HOUSE OF COMMONS
CHAMBRE DES COMMUNES
CANADA

Standing Committee on Transport, Infrastructure and Communities

TRAN • NUMBER 034 • 1st SESSION • 41st PARLIAMENT

EVIDENCE

Thursday, May 3, 2012

Chair

Mr. Merv Tweed

Standing Committee on Transport, Infrastructure and Communities

Thursday, May 3, 2012

● (0850)

[*English*]

The Chair (Mr. Merv Tweed (Brandon—Souris, CPC)): Good morning everyone and welcome to meeting 34 of the Standing Committee on Transport, Infrastructure and Communities. The orders of the day, pursuant to Standing Order 108(2), call for a study of innovative transportation technologies.

Joining us today from the Canadian Aviation and Space Museum are Mr. Stephen Quick, the director general, and the curator, Rénald Fortier. Welcome.

I understand you know the process. We'll open the floor for you to make some comments and then we'll move to questions from the committee, so please proceed.

Mr. Stephen Quick (Director General, Canadian Aviation and Space Museum): Thank you very much.

[*Translation*]

Mr. Chair, members of the committee and parliamentary secretary, on behalf of our board of trustees and its chair, Gary Polonsky, as well as our president and CEO, Denise Amyot, I would like to thank you for your invitation and the opportunity to present our point of view.

[*English*]

Please allow me first to give you a brief overview of who we are and what we do. I will make it brief.

The Canada Science and Technology Museums Corporation's vision is to engage all Canadians with their scientific and technological past, present, and future.

[*Translation*]

The Canada Science and Technology Museums Corporation operates the three national museums that house the richest collection of Canadian achievements in science, technology and innovation. Those museums are the Canada Science and Technology Museum, the Canada Agriculture Museum and the Canada Aviation and Space Museum.

[*English*]

We are here today to provide you with an overview of what history can teach us about the public sector's contribution to innovations in transport, particularly in the area of aviation in Canada.

You might be interested to know that we have embarked on a six-year energy literacy initiative entitled let's talk energy: engaging ideas for Canada's future. This initiative aims at helping Canadians gain a deeper awareness of energy issues facing our country and understanding the underlying science. We have mobilized the creative capacity of the three museums in the corporation to do three major exhibitions on this theme and have enlisted 24 science centres and museums from across Canada, so far, to engage Canadians on this theme.

We are keenly interested in presenting the technological innovations that will help our country become a world leader in sustainable energy production and consumption, and notably for this committee, which is why I mention it, transportation, infrastructure, and communities.

Technology, innovation, energy, and sustainability are the key thrusts for the future of our country and our museums are committed to not only engaging Canadians about their heritage, but also to providing the incubator for the birth of innovations that will secure our future. As museums our remit is science and technology. Innovations in transportation feature heavily in our collection, which is celebrated through our exhibitions and programs. Most notably, these include new composite materials and technology in biofuels, bioplastics, and biocrops.

I wish to commend the committee for engaging in this study. The Canada Science and Technology Museums Corporation is supported by curators; Dr. Rénald Fortier is with us today. They look after collections covering marine, rail, and road modes of transportation, as well as aviation—which is ours—and could be at your disposal to answer questions salient to these areas of concern at future meetings.

I will ask Dr. Rénald Fortier, our chief curator for aviation, to present a historical perspective on the history of aviation in Canada and the importance of the contribution of the Canadian public sector in supporting innovation in that industry. He will focus his remarks by period in order to give them a structure and contemporary context. You will see that success for a high-tech industry like aviation depends upon the adoption of a holistic approach to the environment that supports and nurtures it. This is not realistically feasible with private sector resources alone. This environment is supported by a number of key elements, namely education, research, training, infrastructure, certainly public policy, support for domestic and foreign markets, and active retention of expertise, which is really key especially given the ebb and flow of the market needs in conflicting sales and operating conditions.

Continuity is paramount to success given the longer gestation periods of such high-tech machinery, and the fragility of the infrastructure and markets that support it. As a national museum, the Canada Aviation and Space Museum is striving to be an integral part of this infrastructure through the creation of a creative campus that will provide the incubator for generating innovative solutions to the issues that face the industry and by showcasing not only its history but its future. We are part of the supply chain.

A historical overview is important in order to better understand where investments in this holistic environment and its infrastructure are necessary, and so at this juncture, I will pass the microphone to Dr. Rénald Fortier.

Thank you.

Mr. Rénald Fortier (Curator, Canadian Aviation and Space Museum): Good morning.

There are a number of ways to approach the history of aviation, especially from the point of view of innovation and technology. Very quickly, each period in history can be used to bring about and illustrate certain aspects of it.

For example, in the early days of aviation, around 1903 to 1914, when the first airplanes flew, it was pretty much a level playing field. No one had the experience of building aviation or designing aviation. Pretty much everyone started from scratch. One could argue the same thing is true of, for example, biofuels.

Everyone is starting pretty much from scratch, so the history can, I would say, bring lessons or can illustrate that different technologies appear at different times, and in some cases, all start from scratch and from the same basic level.

Before 1914, very few knew aviation here. During the Great War, it was mainly the British who set up an aircraft manufacturing company in southern Ontario to provide aircraft for training schools, for flight schools in Canada, and to train pilots for service overseas.

With the end of the war, the company sort of disappeared. There was no market here. After the war, there was no military market, and civilian-wise there was very little.

During the interwar years, you have the rebirth—the second phase of the aircraft industry. The federal government—there was an air force—wanted to replace the older machines they had received from the British. Therefore, it was decided that a nucleus of aircraft manufacturing in Canada would be set up.

It chose Canadian Vickers in Montreal to develop a series of aircraft for the air force, but not for combat roles. It was asked to provide aircraft, Canadian-designed, for resource development—for example, forestry patrol and aerial mapping—because the air force knew they wouldn't be able to get lots of money anyway, and lots of money for combat aircraft.

So, it was decided to have aircraft that could be used by the civil authorities for resource development. That was the role of the air force for much of the interwar years, until rearmament took place in the mid-thirties because of tensions in Europe. Again, that policy of developing the industry was not something that the government came up with, it was something imposed on them from the outside.

There were tensions. They knew that something could happen, so precaution let us rearm slowly, according to our resources. Aircraft were ordered for production in Canada. By and large they were British designs, because at the time the Canadian air force was closely aligned with the Royal Air Force, for training and combat equipment.

If you look, for example, at civilian operators, the situation was quite different. Civilian operators used mainly American aircraft, ones called bush planes, small aircraft fitted with floats or skis to operate all over Canada. That's how certain companies came to Canada, to build aircraft for the Canadian market.

These companies discovered that there was a market in Canada. Rather than import into the country and face tariffs and taxes, they decided to build the aircraft here. That's why a number of companies were created in the late twenties to cater to that market, and also to cater to another market, which was also developed by the Canadian government, and that was the flying clubs.

The flying clubs were set up by the federal government as schools that could develop trained pilots in case of emergencies. Of course, these aircraft could be either manufactured in Canada or assembled in Canada. You have companies like de Havilland Aircraft of Canada, which was formed in a way to provide aircraft for the flying club movement.

Also you have airmail. Airmail worked very well. You had trains that would carry the mail across the country very satisfactorily, but subsidies were given to the struggling bush operators to carry mail in outlying areas where there were no trains and where mail could take a while to get through. By using that to help the operators—because they were struggling and didn't make a whole lot of money, if any, profits at all—the mail subsidies were very helpful. They helped them carry through from year to year, because at that time, in commercial operation in Canada, until pretty well the Second World War, the end of the months were painful. The end of the year was very painful. There was a lot of turnover and companies disappeared and reappeared.

You have rearmament for the air force, as I said, mainly British aircraft for service here. The British also offered contracts to Canadian manufacturers to help build up a potential in Canada for combat aircraft to be used by the British outside Canada.

That was the situation in 1939; you were looking at fewer than 4,000 employees in about eight companies. The industry was small, just looking at 300 aircraft ordered over let's say four years, that's about 75 aircraft per year. You have about eight aircraft manufacturers.

● (0855)

The number of aircraft built per year was minuscule. The industry was struggling. The Second World War started. You had military contracts increasing. You had the fall of France in the spring of 1940, and, if I may use the expression, all hell broke loose.

At that time, military budgets went through the roof. We had to do something. We had to produce a lot more aircraft. It was urgent. There was the so-called phony war from 1939 until mid-1940. There was a war on, but it didn't really change much. One of the things, though, was the training plan of the British Commonwealth. It was one of the major accomplishments of Canada during the Second World War. You're looking at 1939. There was a nucleus of training establishments for the air force. By the middle of the war, you were looking at 100 bases and 100-plus schools, plus the supplementary airfields for emergency use as well as all the roads, networks, control towers, equipment, and aircraft.

By the end of the war, Canada had trained something like 125,000 air crew. That's gunners, radio operators, pilots, the whole gamut. This was for fighters and bombers for service mainly overseas, but also for local defence. That's a lot—125,000 people. My personal calculation is that it was probably one of every eight Allied air crew trained during the war.

That made a huge impact on pilot training. Aircraft manufacturing was fairly small—you're looking at about 16,000 aircraft. You may think 16,000 is huge, but over 800,000 aircraft were made during the Second World War. Aircraft-wise, Canada was not all that significant. Training-wise, Canada was very significant. This was a massive construction effort, an infrastructure project. In 1939 when that was signed, there was nothing. A few years later, you had 100 schools running seven days a week. It was a massive accomplishment.

