment, feedstock selection
Licence	Attribution
Useful for whom?	To all work package and stakeholders
Key data sources	Scientific peer-reviewed literature, SIMAPRO database, Field data.

Topic	Description
Dataset identifier	STAR-ProBio_Results LCA upstream processes_v1 _report
Dataset name	Life cycle impact assessment for production and upstream processing of selected feedstocks
Dataset description	This data is part of Task 2.5 and the main objective of the deliverable D2.4 is to perform a life cycle assessment of the upstream processing of bio-based products. More specifically, this report evaluates the environmental burdens of producing fermentable sugars from maize grain, maize stover and sugar beet pulp. The dataset is included in the from of annexes to the report.
Dataset DOI	10.5281/zenodo.3744238
Dataset version history	Final
Key contact [Beneficiary]	Iana Salim [USC]
Dataset file format and size	PDF document, STAR-ProBio-D2.4-FINAL.pdf (3.5 MB)
Associated WPs/Tasks/Deliverables/Milestones	WP2 D2.4
Other contributing beneficiaries	Leader: USC Partners: AUA, UWM, Unibo, ChemProf, Quantis
Dataset public?	Yes
Published version(s)	Version 1: 10.5281/zenodo.3744239 Mar 31, 2020
Repository(-ies)	STAR-ProBio website, Zenodo
Keywords	Life cycle inventory assessment (LCIA), upstream assessment, feedstock selection
Licence	Creative Commons Attribution 4.0 International
Useful for whom?	To all work packages and stakeholders
Key data sources	Scientific peer-reviewed literature, SIMAPRO database, Field data.

Topic	Description
Dataset identifier	STAR-ProBio_LCI for downstream LCA v1 _Inventory
Dataset name	Literature review and life cycle inventory for LCA of case studies
Dataset description	A life cycle inventory was developed, on a locked and protected spreadsheet for a single user, for the candidate case studies considered as a part of the life cycle assessment undertaken within this WP. The data for the candidate case studies were drawn from WP4, which is responsible for processing raw industrial data into processable clean data for life cycle impact analysis and interpretation. The dataset contains information about the material, energy consumption and other process specifications accounting the productivity of the technology considered from "manufacturing to formulation" phase. This dataset has not been published owing to the confidential nature of the industrial data shared with us.
Dataset DOI	Not applicable
Dataset version history	V1
Key contact [Beneficiary]	Kadambari Lokesh [UoY]
Dataset file format and size	.xlsx spreadsheet
Associated WPs/Tasks/Deliverables/Milestones	WP3
Other contributing beneficiaries	Quantis, AUA, UWM, USC
Dataset public?	No
If No, justification:	The dataset contains raw industrial data which is covered by the project's confidentiality procedures
Published version(s)	Not applicable
Repository(-ies)	UoY
Keywords	Life cycle inventory, case studies, Material use, energy consumption
Licence	Not applicable
Useful for whom?	Researchers
Key data sources	Scientific peer-reviewed literature, Industrial project partners, SimaPro databases

Topic	Description
Dataset identifier	STAR-ProBio_LCI for EoL_v1 _Inventory
Dataset name	End-of-life (EoL) life cycle inventory for the case studies
Dataset description	WP3 is currently at preliminary stages of literature review and method development with respect to the T3.3. We do not currently have the data/ datasets to populate the life cycle inventory for the managed end-of-life options for the bio-based case studies and it is a work in progress. However, similar to T3.2, the raw data received from literature review or the industry will be processed by WP4 members and transformed into useable technical information for use within WP3. Any updates on the dataset we receive will be provided in the upcoming reporting period.
Dataset DOI	Not applicable
Dataset version history	V1
Key contact [Beneficiary]	Kadambari Lokesh (UoY)
Dataset file format and size	.xlsx spreadsheet
Associated WPs/Tasks/Deliverables/Milestones	WP3
Other contributing beneficiaries	Quantis, AUA, UWM, USC
Dataset public?	No
If No, justification:	The dataset contains raw industrial data which is covered by the project's confidentiality procedures
Published version(s)	Not applicable
Repository(-ies)	UoY
Keywords	Life Cycle inventory, Datasets, product transformation, EoL
Licence	Not applicable
Useful for whom?	Researchers
Key data sources	Scientific peer-reviewed literature, Industrial project partners, SimaPro databases

