

Esteban

Solar Car





WE ARE THE ESTEBAN TEAM

Developing renewable energies represents one of the biggest technological issues of the 21st century. It is an enormous challenge that the next generation of engineers will have the opportunity to overcome. It is with this vision in mind that the Esteban Project was first created fifteen years ago, and that same vision continues to push us forward. Year after year, Esteban proudly presents new and innovative prototypes of electric solar vehicles. It is with great pleasure then, that I present to you the new solar vehicle of Polytechnique Montréal: Esteban VII.

The latest Esteban vehicle is more than just a simple university prototype; it is the result of the countless hours of work of more than thirty passionate students from many areas of engineering. Thanks to the perseverance and motivation of the Esteban team, they were able to finance, design and build a prototype that finished in 9th place out of 16 of the most renowned engineering schools during its very first participation at the 2012 American Solar Challenge, a 2,700 km long race across the United States. Not only, but the Esteban team were also granted awards for the best powered solar panels and best team work of the competition.

Esteban is also a project that strives to promote science and technologies as much at a provincial level as it does internationally. We believe that it is our duty to encourage education and sustainable engineering in our community, and our involvement earned us an award in the environmental category of the Forces Avenir provincial competition, as well as an invitation to the World Future Energy Summit, in Abu Dhabi in January 2014.

As for the competitive aspect of our mandate, we will bear the colours of Polytechnique Montréal at the 2014 American Solar Challenge and will aim for our best performance to date. Esteban VI enabled us to push the limits of our expertise in design, and we plan to build Esteban VII on the basis of these accomplishments.



It is clear that we would not be able to accomplish all of these achievements without the help of sponsors who share our passion. On this note, I commit to ensuring that our partners will have the recognition they deserve, in Canada as well as internationally. By supporting the Esteban Project, you are investing in the know-how of 35 students eager to perform and innovate, working towards a greener future, one solar vehicle at a time.

This is the reason why I encourage you to join us in living this adventure, and help 35 future engineers overcome one of the biggest challenges of our time.

Gabriel Brassard
Director

Esteban VII Technical Fact Sheet

SOLAR CELLS

- 6m² of monocrystalline sillicium cells
- Module efficiency of 23%
- Nominal power of 1300 W

SYNCHRONOUS IN-WHEEL MOTORS

- Propulsion from two In-Wheel motors
- Three-phase supply
- Efficiency of 97%
- Regenerative brakes
- Top speed of 105 km/h

CHASSIS

- Carbon fiber monocoque
- Design optimized for security and balanced structure distribution
- Total mass: 250 kg

BATTERY

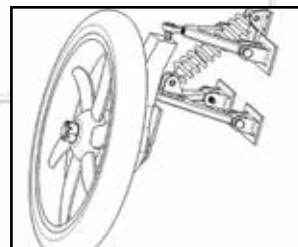
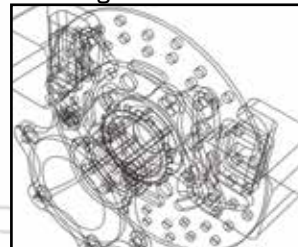
- Normal tension of 130 V
- Capacity of 25 Ah
- 3 hours of autonomy with an overcast sky
- 200 km of autonomy
- Mass of 20kg

COMPOSITE BODY

- Carbon fibers
- Pre-impregnated fibers and vacuum infusions
- Use of organic resin
- Use of soya fibers
- Aerodynamic profile
- 4.5m x 1,8m x 1,2m

SUSPENSION

- Front wheels (Traction): Dual triangle
- Back wheel: Trailing arms



Applications & Innovations

Through its collaboration with institutions such as [BOMBARDIER](#), [HYDRO-QUÉBEC](#) and the Department of [MECHANICAL ENGINEERING OF POLYTECHNIQUE MONTRÉAL](#) and its research chairs, [ESTEBAN](#) benefits from a unique support to accomplish mechanical and electrical innovations.

Esteban innovates through its use of various advanced technologies:

- Composite materials manufacturing processes
- Study of aerodynamics
- Finite element analysis
- Regenerative brakes
- Optimization of captured solar power
- Micro-prism structured solar cells
- Lithium-ion polymer battery
- Telemetry and data analysis
- Programing
- Ergonomics and industrial design

American Solar Challenge



During the summer of 2012, Esteban VI had the honor of representing Canada at the Formula Sun Grand Prix, in Monticello, New York, and at the American Solar Challenge, an interuniversity race of 2,700 km across the United States.