Towards the end of the war, the government realized that the war would end and that we would win. It looked really good. They decided to do something so that when the war ended we wouldn't have a collapse of the industry, like the one that had taken place in 1918-19. In 1944, you had about 120,000 employees—about 30,000 women. The number had started to go down. I think they were hoping that if the war continued until 1946, the number would go down significantly, so that the number of firings would not be too great. They would be able to manage it and have some sort of nucleus of an industry. The big manufacturers would survive and would be helped with government contracts after the war. But the war ended unexpectedly in August 1945. You had about 80,000 who just went pfft! Most of them were fired. The contracts were cancelled. There were no more military contracts, so it was not a fun period for the industry.

In the early postwar years, you had production of airliners like Canadair. At the end of the Second World War, the government wanted to preserve the big manufacturers at least as a nucleus. One was Canadair, which is now part of Bombardier in Montreal. You had the de Havilland Aircraft company in Toronto, which is now also part of the Bombardier empire. You had Avro. Of these three companies, two were British-owned—Avro and de Havilland. The third one became American-owned—that's Canadair.

In the early postwar years, you had the production of airliners. The war was over, and we had to develop something. The air force needed transport. The airline TCA—Air Canada—needed transport aircraft. There were projects and high-tech innovation. The first jetliner to fly in North America was Canadian. It was made by Avro Canada. It was the second in the world, actually. There was certainly innovation there. As to jet production, there was little experience in starting at ground level rather than in mid-stream. It was uncertain whether Canada, with its limited resources, would be able to compete in developing this new technology.

Then the Korean War happened. The jetliner was put aside in order to produce combat aircraft for the Cold War. You had massive increases in government spending for defence. Canadair got massive orders, as did de Havilland. All the manufacturers were producing massively, using factories that had been put up during the Second World War by the federal government. They used machine tools that in some cases dated from the Second World War. They had been paid for by Ottawa because the industry didn't have the time, money, or resources to build the factories and obtain the machine tools. The federal government went to American manufacturers and told them what they needed. They got the tools and distributed them across the industry.

During the Cold War, there was massive development, massive production. The production capability was so large that they could afford to give away something like 900 aircraft to smaller NATO countries who were struggling because they had been devastated during the war.

● (0900)

Canada was a big player as far as aircraft manufacturing was concerned, either manufacturing foreign aircraft under licence, mainly American ones, or designing aircraft of its own and producing aircraft design here. There was a great variety, some of them fairly low-tech, like bush planes, for example. De Havilland continued to produce bush planes throughout the 1940s, 1950s, and 1960s, exporting them all over the world. Of the three great manufacturers, it was pretty much the one that was most independent. It exported most of its planes.

That's a very significant aspect of Canadian aircraft manufacturing. By and large, the internal market is too small. Unless you have large military budgets, as in wartime or the death of the Cold War, there's not enough internal market; you have to export. Whether it's aircraft engines or subcomponents, you have to export, which means you need products that are exportable.

Bush planes, such as the Beaver, were examples of that. A bush plane is a pickup truck with wings. Everybody can use a pickup truck. They were exporting them like crazy, all over the world.

The combat aircraft is a more specialized market. If you design your own aircraft—again, the cost of design was such that by the late 1950s Canada had overextended itself a bit. We were trying to build and design a variety of planes. The cost of aircraft designing was very high and producing them was very high as well, so eventually a wall was hit.

Canada had to realize that realities were such that high performance aircraft.... We had to specialize. We had to reduce, to diversify, to build what we could under licence, or to design what we could, in order to export these aircraft. That turning point was the late 1950s and early 1960s, and I can end that very quickly.

In the early 1960s you had the cancellation of the Avro Arrow. Avro Canada went out of aircraft manufacturing. The engine side continued, but not designing new engines. They were manufacturing engines for other people. De Havilland Canada lost its major customer, which was the U.S. Army. De Havilland exported mainly to the U.S. Army, not the Canadian armed forces. In the mid-1960s they lost that, for reasons I can go into if you have questions.

Canadair was doing relatively well. But again, you had decreases in defence budgets, so that was a turning point in the mid-sixties. Pratt & Whitney Canada, however, was beginning its climb to greatness, and by the mid-seventies Canadair and de Havilland Canada were in trouble. The federal government took over both companies and eventually sold them to Bombardier.

We had concentration of the aircraft industry. Avro was gone. So we had one aircraft manufacturer, one main engine manufacturer—Pratt & Whitney Canada—and a great deal of expertise in other areas, like simulators, for example.

I probably went over my time. I apologize. But in a nutshell, it's one of the largest industries in the world as far as aerospace is concerned. With regard to exports, it's one of the major export industries in Canada. It's a high-tech product. It's well-paying jobs.

It's the future in the way that there are great possibilities as far as new aircraft, new engines, simulators.... There is research being done in biofuels and alternative fuels. There's a great potential there, but in order to continue that the industry will need new products.

There are a variety of ways to help the industry. Government should be a part of that and has been a part of that pretty well since the early days.

I'll be quiet now. Thank you.

● (0905)

The Chair: Thank you very much.

Ms. Chow.

Ms. Olivia Chow (Trinity—Spadina, NDP): What role do you think the government should play now? I know you're dealing with the history, but what are some of the challenges facing the aviation industry?

Mr. Rénald Fortier: You have research and education, for example. There are a number of engineering schools in Canada that teach aerospace engineering. You have to help research; therefore, you need to have researchers—NRC, for example. They need equipment in order to conduct this high-tech research, so it's about renewing the equipment.

You have the idea also of the various levels of government—municipal, provincial, national, international, as well—if I could use the expression, trying to row in the same direction.

You don't want duplication. You don't want conflicts when you try to help the industry to export. That is a main purpose. You have to develop the aircraft and sell the aircraft, so having government....

For instance, if the Quebec Government wants to help Bombardier sell its aircraft, that's good. Would the federal government want to do the same thing in the same places? They might want to go to other places so they can cover as many places as possible to get the aircraft sold.

Ms. Olivia Chow: Bombardier, for example, has been working with the federal government in China, in Shanghai, and in other places where they're trying to sell, because the Chinese government is building a lot of airports now, and the industry is taking off there.

But beyond what we're already doing, are you familiar with what else the federal government can be doing, especially connected with Transport Canada, not necessarily with industry and trade, because this is the transport committee. Are there legislative problems or barriers that are preventing scientists from taking a product to market, or are there regulations that are making it difficult?

● (0910)

Mr. Rénald Fortier: I must say, being a historian, I tend to be a bit more interested in the past than in the future, although we have been asked in our corporation to be a lot more open to that aspect at present and in future. The exhibition we have now on energy looks at new material, so I've learned a great deal about the research that's being done at NRC, for example.

But as far as Transport Canada is concerned, Nav Canada is certainly an aspect of that, which is quite important. They have great expertise in air traffic management and that should be helped. In terms of the material, the software they have can be exported. That, again, helps them to build on that, to design more software, to improve air traffic management, because that's a significant aspect.

The idea of transportation is a lot more than aircraft. The aircraft play a role in efficiency, so do airports. Air traffic management is a very crucial point because, if you can stack more airplanes in the same volume because you know precisely where they are, you can increase efficiency and reduce your consumption. So Nav Canada has a great role. Helping them as much as possible, given the budgetary limits, might be difficult.

Ms. Olivia Chow: If there is one mistake that previous governments have made, historically—either they didn't put up barriers, or they did not come in at the right time—what would that incident be? What one lesson should we learn from? Is it not contributing, or not making the right decision?

Mr. Rénald Fortier: There are so many cases. In some cases the right decision.... It's hard. You do the best you can at the time.

But one of the main things, in my mind, would be continuity. You come up with issues, you want to help, and consult as broadly as possible with the provinces—and internationally, if you have to—and develop policies and directives. Once you've decided what they are, stick with them as much as possible.

Regarding efficiency, the industry, the idea of continuity, and not changing your mind would be very useful.

Ms. Olivia Chow: So consistency, having a plan, having a policy that would be locked in for 10 or 20 years is important.

Mr. Rénald Fortier: A partial lock would be good. It's the idea of having—being able to change it if need be—some sort of guidelines and having a direction whereby everyone paddles in the same direction. That might be difficult in a federal country, especially with international affairs as well that come into conflict. But the idea of continuity is very useful because nowadays developing an aircraft program in the CSeries, for example, takes years. Developing anything takes years, so if you have changes of policy mid-term, it's very difficult.

If you have big changes, as in the case of the Concorde, for example—it may be off topic, but the Concorde was a great idea, supersonic airliners. Everyone was going to fly supersonic in the seventies and eighties. You had the question of pollution in the atmosphere, the idea of sonic booms over continents, the cost of fuel, and the oil crisis. It seemed like a wonderful idea and it hit a brick wall.

So you cannot predict what will happen, but the idea of flexibility, with the idea of having a direction where you're going, is very important.

Ms. Olivia Chow: In your mind, in the period of let's say the last 30 or 40 years, did the Canadian government have the kind of policy that was able to direct the industry?

Mr. Rénald Fortier: Certainly there were efforts. In some cases it was reactive efforts. When the government took over Canadair and de Havilland—in a way they didn't have much of a choice, the companies might have gone under—those were reactive policies, which were very good in that case. It supported the industry and helped it, and eventually Bombardier took over and it's one of the largest aerospace industries in the world.

Ms. Olivia Chow: That's a very good example of something collapsing and the federal government stepping in to support it for a little while. Then, because it was able to continue, Bombardier stepped in and—

Mr. Rénald Fortier: But you need to have good products. To support a company or an industry that is sort of paddling and going around in circles, may not be very helpful.