Topic	Description
Dataset identifier	STAR-ProBio_D3.1_v1.0_Report
Dataset name	Expanding environmental sustainability criteria to address the manufacturing and other downstream processes for bio- based products
Dataset description	This report describes the creation of a set of sustainability criteria for the production processes ("downstream processes") of bio-based products, in compliance with standard life cycle assessment accounting (i.e.: ISO 14040 and EN 16760). These efficiency and circular indicators take place within a coherent set of environmental and techno-economic indicators, which are intended to be included in sustainability certification scheme. For this purpose, thresholds to these indicators are proposed and tested via case studies and data collection. In addition, these indicators' compliance to the EN 16751 framework is assessed.
Dataset DOI	10.5281/zenodo.3736124
Dataset version history	Final version (30/05/2019)
Key contact [Beneficiary]	Xavier Bengoa [Quantis]
Dataset file format and size	Report (pdf, 2.1 MB)
Associated WPs/Tasks/Deliverables/Milestones	WP3 D3.1
Other contributing beneficiaries	Leader: Quantis; Partners: UoY, AUA, UWM, USC)
Dataset public?	No (Restricted access)
If No, justification:	Confidential, only for members of the consortium (including the Commission Services)
Published version(s)	0.1 First draft, 0.2 – 0.4 Intermediate drafts, 0.5 Final draft for internal review, Version 1.0: 10.5281/zenodo.3736125 May 30, 2019
Repository(-ies)	Zenodo
Keywords	Bio-based products; life cycle assessment (LCA); sustainability criteria; impacts thresholds; planetary boundaries
Licence	Restricted access
Useful for whom?	For all the Work packages, especially WP2, 3, 4 and 8
Key data sources	Scientific peer-reviewed literature, European Commission's ILCD and PEF frameworks

Topic	Description
Dataset identifier	STAR-ProBio_Techno-economic Principles-Criteria-Indicators_v1.0_Spreadsheet.xls
Dataset name	Description of full chain Techno-Economic Sustainability Assessment (TESA) methodology
Dataset description	The dataset provides a preliminary description for techno-economic sustainability principles and criteria in relation to SAT-ProBio blueprint.
Dataset DOI	10.5281/zenodo.3766655
Dataset version history	Final version
Key contact [Beneficiary]	Demetres Briassoulis (AUA)
Dataset file format and size	.xlsx spreadsheet (17 kB)
Associated WPs/Tasks/Deliverables/Milestones	WP4 T4.1 to 4.4 D4.2
Other contributing beneficiaries	AUA, UWM
Dataset public?	Yes
Published version(s)	Version v1.0: 10.5281/zenodo.3766656 Apr 26, 2020
Repository(-ies)	Zenodo
Keywords	Bio-based products, sustainability, principles, techno-economic criteria, indicators
Licence	Creative Commons Attribution 4.0 International
Useful for whom?	To all partners
Key data sources	Scientific peer-reviewed literature, standards, regulations, data-bases, certification schemes related to bio-based products, STAR-ProBio partners and EAB contributions

Topic	Description
Dataset identifier	STAR-ProBio_Feedstock-Routes-EoL TESA methodology_v1.0 Deliverable.pdf
Dataset name	Techno-economic sustainability analysis methodology on resources for bio-based products, conversion routes and end-of-life alternative valorisation options
Dataset description	Techno-economic sustainability analysis (TESA) is a methodology framework to evaluate the performance of a process under technical and economic perspective. A process can be divided into three main sections, the resources required for bio-based products, the conversion routes for the production and finally, the end-of-life alternative valorisation options. Consequently, TESA is carried out separately in the three sections and evaluates the likelihood of their different technology scales and applications and their economic feasibility.
Dataset DOI	10.5281/zenodo.3766661
Dataset version history	V1.0 final
Key contact [Beneficiary]	Demetres Briassoulis (AUA)
Dataset file format and size	.pdf (5 MB)
Associated WPs/Tasks/Deliverables/Milestones	WP4 T4.1 to 4.3 D4.1
Other contributing beneficiaries	AUA, UWM
Dataset public?	Yes
Published version(s)	Version 1.0: 10.5281/zenodo.3766662 Apr 26, 2020
Repository(-ies)	Zenodo
Keywords	TESA methodology, Alternative feedstocks, bio-based production routes, End-of-Life
Licence	Creative Commons Attribution 4.0 International
Useful for whom?	To all partners
Key data sources	Scientific peer-reviewed literature

Topic	Description
Dataset identifier	STAR-ProBio_Feedstock-Routes-EoL-case studies_v1.0_ Executive summary.pdf
Dataset name	Definition of techno- economic sustainability criteria and LCC indicators for bio-based products
Dataset description	The dataset provides a set of sustainability principles to be fulfilled by the process or the product and develops a set of criteria and indicators to show how well these sustainability principles are fulfilled. Case-studies related on alternative feedstocks, bio-based products production routes, and EoL options are implemented in order to evaluate the proposed methodology.
Dataset DOI	10.5281/zenodo.3766707
Dataset version history	V1.0 final
Key contact [Beneficiary]	Demetres Briassoulis (AUA)
Dataset file format and size	.pdf (0.15 MB)
Associated WPs/Tasks/Deliverables/Milestones	WP4 T4.4 to 4.5 D4.2
Other contributing beneficiaries	AUA, UWM, ChemProf, NOVAMONT
Dataset public?	Yes
Published version(s)	Version 1.0: 10.5281/zenodo.3766708 Apr 26, 2020
Repository(-ies)	Zenodo
Keywords	Principles, Criteria, Indicators, Alternative feedstocks, bio-based production routes, End-of-Life
Licence	Creative Commons Attribution 4.0 International
Useful for whom?	To WP4 partners and other WPs to utilize the data in reports.
Key data sources	Scientific peer-reviewed literature, industry-based partners contribution

