



THE CANADIAN CLEAN
TECHNOLOGY COALITION

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Standing Committee on Natural Resources

Thursday, March 7, 2013

Witness Testimony by the Canadian Clean Technology Coalition on Innovation in Energy

Background

Given the increasing economic importance of Canada's energy resources, innovation in the energy sector is especially pertinent. Innovative energy technologies are needed not only to help meet the growing global demand for energy, but also to ensure that supplies of energy are clean, cost-effective, efficient and reliable. For this reason, the House of Commons Standing Committee on Natural Resources has decided to undertake a study on innovation in Canada's energy sector with a focus on technological innovations in the generation, transmission and use of energy.

In order to gain a broad perspective of the key issue areas in energy innovation, the Committee will examine opportunities and challenges involved in the research, development, demonstration and diffusion of new energy technologies. The Committee has agreed to proceed by exploring innovation in renewable and non-renewable energy sectors including:

- Oil sands;
- Shale oil and gas, and gas hydrates;
- Coal;
- Nuclear;
- Hydro, marine and tidal;
- Bioenergy;
- Geothermal; and
- Solar and wind.

During the study, the Committee will draw on the expertise and knowledge of various energy sector stakeholders in order to answer the following questions:

- What is the current status of research, innovation and technology development of the respective energy sectors?
- How does it compare to other countries? In which areas Canada is a leader, and in which areas can it improve?
- What are the most promising innovative technologies that can be implemented in the near future?
- What are the main challenges or barriers to innovation, development and deployment of new technologies in the respective energy sectors?
- What role can the federal government play in strengthening the foundation of energy innovation in Canada?

Below are excerpts from the Minutes from the Standing Committee on Natural Resources session, March 7, 2013 at which the Canadian Clean Technology Coalition, represented by Céline Bak, was invited to present as a representative of the clean technology industry. The complete Minutes can be found on the following site: <http://www.parl.gc.ca/HousePublications/Publication.aspx?Language=E&Mode=1&DocId=6035335&File=0#Int-7925731>

Witness Testimony

Ms. Céline Bak (President, Analytica Advisors, Canadian Clean Technology Coalition):

Mr. Chair, Mr. Vice-Chair, members of the committee, thank you very much for this invitation to appear today.

I am very pleased to represent the Canadian Clean Technology Coalition, whose mandate is to promote information and facts about the clean technology industry. It gives me great pleasure to follow the presentations of Monsieur Morin and Monsieur Lavoie, because the companies of this industry are providing the technologies that were just referred to in the two previous discussions.

I'm going to speak about three things: first, to characterize the industry; second, to talk about the barriers for Canada to reap the economic benefits of this industry; and third, to speak about the benefits that would ensue if we chose to pursue these strategies.

Just very briefly about the industry as a whole, it's a vibrant and expanding sector where clean technologies are increasingly becoming economic drivers of growth in the energy and other industrial sectors.

There are more than 700 innovation-based SMEs in this sector in Canada, including 10 sectors overall and 60 subsectors. You can think about it like the aerospace industry, where you have flight simulators on one side and then the forming of nanomaterials and things like that on the other side. It's really as diverse as that.

The thing that unifies the industry is that all of these companies have intellectual property, all of them are investing in R and D, and almost all of them are already exporting. In fact 82% of them already export today, with 50% of revenues from exports.

The thing you may find surprising is that whereas the industry is investing about \$1 billion a year in R and D, more than 75% of that investment is by companies that have less than \$50 million in revenue. It's a bit of an interesting combination of relatively small companies that are very significant investors in R and D.

Together they employ 52,600 Canadians, which again is a surprising figure, but it's a lot of small numbers, with many small companies who together employ the equivalent of the mining industry or the oil and gas core employment.

I'd be very pleased to answer any questions about the sectors that we have included, but at a very high level it includes production of energy, the use of energy including transportation, manufacturing, etc., and then water and waste water. Where you speak about water, it's almost always to do with energy and water applications, be they in an industrial context, in an agricultural context, or obviously in a municipal context.