In this case the industry was strong, the people were well trained, and the factories were well equipped. They had a product, the Challenger, eventually the regional jet, and de Havilland had the Dash 8, and these products were of very high quality.

By preserving these aircraft, getting them under way, it was very successful. But you need the products in order to justify saving an industry. If you don't have the products, there is not much point.

● (0915)

The Chair: Thank you.

Ms. Murray. Welcome.

Ms. Joyce Murray (Vancouver Quadra, Lib.): Thank you.

Thank you very much for your presentations. That was an amazing feat: the history of aviation in Canada in 10 minutes.

Voices: Oh, oh!

Ms. Joyce Murray: Dr. Quick, you talked about the mandate of your organization being education in science and energy, with the key theme of technology, innovation, and energy sustainability.

I just came from a breakfast this morning with Dr. Steve Larter, the Canada research chair in petroleum geology at the University of Calgary and the scientific director of the networks of centres of excellence in Canada for carbon management. He was saying—I mean, this is not directly about aviation, but it's about transportation and transportation fuels—that our oil and gas industry has low innovation and investment compared to other sectors. He was also saying there hasn't been a revolutionary new innovation since the steam method of separating oil, the SAGD method. His view is that the biotechnological revolution will be a way that we can reduce greenhouse gases and achieve some of these sustainability goals—reduce greenhouse gases by half—in our transportation fuels.

His comment is that industry won't drive these innovation investments unless public policy supports that. I think key, in his view, is that we lack proper carbon pricing to be able to drive industry to move to innovation to decarbonize our economy and our fuels, including transportation.

I just wondered if you had any comments on the concept of carbon pricing in terms of the driving of innovation—with the caveat that I understand that aviation fuels are the higher-octane fuels and are not as amenable to things like natural gas. But you did talk about bioenergy yourself.

Can you give me some thoughts on that?

Mr. Stephen Quick: Again, both of us are better with things with wings, but in terms of the fuel that goes in, I know that Porter and Bombardier had one of their Q400 aircraft fly from Toronto to Ottawa with one of the engines just on biofuel. It was the first time they had flown on a commercial line in regular service with biofuel.

One of the key things in terms of the air carriers is the cost of fuel. It can make or break them, absolutely. Because it's a consumer-driven product, and no one wants to overpay for flying, or pay too much carbon tax, they base their price—

A voice: [*Inaudible—Editor*]

Voices: Oh, oh!

Mr. Stephen Quick: Again, much of the industry is consumer-driven, certainly in terms of transportation infrastructure.

We were just discussing the other day some of the new designs they're coming out with. They are basically a solid wing, so that the passenger would be embedded in the wing. You would basically have a screen in front of you that would show you the outside, but there would be no windows.

Pardon the pun, but that will not fly with the consumers. That has been a design kicking around since about 1910. It's an incredibly efficient design, but again, it's consumer-driven. My only comment would be that obviously for the carriers, it will be very important that the pricing be right for them.

The nice thing about the aviation industry is that it's kind of a closed circuit. It's a great place to test biofuels because it's a captured market. The infrastructure that supports it is, as well, a captured market. You're not actually going out and looking for the average consumer in terms of consumption. The airlines know what they're looking for. It's a closed circuit in terms of the infrastructure for delivery and production.

So it would be a good area. The problem is that it's a higher octane and also very specialized fuel. When it comes down to biofuels, it will be interesting to see exactly who's in the lineup to get the biofuels. There's going to be a limited quantity, and most of our transport is road and rail at this point, so....

● (0920)

Ms. Joyce Murray: Thank you, but I only wanted—

Mr. Rénald Fortier: May I add?

Ms. Joyce Murray: Sure.

Mr. Rénald Fortier: There is some biofuel research being done in Canada, because some of the plants that will be used for that will grow here. I completely forget the names of them, but they're mustard-like plants. You sort of take the seeds—Camelina and Brassica, I think—that can be used for that. There's research being done in Canada. Actually, some Porter flights, I believe, use fuel that was produced from Canadian-grown plants. You also have algae that can be used, so the idea of biofuels is certainly with us.

The cost would be huge, but it's planning to sort of get over.... The idea is not to produce 100% of the fuel needed for aircraft using plants. The idea is to gradually increase the percentage. It's quite likely that some government money will be required somewhere, either in Canada or the U.S., if not somewhere else, in order to get these things under way. Then you also have synthetic fuels, which are not biological in nature, that can be used, anything from fuel made from coal, natural gas, or methane. There's a variety of hydrocarbons that can be used for that.

Ms. Joyce Murray: Excuse me, I'm sorry, but I'm going to use my time for another question.

There are other countries that do actually price in the cost of pollution and carbon in their energy costs, so there would be more motivation for industry there to do the kind of innovation and make the deep investments in revolutionizing their products. Do you see this being a possible barrier to Canada continuing to have a leading-edge industry on issues like transportation, transportation fuels, innovation? Aviation is going to have to solve its greenhouse gas emission problems. Will this make it more difficult for Canada to have a competitive advantage on these issues—that our oil industry is subsidized and that there is little pricing on carbon?

Mr. Rénald Fortier: If I may, commercial aviation has a relatively small impact at the moment. I think it's around 3% or 4% of the overall global emission. The problem is, if you increase the number of aircraft, then the expectations, hopes, provisions, are that the number of airliners will sort of double within the next 20 years when you have markets like India and China that are developing, because you have middle-class people and they want to travel, they want to do things. The number of aircraft will grow, so the potential for the amount of carbon monoxide and other pollutants will sort of double from 3% to 6%. You're looking at an increase, but it's still relatively small. It's a huge amount, but it's still relatively small compared to the rest. Whether or not there will be an impact on that.... Well, there will be some impact.

In terms of causing problems through export, because we mainly export our aircraft, we don't use as many aircraft as we produce. That's the difference. It's a fairly small percentage—it's hard to say. I have the feeling that it probably won't have too much of an impact because if you look at the new Bombardier CSeries, it was designed to be fuel-efficient because it's good for the industry.

There are two aspects here. The industry realizes they must have fuel-efficient aircraft in order to sell the aircraft and use the aircraft. It's also very good for them from a PR point of view, if I can use that expression, to have greener aircraft. It makes them look better and everyone wants that, so it's a bit of a win-win situation. They want fuel-efficient aircraft because they're cheaper, and they want greener aircraft because it makes them look good. Their new CSeries is sort of a winner in both cases. That's one thing they're trying to push—that it's a green aircraft, it's a modern aircraft, very fuel-efficient, it will have less impact—and the market is growing. Therefore, buy our aircraft; it's much more fuel-efficient and much better than the old clunkers you are using now.

The Chair: Thank you.

Before we go to Mr. Adler, we'll take a one-minute recess. We've had a bit of a technical problem, so we have to take a one-minute break. We're going to reboot, then we'll come back to you, so we'll suspend for one minute.

● (0920)

(Pause)

● (0925)

The Chair: We are back and technically sound again, so I'll go to Mr. Adler.

Mr. Mark Adler (York Centre, CPC): Thank you, Chair.

Thank you to the witnesses for appearing today.

Mr. Fortier, as a historian, could you review some of the history of the aerospace and aircraft industry in Canada?

I just want to preface my comments by saying that I represent the riding of York Centre, where Bombardier is located, the largest private sector employer in the GTA, and they were just awarded yesterday, as you probably know, a contract from WestJet to produce 20 Q400s with an option for an additional 25. We're all very happy about that and York Centre is bringing lots of jobs and investment to my community.

Mr. Fortier, I just want to ask you how has the history of the development of the aerospace and aircraft industry in Canada been skewed, if you will, by involvement from government, notwithstanding wartime production but during peacetime production?

Let me give you an example. In 1986 when the CF-18 maintenance contract was awarded to Montreal instead of Winnipeg, it caused a whole big political scandal. Then in the early 1990s when Boeing owned de Havilland and wanted to sell it, there was a consortium from Europe that was interested, and the Ontario NDP government of the time wanted to be a partner and own an aircraft industry. Could you talk a bit about that, and in light of those examples, about how government involvement can really skew the private sector development of Canada's airplane or aerospace industry?

Mr. Rénald Fortier: It can happen. It's probably not only Canada; that sort of thing can happen in different countries.

You might have to remind me about the first aspect of your question.

On the second one, the purchase from a European consortium, I'm not all that familiar with all the details, but there was certainly an interest, as you said, and eventually when the federal government approved the whole thing, eventually Boeing disposed itself of de Havilland because it was sold to the Ontario government and to Bombardier, and eventually the Ontario government pulled out and Bombardier became the sole owner.

My understanding as far as that general sale was concerned was that the Ontario government was certainly concerned, but Boeing had great problems with de Havilland because Boeing had experience with big airplanes, long-range aircraft, jets on their own soil, and they had this little company that had its own culture. You have company cultures, and they had massive problems so they were trying to find a way to divest themselves of it.

Why exactly the Ontario government objected might have been a question of job loss. It's possible, and I'm not just fabricating here, but it's possible that the European consortium might have decided that since they were making regional airliners that in a way competed with something that de Havilland could build, they might have wanted de Havilland to become more of a subcontractor to them—that is to make parts rather than make complete aircraft. That might have been part of the concerns that the Ontario government was involved with.

● (0930)

Mr. Mark Adler: It turned out it wanted to be a partner with the European consortium. The Ontario government wanted to be a partner with the European consortium initially.

