



Jaap Kiel

<https://www.eera-set.eu>

<http://www.eera-bioenergy.eu>



The **EERA** is a non-profit organization and the largest Energy research community



EERA Bioenergy JP

The **EERA Bioenergy Joint Programme** was established in **2011**

Currently EERA Bioenergy JP is composed by **36 members** (universities, research alliances, technology centers, scientific agencies, institutes and associations)



- PARTICIPANTS
- ASSOCIATES



24 FULL MEMBERS PARTICIPANTS



12 ASSOCIATE PARTICIPANTS

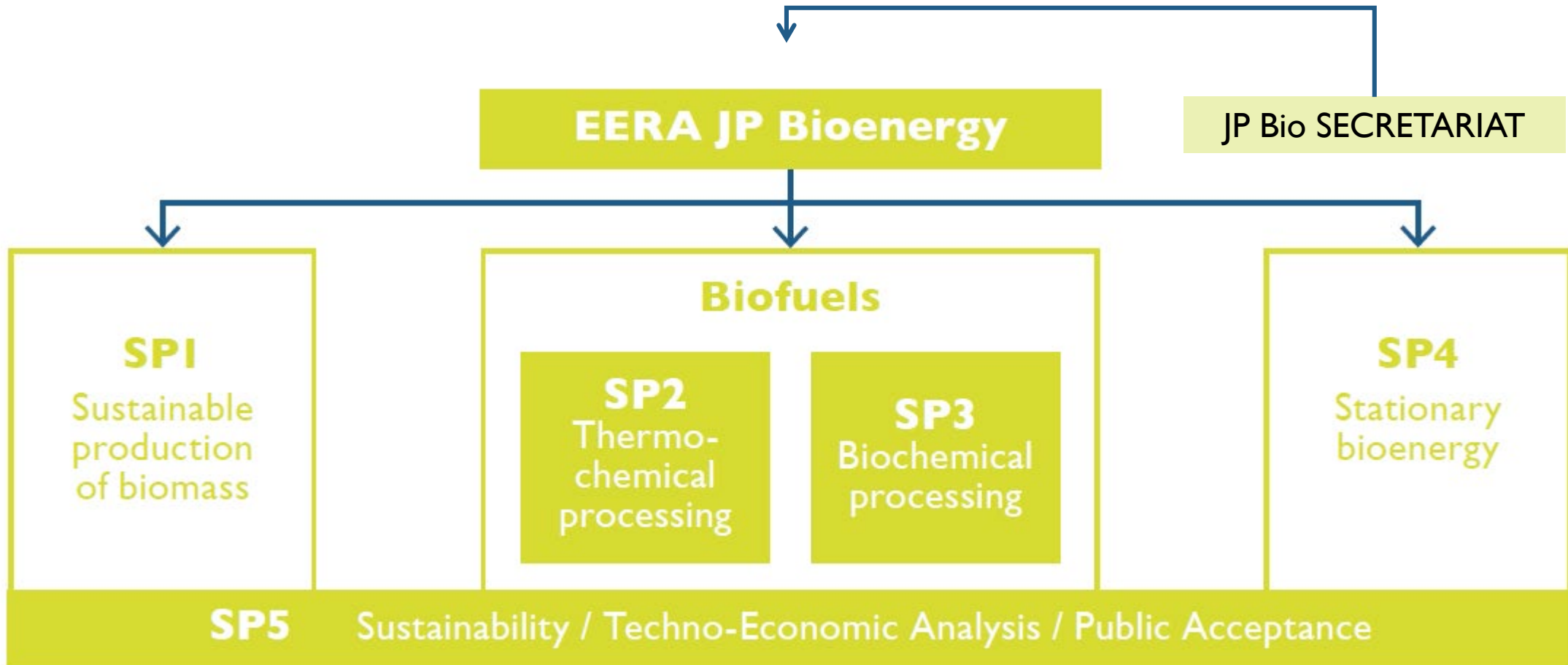


Current full and associate members of the EERA Bioenergy JP

| | | | | | | | | | | | |
|--|--|---|--|---|--|---|---|---|---|---|---|
| Aalborg University Department of Energy Technology Associate Director EERA Bioenergy Full Member Department of Energy Technology | BERRA BioEnergy Research Alliance Associate Director EERA Bioenergy Full Member Department of Energy Technology | C22 Research Center for Energy and Environmental Technology Associate Director EERA Bioenergy Full Member Department of Energy Technology | CENER National Research Center for Energy Research Associate Director EERA Bioenergy Full Member Department of Energy Technology | INRA National Institute for Research in Food Safety Associate Director EERA Bioenergy Full Member Department of Energy Technology | KIT Karlsruhe Institute of Technology Associate Director EERA Bioenergy Full Member Department of Energy Technology | LNEG Laboratório Nacional de Energias Renováveis Associate Director EERA Bioenergy Full Member Department of Energy Technology | NTNU Norwegian University of Science and Technology Associate Director EERA Bioenergy Full Member Department of Energy Technology | aicia Association of Industrial and Chemical Engineers Associate Director EERA Bioenergy Full Member Department of Energy Technology | CAIPUS EERC Center for Energy Research Associate Director EERA Bioenergy Full Member Department of Energy Technology | E.ON Energy Research Center Associate Director EERA Bioenergy Full Member Department of Energy Technology | IFU BioEnergy International Institute for Energy Conversion Associate Director EERA Bioenergy Full Member Department of Energy Technology |
