FORMULA ELECTRIC BELGIUM

Partner File

2022- 2023


Green innovation
meets performance
KU LEUVEN THOMAS MORE
COMMSCOPE
TITAN
brievenbus

Contents

Preface

Dear (future) Partner,

Through this partner file, we would like to inform you about **Formula Electric Belgium.** Our goal: to design and build an electric race car within nine months. This includes the design, the construction, the testing and the 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 project planning wins.

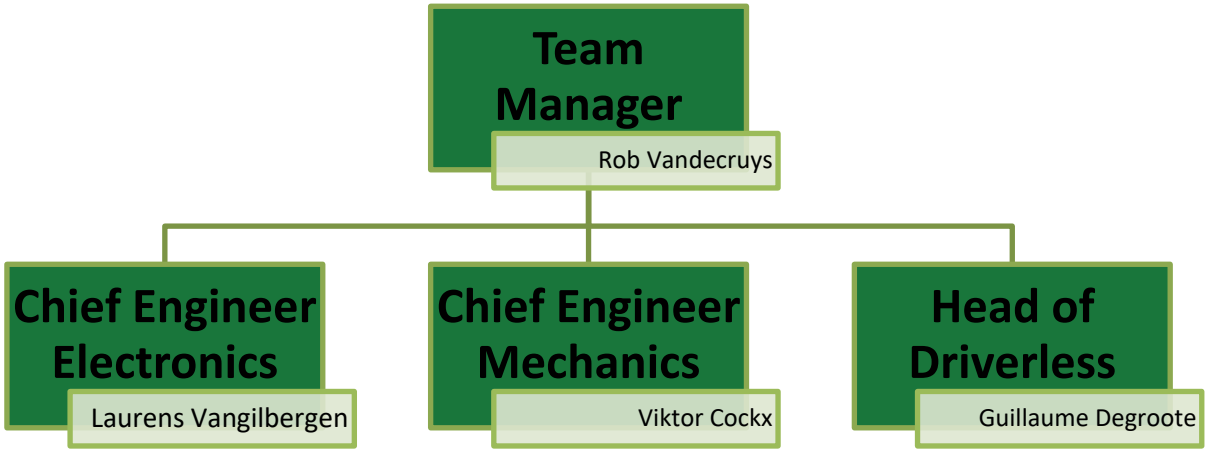
We cannot achieve our goals all by ourselves. To build an innovative car each year, we rely on a network of various partners.This cooperation is of **mutual gain.** With communication between team and partner during meetings and various events we ensure the best experience that we can offer towards the partners. 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, what we do and why we do this. We are looking forward to starting the collaboration with you.

Rob Vandecruys
Team Manager – Formula Electric Belgium

Team: Management

Formula Electric Belgium consists of 21 postgraduate engineering 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 13 thesis students that perform the necessary research and develop innovative technologies. These can be implemented in the same year or in the near future. This year the team even introduces 14 volunteers to the team. In total the team consists of 58 driven students to finish this impressive project successfully.



In order to realize the different parts of the car. The team is divided into three departments: Electronics, Mechanics and Driverless. Not to mention that we also take the whole marketing side of the project with the technical sides. Next to that, the R&D explores the new innovating technologies.

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

Rob Vandecruys	Wout Vanderwegen	Viktor Cockx
Dries Van Lommel	Dieter Evers	Ward Smets
Laurens Vangilbergen	Seppe Sleurs	Tim Rens
Melchior Mertens	Jef Eyckmans	Henri Parez
Thomas Verkinderen	Guillaume Degroote	Pieter Peeters
Matthew Snyman	Seppe Ameel	Simon Verstraete
Toon Vekemans	Stan Eykerman	Simon Devos
Wouter Heerwegh	Remko Schippers	Ward Himpe
Alvaro Piergili	Anatole De Becker	Andy Van der Vaeren
Anthony Van Bijsterveld	Arthur Tavares	Diego Vangeneugden
Emma Van De Wouwer	Filippos Oikonomopoulos	Javad Nematli
Lefty Verlinde	Lissa Berlo	Lode Heylen
Louis Storm	Maxim Decherf	Naut Debruyn
Nicolas De Bie	Ramazan Yetismis	Shengzhe Lyu
Thomas Wijgers	Tijs Proost	Warre Verlinde
Willem Verstrepen	Baue Boersma	Bram Aertgeerts
Jan Martens	Jarden Dirckx	Kerem Okyay
Louis Libert	Manu Kranzen	Pieter Eelen
Rio Evrard	Thomas Brouwers	Thomas Clayson
Yannick Lauwers	Paula Mate Pulido	Max Van Strydonck

Mission & Vision

Our goal each year is to develop new technological innovations, built together with our partners. We demonstrate the result of these innovations by participating in the international Formula Student competitions. **The mission** is to offer an **innovative platform** for creating **technological breakthroughs** in the automotive industry and beyond. This technology and research add to the **green and driverless future of mobility**.

