

ITAQ Serving Companies

The Québec Advanced Transportation Institute, affiliated to the Cégep de Saint-Jérôme, has positioned itself as a catalyst in the development of technologies for sustainable transportation : an emerging industry in Quebec.

The Strength of a CCTT

ITAQ fulfils its activities within a mandate from the Collegial Centre for the Transfer of Technologies (CCTT), as well as about 30 other centres in Québec that work in different manufacturing sectors. The CCTTs are technological research environments that maintain privileged links with the education sector and companies, providing them with research and development (R & D) services, technical support and training. ITAQ is supported by the Ministère de l'Éducation, du Loisir et du Sport (MELS) and by the Développement économique, de l'Innovation et de l'Exportation (MDEIE). Now, after being in operation for three years, ITAQ has just had its mandate renewed until 2010.

Applied Research and Product Development

Since ITAQ was created in 2002, it has aimed its activities at research and development, technological transfer, strategic information and training. It also takes an interest in new propulsion, fabrication, telecommunication and transport management technologies.

Pierre Tison, Director of ITAQ and Business Services states that , *«First and foremost, we offer the know-how and expertise of a team of engineers and technicians specialized in fields such as applied research, technical assistance as well as the diffusion of information and training in different branches of advanced transportation : electric vehicles and energy storage systems, biodiesel and biofuel, prototyping, normalized tests, certification, etc.»*

With the publication of this newsletter, our wish is to establish a regular and permanent contact with our partners, clients and all companies and organizations who take a special or remote interest in advanced transportation.

With our clients' authorization, we will keep them abreast of some practical work being done to keep them better informed on recent developments in the sector of advanced transportation, to help them better understand our expertise and to inform them on all the different services we offer to companies.

This newsletter will also allow our readers to follow ITAQ's evolution, its influence here and internationally, its activities along with the development of its research center within the Cameleon project.

Pierre Tison
Director of ITAQ

A Unique Infrastructure

In 2006-2007, ITAQ will equip itself with a research and state-of-the-art equipment infrastructure totalling \$5.4 million. The Fondation canadienne pour l'innovation (FCI) as well as private partners will therefore contribute in setting up a specialized laboratory, the only one of its kind in Canada (see article page 3).

Collaboration Agreements

ITAQ has concluded collaborative agreements and carried out works on specific projects with about fifteen organizations, including companies, universities as well as tests and experimentation centres.

Tax Credit for Clients

Good news for companies : ITAQ as a CCTT enables his/her clients to benefit from a tax credit that is at least equivalent to 40%, applicable on expenses the company committed to. From now on, most companies can benefit from this tax credit, whatever the amount.

For more information about this new measure :
www.revenu.gouv.qc.ca/fr/formulaires/co/co-1029_8_21_22.asp

ITAQ and Nemo : A Close Collaboration

In January 2004, when promoters wanted to set up a new company specialized in design, fabrication and sales of electric vehicles, they approached Hugo Marsolais, ITAQ's Director of Operations. *Véhicules Nemo inc.* was therefore born out of one businessman's vision, that of Jacques Rancourt. From then on, a collaboration is established, one that will become fruitful through strategic and technological development, the setting up of a team of engineers, certification and approval. In less than two years, here is a company that introduced, along with ITAQ's close collaboration, a new product designated as HD2.





Tour de Sol The Olympic Games of the Green Car



Mr George E. Pataki, New York states' Governor, congratulating Hugo Marsolais.

In May 2005, ITAQ signed up for the Tour de Sol, an activity organized by the Northeast Sustainable Energy Association (NESEA) in Saratoga and Albany in the State of New York, an association that brings together «green» cars from Canada and the United States. Companies, universities, colleges, governmental agencies and individuals participated in this friendly competition that included a dozen tests such as acceleration and braking tests as well as a test that determines a car's capacity to cover a certain number of kilometers using

the least possible energy. The cars offered different types of technologies: electric propulsion, solar energy, natural gas and biodiesel. This yearly event is meant to be a showcase for the clean energies and sustainable transportation industry.

In the field of advanced transportation, Québec is a well-known Canadian leader. It was therefore important for ITAQ and its representative, Hugo Marsolais, Director of Operations at ITAQ, to participate in the 17th edition of this get-together. During these tests, the latter was driving a Smart CDI, running on biodiesel, at a B20 concentration.

For this kick-off, Bio Smart won three prizes, one of which due to the best consumption for a diesel-motored vehicle reaching a performance of 3.2 litres for every 100 km on a 300 km stretch at an average speed of 85km/h. It also came in among the first three best vehicles for its energy efficiency and for the reduction of greenhouse gases.

«But the very first objective for participating in the Tour de Sol was to observe the logistics and training needed to set up such an event : regulations, number of volunteers, number of sponsors, etc, explains Pierre Tison, Director General of ITAQ. Should ITAQ wish to organize, alone or in collaboration with



other partners, a similar event one day, we had a unique opportunity to learn from the experience of its organizers.»

