# BioMates

Public Summary of Deliverable D 5.2

**IPR – risk management report**

*Version 01*

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| Grant Agreement number: | 727463 |
| Project Acronym: | BioMates |
| Project title: | Reliable Bio-based Refinery Intermediates — BioMates |
| Start date of the project: | 01.10.2016 |
| Duration of the project: | 30.09.2020 |
| Deliverable N°.: | D12 |
| Relative Deliverable N°.: | D5.2 |
| Work Package N°. Task N°.: | WP5 (Task 5.3) |
| Deliverable title | IPR – risk management report |
| Scheduled date of submission | 31/10/2017 |
| Date of submission of Version 01: | 30/10/2017 |
| Version: | 01 |
| Date of submission of this version: | 30/10/2017 |
| Dissemination Level: | Complete deliverable: Confidential, only for members of the consortium (including the Commission Services)<br>**This summary: Public** |
| Project website address: | www.biomates.eu |
| The deliverable is elaborated on the basis of | the original Grant Agreement |
| Submitting party: | UCTP |
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| Verification: | Report with public summary |

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 727463.

## Contents

# 1. Introducing BioMates

## 1.1. The BioMates Project

The BioMates project aspires in combining innovative 2nd generation biomass conversion technologies for the cost-effective production of *bio*-based inter*me*di*ates* (BioMates) that can be further upgraded in existing oil refineries as renewable and reliable co-feedstocks. The resulting approach will allow minimisation of fossil energy requirements and therefore operating expense, minimization of capital expense as it will partially rely on underlying refinery conversion capacity, and increased bio-content of final transportation fuels.

The BioMates approach encompasses innovative non-food/non-feed biomass conversion technologies, including **ablative fast pyrolysis (AFP)** and single-stage **mild catalytic hydroprocessing (mild-HDT)** as main processes. Fast pyrolysis in-line-catalysis and fine-tuning of BioMates-properties are additional innovative steps that improve the conversion efficiency and cost of BioMates technology, as well as its quality, reliability and competitiveness. Incorporating **electrochemical $H_2$-compression** and the state-of-the-art **renewable $H_2$-production** technology as well as **optimal energy integration** completes the sustainable technical approach leading to improved sustainability and decreased fossil energy dependency. The overall BioMates-Concept is illustrated in Figure 1.

