

Automotive R&D Partnership Initiative

Introduction

The Automotive R&D Partnership Initiative, or Automotive Partnership for short, is being established by five partnering agencies within the portfolio of Industry Canada. The objective of this 5-year, \$145 million Initiative is to support significant, incremental, collaborative R&D activities of benefit to the Canadian automotive industry; partnerships between industry and academia and/or the NRC.

- A key guiding principle of the Automotive Partnership is that all projects (or programs of research) to be funded within this initiative must be driven by industry needs, and must have active industrial participation and collaboration.

The program involves funding from the following agencies:

- NSERC, the Natural Sciences and Engineering Research Council (\$85M);
- NRC, the National Research Council (\$30M);
- CFI, the Canada Foundation for Innovation (\$15M);
- SSHRC, the Social Sciences and Humanities Research Council (\$5M); and the
- Canada Excellence Research Chair Program (\$10M).

The overriding goal of this Initiative is that at the end of the Automotive Partnership's five years, the Canadian automotive industry will have established, through the experience of successful collaborations with academic and NRC researchers, a long-term resource through which it may address many of its research and innovation challenges.

Moreover, the Initiative will be considered a success if the Canadian automotive industry is able to say that the activities funded by this Initiative made a significant contribution to the industry's ability to innovate, and to remain competitive and sustainable.

Formation of the Automotive Partnership

In keeping with the motivation to have this Initiative be industry-driven, an Industry Task Force was established in the autumn of 2008 to provide input and guidance on the form of the Automotive Partnership. The membership of this Task Force is provided at the end of this document for reference. The outline and structure of the Automotive Partnership, as laid out below, is based explicitly on the recommendations put forth by the Industry Task Force.

Research Areas

The Automotive Partnership will support research and development activities within the following sub-priority areas (i.e., the bulleted items). The listing of the priorities and sub-priorities is not in any order of precedence.

Improving the Automobile's Environmental Performance and Impact

- Lighter Weight and/or Sustainable Materials
- Advanced Powertrain
- Energy Storage
- Application of Alternative Fuels

The Cognitive Car

- Vehicular Software
- Electronics and Mechatronics for Safety and Performance Enhancement
- Wireline and Wireless Communications for Vehicular Application

Next Generation Manufacturing

- Manufacturing Processes for Mass Reduction
- Manufacturing Processes for Cost Reduction and Quality Improvement
- Improving Manufacturing Flexibility and Efficiency

Research Areas: Further Considerations

- Research activities pursued within this Initiative need to be carried out in consideration of the broader North American and international contexts, and should not be done in isolation.
- The importance of the social sciences and humanities within the research priorities is well recognized. There is significant social science research that correlates with the research themes, including, but not limited to, issues of: safety, cognition and behavioral issues; supply chain management; and social science aspects of cost reduction, e.g., organizational behavior, plant performance and productivity, worker interaction and empowerment.

Programming Mechanisms

The Automotive Partnership has been conceived to meet the R&D needs of the Canadian automotive industrial sector. As such, there are two fundamental and underlying tenets to the Automotive Partnership:

1. As noted above, any project (or program of research) funded by the Automotive Partnership must be driven by industry needs, and must have active industrial participation and collaboration.
2. A flexible approach to funding mechanisms is to be employed, so as to be able to meet the needs of industry. The Automotive Partnership will not be taking a "business as usual" approach, forcing researchers to fit their proposed activities to pre-existing program structures. Rather, NSERC and the partnering agencies will work with applicants and their industrial partners to develop proposals and funding mechanisms that will fit the research activities best suited to industrial needs (bearing in mind, of course, the overarching mandates of the agencies funding the Automotive Partnership).

Programming Mechanisms: Further Considerations

- Since all research to be funded by the Automotive Partnership must have an engaged industrial partner, proposals that comprise only the passing interest of an industrial partner will not be considered. For example, a proposal that has an industrial partner merely saying that they are interested in the results of the project, and whose in-kind support is limited to occasionally reviewing progress, would be rejected.
Instead, proposals must be able to demonstrate how the planned activities will be meeting the needs of industry; how industry has been integral in developing the proposed research; and how the support of the industrial partner is integral to the research. As such, proposals will need to be crafted by researchers in close collaboration with their industry partners.
- NSERC and the other partnering agencies will work with the teams of researchers and their industrial partners to advise both on what activities could be funded within the Automotive Partnership, and on how proposals should be structured so as to fit the types of activities being anticipated, and to be in a suitable form for peer review. To facilitate this process, a Project Office, to act as a portal for the Automotive Partnership, is being established (see below).
- No preset funding mechanisms will necessarily be used within the Automotive Partnership (although it is possible, based on discussions, that using a pre-existing mechanism may make most sense in certain cases). Moreover, there are no preset industrial cash or in-kind leverage ratios.
- To increase flexibility and responsiveness, the Automotive Partnership will not involve a specific “call for proposals”. Rather, the Partnership will accept new proposals on an ongoing basis. This will allow proposals to come forward as industry needs arise, as well as allowing for proposals to be uniquely crafted according to the requirements of the research and industry challenges at hand.
- Emphasis is being placed on proposals involving the participation and contributions of more than one agency within the Automotive Partnership. This is to say, integrated research projects (or programs of research) involving universities and the NRC, NSERC researchers and SSHRC researchers, tackling multi-faceted and multidisciplinary research challenges.
- The amount of funding being allocated to the Automotive Partnership is, in many ways, unprecedented. As such, particular emphasis is being placed on transformative proposals valued in the range of \$20-\$30 million. If Canada is to place itself at the top rung of automotive research excellence, significant efforts will be required.
While the emphasis is on large, integrated proposals, with the flexible approach being taken, the Partnership will also fund small projects. However, if smaller projects are all that arise, the impact of this initiative will not be significant.
- The inclusion of students and fellows within projects is strongly encouraged, even in cases where the tight timelines required by industry may present a challenge. The enhancement of the knowledge and skills of industrially based professionals is also being emphasized.