Mr. Rénald Fortier: Okay, that's my mistake. I was not aware of that, but eventually it became partners when it was sold to Bombardier. The idea might have been they wanted to have some sort of control over it.

Mr. Mark Adler: At the de Havilland facility, 90% of what Bombardier produces is for export. They also produce all of the planes that Porter Airlines uses.

They have told me that they have benefited by the free trade agreements that our government and previous governments have negotiated, but particularly the nine that we have negotiated since we've been in power.

Could you talk about the advantages historically of how free trade can benefit the aerospace industry and the airplane industry in Canada?

Mr. Rénald Fortier: Historically speaking, I'll give you a foreign example. The airline industry in the interwar years in Europe very often was government-owned, and very often they ordered aircraft that were built in their country.

In some cases, they were not necessarily the best aircraft available, but they were the aircraft that were built in the country, whereas in America from the mid-thirties onward pretty much until Airbus came along—with some exceptions—the airline industry was dominated by U.S. airliners. So there were cases where European airlines were stuck with European airplanes from their own countries. They were not bad airplanes, but the American ones were better.

So we certainly have that aspect to it. In Canada TCA/Air Canada was in a rather different situation. There was no airline manufacturing here in the late thirties. There was some after the Second World War, Canadair and the North Star, for example, but by and large, the policy—because it was a crown corporation, owned by the government—was don't get us into trouble, don't embarrass us, don't have deficits, and if you want to buy American or British, you buy the best airliners available.

There was something about the North Star. There was some encouragement to buy it, but TC was involved in the development of the aircraft. They were able to get what they wanted and eventually it proved to be a reliable airplane. TC was also involved in the development of the jetliner by Avro and that didn't pan out, but they tried certainly to keep the airline.... You're an airline. You do the airline stuff. We're the government. We're paying you, but do what you have to do.

Mr. Mark Adler: Could you just jump back to the CF-18 maintenance contract and how that really skewed not only the political environment, but how Winnipeg really suffered and the industry really suffered in Winnipeg for that political decision?

Mr. Rénald Fortier: Politics do play a role and you have large players like Bombardier. In the United States it's the same thing. You have “senators from Boeing”, they're called, probably behind their backs. There's a lot of lobbying that takes place. In some cases, some areas of the country will come up in second position.

Mr. Mark Adler: But all things being equal, letting the marketplace decide where those jobs should have gone, it should have been Winnipeg, right?

Mr. Rénald Fortier: I have to say I'm not familiar enough with the file to actually look at it.

Mr. Mark Adler: With hindsight, it's possible.

The Chair: I'll have to stop there, but thank, Mr. Adler, for the support for Winnipeg, and my province.

Ms. Rempel.

Ms. Michelle Rempel (Calgary Centre-North, CPC): Good morning, and thank you to the witnesses for their presentation.

We're here today to talk about innovation in the aviation sector. Maybe I'll start by talking about the difference between invention and innovation. Invention is commonly referred to as creator-driven. It's the creation of something new whereas innovation is usually something that responds to a market demand, something that provides some sort of a public benefit, be it a social benefit or economic growth.

So with that concept in mind, we also have to look at the difference between market pushes and market pulls. Market push is the push of an invention into the market to try to create a demand, whereas a pull is where there's an existing demand that you can easily adopt a technology to. So bearing those four principles in mind, how do you think that Canadian aviation could allow for better adoption of technology, knowing that the path to adoption is usually a market pull factor?

● (0935)

Mr. Rénald Fortier: Being more of an historian than an economist, I might have problems with that one.

In the industry, Pratt & Whitney Canada, for example, have very close relationships with their customers. They're very attuned to what the customer wants, and that can be the airline or the aircraft manufacturer, because they tend to sell to the aircraft manufacturer, which then sells to the airlines. They have some sort of close connection.

So on the push and the pull and the ideas, they're certainly very closely connected in that aspect, in order to develop new ideas using their existing designs and to improve them, and mainly to improve fuel efficiency. Because that's the main thing. It's to reduce costs. You want to have an engine that performs as well as possible and that's as simple to repair as possible, as long-lasting as possible, and as cheap as possible. You want it to have everything. It is squaring the circle.

But with every product in aviation, whether it's a seat, radar, an airplane, or an engine, it's a compromise. You cannot have everything, so eventually you have to choose. But there are certainly close relationships within the industry and also outside the industry with regulatory agencies—or with the NRC as far as research is concerned—in order to get the best product available.

As for new ideas and innovation, and the push and pull, being export-driven, there's certainly a great deal of interest as far as innovation is concerned, because there's no internal market. So if MPs—no offence intended—wanted to push Air Canada to buy a Canadian airplane, it would help, but most of the airplanes are exported anyway, so it would not have that much of a pull.

They have to be as open-minded and as innovative as possible in order to produce something. As far as aircraft manufacturing is concerned, in anything from the simulator manufacturers to the aircraft manufacturers, they've been extremely successful at innovation.

As for revolutionary ideas, we did not invent the jet engine. We did not invent the airplane. Canada is not a superpower, so we don't have to invent things. We certainly have invented ideas, such as, for example, the regional jet—the Canadair Regional Jet—which is now the Bombardier regional jet. There were regional airplanes before, but the idea of having a jet-powered one—pure jet, not turboprops and propellers—was very innovative. In a way, it was risky. They didn't quite risk the business, but they certainly risked a great deal when they went to that.

It proved to be highly successful, in the same way that Boeing was when they went with the jumbo jet. That was still an airliner, and it still looked like an airliner with swept wings, but it was revolutionary in the size of the thing. They were very innovative.

Ms. Michelle Rempel: Along the lines of that example, earlier today we talked a bit about locking in a national strategy, yet you've just outlined the fact that in order to achieve sustainable adoption of innovations, you do need to have that market-based demand, right?

There have been some allusions to government creating that demand. Would you characterize long-term sustainable demand for technology adoption as being more successful when there are actual market factors pushing it or when government's pushing it?

Mr. Rénald Fortier: When Canada and Bombardier came up with the design, they had to sell it, but the airlines realized there was a market for it, because this was a nice idea, in that you could actually fly a lot faster. The market was there and floating, but it was sort of nebulous. Through having the aircraft, the market materialized and became solid, and eventually it sort of....

So as for having government do that sort of thing, they might push it at air shows and talk ambassador to ambassador, or trade attaché to trade attaché, but you must have the product and push it. With regard to government assistance, it's possible with the trade attachés, etc., but you must have a product to sell, or at least an idea to sell.

In the case of the regional jet, it caught fire. The thing sold like hotcakes. It's still selling like hotcakes. In other cases, you may have a smaller niche—for example, the water bombers. The Bombardier water bombers are superb aircraft and very well adapted to their role, but it's a fairly small market. You won't produce hundreds of them, but the people who buy them... They might have sold 200 in the past 40 years. That's not a lot, so the company won't survive on that, but it's one of the aspects of the manufacturing industry.

That's another aspect of aircraft manufacturing—and I plead guilty to this because for a long time I neglected it—in that you have subcontracting. You don't have the big, sexy projects. Subcontracting may not be sexy, but you have cars, spare parts.... It's very broad.

● (0940)

Ms. Michelle Rempel: So then you would characterize the adoption of technology as better suited to responding to market needs or responding to a policy environment that is flexible, as opposed to locked in, as we've heard in the terminology used this morning.

Mr. Rénald Fortier: We're also realizing that there's a market there to buy the turboprop, the propellor-driven aircraft, to fill that market, but having a jet, no one has thought about it, but let's try that. They have already had the Challenger, which served as a basis for the regional jet, so there was a market there, but it didn't really exist. They sort of invented the market. They realized there was something there, and it worked. I some cases it may not work, and that's also the case with aviation. It's a high-cost industry. It's a high-tech industry. Everything is expensive. Not everything that you do to help will work. It will work a little bit, medium, some will work like hotcakes, but you don't know that in advance.

Concorde was a great idea, but—

The Chair: I have to interrupt there, and go to Mr. Sullivan.

Mr. Mike Sullivan (York South—Weston, NDP): Thank you, Mr. Chair. I'm really pleased that you're here because there is a wealth of history in what you've said to us, and we need to learn from that history.

My riding is in Toronto, and in fact, either Toronto's or Canada's first airfield—I'm not sure which—is in my riding. It's the Trethewey property, and that was in 1911, I think, when they had an airfield there.

And of course I'm wearing a pin that's the Avro Arrow, so there is some Canadian history that is less stellar. I'm also aware that there's a museum that's closed and an historic property that is being destroyed at 65 Carl Hall Road that must give you some sadness.

But I want to come to the Bombardier example that we talked about. Bombardier is now building incredibly advanced wings in Northern Ireland. Not here in Canada, but in Northern Ireland, and Mr. Holder and I went to see this, and I was absolutely blown away by the use of new technologies. However, their view—it was quite surprising—was that they're not a manufacturer. They are an engineering firm, and they leave the manufacturing to subsidiaries, or it's an afterthought. The last time the CFO of a company told me that they were not a manufacturer, they were an engineering firm, it was Nortel, and it's something I'm very alarmed about.

Bombardier is also in the process of building factories in low-wage jurisdictions because free trade agreements allow them to build their products offshore and still sell them in Canada and elsewhere. So it's not necessary to have a Bombardier plant in Mr. Adler's riding in the future.

Like with Aveos and other recent announcements of a loss of Canadian aviation infrastructure, is the government's hands-off approach going to be harmful to our continuing as an aviation player? I won't say we're a superpower, but at least we're a player in the aviation world.

