



PROJECT ESTEBAN: SOLAR RACING TEAM

2014-2016





ROLLING ON SOLAR POWER

Since its inception, the Esteban Project combines both creativity and perseverance toward an ambitious objective: developing the most competitive electric car powered entirely by the sun. Every year, our team must ingeniously surpass itself to build ever more performing prototypes, thus adding its own contribution to the development of sustainable energy sources. Today, the Esteban Project is proud to introduce Polytechnique Montréal's latest solar car prototype: Esteban 8.

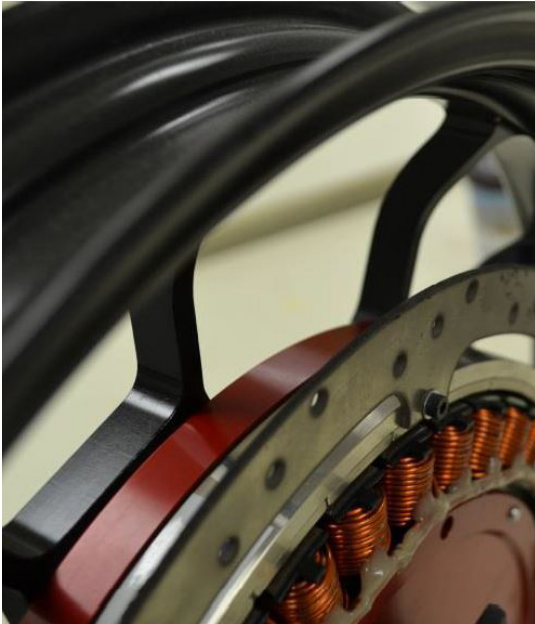
Needless to say, we could never reach our goals without the precious contribution of our sponsors, who share our passion and our vision. Our partners support not only an innovative technological initiative, but also contribute to promoting science and technology both in Quebec and around the world. We believe it is our responsibility to use our project to popularize science and sustainable engineering within our community, and this initiative was notably awarded the prestigious Forces Avenir prize in the Environment category.

« We are launching the design of this eighth prototype with an extensive experience and knowledge legacy. During the 2014 summer, Esteban VII ranked itself as one of the best Canadian solar car entries ever, by finishing the American Solar Challenge 2014 in fourth position. »

Esteban 8 will be the first four-wheeled vehicle in our team's history. This new feature, which brings our vehicle concept closer than ever before to a consumer car design, will change our development and fabrication process radically. Our team now faces this challenge eagerly with one event in mind to put it to the test: the American Solar Challenge 2016.

Supporting the Esteban Project is nothing less than an investment in the training of 40 students eager to innovate, and who are convinced it is possible to build a greener future. This is the reason why we invite you to join our team and live this great adventure with us by encouraging future engineers to tackle the energy challenges of tomorrow.

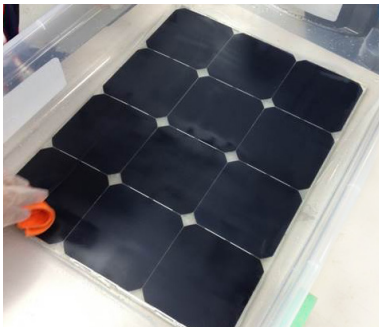
OUR CORE VALUE: INNOVATION



By replacing our three-wheel configuration by a new four-wheel design, the Esteban Project enters a new phase of its life, a phase which brings us closer than ever before to the world of standard consumer cars. Upgrading from three wheels to four poses a substantial technical challenge, as our team must start anew its product design process.

