

6th Edition

National championship



Desafíos

Ref. 10-2022

Tknika

Euskadiko LHren Ikerketa Aplikatuko Zentroa
Centro de Investigación Aplicada de FP Euskadi
Basque VET Applied Research Centre

Fp
EUSKADI
LANBIDE HEZIKETA

EUSKO JAURLARITZA



GOBIERNO VASCO

HEZKUNTZA SAILA
Lanbide Heziketako Sailburuordetza

DEPARTAMENTO DE EDUCACIÓN
Viceconsejería de Formación Profesional

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1 INTRODUCTION

This document contains the definition and summary of the challenges in the Euskelec Championship 2022-2023.

1.1 DEFINITION OF CHALLENGE:

The championship challenges are objectives that help and guide the teams in the correct development of the project.

The aim of the challenges is to create benchmarks for the important project events as well as offering a tool to monitor the progress of the teams.

The challenges involve a series of tasks that must be carried out in order to comply with the championship calendar. The correct resolution of the challenges will keep the project moving in the right direction, on time and with the required quality.

These scheduled submissions will be part of *Phase 1: technical-creative section of the championship*.

1.2 SUBMISSION OF THE CHALLENGES:

The submission of the challenges must be made, by the deadline stipulated by the organisation, via email to the address admin@euskelec.eus

These submissions are **complete and definitive**, and will be evaluated to assign the final score. The Organisation will provide feedback on the submission made and the score obtained within approximately 2 weeks.

1.3 FORMAT OF SUBMISSION

In this edition the **MP4 video** format is added . In each challenge, in addition to the docx, conventional pdf format, a brief video explaining how each challenge has been developed must be made and submitted to the panel. The videos must be brief and dynamic, with an approximate duration of 1 to 5 minutes.

In addition, as in previous editions, each challenge must be delivered in digital **.PDF** format within the established deadlines. A **.docx template** which has a pre-established format (margins, font, spacing, etc.) and **use of which is mandatory** will be provided. This template must be used without making any changes to it, so students must take the necessary precautions not to do so.

In addition, the documentation will be requested with the following name:

"CHALLENGE-0X-team number.PDF"

For example, if it is the concept challenge, which is the 4th challenge, and your team number is 10, the name of the document submitted will be:

"CHALLENGE-04-10.PDF"

In the event that the name of the submitted document is incorrect, the corresponding team will be required to send it again in the correct format.

Each Challenge will have the following maximum limit of pages for the content (not including cover nor index):

1. **Structure of the team:** 5 pages.
2. **Methodological Project:** 5-10 pages.
3. **Analysis of the competition:** 12 pages.
4. **Communication:** 10 pages.
5. **Concept:** 15 pages.
6. **Electrical diagram:** 10 pages.
7. **Innovation:** 10 pages.
8. **Report:** 30 pages.
9. **Presentation:** There will be no limit to the number of slides, but it must be borne in mind that the maximum duration of the presentation will be 10 minutes, as indicated in section "2.9 Presentation".

The championship challenges will be evaluated and given a score by the championship organisation according to the following criteria:

- **Document format:** This must have been followed correctly and without modifying the format of the template provided by the organisation.
- **Quality of the writing,** correct and clear insertion of **images** that clarify explanations, etc.
- **Inclusion of the specified sections** of each challenge in this document.
- **Coherence** in mechanical, electrical, organisational aspects etc., depending on the challenge in question.
- **Technical difficulty** of the decisions made to carry out the project.

1.4 PENALTIES:

In the event of delay in the submission of the stipulated challenges, the penalties specified in the rules will be applied.

The delay in the completion of each challenge in an administrative sense will lead to a penalty of **5%** of the total "score" of the challenge for each day of delay with a maximum of **50%** of the "score". In other words, when a team submits a completed challenge within the stipulated period, they can achieve a maximum "score" of **100%**, but if, for example, the submission is delayed for 2 days, they can only achieve a "score" of **90%** for the challenge.

To participate in phase 2 of the championship, participation in and submission of challenges 7 Report and 8 Presentation is mandatory, and the team will not be able to continue in the championship until submission of the outstanding challenge, being penalised appropriately for the delay in its submission as specified above.

