



FORMULA  
ELECTRIC  
BELGIUM

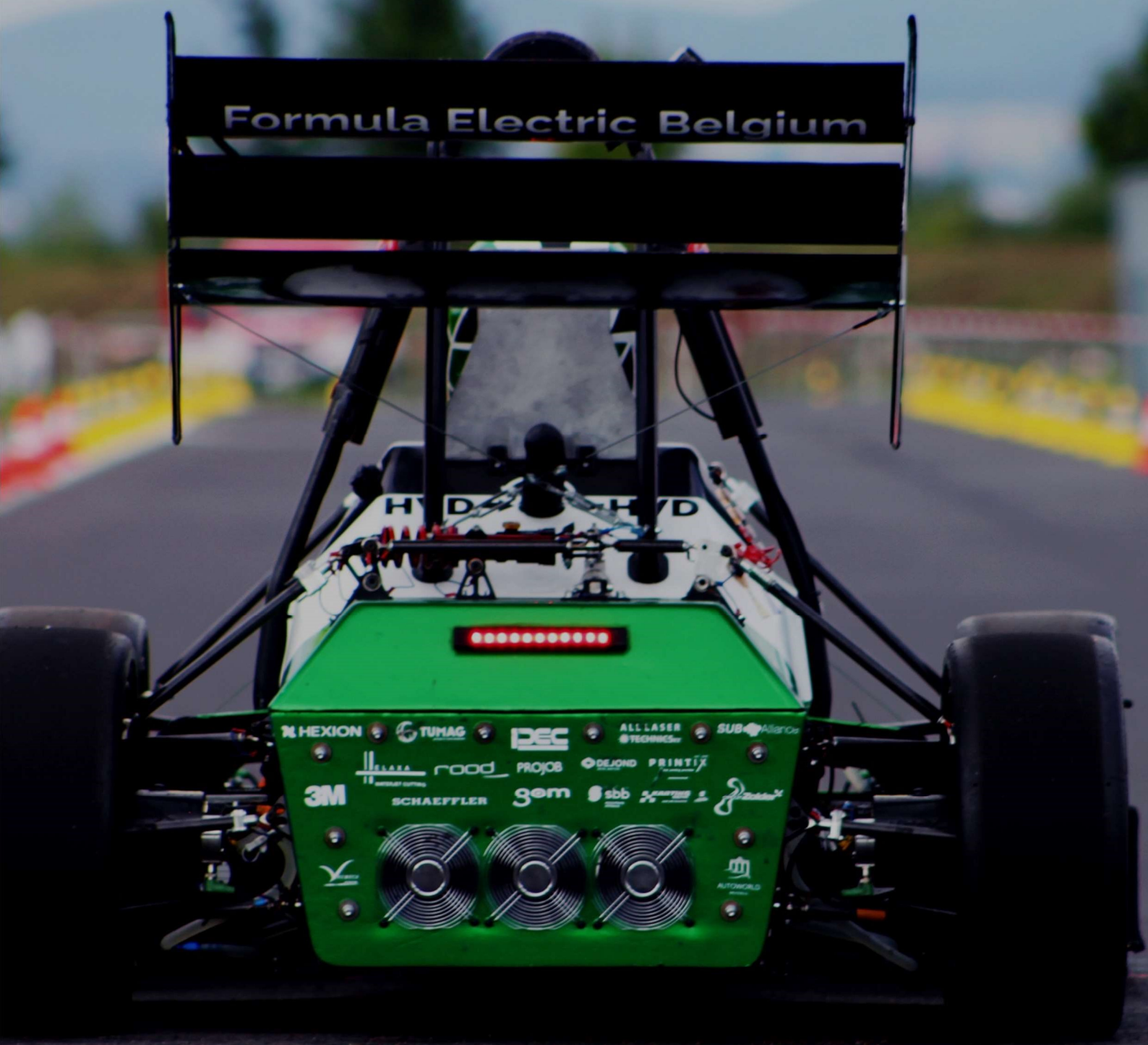
# Partner File

2020-2021



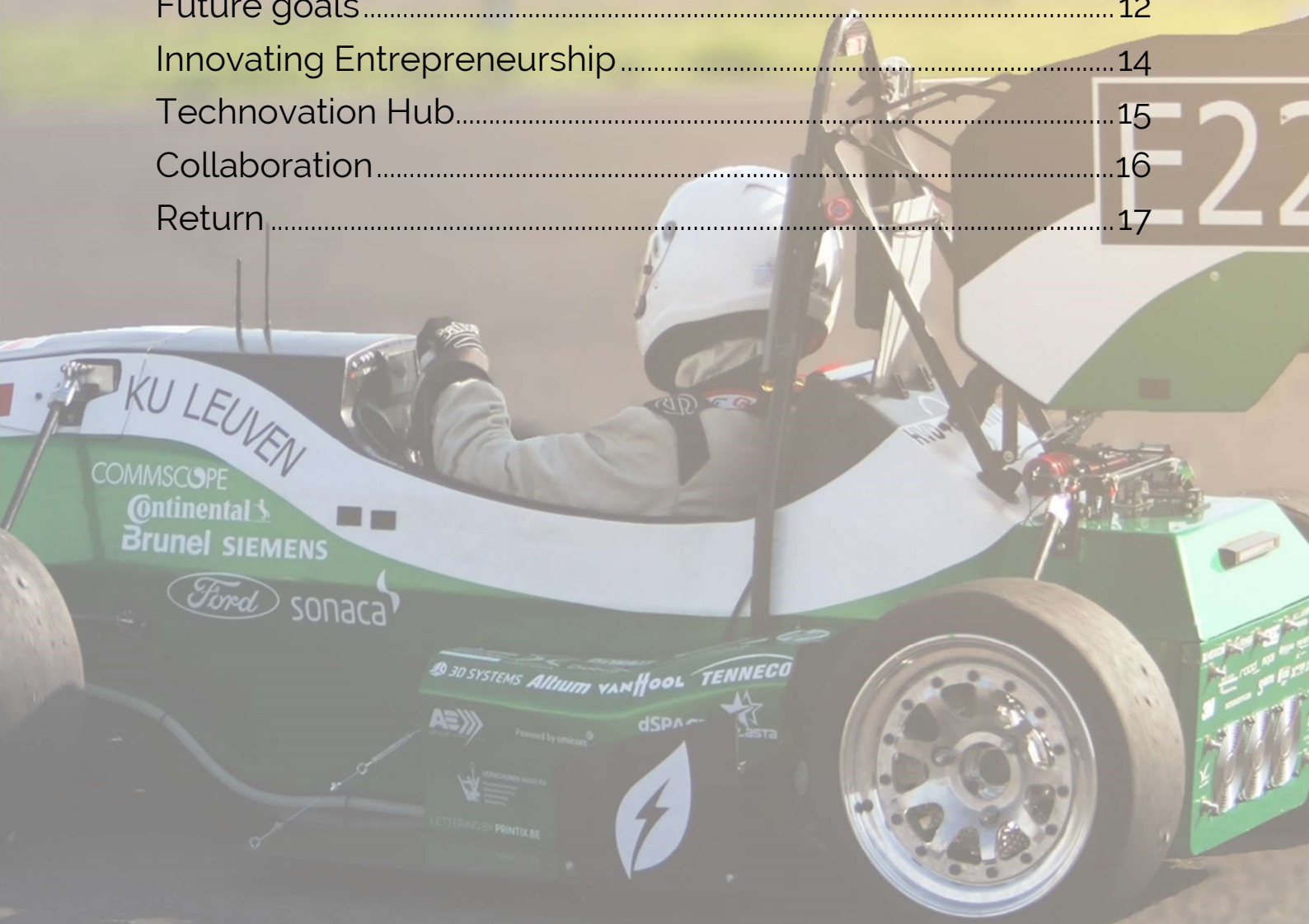


# Green innovation meets performance



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# Preface



Dear (Future) Partner,

Through this partner file, we would like to inform you about **Formula Electric Belgium**. Our goal: to complete an electric race car within nine months. This includes the design, construction, testing and optimization of the car. During all these phases, our focus remains the same: innovating towards a better future.