Esteban 8 Technical specifications

Dimensions	4,85m x 1,7m x 1m
Weight	180kg
Maximum speed	115km/h
Cruising speed	75km/h (sunny weather)
Braking distance	20m (on wet pavement)
Power	2 hp (solar) 2.5 hp (motors)
Layout	Rear-wheel-drive
Autonomy	6h (cloudy weather)



Esteban 8: A prototype integrating state of the art technologies

Electrical

Three-phase synchronous **hub-motors** and regenerative braking
Monocrystalline silicon **solar cells**
Automobile standard modular CAN network
Battery management and protection system
Control system optimizing efficiency and performance
Smart dashboard and **telemetry** system exporting data in real time

Mechanical

Monocoque **carbon** chassis optimized by **finite elements** method
Composite structure manufactured by vacuum infusion
3D model developed by computer aided design
Hydraulic braking system on four wheels
Double wishbone suspension on front and rear wheels
3D printed polymer bracketing

Now back to the drawing board, our team will focus on upgrading aerodynamic properties and reducing weight, while respecting important safety requirements and offering better driving ergonomics. These improvements will greatly reduce the vehicle's power consumption.

The electrical systems network constitutes the vehicle's brain, and we plan to design for the first time the entirety of our prototype's embedded systems, thus making it more efficient and reliable, while allowing a better adapted real time analysis of our performance metrics during races.

RACING EVENTS: A DAUNTING CHALLENGE

One of the most demanding objectives of the Esteban Project is to measure our vehicle against those of the best engineering schools around the world. To do so, we must build a street legal car, as rallies are performed on United States public roads!

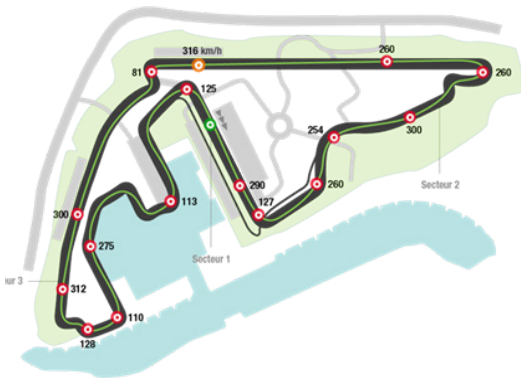
Our latest achievement: The American Solar Challenge 2014



A 2700 km rally aboard a solar car: this is the adventure proposed by the American Solar Challenge, a race organized every two years in the United States, and which extended from Austin, Texas, to Minneapolis, Minnesota for its 2014 edition. For the second consecutive time, Esteban was the only Canadian entry to complete the qualifying round and hit the road. Our team managed to improve from a middle rank position in 2012, to the 4th place in 2014, which is the best performance of a Quebec team to this day. Esteban was also awarded the Spirit of the Event Award, rewarding the team showing the best combination of sportsmanship, perseverance and excellence.



