

1 Aim

- 1.1 The Biobased Innovation Student Challenge Europe (BISC-E) aims to raise awareness and involve students in the transition towards a bio-based economy. The ability to work in a multidisciplinary team is believed to be essential to design viable bio-based solutions, therefore the requirements include technical, environmental and economic elaborations. In addition, participation in the BISC-E will offer opportunities to interact with actors in the bio-based industry throughout Europe. This can be done during the preparation of the business cases and during the evaluation both at the national and the European level. This interaction can possibly lead to further relationship between students/graduates and the industry. The **European final rounds are coordinated and financed by the Bio-based Industries Consortium (BIC).**

2. Organisation

- 2.1. The Bio-based Innovation Student Competition Europe is organized on a national level by the Dr. Sanja Jelić Milković on behalf of the University of Josip Juraj Strossmayer in Osijek, Faculty of Agrobiotechnical Sciences Osijek. After the national finals, a European final is organized where all national winners can compete for the title of European Champion.

3. Indicative timeline Croatia

24 March 2023	Registration deadline
30 March 2023	Kick-off with all participants
15 May 2023	Submission of presentation and supporting documents
26 May 2023	Presentation and Croatian final
Autumn 2023	EU Final

4. Participants

- 4.1. **Student teams for the national BISC-E must consist of at least 3 students and maximally 6.**
- 4.2. All team members should be enrolled in a programme at an institute for higher education in Croatia. These include students in their graduating years (bachelor's or master's program) at universities of Applied Sciences, and at universities for fundamental research.
- 4.3. Since national Qualifications Frameworks differ across Europe, the teams can include students in the first years PhD curricula, provided their current level is comparable/identical to others within the European Qualification Framework (EQF), and the overarching framework of qualifications of the European Higher Education Area (QF-EHEA).
- 4.4. Because of the multidisciplinary character of BISC-E, it is highly advisable that the teams include students enrolled in curricula in different disciplines.
- 4.5. **Each team must appoint one student as the team leader.** The team leader will be the contact person with the National Coordinator (NC).
- 4.6. **Each team must be supported by a supervisor** employed at the host institution, or at one of the host institutions if the team includes students from more than one institution. The supervisor should be employed as e.g., lecturer, Postdoc, assistant professor, associate professor, or professor. Each student team can seek support from any/more staff member(s) at the institution, but these will have no official role in the national BISC-E.
- 4.7. **Students and supervisors can only join one team participating in the national BISC-E.**

- 4.8. **At least 2 team members should participate in kick off meeting called by the NC, and the national final round(s).**

5. Registration

- 5.1. The registration for the national BISC-E will be arranged by the NC (sanja.jelic@fazos.hr).
- 5.2. The team registration must include:
- Team name.
 - The leader (one of the team members).
 - The supervisor (see 4.6) and his/her coordinates.
 - A 150-word description of the bio-based (business) case and the proposed innovative solution (participation form).
 - Personal details of the team members.
- 5.3. The NC verifies that the teams comply with this Regulation (especially Art. 4) and communicates with a team as needed for clarification and/or correction to approve the registration.

6. Challenge

- 6.1. In this programme, student teams are asked to develop an innovative bio-based product or process help resolve technological, environmental, or societal challenges. It will benefit the proposed solution if it has been tested in a lab (or beyond lab) to provide an insight into its potential for integration in the current (or near future) bio-based industry and bioeconomy.
- 6.2. Within the scope of this programme, a **bio-based product is a product wholly or partly derived from renewable biological sources**¹. These sources can be plant-, forestry-, animal-, or marine/aquatic-based, and derived from gaseous biogenic carbon, or bio-waste². The bio-based product could be based on a 'drop-in chemical'³, or a 'dedicated chemical'⁴ resulting from a bio-based process. It can be an intermediate material, a semi-finished or a final product.
- 6.3. Within the scope of this programme, a **bio-based process is a process using only bio-based feedstock**, applying biotechnology, chemical, mechanical, physical, or any other appropriate technology, or combination of technologies. Bio-based feedstock is defined in 6.2. The process may yield intermediate or final products, preferably with a higher economic value than fossil-based alternatives.
- 6.4. The innovation may, but does not have to, replace a fossil-based product or fossil-based process.
- 6.5. **Aspects related to enhancing biodiversity and circularity, and to climate change mitigation will add value to the proposed solutions.**
- 6.6. This programme will not negatively affect the food chain. If food and feed residual (or excess) streams are used as a resource for bio-based products, the envisaged process should help increase effectiveness and competitiveness of the food/feed industry. The development of a new food or feed **ingredient** from these or other sources is allowed in this programme. However, the **development and production of a food and/or feed final product** as such, are excluded from this programme.
- 6.7. Individual work, done in the framework of a MSc-thesis, is not eligible for this programme. Further development of a subject/theme as part of such a thesis in a participating team is eligible, provided it is a clear team effort.
- 6.8. The programme invites student teams to meet the challenges as described above, including a presentation of their findings with supporting information, on either of the two tracks mentioned in 6.8.
- 6.9. Two tracks can be followed:
1. For innovations regarding a bio-based product.
 2. For innovations regarding a bio-based process or improvements of a bio-based process step. Also, services or other innovations that will strongly advance the bio-based economy but not leading to a tangible (prototype) product are included in this track.
- 6.10. The teams will provide the business cases' presentation and supporting documents two weeks

before the national final. The supporting documents consist of a description of the process or product (½ A4) and its contribution to sustainability, a description of the technical aspects (½ A4) and the outline of the business case (½A4). The claims in the business case and/or production process should be supported with basic calculations (additional).