2 DESCRIPTION OF THE CHALLENGES

2.1 CALENDAR

Task	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23
registration	30-Oct								
Training									
Team details		30-Nov							
Methodological Project			22-Dec						
Analysis of the competition			16-Dec						
Communication				31-Jan					
Concept					28-Feb				
Electrical diagram						31-Mar			
Innovation							28-Apr		
Report								29-Apr	
Presentation Phase 1 + Verification									
Phase 2									

2.2 TEAM DETAILS

The organisation will request a document from the teams specifying the general information about the team:

- Name of the team
- Team tutors
- Name and surname of the participants and the course they are studying.
- T-shirt size (one T-shirt will be given to each participant in phase 2)
- Team leader
- Structure and sections of the team. Organisation.
- Strategy for controlling and monitoring progress

2.3 METHODOLOGICAL PROJECT

This challenge must be fulfilled by the teaching staff, coordinated by the main tutor from Euskelec in each centre.

The aim is to implement active/collaborative methodologies in the classroom in order to achieve a more motivating learning process, with a prior design defined and integrated in the students' learning process itself.

With future editions in mind, the goal is to create a repository of good methodological practices within EUSKELEC, that we can share and be used by both teachers and students to design and improve during the learning process.

Proposing the project as one for the centre, seeking the involvement of as many professional branches as possible, and the training programmes of each centre, will be assessed positively. In turn, the inter-centre modality will be allowed, enabling collaboration between different vocational training centres, where a single centre will be the sole representative registered and the other will participate as a collaborator.

When evaluating the methodology implemented to develop the project, the following sections will be taken into account:

No. of centres.

No. of professional branches.

No. of training programmes involved.

No. of modules involved.

Methodological strategy: Explain how the activities put forward develop the results of the learning/skills of the different modules involved and how all this is reflected in the students' evaluation process.

This challenge (Methodological Project) becomes highly relevant in this edition, as it has a considerable percentage in the final score (200 out of 1000); therefore, the fact that it will impact the general classification must be taken into account.

2.4 ANALYSIS OF THE COMPETITION

"Benchmarking is a continuous process by which the products, services or work processes of leading companies are taken as a reference, to compare them with those of your own company and later identify improvements and implement them."

The objective of the analysis or comparison is to find out about the current situation and the state of the art in similar projects (including projects in the centre itself). As a consequence of this analysis, teams should be able to develop more complete technical solutions with fewer iterations than starting from a project without this information.

Analysis of the following points is required:

- Brakes
- Suspension
- Chassis
- Bodywork
- Transmission
- Good practices/interesting ideas/innovation

2.5 COMMUNICATION

This challenge creates the need for teams to think, debate and choose a communication strategy (from the beginning of the project) both within the centre and outside the centre. Creating a communication plan can have multiple purposes, such as financing, manufacturing, acquiring resources, etc.

The team must create a logo for the group that represents them and that, together with the team name, will be used to identify the different teams.

A document is requested that details:

- The main idea of the communication campaign
- The objectives of the communication campaign
- The strategy of the communication campaign
- The communication campaign timeline
- Analysis of the expected impact of the campaign
- Sponsors achieved for each project (no. of sponsors, financial aid, materials obtained, collaboration agreements, etc.).

In other words, the communication and marketing actions the team will carry out, the channels they will use and the results they expect. In preparing for the campaign, teams are encouraged to use a wide range of channels and media, from traditional media (print, radio and television) to online tools (websites, blogs) and social media (TikTok, Facebook, Twitter, YouTube, Instagram, etc.).

When evaluating and measuring the quality of this challenge a factor to be taken into account is the number of views achieved by the informational videos created.

2.6 CONCEPT

This challenge includes the submission of the conceptual design of the prototype and the innovative idea or ideas that it is intended to implement in the project. A brief report should describe how the different parts of the prototype (chassis, wheels, suspension, steering, transmission, location of the traction and electrical components, etc.) are going to be made, what strategies will be implemented in order to build it and if different alternatives or possibilities are being considered. The intention is to present the organisation with **an outline of the prototype** that you aim to design and what is innovative about it, without having to carry out an in-depth explanation of how to produce each of the parts, but simply transmitting the idea for the solution that the team aims to achieve.