With this race car, we take part in the international Formula Student competitions, where we compete against other teams from all around the world. This competition tests more than just speed, the team with the best overall package of construction, performance, and financial and sales planning wins.

We cannot achieve our goals all by ourselves. To build an innovative car each year we rely on a network of various partners. This cooperation is of mutual gain with communication between team and partner during meetings and various events. Therefore, we are always looking for partners, such as you, with whom we can guarantee the success of the project.

In this partner file, we offer you an overview of who we are & our project and possibilities to participate. We look forward to a splendid collaboration with you.

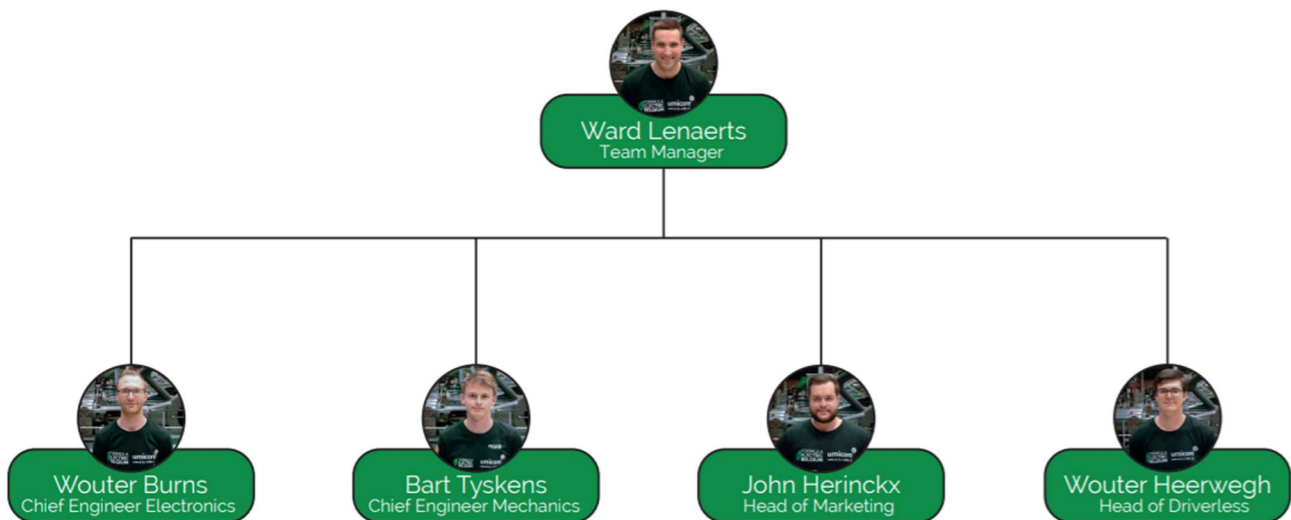
**Ward Lenaerts**

Team Manager – Formula Electric Belgium

# Team: Management

**Formula Electric Belgium** consists out of 15 engineering postgraduate students from KU Leuven and Thomas More. Each year, they fully commit themselves to the design and development of their electric race car. The team is reinforced by 12 thesis students that perform the necessary research and develop innovative technologies. These can be implemented in the same year or in the near future. In total, the team consists out of 27 driven students to finish this impressive project successfully.

In order to realize the different parts of the car, the team is divided into four departments; Electronics, Mechanics, Marketing and Driverless. Next to that, the R&D researches new, innovating technologies that can be implemented in this car or future cars.