The Tour de Sol is first and foremost a public sensitization company to prove there are solutions, within arm's reach, that are capable of reducing our fuel consumption. Hugo Marsolais adds, «This event was the opportunity to demonstrate that Québec holds an expertise in advanced transportation, one that can compare to other international research centres, help biodiesel become better known and inform participants and the public that one of the biggest manufacturing plants of this product is located in Sainte-Catherine, near Montreal » This is a reality that is overlooked by most Quebecers because all the production is exported to Ontario, the United States and Europe. Quebecers do not have access to biodiesel because of the taxes that affects this form of energy.

The success of this first experience for ITAQ turned into a golden opportunity to achieve excellent visibility. Here is a good example of the repercussions that were felt from this event: the Actif Roulant magazine, a publication intended for managers that monitor the number of vehicles on the road in Quebec, and who publishes 17,000 issues, dedicated a full page to ITAQ's performance in the 2005 Tour de Sol edition.

In years to come, ITAQ intends on organizing a similar competition in Québec during the winter season.



A Few of ITAQ's Achievements



Technical and scientific support in various electric vehicle projects

- Technology assistance for *Alternativ* for the choice of propulsion and batteries
- Elaboration of an evaluation protocol



proving the concept of the first Scootcart prototype.

- Technical assistance and engineering at *Véhicules Nemo* - Strategic and technological development, certification and testing - within the framework of the



development of the HD2 utilitarian electric vehicle.

- Design, prototyping and tests on the new ZENN electric vehicle for the *Feel Good Cars* company



Customized training

In collaboration with the Centre d'études professionnelles de la Rivière-du-Nord, ITAQ has offered many programs geared to theoretical and practical training regarding installation, use and maintenance of hydrogen injection systems meant for trucks from the *Canadian Hydrogen Energy Company*.

The Cameleon Project or The Esperanto in Electric Propulsion Research

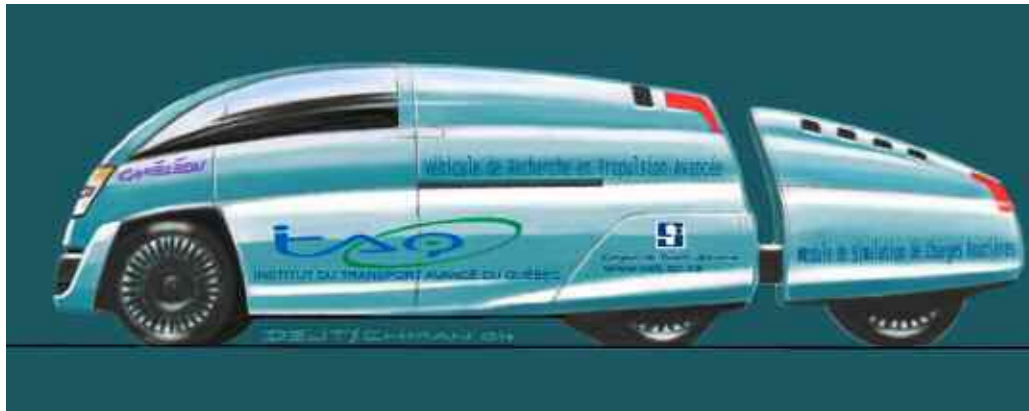
In Quebec, flagrant needs have been detected in the research field concerning the development of advanced propulsion. Québec university researchers do not have all the necessary tools at their disposal to carry out this type of work.

Following this observation, Cameleon, a project requiring the acquisition of research infrastructures and equipment in the field of electric propulsion, was created. « Our partners from the *École de technologie supérieure (ETS)*, *McGill University* and *Sherbrooke University* have many research projects on file, but are unable to carry them out for lack of equipment, declares Hugo Marsolais, Director of Operations at ITAQ and the person in charge of this project. We therefore wanted to fill that void by possibly setting up a laboratory that would facilitate research, especially in the field of electric and hybrid propulsion.»

For the Fondation canadienne pour l'Innovation (FCI), this situation justified obtaining subsidies for setting up research infrastructures. The FCI and the Québec government has also added their contribution in the amount of \$4.1 million for implementing the Cameleon project. Furthermore, ITAQ has received some support from companies through equipment estimated at \$1.3 million; the main contributions come from Industech, a Hydro-Québec subsidiary and Feel Good Cars.

A Project in the Works

The ITAQ team has already tackled designing three research vehicles having variable and adjustable physical characteristics. The equipment needed to make them work will include, among others, a dynamometer, a 3-phase voltage source, data acquisitions systems, glycol circulators and an exhaust gas measuring system. ITAQ has already acquired some of



this equipment. The latter will be fixed and gravitate around replacement cars namely the « Cameleon research vehicles ».