Together with our mission, we always carry with us the following **6 fundamental values.**

Our vision is simple: taking steps towards a more **sustainable future**. At Formula Electric Belgium, we believe that on a technical level, there is still room for improvement in the automotive industry.

We therefore search for new technologies, focused on **electrical and autonomous driving,** while increasing the performance of the car. With the help of **STEM-lecture**, which we provide for enthusiast students, our vision takes shape at a young age.
To formulate our vision in one slogan:

GREEN INNOVATION
meets PERFORMANCE

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Historical overview

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2015

Umicore Luna

Mass: 213 kg
Acceleration: 2.7s

2016

Umicore Isaac

Mass: 213 kg
Acceleration: 2.7s

2017

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

Mass: 220 kg
Acceleration: 2.6s

2021

Aurora MKII

Mass: 240 kg
Acceleration: 2.6s

2022

Titan

Mass: 218 kg
Acceleration: 2.5s

Our year & Formula Student

Our year is divided into three main phases: **Design, Build and Race**. During the Design-phase, the team creates new concepts with technological innovations for the newest vehicle. These concepts are then translated into a design and validated using software. When the new car is validated, it's time to turn vision into reality and the Build-phase can start. This phase contains both the manufacturing of the vehicle and thoroughly testing it. These two processes, designing and building, from start to finish, take about nine months for the team. When the vehicle is built and tested, it's time to take it to the racetrack. The team enters the Formula Student competitions held during the summer months July and August.

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, out of young students, real innovating and enterprising engineers.

Formula Student challenges university teams worldwide to design and build their own car. 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. 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'.

Formula Student: The Events

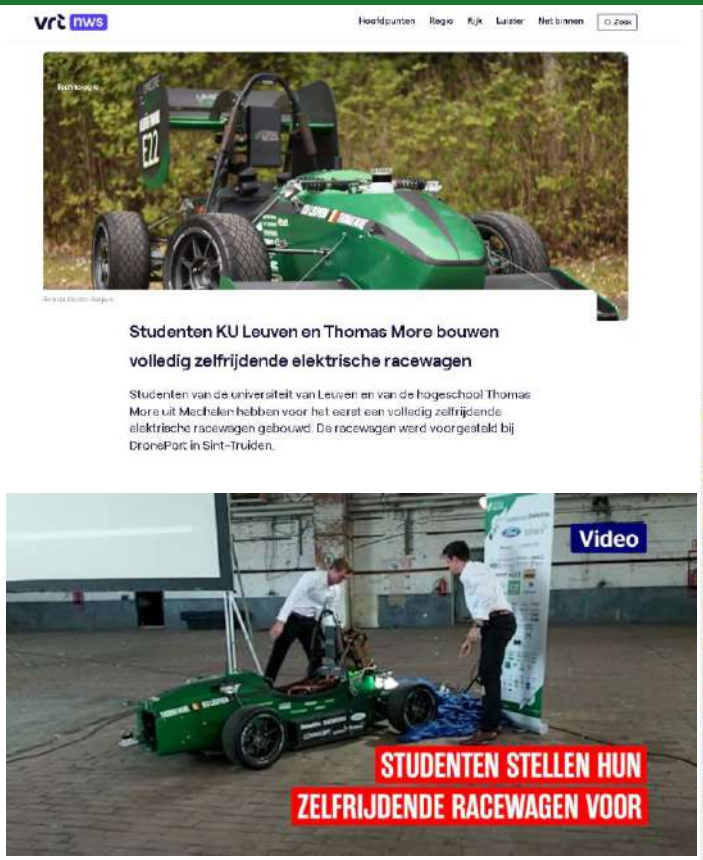
Static Events

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 potential investors or manufacturers, represented by the judges. With this business plan, the teams want to convince them to invest in their 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 75 meters.
Autocross: Here the driving dynamics and handling qualities of the race car are being tested on a course of about one kilometre through straights and curves.
Endurance: Over a distance of 22 kilometres the cars must prove their durability under long-term conditions. Acceleration, speed, handling, dynamics, efficiency, reliability... the cars must prove it all.

Media



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.

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Future goals

Last year, we have pushed ourselves towards **reliability**. With this term as concept to guide the throughout the year, resulted in reliable results during the competitions. Eager to win the for the coming year, the goal is made simple, introducing an iteration of the car of last year, Titan, with as goal to perform better than last year in the EV Formula Student Competition.

First, we will thoroughly **revise** all the previous designs with reliability as a standard, whilst pushing to performance with a keen eye for detail for each system.