Topic	Description
Dataset identifier	STAR-ProBio_Conversion Routes- case studies_v1.0_ Report.pdf
Dataset name	Techno-economic sustainability analysis methodology for conversion routes of renewable feedstock resources to bio-based products – case studies
Dataset description	The dataset provides a set of sustainability principles, criteria and indicators for the evaluation of the conversion routes stage of a bio-based product. The selected cases studies on the employment of alternative feedstocks and production of the bio-based products are implemented in order to evaluate the proposed methodology. Mass and energy balances for all case studies, estimated techno-economic metrics, cost of externalities and risk assessment results are provided
Dataset DOI	10.5281/zenodo.3766744
Dataset version history	V1.0 final
Key contact [Beneficiary]	Apostolis Koutinas (AUA)
Dataset file format and size	.pdf (3.0 MB)
Associated WPs/Tasks/Deliverables/Milestones	WP4 D4.2
Other contributing beneficiaries	AUA, USC, NOVAMONT
Dataset public?	Yes
Published version(s)	Version 1.0: 10.5281/zenodo.3766745 Apr 26, 2020
Repository(-ies)	Zenodo
Keywords	Principles, Criteria, Indicators, Alternative feedstocks, Bio-based production routes, Techno-economic evaluation, Externalities
Licence	Creative Commons Attribution 4.0 International
Useful for whom?	To WP4 partners and others WPs to utilize the data in reports.
Key data sources	Scientific peer-reviewed literature, industry-based partners contribution

Topic	Description
Dataset identifier	STAR-ProBio_Delphi response_v1.0_ questionnaires
Dataset name	Delphi results of stakeholder sustainability preferences and expectations. For the consumers 2 rounds and for the professionals 3 rounds.
Dataset description	Views of different stakeholder groups regarding the acceptance of bio-based products, certification schemes and assessment criteria: underlying dataset for: • Deliverable D5.1: Acceptance factors among consumers and businesses for bio-based sustainability schemes • Deliverable D5.2: Results of the experiment / Case study
Dataset DOI	Not applicable
Dataset version history	V1.0
Key contact [Beneficiary]	Luana Ladu and Simone Wurster [TU Berlin]
Dataset file format and size	xlsx spreadsheets, 5 datasets (consumers 2 rounds, experts 3 rounds)
Associated WPs/Tasks/Deliverables/Milestones	WP5
Other contributing beneficiaries	SQ Consult, Unitelma, ECOS
Dataset public?	No
If No, justification:	GDPR-based requirement, respondents were promised the data is not passed on to third parties. In the LimeSurvey, the following phrase was included: "The collected data is used exclusively for scientific purposes and is scientifically processed by the STAR-ProBio project. It is not passed on to third parties outside the STAR-ProBio project. Your contact details will not be passed on to third parties outside the STAR-ProBio project. Aggregated survey results are used for scientific research and lectures. This work shall be made public. Names and e-mail addresses of participants will not be used for data analysis. " The aggregated results are included in two public deliverables Deliverable D5.1and Deliverable D5.2.
Published version(s)	Not applicable
Repository(-ies)	TU Berlin
Keywords	Sustainable bio-based products, assessment criteria, procurement, environment, social assessment
Licence	Not applicable
Useful for whom?	STAR-ProBio WPs involved in the development of the SAT-ProBio blueprint
Key data sources	Web-based survey, 1000+ participants

Topic	Description
Dataset identifier	STAR-ProBio_ WTP field experiment_v1.0 _Spreadsheet
Dataset name	Field experiment on consumer preferences for bio-based products
Dataset description	Dataset underlying D5.2: Field experiment comparing consumer choices on bio-based products vs. conventional products
Dataset DOI	10.5281/zenodo.3739078, Dataset and report
Dataset version history	V1 Final
Key contact [Beneficiary]	Enrica Imbert [Unitelma Sapienza]
Dataset file format and size	Dataset: xlsx spreadsheet (0.15 MB) Report: pdf document (1.5 MB)
Associated WPs/Tasks/Deliverables/Milestones	WP5 T5.3; D5.2
Other contributing beneficiaries	TU Berlin; SQ Consult; ECOS
Dataset public?	Yes
Published version(s)	V1: 10.5281/zenodo.3739079 Jul 30, 2019
Repository(-ies)	STAR-ProBio website, Zenodo
Keywords	willingness to pay; field experiment
Licence	Creative Commons Attribution 4.0 International
Useful for whom?	Scholars and practitioners interested in consumers' willingness to pay for bio-based products
Key data sources	Field experiment involving consumers and interviews