A rightly chosen name according to Hugo Marsolais who goes on to explain, « We have noticed that research centres, as well as those throughout the world, do not have harmonized methods to carry out their research. Most of the time, a centre will use the vehicles they have at hand. Conclusion: it is impossible to corroborate the data and establish scientific comparisons. Our research vehicles will have an adaptation capacity. We will be able to vary the frontal area, the weight, the drag coefficient, the resistance to movement, etc.»

Cameleon's first objective is to create a research method by using three standardized research vehicles that would become standards in the industry. « The idea we developed would require that research centres use all the same standardized vehicles, just as it is now seen in the field of automobile safety where, for example, the use of dummies and mobile standardized collision barriers were adopted by the whole industry. This scientific approach calls for the establishment of certain parameters to better analyze and understand certain phenomena. This is exactly the approach Cameleon recommended.»

A Growing Interest in the Cameleon Project

We have already started working on the project and it is becoming known by many research centres elsewhere in the world who have expressed their interest in joining the « Cameleon Club ». ITAQ wishes to create a Cameleon network, made up of research workers working with the same standardized equipment and speaking the same language. As Hugo Marsolais likes to say, « Cameleon would become some sort of Esperanto in electric propulsion research.»

Not only are research centres eyeing the Cameleon project, but also companies who could benefit from this project. For example, Véhicules Némó, an electric car manufacturer, that could have use these research vehicles to validate different types of electric propulsion.

But, as many others, they will have to wait because the replacement cars will not be in operation before 2007.

Validation on a technologies test bench reducing gas consumption and GHG.

Many small and medium-sized Québec companies have entrusted ITAQ with the mandate of carrying out tests on a dynamometric bench to quantify the impacts related to using additives and devices on consumption and CO₂, CO, HC, Nox et O₂ emissions.

The DBF-4 from ProLab : a promising product

ITAQ carried out the performance validation of this diesel additive according to a comparative methodology on a dynamometric bench. Conclusion : 7 % fuel economy.





RITÉ Mutual Agreement and Innovation

In order to enhance the level of mutual agreement and innovation to support the development of advanced transportation in the Laurentians, four organizations have grouped themselves together to create the Réseau pour l'innovation en transport écologique (RITÉ).

Partners

- Centre de développement des composites du Québec (CDCQ)
- Centre d'expérimentation des véhicules électriques du Québec (CEVEQ)
- Centre d'innovation en microélectronique du Québec (CIMEQ)
- Institut du transport avancé du Québec (ITAQ).

Financial Aid Benefiting the Company

The ministry for the Développement économique, de l'Innovation et de l'Exportation du Québec awards a \$150,000 subsidy to RITÉ every two years, a subsidy that is fairly and justly distributed among the four partners. Therefore, a company that carries out a project with a promoting partner may be allotted a subsidy that will subsequently reduce the costs for carrying out the project.

«The Laurentian region is now recognized as a leader in the field of advanced ground transportation, states Pierre Tison, Director General of ITAQ. We want to encourage any type of activity in this field, whether it is done individually or collaboratively. Our groupings of companies will therefore allow us to respond to our potential clients' different needs; making RITÉ an interesting economic leverage. Although we may seem to be competing on certain dossiers, our association makes sure we become collaborators rather than competitors.»

In the next few months, ITAQ will be equipped with:

- Dynamometer
- Road load simulation trailers
- 3-phase high-power battery simulator
- Control and data acquisition systems
- Test bench for battery cycling
- Glycol circulators
- 5 gas emissions analyzer
- Modular research vehicles with adjustable physical characteristics
- Set of thermal motors
- Set of advanced electric motors and generators
- Set of advanced batteries

Our Team is Expanding

François Adam

Electrical Engineer

- Our most recent recruit
- Twelve years of experience as Projects Director (Véhicules Nemo, Feel Good Cars, Nortel, Nordx-CDT, Siecor, Videotron)

Véronique Lamy

Project Manager, Administration & Development

- With ITAQ since October 2005
- Thirteen years of experience in Marketing and Communications, eight of which in the field of electric vehicles (CEVEQ, Oka Express)

Florin Munteanu

Doctorate in Mechanical Engineering, specialization : Automotive Engineering

- With ITAQ since November 2004
- More than 20 years of experience in the industry, R&D and CAD
- Academic teaching experience and research in Romania, Sweden, England, Canada

Pierre Tison

Director of ITAQ

Director of Continuing Education and Business Services

- Various experience in management and development of projects, in the private sector as well as in the collegial environment.

Hugo Marsolais

Director of Operations

Mechanical Engineer

- With ITAQ since its creation in 2002
- Extended experience in the development and testing of various vehicles and advanced systems (Transport Canada, Track Test, Bombardier NV, TM4, New Tech Brakes, Feel Good Cars)

ITAQ's Contact Information



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