

DESIGN AND GET INVOLVED IN THE NEXT H2020 BIOENERGY PROPOSALS

List of H2020 bioenergy topics, budgets and deadlines

Topic-ID	Topic title	TRL	Indicated project size (MEUR)	Indicated deadline
LC-SC3-RES-11-2018 (RIA)	Developing solutions to reduce the cost and increase performance of renewable technologies - Improve small and medium-scale combined heat and power (CHP) from biomass	3-4->4-5	2-5	31 Jan 2018 (1 st Stage) 23 Aug 2018 (2 nd Stage)
LC-SC3-RES-12-2018 (IA)	Demonstrate highly performant renewable technologies for combined heat and power (CHP) generation and their integration in the EU's energy system – Biomass based combined heat and power (CHP)	5->7-8	15-20	13 Feb 2018
LC-SC3-RES-16-2019 (RIA)	Development of solutions based on renewable sources that provide flexibility to the energy system – Bioenergy carriers	3-4->4-5	3-5	27 Aug 2019
LC-SC3-RES-17-2019 (IA)	Demonstration of solutions based on renewable sources that provide flexibility to the energy system – Intermediate bioenergy carriers	5->7	12-15	11 Dec 2018
LC-SC3-RES-21-2018 (RIA)	Development of next generation biofuels and alternative renewable fuel technologies for road transport	3-4->5	3-5	13 Feb 2018
LC-SC3-RES-22-2018 (IA)	Demonstration of cost effective advanced biofuel pathways in retrofitted existing industrial installations	5->7	8-10	5 Apr 2018
LC-SC3-RES-23-2019 (RIA)	Development of next generation biofuel and alternative renewable fuel technologies for aviation and shipping	3->5	3-5	27 Aug 2019
LC-SC3-RES-24-2019 (IA)	Boosting pre-commercial production of advanced aviation biofuels	5->7	15-20	11 Dec 2018

Complete text of the bioenergy topics addressed:

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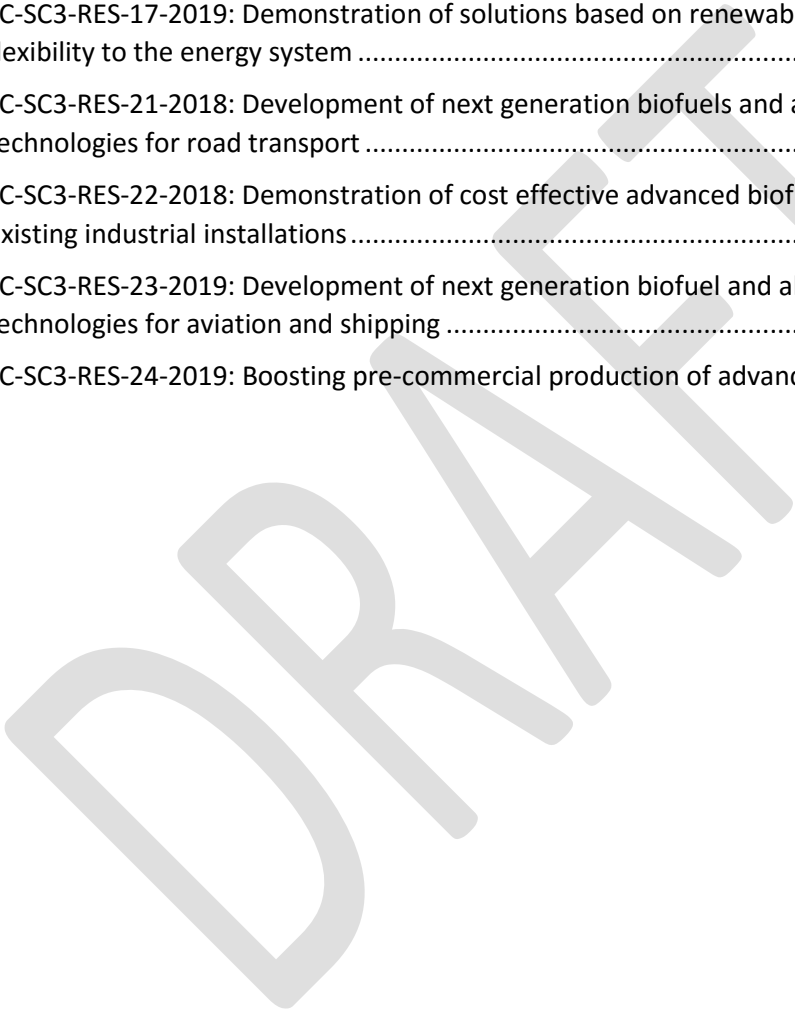
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Annex 13

Horizon 2020

10. Secure, clean and efficient energy

DISCLAIMER

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LC-SC3-RES-11-2018: Developing solutions to reduce the cost and increase performance of renewable technologies

Specific Challenge: Achieving or maintaining global leadership in renewable energy technology requires that the innovative solutions are affordable at the same time. Therefore cost reductions remain a crucial necessity for existing or new technologies.