| CIBAT Center for Industrial Biotechnology Associate Director EERA Bioenergy Full Member Department of Energy Technology | CIVR Center for Industrial Biotechnology Associate Director EERA Bioenergy Full Member Department of Energy Technology | CIVS Center for Industrial Biotechnology Associate Director EERA Bioenergy Full Member Department of Energy Technology | CRIC Center for Research in Industrial Chemistry Associate Director EERA Bioenergy Full Member Department of Energy Technology | FBI Federal Biotechnology Institute Associate Director EERA Bioenergy Full Member Department of Energy Technology | SINTEF Science and Technology for Energy Associate Director EERA Bioenergy Full Member Department of Energy Technology | RISE Research Institute for Solid State Physics and Chemistry Associate Director EERA Bioenergy Full Member Department of Energy Technology | ULM University of Leoben Associate Director EERA Bioenergy Full Member Department of Energy Technology | idea energy Institute for Energy Efficient and Energy-Electronic Design Associate Director EERA Bioenergy Full Member Department of Energy Technology | INM Institute for Energy Efficient and Energy-Electronic Design Associate Director EERA Bioenergy Full Member Department of Energy Technology | IPSEN Institute for Energy Efficient and Energy-Electronic Design Associate Director EERA Bioenergy Full Member Department of Energy Technology | TU/e Technische Universiteit Eindhoven Associate Director EERA Bioenergy Full Member Department of Energy Technology |
| DTU Technical University of Denmark Associate Director EERA Bioenergy Full Member Department of Energy Technology | ECN Energy Research Centre Associate Director EERA Bioenergy Full Member Department of Energy Technology | E.ON Energy Research Center Associate Director EERA Bioenergy Full Member Department of Energy Technology | ENEA National Institute for Nuclear Physics Associate Director EERA Bioenergy Full Member Department of Energy Technology | UKERC United Kingdom Energy Research Centre Associate Director EERA Bioenergy Full Member Department of Energy Technology | UWEC University of Wuppertal Energy Center Associate Director EERA Bioenergy Full Member Department of Energy Technology | VTT Technical Research Centre of Finland Associate Director EERA Bioenergy Full Member Department of Energy Technology | WZL Wuppertal University Associate Director EERA Bioenergy Full Member Department of Energy Technology | UNIVERSITA DI TORINO University of Turin Associate Director EERA Bioenergy Full Member Department of Energy Technology | UNIVERSITA DI VERONA University of Verona Associate Director EERA Bioenergy Full Member Department of Energy Technology | UNIVERSITA DI PADOVA University of Padua Associate Director EERA Bioenergy Full Member Department of Energy Technology | UNIVERSITA DI TRIESTE University of Trieste Associate Director EERA Bioenergy Full Member Department of Energy Technology |