I think it's helpful to note that the companies are distributed across Canada per GDP. This is an opportunity for all Canadians, for all regions, and reflects an entrepreneurial capacity that we have across the country to incubate and grow companies that are in many cases world class.

The rate of exports at the moment is 50% of revenues. Total revenues of the industry are \$10 billion, which is about half of the aerospace industry today. You may know that in aerospace, exports are now 70% of revenues.

That is a very basic characterization of the industry.

In terms of the challenges the industry faces, many of you will already have heard about capital and debt financing. I think Monsieur Lavoie made some very useful remarks regarding STDC.

To build on that, the government funding is leveraged 3:1 with the private sector in the early stage. The policies we have in place are definitely attracting capital from the private sector. I think that's all to the good, and speaks very highly of the programs that are in place.

You may have heard about the 33¢ to the dollar ratio between investments in Canadian companies and their American equivalents. That leads to slower growth and makes our companies more vulnerable. That's something we need to bear in mind.

What I'd like to add to this discussion is the question of debt and project finance, because it's not often brought up. Companies in this area are exporting, and often in the form of projects, whether they are large deployments or multiple deployments in international markets. Those projects will need to be financed through debt. We don't really yet have policies and programs in place for that. I'd be very happy to answer any questions on some possible recommendations in this area.

The other thing is human resources. It's not necessarily often spoken about in terms of innovation and energy, but in this sector the human resources gaps are not what you would expect. They have to do with international business development and complex systems sales. It's not the usual that we need more engineers. It's actually that we need people who can sell into complex international markets.

What is the potential role of the federal government for this industry? It's important for us to think about how domestic markets must act as a springboard for international exports. That means that the government walks the talk, as it already has through the expansion of Public Works' Canadian innovation procurement initiative. It means a strategic approach to supporting the exports for this sector, and possibly doing that in conjunction with new free trade agreements.

I happened to be in Panama earlier this week. We're about to announce a free trade agreement in Panama. That's an opportunity to really shine a light on this new sector. It just happens that in that market there are certainly opportunities.

In terms of the government's recommendations in the recent Jenkins report on procurement, there was mention of a whole of government approach for defence procurement. We would benefit from a similar type of thinking for this new innovation-based industry, as we have done in the past with aerospace, more than 15 years ago now.

In terms of financial markets and financing, I'd like to introduce the concept of a CMHC for technical risk. I'd like to do that in the context of what will probably be quite a lot of new thinking and policy work to be done on the financing of energy-related technologies in developing countries in the next eight to 10 years.

CMHC has played a foundational role in our property development industry, in our banking industry. If we are to have the same growth and success in this industry, we have to address technical risk. Otherwise the debt that I mentioned a moment ago will not be available to enable our companies to grow.

As Monsieur Lavoie and Monsieur Morin mentioned earlier, I also really believe in the importance of coordinating with our provincial and territorial governments in order to expand the programs that are in place.

What is the opportunity if we choose to focus on this sector? Per our research, it's a \$3-trillion global market. To give you a benchmark, the aerospace industry is about \$360 billion. We have a 6% global market share in that industry. For us to have even just our share of global commerce in clean technology, we're talking about something in the order of \$60 billion. It's a very significant opportunity. It represents expanded exports and advanced manufacturing, as my colleagues mentioned a moment ago. It represents an opportunity to balance our exports between advanced manufacturing and natural resources. It provides innovation-based opportunity across the country. It's not just in cities; it's also in rural settings. As well, it provides employment opportunity for skilled workers and young people all across Canada.

As has been mentioned earlier, it strengthens our oil and gas industry, mining industry, our forestry and industrial sectors, both through improved performance and through productivity.

Finally, it would definitely be an area of strength for Canada's global brand. It's one that we should take the opportunity to leverage.

Thank you very much.

Ms. Joan Crockatt (Calgary Centre, CPC):

Ms. Bak, I think there are still some myths that Canadians are hewers of wood and drawers of water. For what you've suggested to us today, that certainly would not be the case.