Topic	Description
Dataset identifier	STAR-ProBio_End of Life_v1.0_Inventory
Dataset name	Social and economic criteria referred to the End of Life management. It reports both weights and values of these criteria.
Dataset description	Dataset underlying STAR-ProBio Deliverable D6.4, Report on end-of-life social and socio-economic assessment. End of Life (EoL) management represents a great challenge to develop new opportunities towards sustainability. This report focuses on the existing EoL options with the aim of identifying key community priorities for sustainable EoL management of bio-based products. This is achieved by developing a win-win asset-based model that has been tested on a selected case study, i.e. Poly Lactic Acid (PLA)-based packaging film. The results show that recycling (both mechanical and chemical) is the best EoL option for the considered product.
Dataset DOI	10.5281/zenodo.3739111, Dataset and report
Dataset version history	V1 (Final)
Key contact [Beneficiary]	Idiano D'Adamo [Unitelma Sapienza]
Dataset file format and size	Dataset: xlsx spreadsheet (.zip, 1.8 MB) Report: pdf document (1.4 MB)
Associated WPs/Tasks/Deliverables/Milestones	WP6 T6.4; D6.4
Other contributing beneficiaries	TUB, SEPA, USC
Dataset public?	Yes
Published version(s)	Version 1: 10.5281/zenodo.3739112 May 30, 2019
Repository(-ies)	STAR-ProBio website, Zenodo
Keywords	bio-based products; end of life; multicriteria analysis; sustainability; win-win asset-based model
Licence	Creative Commons Attribution 4.0 International
Useful for whom?	Scholars and practitioners interested in end of life of bio-based products
Key data sources	Multicriteria analysis involves experts of end of life

Topic	Description
Dataset identifier	STAR-ProBio_Social criteria and indicators validation_v1.0_Spreadsheet
Dataset name	Stakeholder validation and integration of the identified list of social impact categories, subcategories and indicators
Dataset description	Stakeholder validation and integration of the list of social impact categories, subcategories and indicators identified in the D6.1 This dataset has also been used for these two publications: • **Imbert, E., & Falcone, P. M. (2020). Social Assessment. Transition Towards a Sustainable Biobased Economy, 64, 166** • **Falcone, P. M., González García, S., Imbert, E., Lijó, L., Moreira, M. T., Tani, A., ... & Morone, P. (2019). Transitioning towards the bio-economy: Assessing the social dimension through a stakeholder lens. Corporate Social Responsibility and Environmental Management, 26(5), 1135-1153.**
Dataset DOI	10.5281/zenodo.3739357
Dataset version history	V1
Key contact [Beneficiary]	Pasquale Marcello Falcone [Unitelma]
Dataset file format and size	xlsx spreadsheet (25kB)
Associated WPs/Tasks/Deliverables/Milestones	WP6 D6.2
Other contributing beneficiaries	USC, TUB
Dataset public?	Yes
If No, justification:	
Published version(s)	V1: 10.5281/zenodo.3739358 Apr 3, 2020
Repository(-ies)	Zenodo
Keywords	Stakeholder analysis, validation, social impact categories, social indicators
Licence	Creative Commons Attribution 4.0 International
Useful for whom?	Scholars and practitioners interested in bio-based products' most relevant social indicators according to stakeholders
Key data sources	Interviews from four workshops conducted with a selected group of stakeholders covering all categories, i.e. workers, consumers, local community, value chain actors and the general society, with the specific aim of validating the value items' list.

Topic	Description
Dataset identifier	STAR-ProBio_ILUCLiteratureReview_v1.0 _Spreadsheet
Dataset name	Comprehensive review of existing key drivers, parameters and standards related to ILUC risk.
Dataset description	Inventory of existing key drivers and parameters for ILUC quantification and future strategies to reduce ILUC risks, and collection of standardisation work related to the sustainability of biofuels and biomaterials.
Dataset DOI	10.5281/zenodo.3733325
Dataset version history	V1.0 Published version
Key contact [Beneficiary]	Eva Merloni [UNIBO]
Dataset file format and size	.xlsx spreadsheet (158 kB)
Associated WPs/Tasks/Deliverables/Milestones	WP7 Deliverable 7.1
Other contributing beneficiaries	TUB, DBFZ, UWM, QUANTIS SARL, USC and ECOS
Dataset public?	Yes
Published version(s)	Version 1: 10.5281/zenodo.3733326 Mar 30, 2020
Repository(-ies)	Zenodo (jointly with directly related datasets)
Keywords	Indirect Land Use Change (ILUC); bio-based economy; Key drivers; parameters; indicators; standards.
Licence	DataCite Metadata Schema
Useful for whom?	Other work package partners, researchers, experts in ILUC, stakeholders from industry, standardisation and science interested in the status quo of LUC approaches
Key data sources	Scientific peer-reviewed literature