Mr. Rénald Fortier: If you look at the past of the aerospace industry, you had companies, any company—let's take Boeing, for example, during the Second World War. You have aircraft manufacturers, but lots of the components of the aircraft—the landing gear, the engines, the instruments, the navigation equipment, the computers—come from outside. So it's been quite a while since aircraft manufacturers have been more assemblers of components that have been made elsewhere. So they make the airframe, and all the bits and pieces are put on it, and you have the airplane.

What has changed in more recent years is that the airframe is in Europe. Airbus might have been a pioneer of that, it's possible. I'm not familiar enough, but they certainly did it a lot, where you have the central assembly plant, which happened to be in France. You have the bodies—the airframe itself is in pieces, so you have the tail section that comes from Spain, the front fuselage comes from France, and another section, and they assemble the thing. Even when building the airframe itself, they are assembling components of the airframe together, attaching the components like the engines, the electronics, and sort of selling that. Well, the French will tell you it's a French airplane. The Airbus will tell you that it's a European airplane, because aviation is extremely nationalistic in that sense. But the internationalization of the industry has been going on, and Bombardier has decided to take that route.

The CSeries, for example, is a case in point. But now that, for example, Bombardier has factories in Northern Ireland, as you've said, which has expertise in composite production going back to possibly an all-composite aircraft that came out in the 1980s, if I remember. There is certainly expertise there in terms of curing composites. It's not like cooking pies, but it's almost like cooking the materials in order to create this fuselage.

Bombardier Toronto and Bombardier Montreal also do work with Learjet in the United States, so they are certainly integrating the aircraft manufacturing aspect of it so some pieces are made here, and some pieces are made there. It's pretty much part and parcel of what the industry is today. Bombardier, being a major player in that, has to play by those rules. It's pretty much the situation. But there's a great deal of assembly of components more than actually manufacturing of components at the factory. That is true, and that is not going to stop. It's going to get more and more.

● (0945)

Mr. Mike Sullivan: Do I have any more time?

The Chair: You have 20 seconds.

Mr. Mike Sullivan: Okay.

But the point is that there is no national policy in any of these countries that says “thou must”. Well there might be in France. But thou must assemble—final assembly must be here because we are supporting it....

Mr. Rénald Fortier: I'm not familiar with things like that, but there might be certain countries where you have policies like that. As far as Canada is concerned, we might be more laissez-faire because Bombardier has been doing rather well so they might be sort of left to do their own things.

Pratt & Whitney Canada might be in a similar situation. They have a lot of work to produce here, but engines might be a tad different because the components are a lot smaller and they tend to do everything in-house. Pratt & Whitney Canada is a subsidiary of a U.S. company so they don't do all the work. They do a certain part of the work, like the smaller engines.

So division of labour in the aerospace industry does exist.

The Chair: Thank you.

Monsieur Poilievre.

Mr. Pierre Poilievre (Nepean—Carleton, CPC): Ms. Rempel asked about pull and push. Push is the builder—the developer of the technology—and pull is the buyers.

Our analyst produced a magnificent table of all the modes of transportation that have been invented and popularized in the last 200 years. With very few exceptions, they have been developed by the private sector. That is to say that the push has come from private industry or private individuals. In many cases the pull came from government procurement; that is to say, massive government purchases of that mode of transportation and almost always for military use. The only exception I can find here is for space and for some public transportation, the subway being another example.

The Silver Dart was the first Canadian-developed aircraft. Is that correct?

Mr. Rénald Fortier: It was tested here. It was developed in part by Canadians but I do believe it might have been made in the United States. The group is certainly Canadian-American. Yes, it certainly has strong Canadian—

Mr. Pierre Poilievre: That was in about 1909?

Mr. Rénald Fortier: Yes—

Mr. Pierre Poilievre: You have a replica at your museum. It looks sort of like an oversized kite.

Five years later Canada was manufacturing large quantities of warplanes. Do you believe in that instance it was the world war that drove Canadian industrial innovation and productivity in such a short period of time?

● (0950)

Mr. Rénald Fortier: If I may be allowed to give a little background here, before the First World War, you had small aircraft industries, especially in Europe and the United States, because you had the military market. You had sportsmen pilots who bought airplanes, but they bought one or two. There might have been many of them but the main buyers were the military. That's pretty much a fact of life. It's been pretty much like that as far as military aircraft are concerned. They certainly had a lot of investment.

As far as Canada is concerned, it was the First World War that changed everything. There were some people who manufactured one-off airplanes. The factory was about the size of this room here with two people, a hammer, and a saw. That was pretty much the extent of the industry in Canada because there was no market here.

The First World War changed all that. The government at the time was very busy because the army was the main contributor in defence. The British set up the factory in order to produce aircraft for schools. The aircraft were of American design. Canadian involvement, except for the workers and some engineers to sort of tweak the airplane a bit, was rather minimal at the time. But it certainly gave experience to some engineers for after the war, but in limited numbers.

Mr. Pierre Poilievre: Basically government's only role at that point in the development of aircraft and aviation technology was in buying it in very large quantities.

Mr. Stephen Quick: If I could speak to that, when I spoke earlier, I talked about a holistic environment. It's really important to understand that these things don't sort of—well, they do sprout out of the ground. Most of them are made out of wood, but that's another part.

The industry, itself, doesn't spring from nothing; there certainly is a market demand. But without investment in education, without bringing engineers—

Mr. Pierre Poilievre: If I may, that's what the American government did with Samuel Pierpont Langley in giving him the largest-ever war department grant for R and D. He produced an aircraft that shot up in the air, shot down into the Potomac River, and lodged in mud, at which point he gave up and said his life was a failure.

The Wright brothers, by contrast, funded all of their R and D from the proceeds of their bicycle repair shop, had zero government help, and produced, for one-seventieth of the cost, the first heavier-than-air powered, piloted aircraft ever. That would seem to contradict what you're saying.

By the way, they didn't even have a college education, whereas Pierpont Langley was the third secretary, I think, of the Smithsonian.

So sometimes these things do sprout from the ground, don't they?

Mr. Rénald Fortier: If I may, there were a lot of people who worked on airplanes before the First World War. You had a number of them. There were probably hundreds of them. The Wrights happened to be the ones who got it—and it's wonderful, although one has to.... Being very innovative, they got it right. But they did not invent the airplane; they invented a control system.

There was certainly a great deal of work being done. Most of the people who developed airplanes before the First World War made little hops, a bit like what Mr. Langley did. They made little hops or none at all, and they sort of got disappointed and pulled out of it. So most aircraft designs are never produced; they remain on paper. So there is certainly an aspect of private enterprise.

As far as the United States is concerned, definitely.... With some government assistance in some cases, through contracts, or through access to research facilities, the equivalent of our National Research Council for wind tunnel research.... But as far as other countries are concerned, there is much more government involvement.

The Chair: I have to stop you there and go to Monsieur Aubin.

[*Translation*]

Mr. Robert Aubin (Trois-Rivières, NDP): Thank you, Mr. Chair.

Welcome, Mr. Quick and Mr. Fortier. Thank you for sharing your incredibly valuable insight with us.

My first question has more to do with the historical aspect. We are going to take advantage of your expertise. If the past is any indication, as they say, we will draw our own conclusions. I won't ask you to predict the future.

Correct me if I am wrong, but you seemed to say, at the beginning of your presentation, that public sector contributions had been critical to technological advancement. Could you give us an approximate idea of what those contributions have been like over the past century, especially in the field of aviation? How much funding has come from the public sector versus the private sector? Is the split 50-50, 70-30?

Mr. Rénald Fortier: I could not say. There are investments in research. For instance, the National Research Council of Canada provides government equipment. There are also investments as far as tools go, meaning assistance is provided so an industry can develop its potential. Investment in the area of contracts is also made. So there are various forms of assistance.

In Quebec, the industry can access electricity at very low rates. The government can get involved in different respects. But it can also choose not to get involved, or to do harm, taking detrimental measures. It is incredibly vague. Putting a percentage or dollar figure on the investments is extremely tough.

My sense is that it is massive, just in terms of aircraft purchasing contracts alone. If you look at government investment and the money spent by airplane manufacturers or Canadian engines, I would say the industry has invested less in research, probably just as a result of the size of the contracts. For instance, if you are buying 1,000 planes—

● (0955)

Mr. Robert Aubin: I appreciate that, but it really takes numbers.

Mr. Rénald Fortier: At the end of the day, the industry is making a genuine investment that tends to increase over time. In the beginning, it was zero. Then, the industry recognizes the size of a project and the time it takes to build an aircraft, and the industry becomes more involved, even though it receives government assistance in a wide variety of forms.

Mr. Robert Aubin: I want to stay on the topic of research, if you don't mind. Is it accurate to say that a private company will agree to invest heavily in applied research to develop greener airplanes, for example, even though the word “green” does not necessarily mean that they will actually be better for the environment?

I also want to know about biofuels. The responsibility of doing the basic research falls more on the public sector's shoulders. Does the private sector conduct any basic research?

Mr. Rénald Fortier: It all depends on the industry. Take aerospace, for example, where you have engines, electronics and planes. That is a sector that can do basic research. Look at Bombardier. In terms of its planes, the basic research can involve materials. In the case of certain alloys or metals such as aluminum or lithium, the research usually comes from companies like Alcan or Rio Tinto, aluminum manufacturers that sell to a variety of customers, including Bombardier and Boeing.

If you look at fuel-related materials, the industry does not carry out that research either.