Today 36 members .. new entrants in June 2019

EERA Bioenergy JP structure



EERA activities

- Bring the European R&D community in Bioenergy together and promote exchange and alignment, e.g. through topic oriented workshops, formation of expert groups, webinars,
- Identify R&D needs and feed them into the European R&D agenda through participation in agenda-setting activities, direct contacts with EC and involvement in other platforms like ETIP Bioenergy
- Organise brokerage events to facilitate proposal preparation for Bioenergy calls
- Explore and exploit synergies and collaboration with other EERA Joint Programmes (e.g., Fuel Cells and Hydrogen and CCS)
- Maintain close links with related organisations, like BBI and SPIRE, to better position bioenergy concepts in the framework of a circular biobased economy



SRIA published on March 2019 downloadable from the EERA Bioenergy web site



SRIA starting points

SET-plan and Action 8 Implementation Plan

Each SP focused on specific challenges and KPIs selected from the *SET-Plan – Declaration of Intent on “Strategic Targets for bioenergy and renewable fuels needed for sustainable transport solutions in the context of an Initiative for Global Leadership in Bioenergy”* (2016)

SP2 KPIs

Main Challenge 1: To develop advanced liquid and gaseous biofuels through thermochemical processing of sustainable biomass ...

KPI 1: By 2030, improve the net process efficiency ... by at least 30% compared to present levels.

KPI 2: GHG savings from the use of advanced biofuels ... at least 60%

KPI 3: Reduce costs for advanced biofuels to <50 €/MWh in 2020 and <35 €/MWh in 2030 ...

KPI 4: Reduce costs for algae-based advanced biofuels to <70 €/MWh in 2020 ...

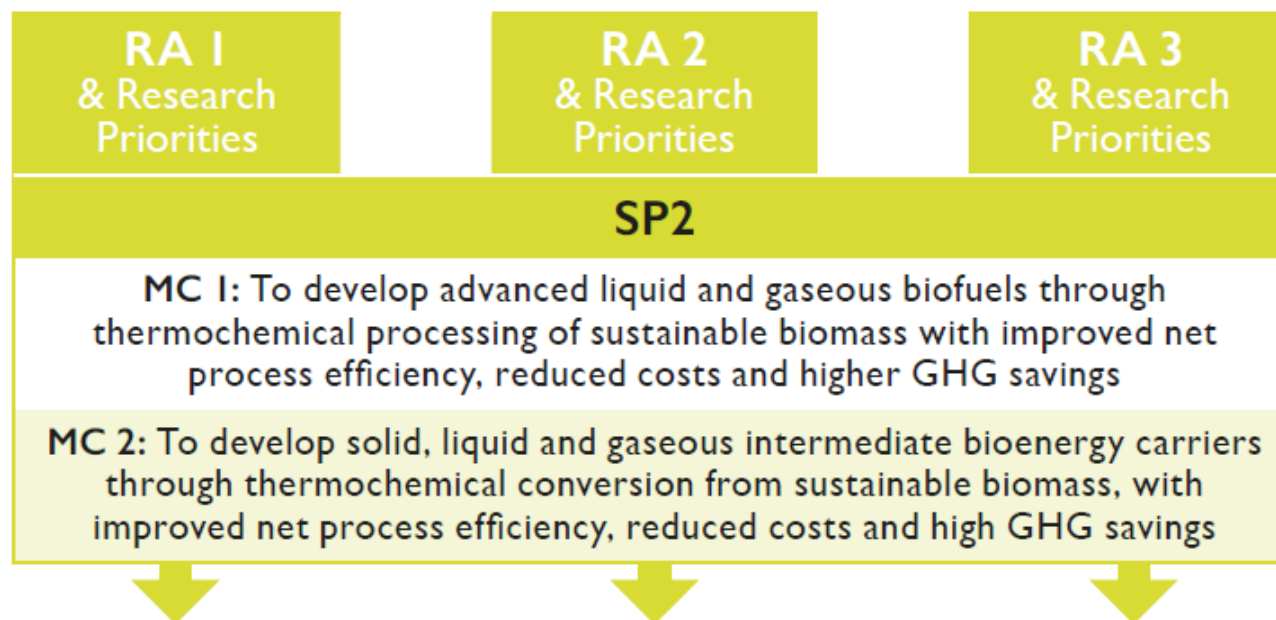
Main Challenge 2: To develop solid, liquid and gaseous intermediate bioenergy carriers ...