In this regard, you should include the changes that will be made to the chassis if it is reused

and what material the roll bar will be made of if this is different from the one proposed in the rules.

This conceptual design must comply with the competition rules. Presenting information that does not comply with the rules will be penalised with a deduction of 3 points per article infringed.

The project must include at least one innovation that provides some degree of novelty. This can be an innovation of any type with respect to the current state of the art, and it is possible to innovate in any part of the prototype, both at the level of electrical and electronic components, the cycle parts, structure and materials and in new manufacturing methodologies, ways of organising the project, marketing methods or any other area.

The purpose of this stage is to propose a prototype solution (including the innovation), without going into detail, in order to verify that the technical idea is viable. Certain decisions must be made to define the concept of the prototype.

2.7 ELECTRICAL DIAGRAM

The project must include a document specifying:

- The complete electrical diagram of the vehicle that can be separated, if necessary, by circuits or systems.
- The function and explanation of the powertrain components.
- All the extraordinary electrical or electronic components that are added to the vehicle and the explanation of the function that these will carry out within the prototype. The inclusion and explanation of the elements will be assessed.
- All safety systems included in the vehicle and the operation of these safety systems must be clearly specified.
- The location of the maintenance switch must be clearly indicated in the electrical diagram.
- The steps to follow should be indicated to guarantee the safe disconnection of the vehicle, that is, the **maintenance disconnection protocol**.

This electrical diagram must comply with the competition rules.

Presenting information that does not comply with the rules will be penalised with a deduction of 3 points per article infringed.

2.8 INNOVATION

Having presented the possible innovations (within the Concept challenge) in the vehicle, the methodologies or any other area, the team must **choose** the innovation to be implemented that they believe is most relevant and explain it in detail. A document must be submitted specifying which innovation has been implemented, in which area, how it has been implemented, and the benefits and complications, etc.

This challenge will have its own prize that will be based directly on the evaluation of this challenge together with the score for this section in the final presentation of phase 1 of the championship.

2.9 REPORT

All the work carried out for the Euskelec project must be documented throughout the championship and will be gathered together in a report that contains all the technical aspects addressed in the championship. The correct monitoring of the challenges will facilitate the drafting of this document, and these provide the principal structure of the report. Teams are encouraged to begin developing this document early in the project to facilitate prioritisation of tasks and streamline the project. Remember that the report is a mandatory challenge and submission is essential in order to participate in phase 2 of the championship.

It is recommended that the project report be made up of the following sections:

- Introduction, presentation of the team and their roles.
- Methodological project: Add as an attachment to the final report and present evidence based on the methodological design carried out (Programming Doc., design of teaching units, design of challenges, activities, evaluation –marks– achieved by students, etc...).
- Relevant benchmarking and foundational ideas.
- Concept of the solution, alternatives and possibilities.
- Detailed explanation of the innovation implemented in the vehicle design, manufacture and/or project.
- Detailed explanation of the electrical diagram and its functions.
- Detailed explanation of the final design of the vehicle, its manufacture and the materials used. Calculation report (documents, data, mathematical formulas, design, drawings, photographs, illustrations and any supporting documents).
- Communication, marketing and financing.
- Conclusions.

The report document produced by the competition participants will be shared with the teams that take part in the next edition of Euskelec once the championship is over, with the aim of sharing the knowledge acquired.

2.10 PRESENTATION

As a final challenge, after having carried out all the tasks in phase 1 of the Euskelec project to design and manufacture an electric vehicle prototype, a presentation **in video format** must be made where a synthesis of what participation in the championship has involved is presented, including the goals that the team has set, how it has been organised, what has been done, what events have occurred, etc. It should be remembered that, like the report, the presentation **in video format** is a mandatory challenge to complete and essential in order to participate in phase 2 of the championship.