Among 16 teams, Esteban VI was able to finish in 9th place, and also win the award for best team work and best solar panels.

2 700 kilometres
Rochester, New York, to
Saint Paul, Minnesota



The Adventure Continues



World Future Energy Summit 2014

January 2014. United Arab Emirates.

At the conclusion of the 2012 American Solar Challenge, the **ESTEBAN TEAM** was invited by organisers of the WFES 2014 to participate in a partnership in the United Arab Emirates. This event will take the form of a twinning between **ESTEBAN VII** and a local university followed by a race of more than 900 miles across the country in which many other tandems of host and foreign teams will compete.



American Solar Challenge 2014

July 2014. Rochester, New York to Saint-Paul, Minnesota.

This is the 2700 km course where Esteban VI delivered its performance of 2012. It is thus in familiar ground that **ESTEBAN VII** will compete against more than twenty foreign teams and establish new precedents.



Visibility and events

Our team is proud of its partners and engages itself to bear their colors at dozens of events all year long.

Besides having its place at the starting line of international competitions starring the greatest engineering institutions in the world, **ESTEBAN** takes part in a myriad of technological, corporative and public events and provides first choice advertising space on its prototype, its uniforms, its promotional documents and its website.

Notable events:

- World Energy Congress (2010)
- Montreal Auto Show
- Eureka Festival
- Canada Science and Technology Museum
- Salon National de l'Environnement
- En ville sans ma voiture
- Ottawa Ecosphere Fair



Esteban VI in the Media:

CBC, CTV, Radio-Canada, La Presse, Journal Métro, radio Ville-Marie.

N.B.: An exhaustive press review is also available on demand.

Finally, our team's mandate transcends its technical and competitive aspects. Every year, our members participate in multiple school visits including elementary schools, high schools and colleges to promote green technologies as well as engineering. Energy will be one of the key issues of the 21st century and **ESTEBAN** is an exceptional tool to stimulate the public's interest in future technologies and in the unique possibilities that can be found within engineering and science professions.



The Team Behind Esteban VII

Electrical transportation, advanced materials and renewable energies are all fields with a high potential for development and will provide major opportunities for the next generation of engineers.

To support the **ESTEBAN PROJECT** is to invest in the training of young, skillful engineers who are ready to innovate. It is an opportunity to create links with students from eight different engineering specialties that develop unique work experiences.

Board of Directors:

Gabriel Brassard	Director
Yoann Arpin	Mechanical Director
Simon Dufour	Electrical Director
Antoine Cadotte	Finance Director
Mélanie Harvey	Logistics Director
Marie Tardif-Drolet	Treasurer





The Esteban VII Budget

PROTOTYPE EXPENSES

Suspension	30 000
Direction	3 000
Brakes system	5 000
Wheels	5 000
Tires	1 000
Materials	20 000
Tools	10 000
Moulds	35 000
Mould materials	5 000
Design softwares	5 000
Paint	2 000
Motors	32 000
Battery	10 000
Electronic components	6 000
Solar pannels	-
Subtotal	169 000

PROMOTIONAL EXPENSES

Events	5000
Promotion and marketing	2 000
Subtotal	7 000

OPERATIONAL EXPENSES

Office softwares	1 000
Team uniforms	1 000
Subtotal	2 000

COMPETITION EXPENSES

Support vehicle	10 000
Fuel	5 000
Food	6 000
Lodging	5 000
Subscription fees	7 500
Communication equipment	1 000
Subtotal	34 500

TOTAL EXPENSES 212 500 CAD

Become a Partner

ESTEBAN is proud to bear its partners' colors during its numerous and diverse public appearances. Through their support, our sponsors have access to the following privileges.

Contribution value	1000 and less	1000 +	2500 +	5000 +	7500 +	10000 +	20000 +	35000 +
Display on the website								
Access to our candidate bank								
Privileged invitation to events								
Subscription to the team's newsletter								
Lettering on the prototype's trailer								
Textual mention on the team's t-shirt								
Logo on exhibition posters								
Logo on the team's t-shirt								
Exclusive presentations of your company at Polytechnique Montréal								
Presentation of the vehicle in your company								
Personalized demonstration and road trials								
Extended exhibition of the vehicle in your company								
Negotiable exculsive visibility								

Display Space on the Vehicle

Small size								
Middle size								
Big size on fairing								
Exclusive fairing								
Exclusive canopy								

Contact

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