KPI 6: Reduce costs for liquid and gaseous intermediate bioenergy carriers to <20 €/MWh in 2020 and <10 €/MWh in 2030 (for e.g. pyrolysis oil) or <40 €/MWh in 2020 and <30 €/MWh in 2030 (for higher quality, e.g. microbial oils) ...

KPI 7: Reduce costs for solid intermediate bioenergy carriers to <10 €/MWh in 2020 and <5 €/MWh in 2030 (for e.g. biochar, torrefied biomass, lignin pellets) ...

SP2: Thermochemical processing of biomass into advanced biofuels and bio-based products

To increase the efficiency, sustainability and cost-competitive production of advanced biofuels and bioenergy carriers from biomass through thermochemical processing



The two main challenges of SP2 are addressed through cross-cutting Research Areas and Research Priorities

SP2: Thermochemical processing of biomass into advanced biofuels and bio-based products

SP 2: TERMOCHEMICAL PLATFORM

Research Areas

Primary thermochemical conversion processes

Downstream processing (product cleaning, conditioning and upgrading)

Value chain design (integral pathways for biomass conversion into biofuels and intermediate bioenergy carriers)

Gasification

Pyrolysis (fast and slow)

Torrefaction
(and steam treatment/seam explosion)

Hydrothermal processing (HTC, HTL, HTG)

Gas cleaning processes

Conditioning and upgrading of clean gas and product recovery

Cleaning, conditioning and upgrading of biocrude

Solid product conditioning and upgrading

Gasification-based production of advanced biofuels

Pyrolysis-based production of pyrolysis oil and advanced biofuels

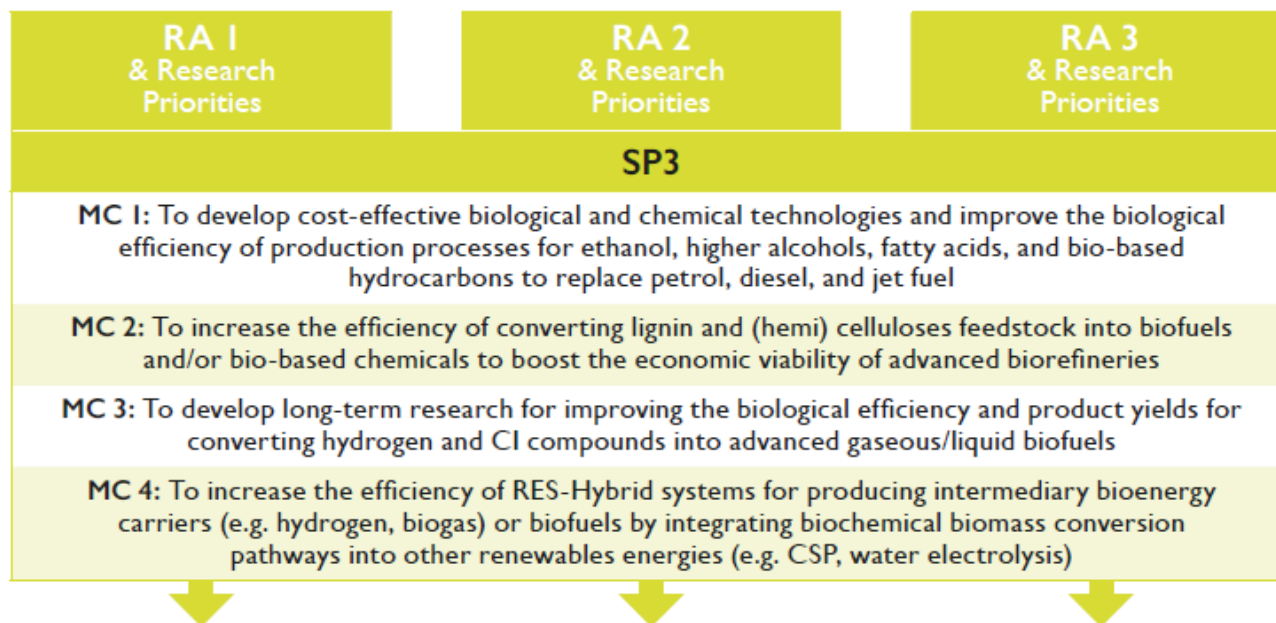
Heat/steam-treatment based production of solid bioenergy carriers