Research in the field of aerodynamics, which has to do with the shape and body of the aircraft, can come from the industry, but it can also come from external sources. Very often, information from external sources, such as NASA, is used.

To my knowledge, the industry does not have any wind tunnels, but it can request access to them. Nowadays, however, research around the shape and body of an aircraft is increasingly done by computer, eliminating the need to go to the National Research Council of Canada or use the big wind tunnels in Ottawa. You can push a button on your computer and it will give you the result.

Mr. Robert Aubin: You piqued my curiosity when you were talking about biofuels. We know this technology can have a huge impact on agriculture and global supply, as compared with oil and synthetic fuels.

Is progress being made in synthetic fuels?

Mr. Rénald Fortier: I am no expert, but I do know that there is a lot going in that field, although not necessarily in Canada.

In terms of biofuel research, I believe Nova Scotia is doing work on algae, in partnership with the National Research Council of Canada.

With respect to land biofuels, the *Camelina sativa* and *Brassica carinata* plants have been used to produce a biofuel that Porter used for a Dash 8 flight. The mixture was a blend of 49% of the first plant biofuel, 1% of the second plant biofuel and 50% regular gas. Research is being done in that area, because these plants can be grown here. The goal is to engineer varieties that can grow in the Canadian climate, similar to what has already been done with wheat varieties. The idea is to come up with plant varieties that could stand up to the climate and parasites and that could be grown on land not currently being used for food production.

Keep in mind that producing biofuels must not mean that you are taking food away from people or cattle. The objective is to produce varieties that could be grown on land that does not serve those purposes. The same goes for algae, which does not require land. It is renewable and efficient. Research in that area is happening in Canada.

Mr. Robert Aubin: Where do synthetic fuels stand?

[*English*]

The Chair: I have to stop you there and go to Mr. Holder.

Mr. Ed Holder (London West, CPC): Thank you.

Mr. Adler just had one thing he wanted to say first, and I will share my time with him.

Mr. Mark Adler: I just want a quick question, Mr. Fortier. I'm very concerned about a statement that Mr. Sullivan made earlier that the free trade agreements Canada has with other countries are going to lead to the dissolution and gutting of Bombardier in the riding of York Centre and the loss of 4,000 direct and 9,000 indirect jobs.

As a former union boss, Mr. Sullivan, I'm really shocked that you would even say that. You're having such blatant disregard for workers.

Could you please comment on that statement, Mr. Fortier, that Bombardier, because of free trade, is at risk of shutting down at the Downsview Park, yes or no?

● (1000)

Mr. Rénald Fortier: I have to say I don't know, but the idea of—

Mr. Mark Adler: Would you say the current state of affairs with Bombardier gives you any indication whatsoever that they will be shutting down any time soon and laying off 4,000 direct and 9,000 indirect workers? Would you say that was just a reckless, negligent comment that should be corrected for the record, I would think.

Mr. Rénald Fortier: I simply don't know. One has to say that industry—I'm sorry.

Mr. Mike Sullivan: For the record, Mr. Chair, can I make a point of privilege.

The Chair: Mr. Sullivan, on a point of order.

Mr. Mike Sullivan: I was never a union boss, and I resent the degrading kinds of comments that come from Mr. Adler on that.

An hon. member: Well, 4,000 workers—

The Chair: Order, please.

I'm going to Mr. Holder now to continue his questions, please.

Mr. Ed Holder: Mr. Chair, our guests are historians, and we're trying to make them economists. I want to stay with the historical perspective, if I can, please.

In my own community of London, Ontario, we have some great history. In fact, Stanley Deluce, whose name you may know, was one of the classic bush pilots. Historically, he was one of the pioneers in northern Ontario and went on to become the chairman of Porter Airlines, and his family carries on in that capacity.

So it scared me, Mr. Fortier, when you called bush planes pickup trucks with wings. That made me a little nervous.

Mr. Rénald Fortier: It's but a term of endearment.

Mr. Ed Holder: I won't tell the Deluce family that, but I'm sure it's very true.

You talk about biofuels as one of the ways that may be utilized going forward. In fact, in some respects it's already being used. In my own community of London, Ontario, through Western—our university—we have the Institute for Chemicals and Fuels from Alternative Resources. They will take leaves, bark, and various things and they have two byproducts: one is basically fertilizer for soil; the other is jet fuel. Who knew? They are going through this process now, which is quite amazing.

When we've had representatives from the transportation industry, particularly around various fuels and the automobile, one thing they've said is that going forward there are two ways you save money. One is related to the type of fuel and the other to the weight of the vehicle. I'm sure historically you've seen those developments over time.

If I can ask you to be a futurist rather than an economist, where do you see the greatest economy associated with those developments, going forward?

Mr. Rénald Fortier: The aircraft manufacturing industry as far as airliners are concerned—we'll leave aside the military side—is a mature industry. The idea that you can have massive increases or decreases in fuel consumption is difficult. If it were a new industry, no. If you look at an airliner of 1960, such as a DC-8, and look at an Airbus A380, and move them a certain distance and remove the painting, they haven't changed a whole lot.

An engineer will tell you that the engines are far more fuel-efficient, the electronics are light years ahead, and so are the aerodynamics, but it's a very conservative industry in certain senses. As far as the future is concerned, what could really help won't be anything massive. It's the idea of small items—a per cent here, half a per cent there, and a sort of tweak here—making sure that the improvement in efficiency doesn't double the cost of the airplane, because the whole thing has to be taken into consideration.

It's incrementalism. They're trying to improve the aircraft and keep them easy to maintain.

Some of the larger assistance as far as fuel efficiency is concerned, for example.... That's the sort of thing that will take awhile, in some cases a very long while, and it would prove very expensive. They have types of engines that have been.... There's nothing new under the sun. Many of the ideas we think of as novelties today, they were thinking about 25 years ago.

● (1005)

Mr. Ed Holder: In my own city, London, we have the jet aircraft museum, which is relatively new. If you're not familiar with it, we would invite all committee members to come to London to see it. It talks about the history of the jet and is thus very much, I think, associated with what you do.

What I didn't hear from you, which is unfortunate, as it relates to innovation is the other part of your business card, which says Canada Aviation and Space Museum. I didn't hear anything about space. This will be my last point, I'm sure—chair?

I don't know whether you have any comment concerning that.

Mr. Rénald Fortier: Transportation in space.... There were certainly projects of space planes, but the idea of transportation as far as space is concerned is rather nebulous and may not exist for awhile, I'm afraid.

The Chair: Thank you.

Ms. Morin.

[*Translation*]

Ms. Isabelle Morin (Notre-Dame-de-Grâce—Lachine, NDP): Thank you.

Thank you for being here today.

I am going to pick up on my colleagues' comments about jobs.

As we saw a few weeks ago, in the case of Aveos or in the aerospace sector overall, job losses are a reality. A lot of jobs were cut, especially in my riding, where 2,800 workers lost their jobs. And we know the production is moving to Brazil.

In Canada, there has been legislation in the past that protected our jobs. We feel the same should apply to these jobs. In any case, I want to hear your take on the use of legislation to protect workers and the government's withdrawal in this area. I am not sure whether you feel or your research shows that this type of protection should be maintained, strengthened or eliminated.

[*English*]

M. Rénald Fortier: Our clientele tends to be very interested in the aircraft themselves, so we have to talk about the aircraft.

Personally, I'm more interested in the people and the history—not the history of the airplanes themselves, but the social history and the context surrounding the history. The legal aspects, or the idea of unionization, certainly—because there's a history of that militancy in the aircraft industry throughout the ages—is something I'm not all that familiar with, as far the types of legislation available are concerned and what should be there, what isn't there, and what is being removed. I'm not familiar enough to make a....

[*Translation*]

Forgive me, I answered in English.

In short, I am not in a position to make a sound judgment on the matter because I don't know enough about it. I am very sorry.

Ms. Isabelle Morin: On a different note, the topic of education came up briefly a bit earlier, and I would say having a good education is critical in the industry. I want to know a bit about your commitment to the education of people, employees, historically speaking. How do you think the government should invest in education?

Mr. Rénald Fortier: Mr. Quick might be able to comment on education and museums, because we do have educational programs in place.

As far as universities go, there are different components. You have the engineer and the technician. The engineer designs the aircraft and the technician repairs them. You have, for example, the École nationale d'aérotechnique de Saint-Hubert. We often get groups from that school. It is vital because you need people to work on the planes. You need the expertise to repair and build the planes here; both of those aspects need to be considered.

As for engineers, numerous schools offer engineering programs, including one in Sherbrooke, where I was born. In that respect, it's a provincial sector. Offering incentives for this type of training is a good idea, because unless I am mistaken, these engineers can easily find jobs. It is harder now because of the economic situation, but workers in the industry are very often in short supply. The positions are there, but not the workers. So the government can do its part by encouraging the high-tech sector, a cutting-edge sector.

[*English*]

Mme Isabelle Morin: Do you want to continue on the same point?

[*Translation*]

Mr. Stephen Quick: Yes, as I said earlier, it is extremely important. If you consider Bombardier's production line alone, the company will need 500 engineers for the CSeries. So it is crucial. That request is not coming from anywhere. We need to have a supply chain that will accommodate these industries. We are talking about an investment at the outset. We are a part of that supply chain. We want to teach children in Grades 1, 2 or 6 about becoming engineers, because there is a serious shortage in that area. The supply chain is vital to support and sustain the industry and factories, and to promote Canada's high-tech sector.

● (1010)

Ms. Isabelle Morin: I will give my last 30 seconds to Mr. Sullivan.