The whole powertrain will get a thorough test, which includes our inhouse made motors with optimized cooling system combined with the drives and battery package. Parallel on this study we will push ourselves more on keeping other concepts in mind and working them out.

The aerodynamics package will continue to be iterated on the previous designs, optimizing the undertray and sidepods for **increased downforce** with minimised generation of drag.

Since the electronics department adapted to a new **future proof** design, we can more focus on optimising components of this whole package. Due to the chip shortage, the electronics department must adapt quickly. This year with 4 people strong they will improve the electronic package, using the **future proof** chips that got introduced in the car last year, which makes the package faster and more efficient. Increasing the performance as well the reliability of the car. Not only this but the battery lay-out will get a new look, other configurations will be tested to increase the power to weight ratio.

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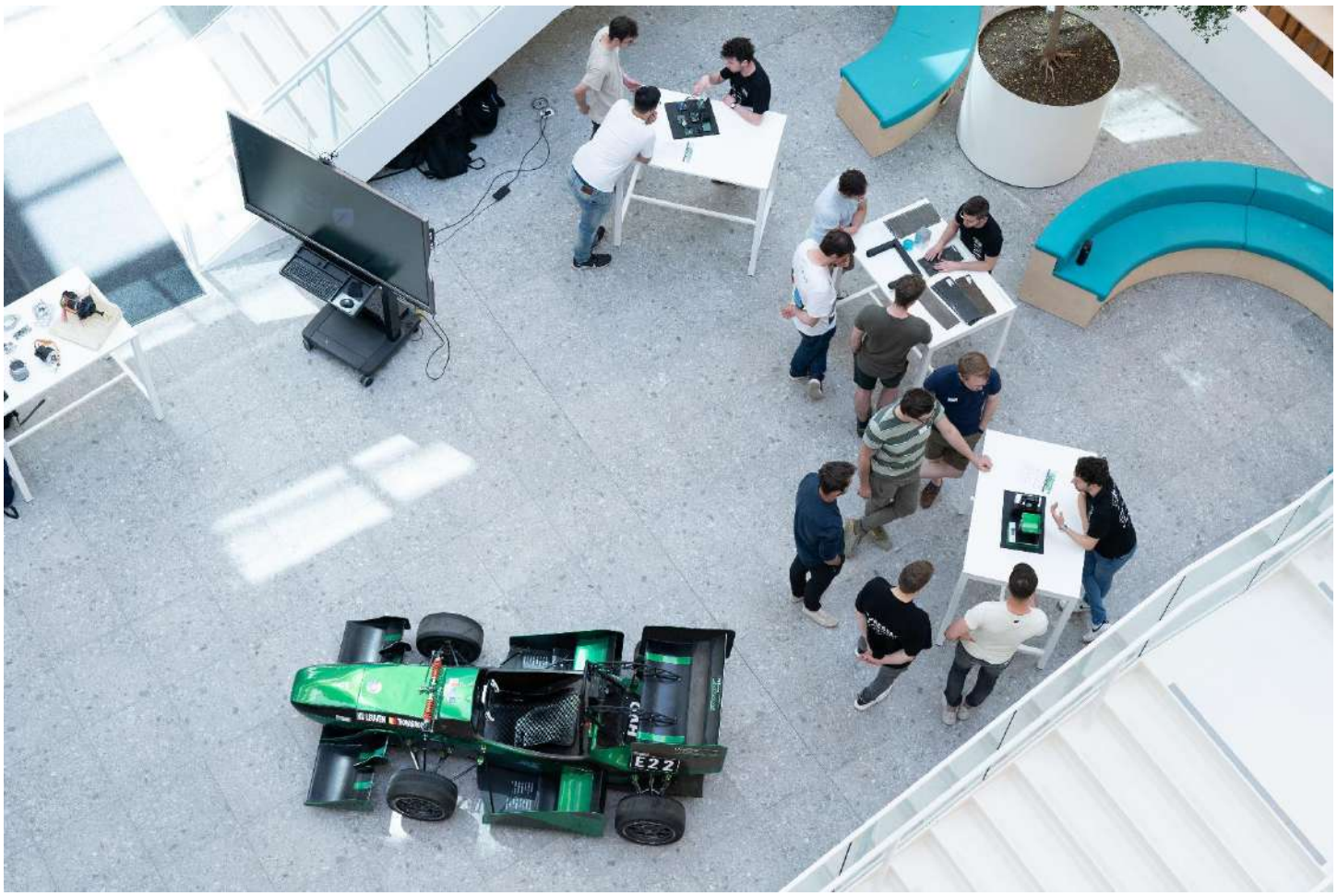
Future goals

Next up, the **sustainability** of the car. In the composites department, we will continue the research about flaxseed fibres in combination with biodegradable or recycled-PET cores and bio-resin, significantly reducing the carbon footprint of the car.