Scope: Proposals will address one or more of the following issues:

- a. – f. Not relevant
- g. *Bioenergy*: Improve small and medium-scale combined heat and power (CHP) from biomass to reduce overall costs of investments and operation through achieving at the same time high resource efficiency and high overall and electrical conversion performance.

Proposals are expected to bring technologies from TRL 3-4 to TRL 4-5 (please see part G of the General Annexes). Beside the development of the technology, the proposal will have to clearly address the following related aspects: potentially lower environmental impacts, issues related to social acceptance or resistance to new energy technologies, related socioeconomic issues.

The Commission considers that proposals requesting a contribution from the EU of between EUR 2 to 5 million would allow this challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: The proposed solution will reduce the CAPEX and/or OPEX of energy generation from any of the mentioned renewable sources making it comparable to generation costs from competing fossil fuel sources. With this, the project will contribute to the achievement of the cost reduction targets as stated in the respective Declaration of Intent of the SET Plan¹, where applicable, and to the longer term objectives of the Energy Union.

Type of Action: Research and Innovation action

¹ <https://setis.ec.europa.eu/implementing-integrated-set-plan/no-1-renewables-ongoing-work>

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

Specific Challenge: Progressive replacement of fossil fuels used in the heat and power sectors by means of renewable energy sources can increase energy security, energy price stability as well as independence from imported sources. However, to unlock the full potential of renewable heat and power solutions to significantly contribute to the energy system, improvement of individual technologies performance and their incorporation into the energy system is needed.

Scope: Proposals will address one of the following areas:

- a. *Biomass based combined heat and power (CHP)*: Demonstration of technically feasible and cost-effective installation of medium to large-scale CHP through retrofitting of existing fossil-fuel driven CHP or power plants, as such plants are already integrated in the energy grid. Project will address the transformation of existing fossil fuel power plants >10 MW el. to CHP plants with the use of sustainable biomass feedstock. Transformations have to demonstrate their overall cost benefits over new biomass-based CHP installations and show at least their state-of-the-art requirements for continuous operation and prove advances in combustion emission reduction. Commercial operation of the plant with biomass after the end of the project is to be envisaged.
- b. *Not relevant*

The proposals are expected to bring the technology from TRL 5 to TRL 7-8 (please see part G of the General Annexes).

The Commission considers that proposals requesting a contribution from the EU of between EUR 15 to 20 million would allow this challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

In order to ensure that a balanced portfolio of activities covering different renewable energy technology areas will be supported, the available budget will be firstly allocated to the highest-ranked proposal in each of the a) biomass-based CHP and b) geothermal sub-topic before any second-ranked proposal is supported. In a second round, proposals will be selected for funding regardless of the sub-topic and only according to the ranking list.

Expected Impact: The successful demonstration of the proposed solutions will reduce the cost of combined heat and power generation from renewable sources, making it competitive to alternative fossil fuel base solutions. The proposed solutions are expected to lead to subsequent commercial industrial projects, thus increasing the EU industrial capacity for renewable power and heat generation at a lower installation cost. This will allow decarbonisation of the power and heat sector.

Type of Action: Innovation action

LC-SC3-RES-16-2019: Development of solutions based on renewable sources that provide flexibility to the energy system

Specific Challenge: Supporting the balancing of the grid and increasing the energy flexibility is possible through dispatchable renewable energy sources, such as for example bioenergy and hydropower. The specific challenge is to increase the potential and performance of dispatchable technologies to provide flexibility services to the energy system by improving their technological characteristics.

Scope: Proposals will address one of the following issues:

- *Bioenergy carriers*: Development of intermediate bioenergy carriers for energy and transport from biogenic residues and wastes at a conversion cost reduced by at least 25% from the state-of-the-art, excluding the feedstock cost, and with increased energy density, storage and trade characteristics, where relevant, and improved GHG performance. The state-of-the-art for conversion costs per technology will be clearly presented in the proposal with cost figures and versatility of use where appropriate.
- Not relevant
- Not relevant

Proposals are expected to bring the technologies from TRL 3-4 to TRL 4-5 (please see part G of the General Annexes).