[*English*]

Mr. Mike Sullivan: My colleague across the way talked about the goal of reducing fuel. Bombardier is doing that with the composite wing manufacture and the great strides.... However, they have said to us they realize that the Chinese are going to steal this and start doing it in a few years. They, then, are looking at the next generation.

Is there a “next generation” that you see, in terms of making the planes lighter?

Mr. Rénald Fortier: Can I say something nasty here? If you compare Bombardier to Airbus, Airbus has sections of their website that talk about airplanes where you push a button and the covering of the airplane becomes translucent, and they talk about the new engines. They have all sorts of cool stuff online.

Try to ask Bombardier what they are doing, and they'll say they're not telling you, so it's very hard in some cases. They may have wild projects like that—super-efficient aircraft, maybe hydrogen fuel, completely revolutionary shapes that are being developed by Boeing and Airbus and other companies—but trying to pry information out of them can be a tad complicated. We wish we were able to show that but again, in their case, they choose to be not secretive, but very private about it.

Other companies such as Boeing and Airbus choose to be more open, which doesn't mean they will build the airplane with a translucent skin or that they will build the airplane that looks like a manta ray. Whether they will or not, I don't know, but they probably have projects like that. They have to. I have a feeling that they probably have multiple teams working on certain ideas. So they're developing a number of ideas, which can be like the fuel pump with wings or something a bit wilder, or something completely wild. They come up with ideas, look at how the marketing of something like that would work, something that looks like a normal airliner could probably sell quite well. Something that looks completely wild and crazy, would passengers be nervous?

Probably a great deal of market research is being done in private to get projects like that. They have projects. They have to. They're in the projects business. Even the CSeries—they may very well have in their computers the whatever series that will follow that. It's very preliminary because in 15 to 20 or 25 years when that airplane appears, there might be hydrogen fuel. They might have engines that are being developed in the States or elsewhere, or perhaps they may have development with Pratt & Whitney Canada and Pratt & Whitney U.S.

They won't share that with us, and it's understandable. It's a very competitive industry. The idea of the Chinese.... I wouldn't say everyone copies everyone else, but they go to the air shows and they look at what they're doing. There are great ways of designing airplanes, but at the moment, there's pretty much a shape of an airliner, and there are certainly ideas about aerodynamics. You cannot do wild and woolly things and expect you'll be able to produce an airplane that will be easy to maintain, easy to repair, that will fit inside the hangar, that will be able to use the current facilities. It can be a very conservative industry in that sense, which is a bit odd. So they can be wild and woolly and in some cases they can be very straight and focused, because you have huge amounts of money.

The 747, for example, Boeing pretty much bet the house on that. Had the thing flopped, they would have been in really deep trouble. When you have problems like that, it's a huge industry and huge sums of money are involved.

The Chair: Thank you.

Mr. Watson.

Mr. Jeff Watson (Essex, CPC): Thank you, Mr. Chair. Thank you for a very interesting presentation and testimony here today.

In terms of the presentation today, there wasn't much distinction with respect to the role of government or the necessity for government involvement between military and non-military purposes. It seemed to be woven together, and I hope we can pry the two apart a little.

With respect to non-military application, the commercial side of aviation, if you will, and the development of innovation, can you talk about the historical access to venture capital, for example? How has the industry historically financed its own innovation? Where do they go? What does that look like, other than the government push side of things?

● (1015)

Mr. Rénald Fortier: To start, a lot of the innovations that are being used in commercial airliners, anything from jet engines to composite materials to computers and other things, very often, it's by the military. The military pays for it. If you look, for example, at the engines of the Challenger and the original regional jet, the basic engine was developed for military programs. So a lot of the R and D was paid for by the military; there was a great deal of piggybacking.

Composite materials, for example, my understanding is that there are certain types of alloy, like the aluminum lithium alloy that's being used by Bombardier on the CSeries, the pioneers as far as that was concerned were the military. The military was looking at ways to reduce weight for combat aircraft, so they did a lot of research, paid companies to develop special alloys that eventually became cheap enough and reliable enough to become usable by civilian operators, because you have to open panels...the military have different requirements.

It's not everything, but a lot of things come from the military. It's not like the automobile industry. There's a lot more involvement of the military, at least on the research and development of new products, new ideas like jet engines, radar, stealth—no not stealth technology—composite materials, and afterwards they become commercially available because the prices go down low enough that they can be produced for airliners. The military tend to be more interested in performance than penny-pinching.

Mr. Jeff Watson: I think my colleague, Ms. Rempel, very adequately drew the distinction in terms of the sustainable adoption of technology between market push and pull. I want to look at the research side of that. There is a research push and a research pull, as well. If you look at the way R and D is done in different countries, for example, we have very different models.

The pull side of it, I think, is everything from government directives that sort of change the environment, industry needs, and what they want to research. On the other side of it, the Canadian system, I think you could broadly say if you're looking at the National Research Council, NSERC, and other things like that—as you begin to get into the granting councils—it's research driven, not an industry-driven model.

They're looking to study something, sometimes out of curiosity, and I'm not only talking about basic science, but I'm talking about applications of basic science, even. Sometimes they fit into these other parameters, what industry wants, or what government wants from it. As a result, I think we have some of the best "public research in development" investment levels in the world relative to other countries, but we have poor commercialization of product compared to other countries. Having said that, the net benefit of our system is that we're training a lot of people in the research-driven side. That may be the plus side of it.

What is the historical record, if you're looking at this from an historical perspective, about university-led research in either invention or commercializing innovation? How effective is that model? What can you point to, historically, coming from that model? What are your thoughts on that?

Mr. Rénald Fortier: As far as aerospace engineering is concerned, if that's the direction you want to go to, the pioneer in that respect was.... It might still be the University of Toronto, what they call the University of Toronto Institute of Aerospace Studies—UTIAS, I think, is how you pronounce it. As far as development is concerned, they certainly do research. They provide assistance to small companies. There is very often basic research, students going to their specialized areas and becoming engineers so that they're hired by companies. There is certainly a great deal of research being done for research's sake, although that is changing.

If you look at NRC, my understanding is that there is a focus to make it more industry driven, or in order to make it available to industry. Although there have been cases in the past—for example, I believe it's called the crash position indicator—various devices that might have been developed, if not completely internally, at least partly, by NRC that were certainly put out in the market.

The same thing holds also for the de-icing of aircraft using electricity. NRC was heavily involved in that, and the research was made available. Nowadays, pretty much everybody uses electrical de-icing on airliners.

The Chair: I have to stop you there.

Mr. Toet.

Mr. Lawrence Toet (Elmwood—Transcona, CPC): Thank you, Mr. Chair.

Maybe I can pick up a little bit on where Mr. Watson left off.

One of the comments that was made during the presentation was that new innovations start on a level playing field, so there's no previous experience for any one of the parties to draw on. Historically, the ones who have won, for lack of a better term, that innovation race.... Can you give us an historical perspective on why you've seen them win that innovation race?

● (1020)

Mr. Rénald Fortier: Every case is different. In some cases it might be luck, and in some cases it might be circumstances. In some cases it might be countries with deep pockets. It's extremely variable. Even then, that sort of a leadership role may or may not last a long time, because in some cases.... Look at Japan, for example—

Mr. Lawrence Toet: I'd rather that you look at the historical context within the Canadian framework, the Canadian companies that have innovated. Where have they seen their advantage come forward?

Mr. Rénald Fortier: As far as de Havilland Canada is concerned, they tend to be rather conservative in their work. They innovated in the way of developing aircraft, but in terms of new ideas, revolutionary ideas, because of what they made—bush aircraft, utility airplanes, transport planes—they tended to keep technology rather low.

You should look at companies like Avro Canada. The jetliner was very innovative. You're looking at the second jet airliner in the world. Trans-Canada Airlines was very interested. I wouldn't say invested, but it certainly helped develop the specification. There was research done at the NRC.

Circumstances changed—the Korean war—and TCA got nervous about the airplane also, so they pulled out. By pulling out, it sort of greatly injured the project. In order to sell it, if your national carrier is not interested, it doesn't help. The Korean war put the final nail in the project. If you look at the Avro Arrow, or the CF-100, there was a government need; the air force needed a Canadian airplane developed for Canada's geography. It was developed, it was produced, it proved successful after some bugs, but it proved to be very successful, so government assistance, as far as contracts and research were concerned, proved fruitful.

You need continuity, but circumstances can change. It's extremely fluctuating.

Mr. Lawrence Toet: You also talked about some of the work that Bombardier has been doing in innovation. The success of that, and you commented on the export market. You talked about the aerospace industry being largely in Canada, and the export market is just simply because of the demand issue, right?

Mr. Rénald Fortier: There's not enough demand here.

Mr. Lawrence Toet: There's not enough demand here, so I guess that's what I'm looking at. This innovation these companies are bringing forward, is it because of a government directive, or because they're looking outside the Canadian...? If you could address it from that perspective, that is kind of where I want to go.

Mr. Rénald Fortier: By and large, especially as far as commercial aircraft are concerned, you have to look outside. You have to develop a product that will sell on the open market outside, especially the United States. If you get American airlines to buy your product, you're halfway there, because they are the main market in terms of aerospace and airliners. Other projects as far as the military.... That was a problem in a way in the 1950s, when it was thought that if the government buys aircraft, you design the aircraft, the air force buys them, and you've done your job. In terms of exports, you try, but very often the products were so specialized for Canadian requirements that they couldn't sell overseas. That's a problem. The idea is to export. You have to develop something that is either so simple, like a utility airplane that everyone buys, or something that is so new and revolutionary, like a regional jet, that everyone will want it, too.