Topic	Description
Dataset identifier	STAR-ProBio_ModelParameters_v13.0 _Spreadsheet
Dataset name	SydILUC model semantics parameters for the calibrated model with "realistic" future projection of the data (for the validation part)
Dataset description	Inventory of parameters and relationships used in the SydILUC model, with related metadata, i.e. source (literature), units, etc...
Dataset DOI	10.5281/zenodo.3733325
Dataset version history	V 13.0 (all other versions shared with WP7 partners)
Key contact [Beneficiary]	Enrico Balugani [UNIBO]
Dataset file format and size	.xlsx spreadsheet (43 kB)
Associated WPs/Tasks/Deliverables/Milestones	WP7
Other contributing beneficiaries	UniBO
Dataset public?	Yes
Published version(s)	Version 13: 10.5281/zenodo.3733326 Mar 30, 2020
Repository(-ies)	Zenodo (jointly with directly related datasets)
Keywords	bio-based economy; feedstock market data; elasticity functions; sustainability assessment; indicator
Licence	Creative Commons Attribution 4.0 International
Useful for whom?	Other work package partners, researchers, experts in ILUC
Key data sources	Various (indicated in the document)

Topic	Description
Dataset identifier	STAR-ProBio_CalibrationGlobalFAOSTAT_v3.0_Spreadsheet
Dataset name	FAOSTAT data used for the SydILUC model
Dataset description	SydILUC model historical dataset of Maize market and production data to feed, calibrate, validate and run the model
Dataset DOI	10.5281/zenodo.3733325
Dataset version history	V 1.0 (all other versions shared with WP7 partners)
Key contact [Beneficiary]	Enrico Balugani [UNIBO]
Dataset file format and size	.xlsx spreadsheet (54 kB)
Associated WPs/Tasks/Deliverables/Milestones	WP7
Other contributing beneficiaries	UniBO
Dataset public?	Yes (but data is actually from FAOSTAT)
Published version(s)	Version 1: 10.5281/zenodo.3733326 Mar 30, 2020
Repository(-ies)	Zenodo (jointly with directly related datasets)
Keywords	Global Maize production, price, use, yields.
Licence	Creative Commons Attribution 4.0 International
Useful for whom?	Other work package partners, researchers, experts in ILUC
Key data sources	Various (indicated in the document)

Topic	Description
Dataset identifier	STAR-ProBio_MaizeNationalFAOSTAT_v1.0 _Spreadsheet
Dataset name	FAOSTAT data used for the SydILUC model, tier 2
Dataset description	SydILUC model historical dataset of Maize market and production data to feed, calibrate, validate and run the model – for the regional version of the model
Dataset DOI	10.5281/zenodo.3733325
Dataset version history	V 1.0 (all other versions shared with WP7 partners)
Key contact [Beneficiary]	Enrico Balugani [UNIBO]
Dataset file format and size	.xlsx spreadsheet (6.3 MB)
Associated WPs/Tasks/Deliverables/Milestones	WP7
Other contributing beneficiaries	UniBO
Dataset public?	Yes (but data is actually from FAOSTAT)
Published version(s)	Version 1: 10.5281/zenodo.3733326 Mar 30, 2020
Repository(-ies)	Zenodo (jointly with directly related datasets)
Keywords	Global Maize production, price, use, yields.
Licence	Creative Commons Attribution 4.0 International
Useful for whom?	Other work package partners, researchers, experts in ILUC
Key data sources	Various (indicated in the document)

Topic	Description
Dataset identifier	STAR-ProBio_BioplasticProductionSydILUC_v1.0 _Spreadsheet
Dataset name	Bioplastic production pathways with yields, for the SydILUC model
Dataset description	Collection of all the yields for different bioplastics from different sources (sugar, starch, oil) – from the document "Biopolymers facts and statistics", 2017 by IfBB
Dataset DOI	10.5281/zenodo.3733325
Dataset version history	V 1.0 (all other versions shared with WP7 partners)
Key contact [Beneficiary]	Enrico Balugani [UNIBO]
Dataset file format and size	.xlsx spreadsheet (93 kB)
Associated WPs/Tasks/Deliverables/Milestones	WP7
Other contributing beneficiaries	UniBO
Dataset public?	Yes (but data is actually from IfBB)
Published version(s)	Version 1: 10.5281/zenodo.3733326 Mar 30, 2020
Repository(-ies)	Zenodo (jointly with directly related datasets)
Keywords	Bioplastic production, yields, processing routes, feedstock, land use.
Licence	Creative Commons Attribution 4.0 International
Useful for whom?	Other work package partners, researchers, experts in ILUC
Key data sources	Various (indicated in the document)