OUR NEXT ADVENTURE



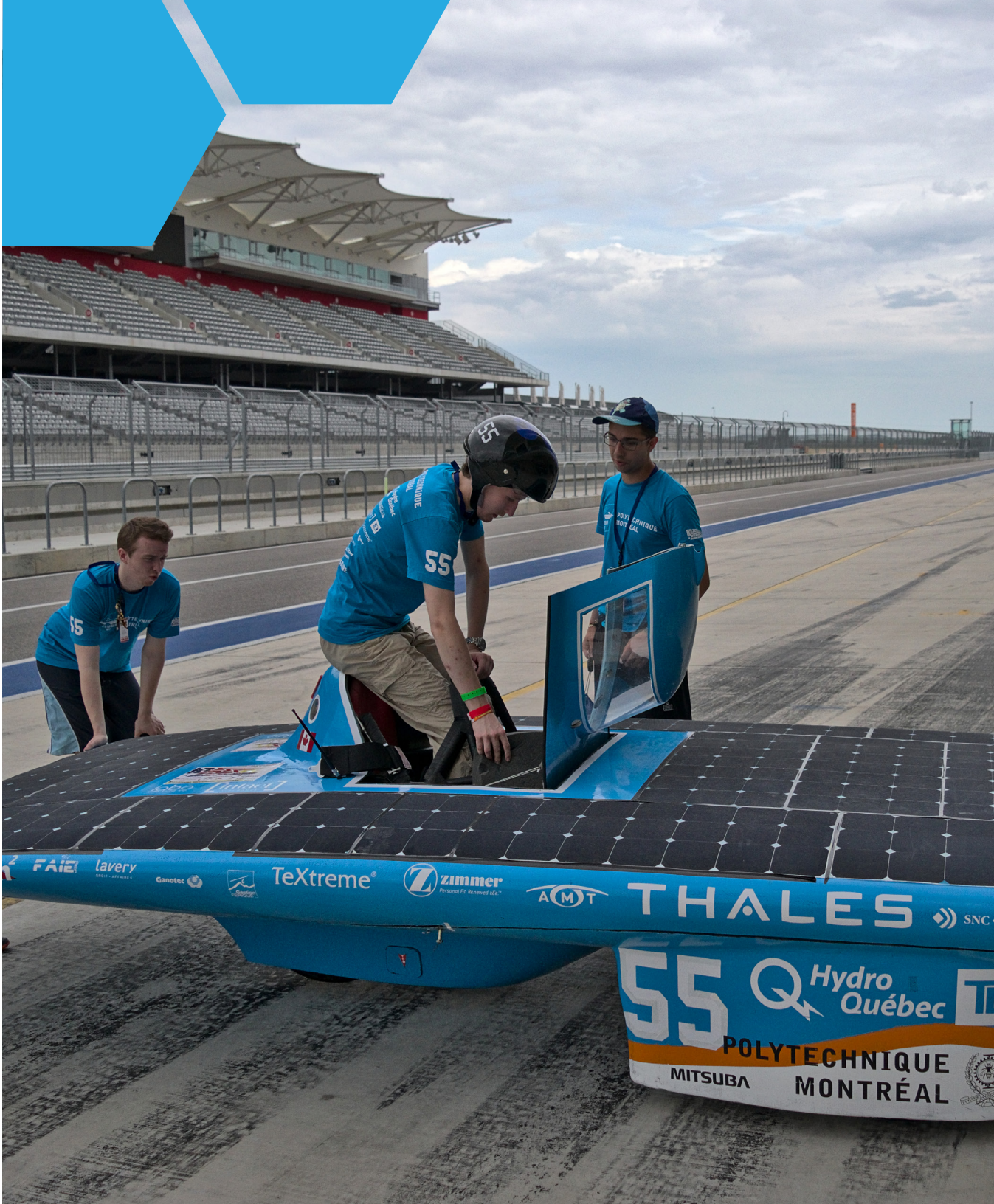
Formula Sun Grand Prix 2015

Building on its positive 2014 results, Esteban VII will race once again, this time in the Formula Sun Grand Prix, organized each year on various United States race tracks. The 2015 race will be held at the Circuit of the Americas in Austin, Texas, and Esteban VII will be optimized in order to push even further its capabilities and climb the rankings. This event will also be an ideal training environment for younger team members, and a testing ground for strategies developed toward the American Solar Challenge 2016.



American Solar Challenge 2016

It is a completely different car that will take the start line at the 2016 American Solar Challenge. Along a 2 700 km route, of which the start and finish points have not yet been revealed as we went to press, Esteban 8 will compete for the podium against the best solar racing teams. Building upon its success in the ASC 2014, and the set of improvements developed for our new prototype, our team aims its best results to this day.



« Esteban is more than a mere college project: it is the outcome of the relentless work of more than forty devoted and passionate students. »

Although most of our team members are majoring in mechanical and electrical engineering, our team makes sure to attract students from a variety of technical fields. Our current roster includes students from computer, mining, biomedical, aerospace engineering, and engineering physics, who actively take part in marketing, planning, designing, manufacturing, and fundraising.

By investing in this project, partners are supporting the training of these future engineers, motivated by progress and aware of the environmental challenges facing their generation. It is a unique opportunity to connect with entrepreneurially minded students developing a concrete engineering experience of unmatched scale.