Mr. Lawrence Toet: So just looking forward to the future, we have a country like India that by 2020 is saying they will need 3,000 more aircraft. Is that the type of market penetration that we'd be looking at? The necessity of free trade agreements is to bring that forward.

Mr. Rénald Fortier: Yes.

Mr. Stephen Quick: The other thing is that in any innovation, it's that pull-push. It has to be a perfect storm. If you take the jetliner, the Korean War comes along and it doesn't have the market that it needs. But you take the regional jet.... Before the regional jet, de Havilland U.K. tried the same sort of thing, but there was no market for it so it flopped. It was the perfect storm. The CRJ came along at the right time. If I take the Q400s coming out of Toronto, years ago turboprops were not the way to go. The consumer again wants to go fast. They want to get there soon, and they want to get there in comfort, so taking a jet, climbing up, getting above the turbulence, and then coming down takes a lot of fuel. It's not as efficient. Jet engines are efficient up top, but then there's less turbulence, so the consumer likes it.

● (1025)

The Chair: I'm sorry, I have to stop you there.

We have time for one last question from each party, if they so desire to do that. I'll give each one two minutes.

I am circulating a document that I need to have approval on before the meeting ends.

Are there any questions?

Mr. Sullivan, final question.

Mr. Mike Sullivan: Your last little intervention was that the export market is clearly how.... As you suggested, since 1960, the planes haven't changed a whole lot in terms of their design and structure. They look essentially the same. So as a market opens up, say in India, what the Canadian manufacturers will want to look to is where they can sell their product now.

It's not really about innovation. There's a little bit of innovation, but it's not really about creating a new technology. Maybe with hydrogen fuels or with clear bubbles or whatever it is Bombardier is working on, there might be some innovative technology in the distant future, but we're not seeing that today. It's not as if government can say, do some R and D and we might be able to create another Canadian industry here. We have a Canadian industry.

Does that Canadian industry continue to need government encouragement in order to make sure they stay here? We have a world in which the lowest wage is where everybody wants to go. Is there some necessity to prod them to stay here and continue to build here for those emerging markets?

Mr. Rénald Fortier: You have a number of issues because innovation in and of itself is not what the airlines want. It's a question of whatever will be the cheapest possible. You want to carry as many bodies as you can for as little as possible in order to break even. So the idea of innovation is not innovation in and of itself. It's innovation in order to make money or survive in some cases. It's the same thing for the airlines and the aircraft manufacturer.

In terms of the government helping, there's certainly the idea of not getting in the way and having as many levels of government—internationally, as I mentioned earlier—sort of pulling in the same direction. That gets very difficult. If you look at India and China, for example, we think of them as big markets. It's in their interest, because they want to industrialize, to have their own aerospace industry. They have a huge market internally so they can certainly sell the aircraft internally. In some cases in China, they might sort of suggest to the airlines that they buy Chinese aircraft. Once they satisfy the internal market and if they have the aircraft—they may actually already have the aircraft that are of world quality—they will be able to export on their own. Canada is sort of exporting there. It may be more difficult than we think. As time goes by, it's an extremely competitive market, and understandably enough. It's a well-paying job. There's lots of money. There's some prestige involved as well.

Governments—Americans, Chinese, Indians, Europeans—certainly there's a great deal of lobbying, as in our aircraft is good and their aircraft is sort of good, but not as good. It's an extremely competitive market. There was no way of predicting where Bombardier would be here today 30 years ago. It's very difficult to say how Bombardier will fare in 15 or 20 years. The CSeries airplane looks very promising. There's no doubt about it, but the Concorde looked very promising, too. I wish them better than that.

The Chair: Thank you.

Ms. Murray, do you have a final comment or question?

Ms. Joyce Murray: Yes. I kept hearing the theme about what you need from government is continuity and direction so that everybody is rowing in the same direction. I'd like to address this to Dr. Quick.

What does that look like? If you could have one thing that would help to create that outcome—understanding that it has to be responsive, etc.—what would the one thing be ? Would it be a cross-ministry table that coordinates government departments and views? Would it be an intergovernmental cooperation mechanism so that you're working with the provincial governments and international partners? Would it be a strategy document, in that there was consultation and all of those partners to say, "Okay, this is the agreed upon strategy. Here's the compass. Point north. We're all going to be going in that direction." Or would it be a package of government policy and recommendations? Would it be a vision?

I really want to be highlighting the part of your objective that you talked about, which was technology and innovation for sustainability. So what would be the one mechanism that could help deliver this continuity and direction?

● (1030)

Mr. Stephen Quick: It's difficult to say one sort of thing. Certainly a dialogue with the industry, but as I said before—and Rénald certainly has alluded to it—innovation doesn't come in and of itself. There's a push and pull with innovation.

Ms. Joyce Murray: If there was one new mechanism—if you had a magic wand and this was what we were going to do—what would it be?

Mr. Stephen Quick: In terms of interdepartmental or provincial versus federal to really take a look at that, even in terms of a historical perspective, it's really difficult to say there's one silver bullet that's going to do—

Ms. Joyce Murray: Just to clarify, I don't mean it's going to solve everything, but if there could be one new initiative or mechanism that you think would be the most effective to develop that continuity and clarity of direction, what might it be?

Mr. Stephen Quick: It think support in sustaining that continuity; I think creating an environment, as I said, that sustains that continuity.

The Chair: I have to stop there.

Mr. Poilievre, final comment.

Mr. Pierre Poilievre: I'm sorry, I'm not sure I understood the question. I'll have to change the subject.

Some of our colleagues have spoken about the need for government to intervene to provide subsidies to keep industry from moving abroad. Mr. Sullivan highlighted the wage gap that might bring the industry to another country. If such subsidies were provided, presumably industry would have to pay for them through higher taxes, since money doesn't grow on trees. When you take money out of the economy to fund industries that are not productive enough to stand on their own, what are the potential consequences to invention, innovation, and discovery?

Mr. Rénald Fortier: There are serious problems. If you subsidize an industry that is no longer functioning, it's sort of like in permanent receivership. I'm not talking about the Canadian situation. But if you have a theoretical situation where an industry is in permanent receivership, the only way it can survive is to have more money pumped into it. At some point you can't continue. It's not feasible. When you have a growing economy you might be able to tolerate it for a while, but eventually something has to happen.

This is not the situation in Canada. Very often the money provided to the industry is in loans that have to be repaid, so it's certainly not the situation here.

At various times the industry was in dire straights. That is true. In the mid-1970s the government took over de Havilland and Canadair in order to keep them from disappearing altogether. It turned out to be a good decision, but there was a period of five to 10 years when it was a fairly closely run thing. It might have gone sour, but in this case it worked.

Very often you don't know in advance whether something will work. You think it will work. You're pretty sure it will work. Then something happens like the Concorde, and the world changes. It has to be a policy decision, but I'm afraid I can't go into detail because I'm not an economist.

The Chair: Okay, make a final comment, then. But make it very brief.

Mr. Pierre Poilievre: I have a question on government grants to promote R and D. If an R and D endeavour has a good business case, why do taxpayers need to fund it, and if it does not have a good business case, why would taxpayers want to fund it?

● (1035)

Mr. Rénald Fortier: Exactly. There are cases where you want to subsidize wild and woolly ideas. If you have lots of money, then go ahead. But in many cases not everything will work. There are lots of good airplanes, Concorde being a case in point. It was a fantastic idea, but commercially it was not that great. Technologically, though, it certainly had an impact on the industry. Some of the ideas that were developed for that project, even though the project itself was not commercially all that successful, were used elsewhere. But you never know in advance. It becomes a policy decision.

If you can afford to put some money, not huge amounts, but some seed money into certain projects, then it becomes a choice. It's a business choice, almost. The government has to deal with it as a business. Eventually you have to sell these products. If there is no market for them that you can foresee, and the government cannot justify buying the product, then don't get into it.

The Chair: With that I'll thank you for your attendance today. This was very informative. I'm sure we'll look back and reflect on what you have presented to us today.

For the committee members, before we adjourn, I've circulated a budget that will carry us to the end of our witness list as it is currently proposed. I would ask for your approval so that we can secure it.

Mr. Holder's moved it. All those in favour? Opposed?

(Motion agreed to)

The Chair: Thank you.

Meeting adjourned.

Published under the authority of the Speaker of the House of Commons

SPEAKER'S PERMISSION

Additional copies may be obtained from: Publishing and Depository Services
Public Works and Government Services Canada
Ottawa, Ontario K1A 0S5
Telephone: 613-941-5995 or 1-800-635-7943
Fax: 613-954-5779 or 1-800-565-7757
publications@tpsgc-pwgsc.gc.ca
http://publications.gc.ca

Also available on the Parliament of Canada Web Site at the following address: http://www.parl.gc.ca

Publié en conformité de l'autorité du Président de la Chambre des communes

PERMISSION DU PRÉSIDENT

On peut obtenir des copies supplémentaires en écrivant à : Les Éditions et Services de dépôt
Travaux publics et Services gouvernementaux Canada
Ottawa (Ontario) K1A 0S5
Téléphone : 613-941-5995 ou 1-800-635-7943
Télécopieur : 613-954-5779 ou 1-800-565-7757
publications@tpsgc-pwgsc.gc.ca
http://publications.gc.ca

Aussi disponible sur le site Web du Parlement du Canada à l'adresse suivante : http://www.parl.gc.ca