Can you tell us about how Canada is doing with regard to clean technology and high-tech, high-quality jobs in this sector?

Ms. Céline Bak:

The current U.S. versus non-U.S. export split for clean technology is 56% to the U.S. and 44% to the non-U.S. The forecast by the companies for that moving forward is for it to actually become half and half non-U.S. and U.S., and for the share of emerging markets to grow significantly. At the moment, Europe is the dominant non-U.S. market. As you say, these are not hewers of wood and drawers of water. These are companies selling to Germany and selling to the U.K. These are highly competitive, difficult markets, and our companies are winning projects there.

I was in Mexico earlier last week. In emerging markets there's a great openness to buying from Canada, and many opportunities. Waste-to-energy is a good one. For leaks of various kinds, whether it's methane at Pemex or energy leaks at the major Coca-Cola bottler, which is a multi-billion dollar industry, we have a very good brand, and there are markets that are quite dynamic.

I would say that Asia is an area where we probably need to think some more, because there are still concerns regarding intellectual property in China. If you're investing a billion dollars a year in IP, you should be concerned about it.

The average number of countries where companies are applying for patents is 11. There's a very interesting rule of thumb. For a \$10-billion industry, 10% of revenue, or \$1 billion, is invested in R and D. Of that, 10% is invested in IP protection. That is invested for 11 patents, on average, per company. It obviously varies according to the type of sector you're in.

Ms. Joan Crockatt:

If I got the number right, I think that this sector employs 52,600 Canadians?

Ms. Céline Bak:

Yes, with the 5x supply chain.

Ms. Joan Crockatt:

Okay.

How has that changed in the last two to five years?

Ms. Céline Bak:

The figures we have are from the last three years. The compound annual growth rate over the recession, with all of the issues in the global credit crisis, was 18% employment growth per year.

Ms. Joan Crockatt:

So our high-tech, high-quality jobs in Canada are growing at a rate of 18% per year.

Ms. Céline Bak:

That's in the clean technology sector; I can't say for all other IT sectors.

Ms. Joan Crockatt:

You said that a lot of those jobs were energy related. I'm wondering how you correlate.... Has the energy sector responded by developing high-quality, high-tech jobs in clean energy?

Ms. Céline Bak:

I think there is an opportunity in Canada for us to develop greater ties between our innovation-based industries and our established traditional industries. Obviously, as Monsieur Lavoie and Monsieur Morin spoke about earlier today, there are investments being made.

I will say that most innovation-based industries in Canada find it harder to sell at home than they do to sell abroad.

Ms. Joan Crockatt:

Even if their primary customers may not ultimately end up being in Canada, or only some of them, are they building on what they're learning in Canada to sell these high technologies elsewhere?

Ms. Céline Bak:

Not enough.

Ms. Joan Crockatt:

Not enough.

So this is where you want more innovation to happen.

Ms. Céline Bak:

Well, with a greater familiarity between our innovation-based smaller companies and our large established companies, I think together we could put together what you might call a power play.

These markets are still emerging, which means that you'll go to a market and work that market for three years, and then perhaps leave the export market for a period of time. It sort of depends....

I think if our big and small companies, like our large engineering firms, for example, were more familiar with our companies such as those that were discussed earlier, we would be able to do very well.

Mr. Peter Julian (Burnaby—New Westminster, NDP):

I want to thank all our witnesses who have said some very interesting things.

Ms. Bak, I will start with you.

We know that we have a record trade deficit. We have lost more than 500,000 jobs in the manufacturing sector. The situation in terms of value-added jobs is very bad in Canada. There is no doubt about that.

So I would like to know how we could implement policies to help create jobs in your industry. What is the job creation potential in clean technologies? What is the difference between our current percentage and the global market? What kind of results could we obtain by implementing policies that could really spark interest in the sector and promote it?

Ms. Céline Bak:

Industry policies are still being developed when it comes to international financial institutions and our policies on developing markets.