In all departments, the different team members interact with partners. The close collaboration with partners and the complexity of the project forms the ideal experience for their future careers. Next to technical knowledge, they also develop their organizational and commercial skills. It should not be surprising that more than 50% of our alumni are employed by different partners.

# Team: Members



Wouter Burns

Wouter Heerwegh

Bart Tyskens

John Herinckx

Ward Lenaerts

Wouter De Man

Robbe Van Gestel

Lukas Puffet

Mathijs Goris

Aaron Dirix

Andreas Monsieur

Simon Willems

Nordin Jansen

Jan Bruneel

Thomas Goossens

Viktor Valckenaers

Jean-Laurent Dirix

Nicolas Philips

Matthias Fonteyn

Wout Foque

Kobe Van Doren

Ward Hofkens

Thomas Ackx

Stijn Bluekens

Remko Schippers

Alec De Keyser

Joppe Leers

Benedict Conings

Hugo De Jong

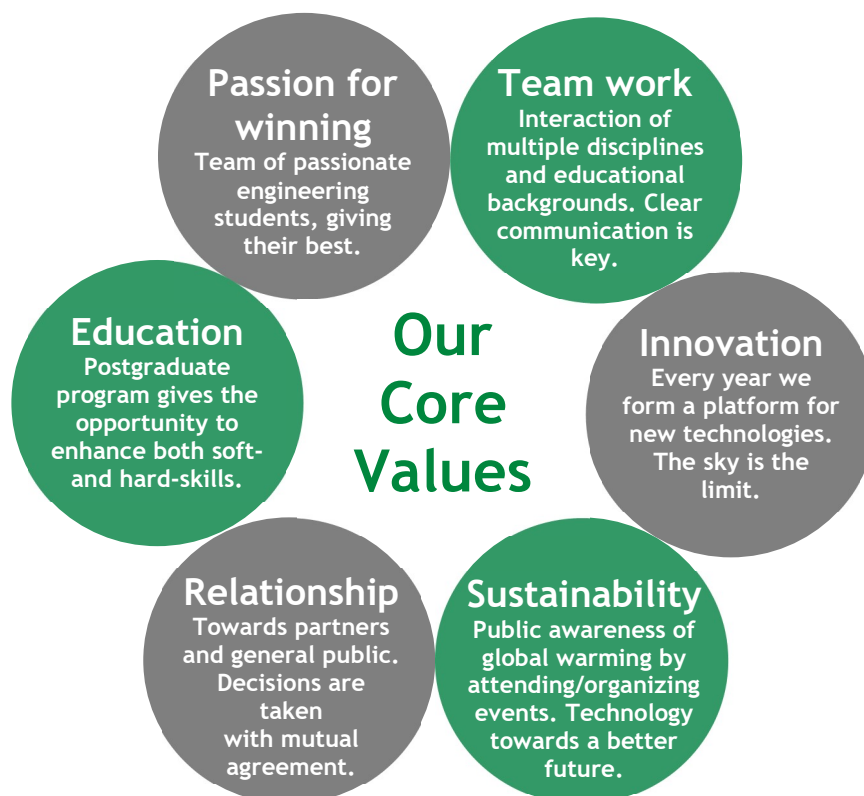
# Mission & Vision

## GREEN INNOVATION meets PERFORMANCE

Our **goal** each year is to develop new technological innovations, build together with our partners. These innovations we show by participating in the international competitions organized by Formula Student.

Our **mission** is to provide new innovations each year that contribute towards a greener future, whilst being more and more performant.

Together with our mission, we carry with us the following **6 fundamental values** at all time.



Our **vision** is simple: we need to take steps towards the future. The automotive industry is responsible for over a quarter of all greenhouse gases in Europe. This astonishing number does not include the manufacturing of these cars. We, at Formula Electric Belgium, think that on a technical level there is room for improvement.