THE ESTEBAN TEAM



BUDGET

Every year, Esteban relies on both its long standing sponsors and on new partners joining the project. The table below lists the expenses projections for the 2014-2016 project cycle.

Expenses forecast	
Prototype development expenses	
Suspension	10 000
Steering	3 000
Braking system	5 000
Wheels	5 000
Tires	4 000
Various materials	25 000
Tooling	10 000
Molds	20 000
Paint	2 000
Solar panels	40 000
Batteries	12 000
Electronic components	20 000
Subtotal	145 000
Promotional expenses	
Events	5 000
Advertising and marketing	2 000
Team uniform	1 500
Subtotal	8 500



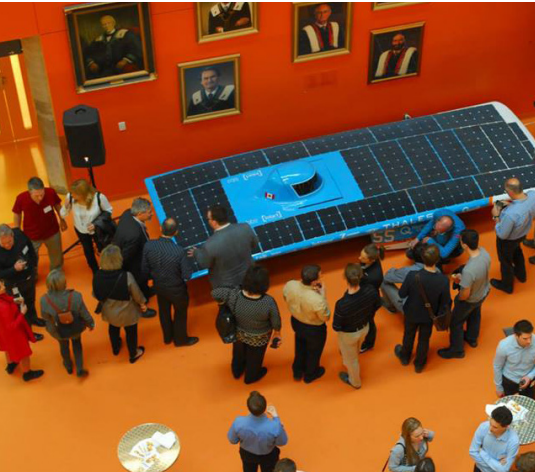
Photo Credit : Aurélien Pierre © 2014

Expenses forecast (cont.)		
Racing expenses	FSGP 2015	ASC 2016
Support vehicles	2 000	4 000
Fuel	4 000	5 000
Food	3 000	6 000
Lodging	2 500	5 000
Entry fees	7 500	7 500
Communication equipments	1 000	1 000
Subtotal	20 000	28 500
Total		202 500

MEDIA VISIBILITY

Esteban is part of many events over the course of each year. Be it during general public events, private corporate exhibitions, visits in high schools around the province or in international racing events, our team proudly displays the name of its partners. Our supporters can be readily seen on our vehicles, our team gear, our website and social media pages, and our promotional documents.

Sustainable energy will be a key issue during the 21st Century, and Esteban is an exceptional resource to stimulate the general public and the youth on future-oriented technologies, and on the unique possibilities offered by careers in science and engineering.



Furthermore, following its impressive 2014 results, our team made numerous appearances in major medias. The project's accomplishments was notably covered by :



- Radio-Canada/CBC (Television, radio and Internet)
- TVA Nouvelles
- CTV (Television, Internet)
- Journal de Montréal, Journal de Québec, Canoë
- 98.5 FM
- Journal Métro
- Les Affaires Magazine
- PLAN (Quebec Order of Engineers publication)

N.B. An exhaustive press review is available upon request

BECOMING A PARTNER

Esteban is proud to display its partners' colors during its numerous and diverse public appearances. By funding our project, our sponsors are offered the following visibility :

Sponsorship value	500\$ and -	500\$ and +	1000\$ and +	2500\$ and +	5000\$ and +	7500\$ and +	10 000\$ and +	20 000\$ and +
Display on our official web page								
Access to our recruiting database								
Invitation to special events								
Subscription to our newsletter								
Display on our racing trailer								
Text display on team t-shirt								
Logo display on exhibition posters								
Logo display on team t-shirt								
Custom information/recruiting session at Polytechnique								
Private vehicle demonstration								
Custom demonstration and road tests								
Extended exhibition of the vehicle within your facilities								
Exclusive naming and negotiable visibility								
Display size on vehicle								
Small size								
Medium size								
Large size on wheel fairing								
Exclusive wheel fairing								
Exclusive canopy								





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