Topic	Description
Dataset identifier	STAR-ProBio_SWOT/PEST_factors_v1.0 _Spreadsheet
Dataset name	Results of SWOT/PESTEL analyses for selected bio-products
Dataset description	The dataset provide SWOT/PESTEL analysis, including identification of SWOT/PESTEL factors in the aspect of improvements of the current sustainability schemes and exemplary approach to weighing indicators attributed to the factors.
Dataset DOI	10.5281/zenodo.3743060
Dataset version history	V1.0 (Final)
Key contact [Beneficiary]	Janusz Gołaszewski [UWM]
Dataset file format and size	.xlsx spreadsheet: SWOT-PEST_factors.xlsx (5.5 MB)
Associated WPs/Tasks/Deliverables/Milestones	WP8/T8.1-3/D8.1
Other contributing beneficiaries	All partners
Dataset public?	Yes
Published version(s)	Version 1: 10.5281/zenodo.3743061 Apr 7, 2020
Repository(-ies)	Zenodo
Keywords	SWOT, PESTEL, sustainability schemes, indicators, weighing
Licence	Creative Commons Attribution 4.0 International
Useful for whom?	To all WP8 partners, especially dealing with improvements of the current sustainability schemes and potential policies, stakeholders
Key data sources	Scientific peer-reviewed literature, standards, certification schemes related to bio-based products, partners contribution

Topic	Description
Dataset identifier	STAR-ProBio_ Principles-Criteria-Indicators _v1_Spreadsheet
Dataset name	Inventory of principles and criteria in relation to SAT-ProBio blueprint
Dataset description	The dataset provide preliminary indication for principles and criteria in relation to SAT-ProBio blueprint as well as a compilation of available data related to sustainability principles, criteria and indicators provided by EN 16751 and STAR-ProBio project partners USC-UNITELMA et al. on social indicators and Quantis et al. on selected environmental indicators.
Dataset DOI	10.5281/zenodo.3743071
Dataset version history	Version 1 (Final)
Key contact [Beneficiary]	Janusz Gołaszewski [UWM]
Dataset file format and size	.xlsx spreadsheet: PCI dataset.xlsx (1.4 MB)
Associated WPs/Tasks/Deliverables/Milestones	WP8/T8.1-3, T8.5/D8.1-2
Other contributing beneficiaries	All project partners
Dataset public?	Yes
Published version(s)	Version 1: 10.5281/zenodo.3743072 Apr 7, 2020
Repository(-ies)	Zenodo
Keywords	Bio-based products, sustainability, principles, criteria, indicators
License	Creative Commons Attribution 4.0 International
Useful for whom?	To all WP8 partners, industry, researchers
Key data sources	Scientific peer-reviewed literature, standards, certification schemes related to bio-based products, STAR-ProBio partners contribution

Topic	Description
Dataset identifier	STAR-ProBio_CertificationCriteria_v1.0 _Spreadsheet STAR-ProBio_T9.1BEPoliciesMatrix_v1.0_Spreadsheet
Dataset name	Inventory of relevant existing bio-based economy related policies, strategies and regulations, 2 directly related datasets
Dataset description	Inventory of ~50 BIO-BASED ECONOMY policy documents including a brief characterisation and analysis regarding their potential impact on sustainability assessment activities • STAR-ProBio_CertificationCriteria_v1.0 _Spreadsheet.xlsx **is the inventory of ~50 BIO-BASED ECONOMY policy documents including a brief characterisation and analysis regarding their potential impact on sustainability assessment activities** • STAR-ProBio_T9.1BEPoliciesMatrix _v1.0_Spreadsheet.xlsx **is the matrix covering the inventory presented in the document STAR-ProBio_CertificationCriteria_v1.0 _Spreadsheet.xlsx**
Dataset DOI	10.5281/zenodo.3738152
Dataset version history	V1.0
Key contact [Beneficiary]	Stefan Majer [DBFZ]
Dataset file format and size	Two .xlsx spreadsheets: STAR-ProBio_CertificationCriteria_v1.0_Spreadsheet (1.2 MB) STAR-ProBio_T9.1BEPoliciesMatrix_v1.0_Spreadsheet (34 kB)
Associated WPs/Tasks/Deliverables/Milestones	WP9 T9.1
Other contributing beneficiaries	TU Berlin, UNITELMA, SQ Consult, ECOS, UWM, Unibo
Dataset public?	Yes
Published version(s)	Version 1: 10.5281/zenodo.3738153 Apr 2, 2020
Repository(-ies)	Zenodo
Keywords	bio-based economy; sustainability; policy framework; standardisation; sustainability criteria; gaps; sustainability assessment; indicator; criteria; SDGs
Licence	Creative Commons Attribution 4.0 International
Useful for whom?	Stakeholders from industry and science who are interested in the current EU BIO-BASED ECONOMY policy framework
Key data sources	The analysed documents are the main source