We therefore search for new technologies. An example of such a field of improvement is improving efficiency, either direct or indirect. A direct improvement is using electromotors with higher performance than a fuel-powered motor. Decreasing the weight of the batteries is an example of indirect reduction. To formulate our vision in one sentence, '**Creating innovative change by working together, to better our world**'.



# Historical Overview



2015

Umicore Luna

Mass: 213 kg  
Acceleration: 2.7s



2016

Umicore Isaac

Mass: 213 kg  
Acceleration: 2.7s



2017-7

Umicore Nova

Mass: 204 kg  
Acceleration: 2.6s



2018

Umicore Pulse

Mass: 203 kg  
Acceleration: 2.6s



2019

Umicore Eclipse

Mass: 200 kg  
Acceleration: 2.6s



2020

Umicore Aurora

In progress...





# Our year & Formula Student

Our year can be divided into three main phases: Design, build and race. During the design, we finalize the concepts and decide on the innovations for the coming year. After all concepts are validated, the building phase starts. This phase signifies the implementation of the concepts. After the building is completed, we thoroughly test the car on the predefined requirements. During the summer months (July-August) we go racing in the Formula Student competitions.



Formula Student is Europe's most prestigious design competition for students. It is a platform for the next generation of world-class engineers. The goal of the competition is to make real innovating and enterprising engineers out of young students.

Formula Student challenges university teams worldwide to design and build their own car in only nine months. The performance of the car and the quality of the team get evaluated during static and dynamic events. To complete this mission successfully, the team must work together and think of creative solutions for the problems given by the judges. An additional difficulty is completing the whole project within a certain budget and time.

## Formula Student

... is a **quality engineering project** which is greatly appreciated by universities and companies. It is an **important addition to the curriculum** of the student.

... is considered by the industry as the ideal opportunity to meet engineering students during their **transition from the university to the commercial workplace**.

... is the **paragon of real-world experience**.

A Formula Student event is not only a race against the clock where the first one to cross the finish line is the winner. During several days the teams are subjected to different tests. A team can set its goal for a sublime result for one of the tests or go for the best all-round result. The events are divided up into two categories: static and dynamic events. All participating teams can join in the static events. To compete in the dynamic events, the teams must qualify during a very strict safety check called 'scrutineering'.

Our competition is made up of the following events:

# Formula Student: the events

## *Static events*

**Design:** Students clarify to a group of judges the specific choice for used materials, different components and the self-developed systems. A strong focus is put on how the design fills in the specific market needs.

**Business plan presentation:** The teams present their business plan for an assumed manufacturer represented by the judges. With this business plan, they want to convince them to invest in your business plan. The content, structure, organization and performance of the presentation are judged.

**Cost and Sustainability:** For this event, the team must make an accurate calculation of the total cost of their race vehicle. An entire BOM of the car must be made and each team needs to clarify what investments were made and which added value this gives to the car. Additionally, they must show that sustainability has been taken into consideration when choosing the components.

## *Dynamic events*

**Skid Pad:** The self-built cars drive on a track in the shape of an eight. The cars demonstrate with a fast lap how much lateral acceleration they can generate.

**Acceleration:** This event focuses on the performance of the powertrain and the capability of the suspension to result in the highest possible tire grip. The result of this test is the time needed to accelerate from standstill to 75m.

**Autocross:** Here the driving dynamics and handling qualities of the race car are being tested on a course of about one kilometer through straights and curves.

**Endurance:** Over a distance of 22 kilometers the cars must prove their durability under long-term conditions. Acceleration, speed, handling, dynamics, efficiency, reliability... the cars must prove it all.