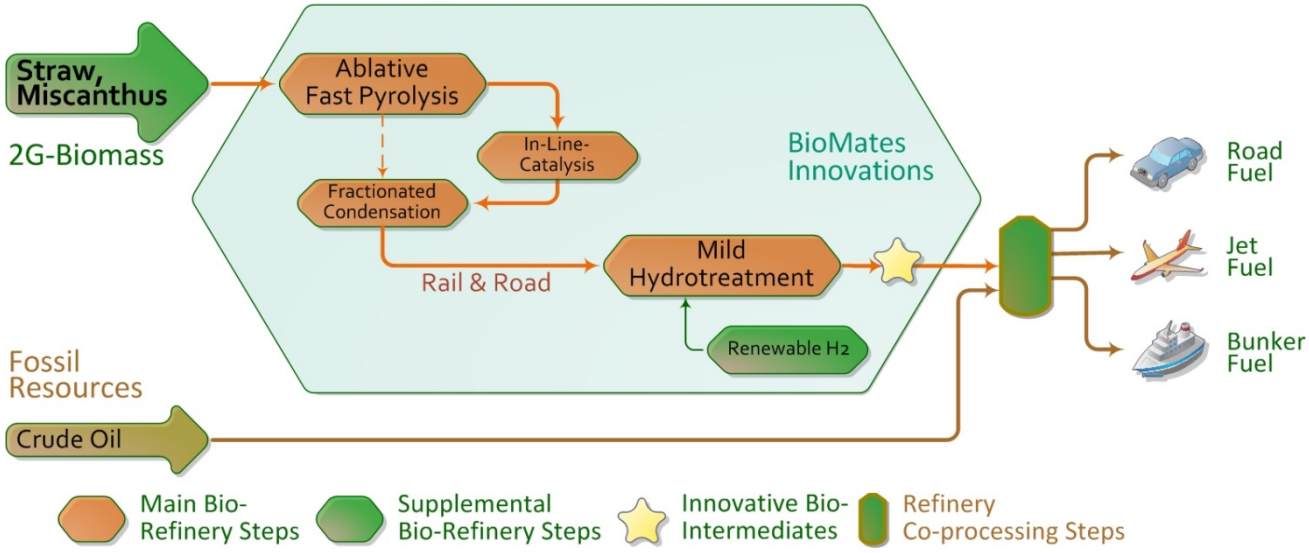


Figure 1: The BioMates-concept

The proposed technology aims to effectively convert residues and non-food/feed plants or commonly referred to as 2nd Generation (straw and short rotating coppice like miscanthus) biomass into high-quality bio-based intermediates (BioMates), of compatible characteristics with conventional refinery conversion units, allowing their direct and risk-free integration to any refinery towards the production of hybrid fuels.

## 1.2. European Commission support

The current framework strategy for a Resilient Energy European Union demands energy security and solidarity, a decarbonized economy and a fully-integrated and competitive pan-European energy market, intending to meet the ambitious 2020 and 2030 energy and climate targets /EC-2014a, EC-2014b/. Towards this goal, the European Commission is supporting the BioMates project for validating the proposed innovative technological pathway, in line with the objectives of the LCE-08-2016-2017 call /EC-2015/. This

project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 727463.

### 1.3. The BioMates team

The BioMates team comprises eight partners from industry, academia and research centres:

- Fraunhofer Institute for Environmental, Safety, and Energy Technology UMSICHT, Germany (Project Coordination) - *www.umsicht.fraunhofer.de*
- Centre for Research & Technology Hellas / CERTH - Chemical Process & Energy Resources Institute / CPERI, Greece - *http://www.cperi.certh.gr/*
- University of Chemistry and Technology Prague, Czech Republic - *http://www.vscht.cz*
- Imperial College London, United Kingdom *www.imperial.ac.uk*
- Institut für Energie und Umweltforschung Heidelberg GmbH / ifeu, Germany - *www.ifeu.de*
- Hydrogen Efficiency Technologies B.V. / HyET, Netherlands - *www.hyet.nl*
- RANIDO, s.r.o., Czech Republic *http://www.ranido.cz/*
- BP Europa SE, Germany www.bp.com/en/bp-europa-se.html

For additional information and contact details, please visit *www.biomates.eu*.

## 2. Preface

Intellectual property rights are one of the most valuable products of applied research, therefore the protection of knowledge and information which leads to patents and other forms of IPR is of concern without any doubt. The problems and risks are related not only to the protection of knowledge acquired by the Consortium during BioMates project, but also prevention against issues connected with misusage of third-party IPR by any of the Consortium members.

Risk management is a process continuing throughout the lifetime of a project and addresses the planning of risk management, identification, analysis, monitoring and control. The main purpose of the report is to suggest an approach how to deal with potential risks linked with intellectual property rights protecting knowledge gained in BioMates project as well as third-party IPR. The status in IPR for the first 13 months of the project is covered as well. The document is focused on both risk management in general or addressing specific questions and IPR – risks dealt within BioMates project.

## 3. Risk management framework in general

Risk management in general aims at identification, quantification, treatment and evaluation methods to reduce risk connected with various activities. Successful risk management process should be carried out continuously with accented proactivity. Appropriate strategies for risk mitigation should comprise of identification, assessment, treatment and monitoring. Following paragraphs will deal shortly with these parts of risk management procedures with respect to IPR protection.

## 3.1. Risk identification

During the course of a project, varying IPR related risks can arise depending on a particular activity or phase of the project, such as research, dissemination of results, their protection using different tools (especially patents) or commercialization (e.g. by licensing). Most common types of risk in research and development IPR are wasting costs by duplicating research due to insufficient prior art search in the project development phase, using protected third-party knowledge in research, IPR disputes of cooperative parties if results joint ownership is poorly treated, or losing revenues by not claiming intellectual property right after completion the research or development.