Topic	Description
Dataset identifier	STAR-ProBio_Eco-labels_overview_V1.0_Spreadsheet
Dataset name	Analysis of EU (eco-) labels
Dataset description	Overview of criteria and indicators for environmental, social and economic product characteristics in 42 eco-labels
Dataset DOI	Not applicable
Dataset version history	V1.0
Key contact [Beneficiary]	Luana Ladu and Simone Wurster [TU Berlin]
Dataset file format and size	xlsx spreadsheet
Associated WPs/Tasks/Deliverables/Milestones	T9.2
Other contributing beneficiaries	AUA, ECOS
Dataset public?	No
If No, justification:	Used for internal analyses to create D9.2 D9.2 presents aggregated results in a reader-friendly format, at the highest practically feasible level of detail. D9.2: Recommendations for Standards and criteria for eco-labels for bio-based products
Published version(s)	Not applicable
Repository(-ies)	TU Berlin
Keywords	eco-labels, EU Ecolabel, Blauer Engel, Nordic Swan, bio-based content, biodegradability, recyclability, toxicity, CO_2 emissions
Licence	Not applicable
Useful for whom?	The aggregated results are useful for STAR-ProBio (development of the SAT-ProBio blueprint) as well as for stakeholders from industry, standardisation, certification and science
Key data sources	Ecolabel index, assessment and certification guidelines as well as related documents of the various schemes

Topic	Description
Dataset identifier	STAR-ProBio_T9.4BEMonitoringActivities_1.0_Spreadsheet
Dataset name	Inventory of existing monitoring options of the socio-economic and environmental consequences of developing a bio-based economy
Dataset description	STAR-ProBio_T9.4BEMonitoringActivities_1.0_Spreadsheet.xlsx is the matrix with a description of BIO-BASED ECONOMY monitoring activities (with both, public and private activities) from EU and EU member states. The overview includes a brief characterisation of the activities, describing the type of data reported, reporting formats and periods, etc.
Dataset DOI	10.5281/zenodo.3738152
Dataset version history	V1.0
Key contact [Beneficiary]	Stefan Majer [DBFZ]
Dataset file format and size	.xlsx spreadsheet (33 kB)
Associated WPs/Tasks/Deliverables/Milestones	WP9 T9.4
Other contributing beneficiaries	TU Berlin, UNITELMA, SQ Consult, ECOS
Dataset public?	Yes
Published version(s)	Version 1: 10.5281/zenodo.3738153 Apr 2, 2020
Repository(-ies)	Zenodo
Keywords	bio-based economy; sustainability; policy framework; monitoring; material flow; biomass trade; sustainability criteria; sustainability assessment; indicator;
Licence	Creative Commons Attribution 4.0 International
Useful for whom?	Stakeholders from industry and science who are interested in an overview on BIO-BASED ECONOMY monitoring and BIO-BASED ECONOMY impact assessment activities
Key data sources	The analysed documents are the main source

Annex II: STAR-ProBio Informed consent template

Informed consent form

Project STAR-ProBio

Sustainability Transition Assessment and Research of Bio-based Products

I consent to participate in the European Union-funded[3] STAR-ProBio research project[4] conducted by NAME of the INSTITUTION. I am aware that the purpose of this research is to support the European Commission in the full implementation of European policy initiatives, including the Lead Market Initiative in bio-based products, the industrial policy and the European Bio-economy Strategy. The research will furthermore be disseminated more widely, e.g. in academic papers, briefing papers, media etc.

This research will involve an interview lasting up to 1 hour where I will be invited to discuss my knowledge about this area with particular reference to the experience of my organisation.

I understand that I am participating in this research voluntarily and that I am free to terminate the interview at any time. I am also aware that I am free to refuse to answer any questions that I feel are commercially or institutionally sensitive or relate to topics that I do not wish to discuss. I understand that I have the right to ask questions and receive understandable answers before making any decision.

I understand that I will only be asked to provide professional, not personal, information and that if I wish, the record of my involvement in the research will be kept confidential. I have been informed that everything I say will be anonymous and if I wish, I can remain anonymous in future published material. The interview data will be recorded via paper notes/tape recorder and I understand that I can request a copy of the notes/transcript to review if I wish. I understand that I am also allowed to delete or make any changes to the notes/transcript if I feel my answers could be improved or clarified. I understand that this research will be used to develop sustainability assessment tools for bio-based products, and by developing credible cases for bio-based products with the highest actual market penetration and highest potential for the future markets.

I understand that should the research team consider making the anonymised data from this interview available by open access I will be contacted for a second informed consent regarding this step.

I understand that this research conforms to European Commission guidelines and that it has been approved by the Ethics Committee in the Cooperation theme of the Horizon 2020 Research and Innovation Programme. Finally, I have been given the contact details of the research team and I have been informed that I am free to contact Professor Piergiuseppe Morone (Project Coordinator) about any queries relating to my data or the project itself.