# Media

**'Het is hard werken, maar je ziet elke week vooruitgang'**



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NICO SCHOOFS | 06 juli 2019 01:10

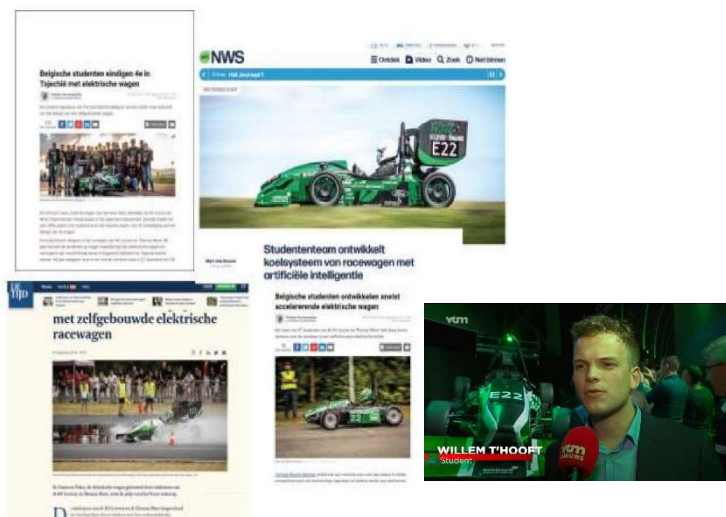
**'Zet je lasbril op, anders speel je een oog kwijt.' De Tijd zat op de eerste rij bij de making-of van de Umicore Eclipse, de elektrische racewagen die maandag debuteert in de Formula Student-competitie.**



Formula Electric Belgium creates a network of students, companies and research institutions.

At this moment, the team is connected to a network of more than 130 supporting companies, partners and industrial contacts. This network will be deployed further in view of innovative opportunities and the development of a synergy between education and industry on one hand and between the partners on the other.

Each form of communication of Formula Electric Belgium, be it through digital and social media, events and exhibitions, always refers to the relation with its partners. Furthermore, press releases are being sent at regular times in order to report over the status of the project. Each form of communication is always adapted to the target public.





# Future goals

Every year we push ourselves towards **new innovations**. For the coming year, our main focus will be on the following innovations. First of all, we will thoroughly test our own motors to optimize the communication with the drives. After integrating our semi-active suspension on the car, it is time to test, validate and improve the control algorithm to obtain the best possible handling for our car. We will also validate the design of our monocoque and improve our battery cooling.

Now that the necessary sensors and actuators have been implemented on last year's car, our first steps towards **a fully autonomous race car** have been made. Now we can start testing our software and algorithms in order to ensure an optimal racing path to further improve its competitiveness.



# Future goals

Our own motors have been designed and built, so now we can start testing them to make sure the communication between drives and motors can function optimally. We will perform these tests firstly on a test setup, later we can perform tests with the motors mounted on our car to see how the motors perform in an actual racing environment.

Now that the mechanical design of the semi active suspension has been developed and built, we can start testing the suspension system to fully integrate it with our torque vectoring and traction control systems. In the near future, our aim is to further improve this system to adapt itself to oncoming road conditions.

Next year, we will also be designing and building a new battery and improve the design of our battery cooling and its integration with the aero package of the car. The battery is quite a heavy component in our car, so we are always looking for new ways to develop a more lightweight design. Better integration with the aero package will also allow us to have a better downforce/drag ratio.

We at Formula Electric Belgium believe that there is no limit to innovation, the future will always contain more innovative technologies.