Advanced biofuels and intermediate bioenergy carrier production based on hydrothermal processing

Research Priorities

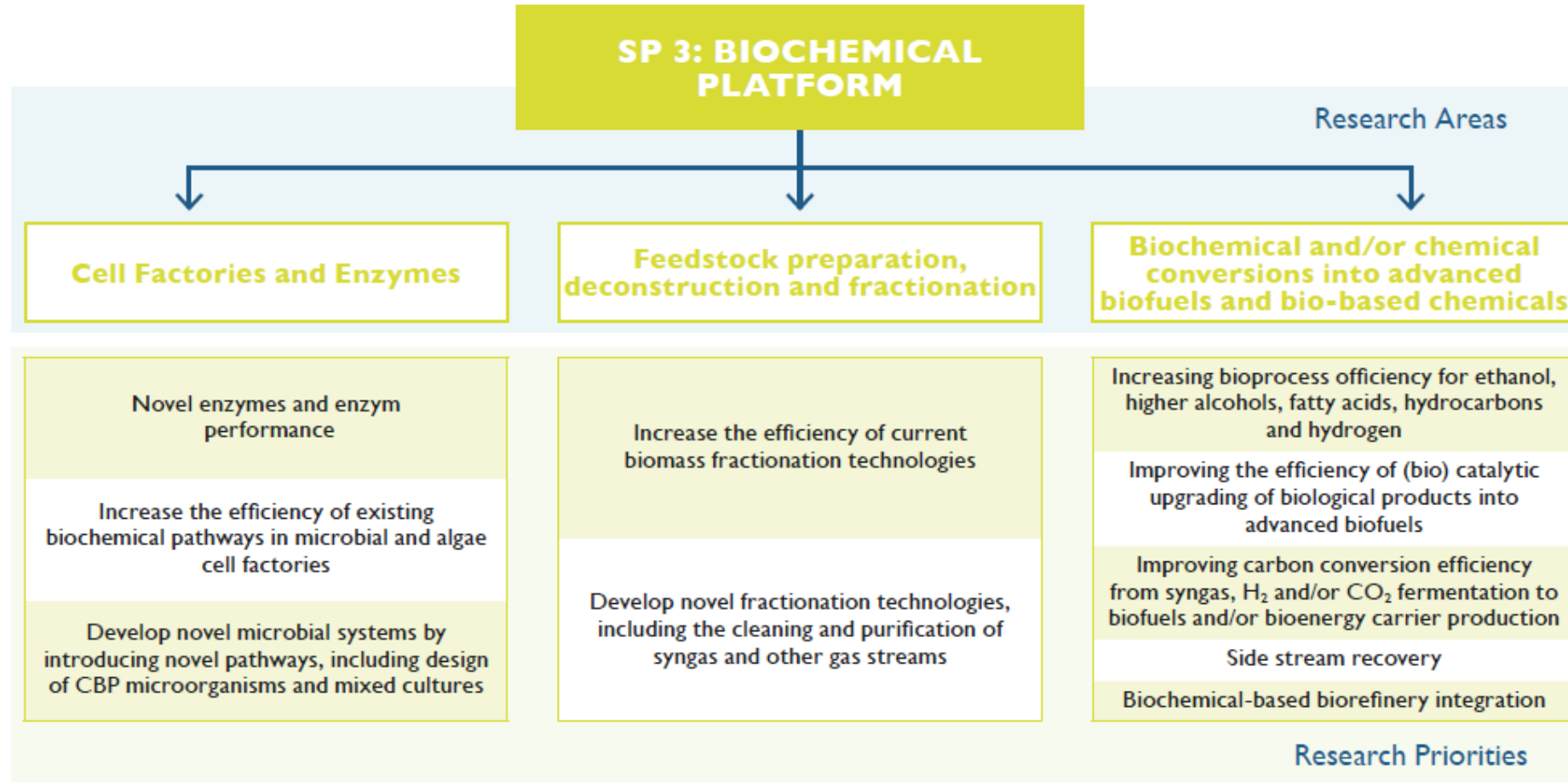
SP3: Biochemical processing of biomass into advanced biofuels and bio-based products

Biochemical and chemical processes and technologies for the production of **advanced biofuels** (including **jet and maritime fuels**) and **biogas**. The production of ancillary **bio-based products** (biorefinery concept). Bio-waste processing, and hydrogen from biomass are also included.