[3] Grant agreement no. 727740 of the Horizon 2020 research and innovation programme. Work Programme BB-01-2016: Sustainability schemes for the bio-based economy.

[4] Website: http://www.star-probio.eu/

Lead researchers: Insert name of person conducting the research activity

Participant Identification Number for this project: **Please initial box**

1. I confirm that I have read and understand the information sheet/letter (delete as applicable) dated *[insert date]* explaining the above research proj and I have had the opportunity to ask questions about the project. ☐
2. I understand that my participation is voluntary and that I am free to withdra at any time without giving any reason and without there being any negative consequences. In addition, should I not wish to answer any particular question or questions, I am free to decline and can contact *Project Coordinator Professor Piergiuseppe Morone on* *piergiuseppe.morone@unitelma.it* ☐
3. I understand that my responses will be kept strictly confidential ☐
   •
4. I give permission for members of the research team to have access to my anonymised responses. I understand that my name will not be linked with the research materials, and I will not be identified or identifiable in the report or reports that result from the research. ☐
5. I agree for the data collected from me to be used in future research ☐
6. I agree to take part in the above research project. ☐

_____	_____	_____
Name of Participant (*or legal representative*)	Date	Signature
_____	_____	_____
Name of person taking consent (*if different from lead researcher*)	Date	Signature
_____	_____	_____
Lead Researcher	Date	Signature

Copies:

Once this has been signed by all parties the participant should receive a copy of the signed and dated participant consent form, the letter/pre-written script/information sheet and any other written information provided to the participants. A copy of the signed and dated consent form should be placed in the project's main record (e.g. a site file), which must be kept in a secure location.

Information Sheet form - Project STAR-ProBio - Grant Agreement Number 727740

Sustainability Transition Assessment and Research of Bio-based Products

STAR-ProBio supports the European Commission in the full implementation of European policy initiatives, including the Lead Market Initiative in bio-based products, the industrial policy and the European Bio-economy Strategy.

STAR-ProBio does so by developing sustainability assessment tools for bio-based products, and by developing credible cases for bio-based products with the highest actual market penetration and highest potential for the future markets.

STAR-ProBio integrates scientific and engineering approaches with social sciences and humanities-based approaches to formulate guidelines for a common framework promoting the development of regulations and standards supporting the adoption of business innovation models in the bio-based products sector.

The aim of STAR-ProBio is to cover gaps in the existing framework for sustainability assessment of bio-based products, and improve consumer acceptance for bio-based products by identifying the critical sustainability issues in their value chains.

STAR-ProBio constitutes a multidisciplinary project that will:

- meet environmental, social and economic challenges, paving the way for a much-needed sustainability transition towards a bio-based economy;
- promote a more efficient and harmonized policy regulation framework;
- boost the market-pull of bio-based products within the context on a sustainable 21st Century.

The overall objective of the project is to promote a more efficient and harmonized policy regulation framework for the market-pull of bio-based products. This will be achieved by developing a fit-for-purpose sustainability scheme, including standards, labels and certifications.

An integral part of STAR-ProBio is the adoption of life-cycle methodologies to measure Environmental, techno-economic and social impacts, and comprehensively assess the roll-out of bio-based products. The analysis of selected case studies on construction materials, bio-based polymers, and fine chemicals, will ensure that the approach is not too broad and theoretic, allowing the benchmarking against non-bio-based products.

The specific objectives of STAR-ProBio are to:

- Develop a fit-for-purpose sustainability scheme;
- Identify gaps regarding sustainability indicators, requirements and criteria;
- Develop a sound and harmonised approach for environmental LCA, Social-LCA and techno-economic LCC assessment of bio-based products;
- Enhance the reliability of sustainability certifications and standards;
- Assess the effectiveness of the proposed sustainability scheme for selected case studies;
- Develop an approach to identify and mitigate the risk of negative ILUC effects;
- Encourage market pull for bio-based products through the assessment of consumers' preferences and acceptance;

- Spread awareness about sustainable production of bio-based products among farmers associations, industries, EU bodies, entrepreneurs and stakeholders from the civil society.

The STAR-ProBio consortium is integrated by:

- UNITELMA Sapienza University of Rome, Italy (Consortium leader)
- University of York, United Kingdom
- Technische Universität Berlin, Germany
- Agricultural University of Athens, Greece
- DBFZ, Germany
- SQ Consult B.V., The Netherlands
- University of Bologna, Italy
- Uniwersytet Warminsko Mazurski W Olsztynie, Poland
- ChemProf, Poland
- Quantis SARL, Switzerland
- Novamont SPA, Italy
- Naturvardsverket, Sweden
- Universidad de Santiago de Compostela, Spain
- European Environmental Citizens Organisation for Standardisation, Belgium
- agroVet GmbH, Austria

STAR-ProBio receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 727740, Work Programme BB-01-2016: Sustainability schemes for the bio-based economy.

Additional information can be found here: www.star-probio.eu