The Commission considers that proposals requesting a contribution from the EU of between EUR 3 to 5 million would allow this challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

In order to ensure that a balanced portfolio of activities covering different renewable energy technology areas will be supported, the available budget will be firstly allocated to the highest-ranked proposal in each sub-topic before any second-ranked proposal is supported. In a second round, proposals will be selected for funding regardless of the sub-topic and only according to the ranking list.

Expected Impact: The increased flexibility to the energy system will be a result of the proposed solution. The proposed solution will contribute to the longer term objectives of the Energy Union and the 10 actions for research and innovation under the SET Plan.

Type of Action: Research and Innovation action

LC-SC3-RES-17-2019: Demonstration of solutions based on renewable sources that provide flexibility to the energy system

Specific Challenge: Supporting the grid balancing and increasing the energy flexibility is possible by means of dispatchable renewable energy sources. The specific challenge is to increase the potential of renewable dispatchable technologies in providing flexibility to the energy system. Different technologies are suitable to address this challenge.

Scope: Proposals will address one of the following issues:

- a. *Intermediate bioenergy carriers:* Focus will be on the demonstration of the most cost-efficient intermediate bioenergy carrier pathways for energy and transport, which improve the economic viability of the subsequent energy production by addressing solid, liquid and gaseous intermediate bioenergy carriers from biogenic residues and wastes with increased energy density, storage and trade characteristics where relevant. Reduced conversion costs and improved energy efficiency and GHG performance of the intermediate bioenergy carrier pathway will be demonstrated. Production at a scale of up to 5000 tons and process feasibility through applications to fuel production including for the heavy duty and maritime sectors, as well as to combined heat and power generation, is to be included.
- b. –c. Not relevant

Proposals are expected to bring the technology from TRL 5 to TRL 7 (please see part G of the General Annexes).

The Commission considers that proposals requesting a contribution from the EU of between EUR 12 to 15 million would allow this challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

In order to ensure that a balanced portfolio of activities covering different renewable energy technology areas will be supported, the available budget will be firstly allocated to the highest-ranked proposal in each sub-topic before any second-ranked proposal is supported. In a second round, proposals will be selected for funding regardless of the sub-topic and only according to the ranking list.

Expected Impact: The developed technologies will allow plant and system operators to operate successfully in the modern power markets and to make a significant contribution to European renewable energy objectives and policies. The successful demonstration of the proposed solutions will contribute to achieving the Energy Union targets and for bioenergy carriers and CSP will also contribute to achieving the specific targets agreed in the Declarations of Intent with the sectorial stakeholders in the context of the SET-Plan².

Type of Action: Innovation action

² <https://setis.ec.europa.eu/actions-towards-implementing-integrated-set-plan>

LC-SC3-RES-21-2018: Development of next generation biofuels and alternative renewable fuel technologies for road transport

Specific Challenge: Current biofuel and renewable fuel technologies are still not competitive compared to technologies of fossil fuel alternatives. This impedes their further development and market penetration. The specific challenge is to increase the competitiveness of next generation biofuel and renewable fuel technologies while diversifying the fuel supply pathways.

Scope: Support will be given to next generation drop-in biofuel and alternative renewable fuel technologies for energy and transport, which improve substantially beyond the state-of-the-art the performance as regards conversion efficiency, cost and feedstock supply, as well as end use compatibility. Proposals have to address one of the following issues:

- liquid diesel- and gasoline-like biofuels from biogenic residues and wastes through either chemical, biochemical and thermochemical pathways, or a combination of them;
- liquid gasoline-like biofuels through biogenic upgrading of biogas.

Proposals are expected to bring the technology from TRL 3 to 5 (please see part G of the General Annexes).

The Commission considers that proposals requesting a contribution from the EU of between EUR 3 to 5 million would allow this challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: Projects are expected to reduce costs and improve performance of renewable fuels, notably as regards the efficiency, the environment and the society. The proposed solution will contribute to achieving the Energy Union targets and implementing the specific priorities for strengthening the EU leadership on renewables laid out in the Communication for Accelerating Clean Energy Innovation³.

Type of Action: Research and Innovation action

³ COM(2016) 763

LC-SC3-RES-22-2018: Demonstration of cost effective advanced biofuel pathways in retrofitted existing industrial installations

Specific Challenge: Commercialization of advanced biofuels depends on up-scaling of the technologies. The specific challenge is to overcome the high cost and high risk of the installation of industrial plants for advanced biofuels.