Like in previous editions, the teams must also present and defend **in person** their projects before a specialised panel, showing the fulfilment of their projects, innovations, justifications and conclusions.

The panel is authorised to penalise the teams if they exceed the established presentation time. After the presentation there will be a round of questions from the panel.

The teams will be able to benefit from the assistance of a presentation in digital format, for which the organisation will provide a projector and screen. To carry out the presentation, teams must bring their own laptop. The teams have to present the panel attending with a copy of their presentation in digital format (in .PDF or .PPTX format).

It is recommended to condense the project to be evaluated in the presentation and focus on the most important parts to be assessed by the panel. The teachers and tutors of each project will only be able to attend as listeners, their participation being explicitly prohibited at any point in the presentation and/or during the questions.

In the presentations the following aspects will be evaluated:

- **Presentation technique and body language:** The speaker maintains eye contact, accompanies the explanation with clarifying gestures and maintains the audience's attention with a clear voice, good pronunciation, and adequate intonation.
- **Organisation and structure of the project:** The way the presentation is structured and whether the content that is being explained can be identified at all times.
- **Presentation time:** Whether the time allowed was adhered to.
- **Technical justification:** The way the choice and manufacture of all solutions adopted in the vehicle (transmission system, brakes, wheels, chassis, etc.) has been argued with calculations.
- **Financial justification:** Has a detailed breakdown of the project costs been provided?
- **Electrical justification:** Have the electrical circuit of the vehicle and the incorporation of auxiliary circuits been described with diagrams and definitions?
- **Degree of innovation:** Is the idea very innovative with no known references to the proposed idea?
- **Degree of implementation:** Has the idea been implemented successfully in the project?

- **Potential for innovation:** To what extent is the idea viable for implementation in a project or applicable to other cases?
- **Dissemination and communication:** Has the team carried out a very active communication and dissemination campaign through different media throughout the year?

The duration of the presentation will have a limit of **10 minutes + 5 minutes** for questions from the panel.

The points listed below should be included in the presentation. It is recommended to focus on the assessable parts of the competition.

2.10.1 INTRODUCTION

The introduction should cover the following points:

- **Description and structure of the team:** Description of the members of the team. How the team has been structured, indicating the type of hierarchy used and the different functions.
- **Motivation and collective goals:** Comment on the goals and motivation of the team in the Euskelec project.

2.10.2 DESIGN

The part of the project referring to the design of the prototype must include at least the following mandatory sections:

- **Description of the generic functional systems** of the prototype (chassis, steering, suspension, transmission system, electrical components and bodywork): This point is intended to provide a description of the different parts or functional systems of the prototype, indicating and justifying the choice of the solution applied to each functional system.
- **Manufacturing methods:** Describe and show how the prototype has been manufactured. This should include the processes that have been followed, the techniques that have been used and the materials that have been chosen for the manufacture of the prototype.
- **Calculations and simulations:** At this point, the calculations, verification and simulations that have been carried out for the design of the prototype must be included. Any graphic and additional material can be included as part of the justification.

2.10.3 INNOVATION

This must include at least the following mandatory sections:

- **Discuss the idea of the need to apply the innovation:** There must be an explanation of the problem this innovation is intended to solve.
- **Description of the innovation:** Explain the innovation presented in detail, with additional information or graphics if necessary. Also indicate the value the innovation adds in its field of application.

2.10.4 COMMUNICATION

This part of the report must include at least the following mandatory sections:

Discuss the methods of communication that have been used: There must be an explanation of the communication campaigns that have been carried out, how they have been managed, which media have been used and the impact they have had, and the number of sponsors who have joined the project.

2.10.5 BUDGET

This point must include the **manufacturing and material costs** of the prototype, as well as the considerations obtained through the sponsors achieved for each project (number of sponsors, financial aid achieved, materials obtained, collaboration agreements, etc.).

2.10.6 CONCLUSIONS

This section, which has a free format, without guidelines, is intended to give each team an opportunity to draw conclusions and assess the impact of the Euskelec competition in terms of training and the development of their cross-cutting skills (teamwork, motivation, knowledge, decision-making, commitment, leadership, creativity, etc.).