## 3.2. Risk assessment

Risk evaluation is commonly carried out using well known formula “risk = impact * probability”, showing that both extent of damages as well as their likelihood are important when deciding if particular risk is acceptable or not.

Impact could be scaled (how “serious” it is) usually by three-point scale of low, medium and high (sometimes minor, moderate, or significant). Similar scale could be used to express the likelihood of the issue occurrence. Impacts of risks lie on consequences caused by occurring untreated risk, which can be of financial and non-financial nature - such as grant reduction or penalties, costly legal battles or fines, missed commercialisation opportunities, loss of potential sources of new funds, or loss of reputation.

It is important to say that assessing risk of non-technical nature such as that related with legal issues is often difficult, especially in cases where there are no tools for exact quantification of impacts (like in case of costs) and probabilities.

## 3.3. Risk treatment

Risk treatment is the process of choosing and implementing suitable measures to resolve risk. Risk treatment measures can include avoiding, acceptance and mitigation or transferring risk. The measures should be selected according to risk strategies developed for specific areas or activities.

Avoidance or prevention – the risk is not taken due to appropriate and preventive action. Prevention is the main and most effective way to reduce risk in research and development. Carefully conducted patent searches and analysis is the basic tool to ensure the freedom to operate and prevent IPR infringement as well as duplicating research due to poor knowledge on state of the art in respective areas.

Acceptance/mitigation – the risk is accepted without any preventive measure (e.g. if the probability and/or impact is small or even negligible), or the risk is decreased by mitigation of the likelihood or impact. In IPR, this approach is rarely used.

Transfer – the risk is handed over to another entity; e.g. transferring intellectual property rights itself could enable avoiding some types of risk (while “gaining” other risks, e.g. complete loss of acquired IPR if improper selection of third party for IPR transfer is carried out).

Several risks are associated with clearance of third-party rights, if their use is necessary. The process can be time consuming, fees may be requested, or permission may be refused.

### 3.4. Risk Control and Monitoring

The set of measures should be established to control and monitor risks. Preventive as well as continuous actions are to be taken at project application, prior the project beginning, and throughout the project life. The substantial part of IPR control mechanisms is embodied in Consortium Agreement. However, additional codes of practice should be developed, and team members and employees trained and informed. In research and development, intellectual property archives (database of patent and literature searches) are useful basic tool.

## 4. BioMates IPR – risk management

The impact of project risks and conflicts on project objectives will be assessed by the project manager and the work package leaders. The impacts will be actively addressed through early assessment and elimination of risk with the identification of proper actions to be taken to mitigate or reduce the probability of occurrence or the impact in case of occurrence to acceptable levels.

It is important that IPR management should not inhibit the dissemination of knowledge. There is always a risk that an over-protective approach will prevent team members from using different methods of dissemination or collaboration. None of the above mentioned recommendations and strategies are intended to interfere with the dissemination of knowledge.

## 5. Conclusion

General and IPR - specific risk management procedures were described for the purpose of research, management and coordination within the consortium to minimise probability and impact of issues connected with improper or insufficient care taken with regard to the use of third – party IP and protection of knowledge gained in the BioMates project.

## 6. Literature

Naomi Korn, Charles Oppenheimer: IPR Risk Assessments, Rights Clearances and Rights Management, Strategic Content Alliance, October 2008

Regulation (EU) No 1290/2013 of the European Parliament and of the Council laying down the rules for participation and dissemination in "Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020)" and repealing Regulation (EC) No 1906/2006, December 2013

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EC-2014b European Commission, Energy Union Package - Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions and the European Investment Bank - A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy, COM(2015) 80 final, Brussels, 22.1.2014,http://eur-lex.europa.eu/resource.html?uri=cellar:1bd46c90-bdd4-11e4-bbe1-01aa75ed71a1.0001.03/DOC_1&format=PDF, *http://bit.ly/198SAUf*

EC-2015 European Commission, LCE-08-2016-2017 "Development of next generation biofuel technologies", Publication date: 14 October 2015, https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/lce-08-2016-2017.html, *http://bit.ly/2ndtvPc*

## 7. Disclaimer

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