Scope: Proposals will demonstrate cost-efficient advanced biofuel pathways which improve the economic viability and reduce capital expenditure (CAPEX) and operating expenses (OPEX). This is to be done through retrofitting of existing industrial installations with necessary innovation specific to the proposed advanced biofuel pathway. Proposals will address integration in first generation biofuels sites, in pulp and paper industry or in existing fossil refineries with production of advanced biofuels at a scale of a few thousand tons through upgrading the existing sites with innovative installations. The economic feasibility and other socio-economic benefits including the impact on current first generation sites will be included and clearly demonstrated. Proposals will provide information about the expected CAPEX and OPEX improvements.

Proposals are expected to bring the technology from TRL 5 to 7 (or higher) (please see part G of the General Annexes).

The Commission considers that proposals requesting a contribution from the EU of between EUR 8 to 10 million would allow this challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: The supported projects are expected to increase the industrial installed capacity for advanced biofuels, and show the socio-economic benefits. The proposed solution will contribute achieving the Energy Union targets and the specific targets for commercialization of advanced biofuels agreed in the Declarations of Intent with the sectorial stakeholders in the context of the SET-Plan⁴.

Type of Action: Innovation action

⁴ <https://setis.ec.europa.eu/implementing-integrated-set-plan/renewable-fuels-and-bioenergy-ongoing-work>

LC-SC3-RES-23-2019: Development of next generation biofuel and alternative renewable fuel technologies for aviation and shipping

Specific Challenge: Decarbonising the aviation and shipping transport sectors, which are expanding fast and increasing the overall fossil fuel consumption, relies on biofuel and renewable fuels. The specific challenge is to increase the competitiveness of next generation biofuel and renewable fuel technologies in aviation and shipping, compared to fossil fuel alternatives.

Scope: Proposals will develop next generation non-food/feed drop-in biofuel and alternative renewable fuel technologies for aviation and shipping transport, which improve substantially beyond the state-of-the-art the performance regarding conversion efficiency, cost and feedstock supply by addressing:

- liquid jet-like biofuels and alternative renewable fuels from biogenic residues and wastes through chemical, biochemical and thermochemical pathways, or a combination of them; and
- bunker fuel-like biofuels for shipping uses.

Proposals are expected to bring the technology from TRL 3 to 5 (please see part G of the General Annexes).

The Commission considers that proposals requesting a contribution from the EU of between EUR 3 to 5 million would allow this challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: The supported projects are expected to reduce costs and improve performance of renewable fuels for aviation and shipping regarding the efficiency, the environment and society. The proposed solution is expected to contribute to achieving European leadership in this area and to the Energy Union targets, and to implementing the specific priorities for strengthening the EU leadership on renewables laid out in the Communication for Accelerating Clean Energy Innovation⁵.

Type of Action: Research and Innovation action

⁵ COM(2016) 763

LC-SC3-RES-24-2019: Boosting pre-commercial production of advanced aviation biofuels

Specific Challenge: The aviation transport sector is growing fast and is expected to be responsible for more than 10% of the global greenhouse gas emissions by 2050. Advanced biofuels achieve direct emission reductions and, as drop-in fuels, are the only alternatives for reducing the carbon foot-print of aviation in the long-term. Due to the absence of a market, the specific challenge is to boost commercial availability of advanced biofuels for aviation.

Scope: Proposal will demonstrate pre-commercial production of sustainable and cost-competitive advanced biofuels for aviation for boosting their market up-take. Proposals will address large-scale production of aviation biofuels from non food/feed sustainable feedstock and through certified pathways according to international aviation fuel standards and thus suitable for commercial flight operations. 30 to 50 thousand tonnes of aviation biofuel and continuous plant operation of 1000 hr within the project will be included.

Proposals are expected to bring the technology from TRL 5 to 7 (or higher) (please see part G of the General Annexes).

The Commission considers that proposals requesting a contribution from the EU of between EUR 15 to 20 million would allow this challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: The supported projects are expected to facilitate the market entry and increase the commercial capacity of advanced biofuels for aviation. In particular, it is expected that pre-commercial plant(s) for advanced biofuels for aviation will be accomplished and the deployment of their technologies will allow the competitive production of biojet fuels on a commercial scale. The proposed solution will contribute to achieving the Energy Union targets and the specific targets for commercialization of advanced biofuels agreed in the Declarations of Intent with the sectorial stakeholders in the context of the SET-Plan⁶.

Type of Action: Innovation action

⁶ <https://setis.ec.europa.eu/implementing-integrated-set-plan/renewable-fuels-and-bioenergy-ongoing-work>