Formula Electric Belgium goes **driverless**! With a new driverless team, it is time to step up the game and start testing the integrated package on the car of previous season, Titan.

Each team member is intrigued about **STEM**, the passion we have for all these subjects is something we want to pass to the younger generations. Therefore, the STEM lectures will get an iteration. Whilst keeping the focus more on the interaction between us and the students, to increase interest in STEM and improve the overall quality of the lessons, we also want to continue to grow in the quality of our STEM packages.

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



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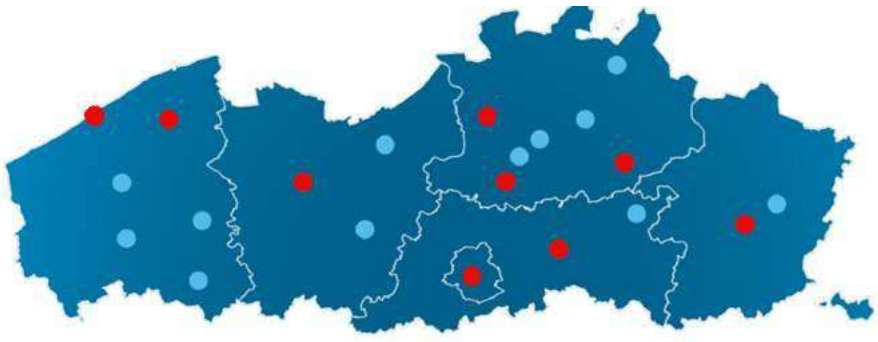
Innovating Entrepreneurship

As part of the Postgraduate Program (Postgraduate Tech Innovations in Ventures and Teams of KU Leuven), focussed on Innovation and Entrepreneurship for engineers, which is offered at campuses all over Flanders. Engineering students learn how to work with the industry in a professional way and how to get to know the entrepreneurship's 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 broader disciplines and soft-skills are gained. Moreover, the students 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 both independently and as a team 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 Arenberg Leuven, 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 the co-creator and member of Technovation Hub.

Technovation Hub is a non-profit organization, founded with the help of KU Leuven that assembles innovative and high-tech student projects, like Formula Electric Belgium. It brings support by assisting them and offering advice. The members in the Technovation Hub are 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 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's matter together.

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

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 the Postgraduate Program Postgraduate Tech Innovations in Ventures and Teams of KU Leuven. The support of partners is needed to 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, the 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 of 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[1]	SOFTWARE SUPPORT
Supporter	For more info regarding the partner levels, contact Rob Vandecruys (Team Manager)		
Regular			
Bronze	Rob.Vandecruys@formulaelectric.be +32 483 19 09 86		
Silver			
Gold			
Platinum			

[1] Containing materials, knowledge and logistics

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Return

On events	SUPPORT	REGULAR	BRONZE	SILVER	GOLD	PLATINUM
Receive event invitations	✓	✓	✓	✓	✓	✓
Press wall	✓	✓	✓	✓	✓	✓
Logo on the digital slideshow	✓	✓	✓	✓	✓	✓
Permission to distribute your promo material (flyers…)			✓	✓	✓	✓
Demonstration of own products				✓	✓	✓
B2B promotion						
Receive poster	✓	✓	✓	✓	✓	✓
Receive newsletter	✓	✓	✓	✓	✓	✓
Invitation on partner events	✓	✓	✓	✓	✓	✓
Present on networking event[1]				✓	✓	✓
Make a promotion video for partners to post[2]					✓	✓
Summary text of what our partner does for us		✓	✓	✓	✓	✓
Continuous promotion						
Logo on poster and website [px]	90*90	110*110	150*150	200*200	300*300	350*350
Website: Explanation enterprise						✓
Logo on the car: Rear side			✓			
Logo on car: Left & right side				✓	✓	
Logo on the car: With agreement on the placement						✓
Logo on newsletter				✓	✓	✓
Logo back side of T-shirt & polo				✓		
Logo front side of T-shirt & polo					✓	
Logo front side of all clothing[3]						✓
Exclusive promotion						
Renting a racecar[6]	750€	750€	500€	500€	500[4]€	500[5]€
Presentation by FEB at the partner company				✓	✓	✓
Logo on trailer						✓
Recruitment						
Link to a vacancy in our newsletter					✓	✓
Stand at Group T Entrepreneurs day (JobFair)					✓[7]	✓
Recruiting at our office[8]				✓	✓	✓

1: Decided in cooperation
2: Will be made when the partner asks for a video
3: Clothing includes, but is not limited to T-shirt, polo and sweater
4 & 5: Gold get 1-time free hire, Platinum 3 times per year
6: Logistics costs depend on the made agreement
7: Decided in cooperation
8: Possibility to recruit members of the team

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