The four main challenges of SP3 are addressed through cross-cutting Research Areas and Research Priorities

SP3: Biochemical processing of biomass into advanced biofuels and bio-based products



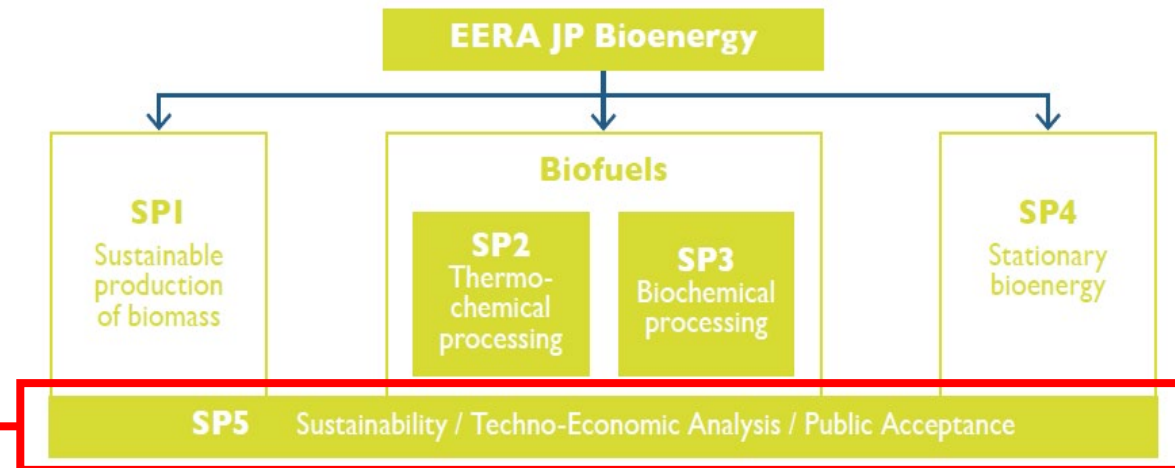
SP5: Sustainability / Techno-Economic Analysis / Public Acceptance

SP5 is still not included in the SRIA (it will be included by the end of June 2019)

The analysis of the environmental sustainability, based on relevant policy requirements, and the techno-economic analysis of bioenergy technologies.

The evaluation of social acceptance has also been incorporated as an indicator of the sustainability of bioenergy systems.

The determination and definition of measures, conditions and frameworks to foster the deployment of bioenergy systems is another important purpose of SP5.



SRIA – implementation

Broker for EU proposals

Each SP coordinator:

- identifies topic calls of potential interest for the EERA Bioenergy members
- through our EERA Bioenergy secretariat (BIOPLAT) he asks EERA members to express their interest on one or more topic calls
- set-up (web) meetings to discuss ideas, innovation and strategies with the EERA members who expressed their interest, and to identify the coordinator and the consortium

H2020 call – Project idea

| | |
|---|--|
| Institution: Contact person: Email address: | |
| Basic idea Concise description (no more than 3 lines!) summarising the basic idea of the project. (This should answer the question: "Tell me in 10 seconds what your project is about") | |
| Main objectives Describe briefly what you are trying to achieve in the project (Why run this project?) | |
| Key results: What concrete results will be produced within the project itself? | |
| Expected impact: Describe what will be made possible when the project has delivered its results and achieved its objectives and these can be taken into use (outside and after the project) | |
| Consortium/Partners Which partners are a "Have" (already defined), a "Might Have" (likely partners) or a "Need" (types of organisation the project needs)? | |