- Flexibility and innovative thinking on the part of the applicants and the funding agencies are important elements of the Automotive Partnership. As such, novel programming elements are being encouraged (within the mandates of the partnering agencies). Some examples of such novel elements, presented here to stimulate thought and ideas, could include:
 - Technology demonstration and prototyping using NRC, university, or college facilities and personnel, as appropriate
 - Collaborative R&D involving university and college research teams and/or NRC research staff (personnel, material, equipment, travel) to work on both problems with immediate application to a company as well as those that require a longer term approach to solve
 - Establishment of experimental and prototyping facilities located at a university, college or NRC Institute and accessible to industry
 - While a consortia approach to research is encouraged, especially for large efforts, a particular activity need not necessarily be structured around a consortium of companies all focused on one major effort. Rather a theme of research could be devised as a central hub—a centre of excellence—where individual companies work with individual teams of researchers so as to not compromise issues of competitiveness and confidentiality.
 - Secondments and two-way exchanges of personnel: e.g., professors spending a period of time in a company working on an industrial problem; industrial scientists and engineers spending time in a university, college or an NRC institute working on company-related projects; placement of undergraduate, and postgraduate students, as well as postdoctoral fellows within industrial settings and the NRC.

Project Office

NSERC, in cooperation with the other agencies of the Initiative, is establishing an Automotive Project Office.

The Project Office will:

- act as a portal for industry to access the Automotive Partnership;
- publicize the initiative to industry, academia, and to NRC researchers;
- proactively broker partnerships between companies and university/NRC researchers;
- provide guidance during proposal development;
- relieve companies of part of the administrative burden of partnering with university and/or NRC researchers.

Acting as the “front door” to the Automotive Partnership, researchers from academia and the NRC, with their industrial partners, will bring forth their ideas for research and development activities which are of interest to industry to the Project Office. The Project Office will then work with the agencies of the Automotive Partnership to provide advice and feedback so that a proposal can be assembled, appropriate to the research being proposed, which suits the needs of the industrial partners, fits within the mandates of the funding agencies, and is in a form suitable for peer review.

When researchers or automotive companies bring forth their ideas for potential research projects, but without an appropriate partner, the Project Office will then work to proactively build partnerships based on the respective needs of industry and the abilities of researchers within

academia and the NRC. Once a collaborative research team is formed, then the Project Office's role of providing advice and feedback on proposal development can begin.

In the case of proposed activities which include elements that fall outside of the mandates of the agencies of the Automotive Partnership, the Project Office will seek to coordinate the support of other agencies. This could include other federal departments, provincial agencies, or any other appropriate funding vehicle.

The Project Office will be located in Mississauga, Ontario, within convenient driving distance of the majority of the Canadian automotive industrial sector. Despite the Ontario location, the Project Office has a national mandate for the support of the Automotive Partnership (being located in Mississauga allows for easy access to Toronto's Pearson airport to facilitate travel further afield as the need arises).

The Mississauga location was also chosen so as to have the Project Office co-located both with the soon-to-be opened NSERC Ontario Regional Office and the OCE Centre of Excellence for Materials and Manufacturing. This will facilitate the coordination between Federal and Ontario provincial programs.

Open For Business

It is anticipated that the Project Office will become operational in April of 2009, and be led by an individual from the automotive industry.

In the interim, before the Project Office is established, the Automotive Partnership is open for business. NSERC is currently able to speak with researchers and industrial partners alike about the possibilities for the funding of research and development activities driven by industrial needs. NSERC will take the lead in the short term in providing advice and feedback on the development of proposals, and in coordinating the participation of the other agencies within the Partnership.

Review Processes

Excellence and competitive advantage are essential elements of the Automotive Partnership. As a result, all funding requests will be evaluated through peer and/or merit review processes to ensure only meritorious activities are supported.

The review processes to be employed within the Automotive Partnership, as with the approach to programming mechanisms, will involve flexibility, utilizing processes that are commensurate with the research proposals being prepared. For any given proposal, and where appropriate, a single, coordinated review process will be utilized to evaluate proposals as a whole, even when components of proposed activities may be funded by different agencies within the Automotive Partnership.

As a result of the intimate involvement of the Project Office in proposal development, it will normally be possible to plan the review process in advance, to contribute to shortened decision times.