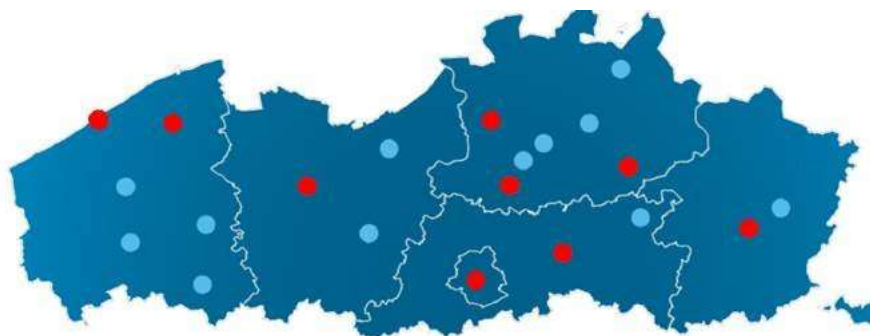
# Innovating Entrepreneurship

As part of Postgraduate Tech Innovations in Ventures & Teams, which is offered at campuses all over Flanders, engineering students of the KU Leuven and Thomas More learn how to work with the industry in a professional way and they get to know the entrepreneurship world. These students form their own personal education program in pursuit of their own interests and focus on the development of innovative and personal competencies. Not only technical disciplines but also the broader disciplines and soft-skills are gained. Moreover, they choose an innovative project which forms the core of their postgraduate.



Formula Electric Belgium is one of these innovation projects in which the team members work independently during a whole year. The success of the project depends fully on the commitment and the dedication of the students. Formula Electric Belgium shows a lot of similarities with a technologic start-up. The members have the responsibility to create structure, make sure the project gets the necessary financial support and monitor every aspect of the start-up.

The team consist out of master students Engineering Technology from **Campus Group T Leuven** and **KU Leuven technology Campus De Nayer**. A team of bachelor students Car Technique, Electronics ICT and Design & Production Technology of the **Thomas More University College** take care of the production for different parts of our car. For both these groups, 'Innovating Entrepreneurship' is the central theme.



● Campuses where the Postgraduate Tech Innovations in Ventures & Teams is offered



# Technovation Hub

We are cocreator and member of Technovation Hub.

Technovation Hub is a non-profit organization that assembles innovative and high-tech student projects, like Formula Electric Belgium and brings support by assisting them and offering advice. The members in the Technovation Hub are enthusiast engineering students, researchers and companies.

The support offered by Technovation Hub is mainly on a financial, juridical, administrative, safety and health level. This service can be realized with a collaboration between enterprises and educational partners. Examples of what Technovation Hub offers is the interest-free lending of financial assets and offering free juridical advice.

Besides, Technovation Hub is a forum for student projects, higher education and the work field. Due to the project-crossing behaviour and sustainable cooperation, a large network of industrial partners and likeminded people are created. Technovation Hub's biggest asset is to tackle entrepreneur matters together.

The combination of bespoke service and a strong network provides an environment in which engineering students really can start as entrepreneurs.

Technovation Hub was founded with the help of KU Leuven.

# Collaboration

Formula Electric Belgium is an independent project in which engineering students from KU Leuven and Thomas More participate in the Formula Student competition. This will be conducted in the context of a Postgraduate Tech Innovations in Ventures & Teams. The support of partners is needed to collectively achieve the team's goal.

Formula Electric Belgium searches for utmost needed financial and material sponsorships. This kind of support is needed for the purchase of critical components, the assembly of the car, organization within the team and the registration of the different competitions. The material support will be converted to its resale value which can be categorized and compared to financial support.

The relation with our partners means more than only a financial resource. As a partner, you will be an associate within this project. Our success will be your success!

Formula Electric Belgium works with different partner levels. There is a specific return which is offered per level. A difference is made between financial support and material support. If a company is willing to give us more financial support than the highest level, that specific return can be subject of discussion.

## Why invest in Formula Electric Belgium?

- Expanding and enforcing your business relations in divergent sectors.
- Promoting your company to an international Student community and their environment.
- Investing in a sustainable project.
- Recruiting young and motivated engineers.
- Obtaining results of jointly conducted research.

PARTNER LEVEL	FINANCIAL SUPPORT	MATERIAL SUPPORT <sup>1</sup>	SOFTWARE SUPPORT
Supporter	from	Up to	Up to
Regular	from	from	from
Bronze	from	from	from
Silver	from	from	from
Gold	from	from	from
Platinum	from		

<sup>1</sup> Containing materials, knowledge and logistics



# FORMULA ELECTRIC BELGIUM

For more information  
regarding the returns we  
offer, contact John Herinckx  
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