Recent H2020 call brokerage events – three examples

- LC-SC3-RES-12-2018: Demonstrate highly performant renewable technologies for combined heat and power (CHP) generation and their integration in the EU's energy system
- LC-SC3-RES-16-2019 Development of solutions based on renewable sources that provide flexibility to the energy system (bioenergy carriers)
- LC-SC3-RES-23-2019: Development of next generation biofuel and alternative renewable fuel technologies for aviation and shipping

Successful proposals – some recent examples

- Ambition – Advanced biofuel production with energy system integration (www.ambition-research.eu)
- BECOOL – Brazil-EU Cooperation for Development of Advanced Lignocellulosic Biofuels Brazil-EU Cooperation for Development of Advanced Lignocellulosic Biofuels (www.becoolproject.eu)
- ARBAHEAT – Cost-effective transformation of a Highly-Efficient Advanced Thermal Ultra-SuperCritical coal-fired power plant into a CHP by retrofitting and integrating an ARBAFLAME biomass upgrading process (www.arbaheat.eu)



Coordinating energy research for a low carbon Europe

JOINT PROGRAMMES
About Joint Programmes

List of Joint Programmes
Advanced Materials and Processes for Energy Application (AMPEA)
Bioenergy
Carbon Capture and Storage
Concentrated Solar Power (CSP)
Economic, Environmental and Social Impacts (EESI)
Energy Efficiency in Industrial Processes
Energy Storage
Energy Systems Integration
Fuel Cells and Hydrogen
Geothermal
Hydropower
Nuclear Materials
Ocean Energy
Photovoltaic Solar Energy
Shale Gas (Socountead)
Smart Cities
Smart Grids
Wind Energy

Bioenergy
Have a look at the participants/associates

BACKGROUND
Bioenergy currently provides more than 60% of renewable energy sources (RES) in Europe and is one of the key primary energy sources for 20% RES target in 2020. More than half of the current bioenergy is forest-based biomass, the growth will be based on forest, agricultural and algae type of biomass resources as well as on the biogenic fraction of municipal and industrial waste. Bioenergy is widely used for heat and power. The current generation of biomass conversion technologies is expensive and uses feedstock that is associated with sustainability issues. To deliver on the targets of the SET-Plan and the 10% transport RES target in 2020, a next generation of more sustainable conversion technologies is required. These technologies require substantial resources to complete the various stages of the innovation process (R&D, pilot scale, demonstration scale, commercialisation). The overall objective of this Joint Programme is to align pre-competitive research activities at EERA institutes to give a technical-scientific basis to further develop the next generation biofuels routes and to explore the possibilities for joint technology development. The more efficient use of R&D investments that this Joint Programme foresees contributes to an acceleration of the development of next-generation conversion technologies.

STRUCTURE
The EERA Bioenergy Joint Programme will develop new technologies and improve the competitiveness of next generation biofuels with four main sub-programmes:

- SP1:** Sustainable production of biomass
Coordinator: Jean TAYEB, jtayeb@inra.fr
- SP2:** Thermo-chemical processing of biomass into advanced biofuels and bio-based products
Coordinator: Jaap KIEL, kiel@ttno.nl
- SP3:** Bio-chemical processing of biomass into advanced biofuels and bio-based products
Coordinator: Francisco GIRIO, fgirio@inec.pt
- SP4:** Stationary bioenergy
Coordinator: Berta MATAS, Guel@intef.no
- SP5:** Sustainability/Techno-Economic Analysis/Public Acceptance
Coordinator: Raquel Santos JORGE, raquel.s.jorge@ntnu.no

Coordinator
Andrea Monti
e-mail
website

EERA Bioenergy Secretariat:
Margarita de Gregorio
e-mail

Coordinator's Assistant:
Barbara Cimatti
e-mail

Contact at EERA
Berta Matas Güell
e-mail

Further details
please download .pdf file

For further information about the Joint Programme please visit the EERA JP Bioenergy website >



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BIOENERGY

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Biobased fuels, power and heat in a circular bioeconomy

EERA Bioenergy

the European Alliance for excellent research in sustainable bioenergy

EERA Bioenergy is open for any scientific-technical entity actively involved in bioenergy research in Europe to join.

5 Subprogrammes

36 Members

<http://www.eera-bioenergy.eu/>