Agency Participation

The Automotive Partnership is providing a unique opportunity to combine the strengths of five organizations to drive innovation and competitiveness within the Canadian automotive industry. As laid out above, it is expected that unique programs, funding mechanisms, interactions and partnerships will all take place. While flexibility and innovative thinking is to be encouraged, the overarching mandates of the specific agencies involved will be preserved.

Natural Sciences and Engineering Research Council

The Natural Sciences and Engineering Research Council (NSERC) is Canada's largest federal funding agency for university and college based research in the natural sciences and engineering. As the lead agency on the Automotive Partnership, NSERC is investing \$85 million over five years. While NSERC's funds may only be directed towards university and college based research, as laid out above, NSERC is committed to invoking flexibility within its funding mechanisms to support research that is driven by industrial needs and comprises active industrial participation and collaboration.

National Research Council

The National Research Council (NRC) is the primary public research organization in Canada supporting industry through collaborative research. Broad competencies and state of the art facilities throughout its 20 institutes enable NRC to conduct research in a wide variety of fields impacting automotive technologies such as advanced materials, manufacturing, information and communication, alternative fuels and aerodynamics. NRC Automotive will channel and reinforce NRC's research in the automotive sector. Special emphasis will be given to research that brings proof of concept technologies closer to commercialization, and provides validation and demonstration of the applicability for use on the vehicle. NRC Automotive will deploy R&D in lightweight materials and structures and fuel efficiency, alternative propulsion and information and telecommunication technologies for vehicles.

NRC is the only partner agency within the Automotive Partnership that itself conducts research. NRC has readied itself to begin to implement incremental automotive activities associated with this initiative in the short term. As the Automotive Partnership moves forward, NRC is committed to strive for and contribute to stronger, more ambitious collaborations with partners from academia and industry. Further, NRC is refocusing their staff's efforts in order to prepare for the increased activities to take place under the aegis of this initiative.

NRC Automotive will be establishing a coordination team that will act as the interface with the automotive industry. This team will strive to increase collaboration between the various NRC institutes, improving coordination and communication with the industry within the Automotive Partnership, and therefore the overall efficiency and impact of NRC in the automotive sector

Canada Foundation for Innovation

The Canada Foundation for Innovation (CFI) is an independent corporation created by the Government of Canada to fund research infrastructure. CFI's mandate is to strengthen the capacity of Canadian universities, colleges, research hospitals, and non-profit research institutions to carry out world-class research and technology development that benefits Canadians.

Under the auspices of the Automotive Partnership, equipment requests (small or large) will only be considered when demonstrated to be an essential part of an integrated research project. Therefore, any requests for funding from the CFI must form part of a larger, integrated project involving research activities to be supported by the other partner agencies of the Automotive Partnership.

Social Sciences and Humanities Research Council

The Social Sciences and Humanities Research Council of Canada (SSHRC) is the federal agency that promotes and supports university-based research and training in the humanities and social sciences. SSHRC is devoting \$5 million to the Automotive Partnership over five years to support social science research that correlates with the priority research areas being targeted within this initiative.

Canada Excellence Research Chair Program

The Canada Excellence Research Chairs will establish 20 prestigious research chairs in universities across the country. Each chair will receive up to \$10 million over seven years to conduct research in areas of strategic importance to Canada. At least one chair will be allocated to research that is of direct benefit to the automotive industry. For further information, please consult www.cerc.gc.ca.

Industry Task Force Membership

The Industry Task Force met during the autumn of 2008 to advise on the form of the Automotive R&D Partnership Initiative. Their recommendations formed the basis for the structure of the Initiative as laid out within this document.

Co-Chairs

Howard Alper
Distinguished University Professor
University of Ottawa
Chair, **Science, Technology and Innovation Council (STIC)**

Rob Wildeboer
Executive Chairman
Martinrea International
Member, **STIC**

Members

Mike Bergeron
Vice-President, Engineering
Zenn Motor Company

Alastair Malarky
Chief Engineer, IVHS Division
Mark IV Industries

Marc Boismenu
Advanced Technology Portfolio – Canada
General Motors of Canada Limited

Angelo Psellas,
Lab Manager, Industrial and Transportation
3M Canada

Frank Burke
Martinrea International

Ted Robertson
Executive Vice President – New Product Creation
Chief Technology Officer – Magna America
Magna International

Mohamed Elbestawi
Vice-President, Research & International Affairs
McMaster University

Mark Stoddart
Chief Technology Officer &
Executive Vice-President, Marketing
Linamar Corporation

Peter Frise
CEO and Scientific Director, AUTO21
University of Windsor

Jimi Tjong
Staff Technical Specialist: Manager,
Powertrain Engineering R&D Centre
Ford Motor Company of Canada Limited

E. Charles (Chuck) Gulash
Senior Executive Engineer
Toyota Motor Engineering and Manufacturing North America, Inc.

Michael Worswick
Associate Dean Research and External Partnerships
University of Waterloo

Hamdy Khalil
Global Director of Corporate Research & Product Development
Woodbridge Foam Corporation

Yves Lasnier
President
Indev Inc.