

From Soviet missiles to family sedans

How a Cold War military engineer is helping to bring innovation to Canada's car manufacturing.
BY GRANT ROBERTSON

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There are those in the auto sector who say they were born to build cars. Roman Maev isn't one of them.

A Russian scientist who assembled missiles for the Soviet Union during the Cold War, Mr. Maev admits his homeland has never been known for its car-making prowess.

But wander into the heart of Canada's auto sector and you can find Mr. Maev working at a laboratory run by the University of Windsor. He is, in many ways, the future of the industry. Ten years after arriving from Moscow, the engineering professor is an integral part of Canada's growing research and development scene.

At a time when the country's car manufacturing is suffering through some bleak days, innovation is being looked upon as the potential saviour. Technology and brain power are needed to prevent jobs, investment and profit from flowing outside the country and eroding the industry further, observers say.

Next week, Mr. Maev will launch Tessonics Inc., a Canadian-made initiative founded using technology he designed at Windsor.

The firm has created a small, high-tech device to help auto makers detect welding flaws during vehicle assembly. If it works as well as the University of Windsor hopes, the idea could save manufacturers \$300-million a year. DaimlerChrysler Canada Inc., which provided some of the startup capital for Tessonics, has secured exclusive rights for the first year.

It's a strange twist for someone who never saw himself in the car manufacturing business. Mr. Maev's expertise always found other avenues. "Because Russia was a very military country, we worked on the welding of missiles. I've never had the experience to work in the auto industry."

Proponents of Canada's research and development scene want it that way. As the industry looks to expand the high-tech side of the sector, universities are drawing on a wide range

of expertise outside traditional car manufacturing to build the brain pool.

Tessonics sprang from the Automotive Research and Development Centre in Windsor, a partnership between DaimlerChrysler and the university, which opened in 1996 with \$30-million in private and public funding.

The centre acts as an incubator for innovation, using a bank of Canadian engineering talent that for years went largely untapped by the major car manufacturers.

"Because Canada doesn't have a lot of this, the very best people are available. There's a surplus," said John Mann, director of engineering at DaimlerChrysler Canada.

The centre is also tied into a network of 38 universities called Auto 21, which links researchers across the country with car manufacturers who need their ideas. As a result, a diverse range of skills has been drawn to the industry, from nurses helping design better child-safety equipment in cars to lighting experts working on better headlamps.

In the past, academic knowledge at Canadian universities was rarely exploited. If a new idea was developed, it seldom got past the prototype stage and withered under a lack of funding. Those experts who worked outside of the auto sector stayed where they were.

"What's happening now is somebody who was, maybe, looking at the design of chairs for offices is suddenly getting involved in the design of auto seats," said Ross Paul, president of the University of Windsor.

Mr. Maev arrived in Windsor on an international exchange program for professors. Though he worked with the military and has extensive knowledge of welding, his actual area of expertise is acoustic microscopy, the study of tiny sounds. He found himself talking to auto engineers and tinkering with ultrasound devices to find flaws in welding. The concept turned into a handheld computer with a stethoscope-like attachment that seeks out small defects in the joints of metal or plastic.

With as many as 4,000 spot welds on every car, the ability to quickly scan for errors is crucial. The technology could allow vehicle manufacturers to find defects earlier and plan their joints more strategically. With a single spot weld costing about 15 cents and auto makers churning out millions of cars a year, the potential savings are massive.

"We've already built 45 or 50 machines," Mr. Maev said. Those will go to Chrysler. Over the next year, another 200 will be assembled by Tessonics and shipped to Volkswagen in Europe and in South America.

It has taken large sums of money to get the research and development segment of Canada's auto industry going over the past decade.

Auto 21 operates with \$5.8-million in federal grants each year and a growing amount of money from the car manufacturers. Private-sector funding, once nearly half what the

government chipped in, now exceeds Ottawa's investment. Car makers last year put \$7.24-million into projects being developed at universities across the country.

Since it opened, funding of the centre in Windsor has ballooned to more than \$541-million, with the help of a \$500-million investment by DaimlerChrysler.

Those dollars were coaxed to Canada by lucrative tax incentives from governments, which are anxious to see the research sector expand and create jobs.

"It has been the fastest growing segment of the auto sector in Canada by far," said Dennis DesRosiers, an analyst at DesRosiers Automotive Consultants. "Vehicle and parts companies recognize the tax advantages of doing R&D in Canada."

Mr. DesRosiers pegs the incentives at nearly 50 cents on the dollar, meaning car manufacturers or parts makers can write off almost half of what they invest in certain cases.

However, the payoff can be swift for governments, said Gary Fedchun, president of the Automotive Parts Manufacturers' Association.

A study the association will publish this fall argues that governments recoup their investments in R&D within the first five years of an operation, through higher employment, income taxes and economic benefits to the community.

"Then for the next 15 years, it's gravy," Mr. Fedchun said.

The impact of the Windsor automotive centre and the creation of Auto 21 has been felt in a relatively short period. During the early '90s, there were only 300 automotive engineers working in the Canadian car industry.

Since the creation of DaimlerChrysler's Windsor facility, along with General Motors of Canada Ltd.'s Canadian Engineering Centre in Oshawa, that number has grown tenfold.

"As the research and development side of the industry builds, so too will the jobs for up-and-coming engineers," Mr. Mann said. "Traditionally, the high-tech jobs have not been in Canada. So any of our children that aspire to an automotive engineering career in research and development really haven't had the opportunity."

Critics have argued that putting new dollars into the auto sector is wasting money to sustain an industry in decline. The Big Three North American auto makers are struggling with slumping sales and high labour costs, including pensions and health care, which have created deepening financial woes.

As auto companies look for ways to save money, more of their design processes are being outsourced to parts makers. As a result, that side of the industry also requires a steady supply of engineering skill, perhaps as much as the car companies do, said Peter Frise

scientific director of Auto 21.

"In the old days, the auto manufacturers would walk into their suppliers with a drawing and say here's a part, make 200,000 of these," Mr. Frise said. "Now, the car companies will come with their specifications and say, 'Here's what we need. Would you please take a crack at designing that?' "

That approach is not necessarily groundbreaking. But for a country whose auto industry has been forged around Canadian branch plants acting as satellites for the Detroit manufacturers, the ability of parts manufacturers and car makers to continually adapt is a step toward survival for the troubled sector.

"We have a long history as an auto-making nation in Canada, but we do not have a very extensive history as a nation that does design or research," Mr. Frise said. "We've begun to move up the value chain. It's a long climb, but it's absolutely necessary that we do that."