The presentation should contain the following elements:

1. Short description of the innovation.
2. Introduction and explanation of the innovative aspect (supported by illustrations), including its sustainability aspects (of which positive environmental impacts detailed as per point 4 hereunder).
3. Technical explanation of the innovation, e.g.:
 - Production process of a product or process scheme of a process.
 - Mass balances.
 - The bio-based materials used.
 - (Production)process energy use estimation.
4. Elaboration of the positive environmental impact of the innovation, e.g.:
 - Product life cycle / process resource chain.
 - Input, output, and residual streams.
 - Comparison with conventional product or process (if applicable).
5. Economic viability, e.g.:
 - Business model canvas with explanation.
 - SWOT analysis.
 - Quantitative and qualitative market analysis and a cost benefit analysis.

6.11. All text and spoken words have to be in English.

6.12. Each of the top 3 teams will have the chance to present their bio-based innovation and prototype product / process animation to the jury during the actual final. The oral presentation, supported by slides, lasts 15 minutes followed by the possibility for the jury to ask questions during 5 minutes.

6.13. The presentation and the submitted dossier should contain work of the team members only. Included work by others should be properly referenced.

7. Jury and assessment at national level

7.1. The jury should consist of several experts in the fields of e.g., bio-based economy, process technology, primary and market applications sectors, environmental impact assessment. Members of the jury should be from both academia and industry.

7.2. Jury members cannot be involved in any way with any of the participating student teams.

7.3. The jury members will not be announced before the submission deadline.

7.4. The jury will evaluate the presented cases and proposed solutions by the following criteria (see added-value aspects mentioned in 6.5):

- Innovation

How creative and novel is the concept? Does it solve an existing problem, or does it replace a fossil-based product? In case of a product, does it demonstrate a better (functional) performance than alternatives?

- Sustainability impact

First, is the innovation truly bio-based? Is it also environmentally friendly, i.e., does it have a better environmental performance, a more environmentally friendly production process compared to the product it replaces? Or does it enhance the sustainability of a process on total life cycle basis? Does it protect and enhance biodiversity? How big is the estimated positive impact for the environment if the product or process would be widely applied?

- Technical feasibility

In case of a product, the technical feasibility of the proposed production process is considered. In case of a process innovation, the feasibility of the claimed advantages is considered.

- Economic viability
Is there a market for the proposed product? Is there an economic incentive to apply the proposed product or process innovation? Is the product or process economically viable?
- Presentation and prototype product / process animation
The presentation is judged on content and presentation skills together with the quality of the answers offered to the jury's questions.
Also, the appearance and professionalism of the prototype product / process animation are considered under this point.

7.5. The jury's decision is final and cannot be contested.

8. Awards

- 8.1. The monetary award is provided 'as is' and is divided equally over the team members. The first team will receive 1000€, the second 500€ and the third 250€.
- 8.2. In case the winning team declines the prize, the NC will decide if it can be awarded to another participating student team.

9. Intellectual property

- 9.1. Only the jury and the NC have access to the presentation and submitted dossiers, and to personal/private information for matters related to BISC-E only.
- 9.2. All IP and know-how in the submitted materials of the teams remain the property of the original owners. Information submitted in the dossiers will not result in any transfer of ownership to the organisers, jury nor sponsors of BISC-E. Foreground IP and know-how generated by the students during BISC-E rest with the students and can be protected or published in close consultation with the supervisor at the host institution.

10. General

- 10.1. All deadlines mentioned in these regulations are 23:59 CET that day.
- 10.2. The NC can exclude a team member, or a full student team when not complying to this Regulation, acting against existing laws, or otherwise acting immorally.
- 10.3. The NC team reserves the right to amend, postpone or cancel the national BISC-E or to change the dates and conditions without incurring liability if circumstances beyond his/her control require to do so.
- 10.4. All participants (student team members and supervisors) grant permission to the NC to use submitted information for promotional purposes. This excludes private and proprietary information. The useable information can include the designed innovative solution targeting a specified challenge. It can also include the awarded prizes. Also, pictures and other contributions provided in the context of BISC-E can be used free of charge for promotion via different communication channels.
- 10.5. In all situations not foreseen in this Regulation or in case of a dispute, the NC shall decide how to resolve the issue.