Currently, about a quarter of our sector's exports end up in developing markets. Obviously, if we were to develop those markets—be it in Latin America or Asia—job potential would increase considerably.

We currently hold 1% of the global market. If we had our fair share, 2.6%—our share of international trade—our industry would generate almost three times as much revenue as it is currently generating. So there would potentially be at least twice as many jobs in the sector. We anticipate that business growth will lead to higher income per job owing to greater productivity and competitiveness.

By focusing more on emerging markets, we will have access to markets that are not necessarily visible at this time. We can do that by developing policies with regard to those markets, and by giving due attention to the fact that our competitors, in Germany and elsewhere, are investing in feasibility and financing studies through concessional investing and concessional support. Germany and Japan are very strong in that area, and Korea is also gaining ground. So that's something to think about.

Mr. Peter Julian:

I see, but we are talking about hundreds of thousands of potential jobs and the risk of Canada losing that opportunity.

Thank you very much:

Ms. Laurin Liu (Rivière-des-Mille-Îles, NDP):

Ms. Bak, you suggest that a strategy on green technologies be adopted. You also conducted a survey in January 2011 on SMEs' needs in terms of federal support for research and development.

Could you tell us about the results of that survey?

Ms. Céline Bak:

The survey concluded that the most popular programs were SHRED and SDTC's program. Another conclusion was that companies wanted various financing programs to be coordinated, so that they don't have to learn a new procedure for each program. Obviously, I should have mentioned that IRAP was among the top three programs.

Ms. Laurin Liu:

I would like to quote an excerpt from your report. I only have the English version. It says the following:

In 2009, total BERD by Canadian clean energy SMEs was \$512 million. For the same period, total BERD by Canadian clean energy large companies was \$1.02 billion.

We see that investment in companies' research and development has been declining since 2008. That sector contributes a lot to research and development. It helps increase our budget and expenditures in that sector. I think that's a success.

You also talk about the importance of establishing a national procurement policy.

Could you elaborate on that?

Ms. Céline Bak:

Thank you. That is a very interesting question.

We should obviously be very careful when it comes to our obligations under agreements on free trade and international trade. However, I think that we, as a society, could decide to invest in infrastructure for our communities that are far from the network or outside the network—self-sufficient communities. We could keep in mind that Canada is advanced when it comes to energy, water treatment facilities and waste management systems. That was discussed today. We should at least be aware of the fact that Canadian companies could serve as a showcase for trade in our remote communities in need of infrastructure.

Mr. Brad Trost (Saskatoon—Humboldt, CPC):

Thank you, Mr. Chair.

I was listening to Ms. Bak when she was talking earlier, and I got the impression that a lot of the companies involved in the sector there tend to be on the smaller side. They're not always the biggest. They tend to be the people with the ideas, but maybe they haven't fully implemented them.

From your perspective as their representative, what tend to be some of the particular issues the smaller firms have? I know you talked here about international business development, but what are some of the other issues they face as they try to take their better mousetrap to the next level?

Ms. Céline Bak:

Thank you for that very interesting question.

There is perhaps an opportunity just to raise the familiarity with this sector among our established industries. We do find ourselves in situations where we'll fly in a large U.S. corporation to solve a problem where there are some Canadian companies that should be invited to the table. The ability to build confidence in what is actually a fairly accomplished industry internationally would be useful. That would open some doors, which may not always be open today.

Mr. Brad Trost:

You're basically saying that there should be a bit more education or advertisement. How do we do that?

Ms. Céline Bak:

Obviously the government has put in place the Canadian innovation procurement initiative. Highlighting the accomplishments of Canadian SMEs and exports would be one way of doing that. There is new data to suggest that over the period from 1997 to 2007, the value of SME exports that were not resource, mine, automotive, or aerospace grew from \$40 billion to \$80 billion. That's a very significant number, and it's probably much more than we expect. There's not an annual figure on this, but SME R and D investment in Canada represents 45% of our private sector R and D, \$7 billion over \$15 billion.

These are figures that give credibility to the industry and make people more open to returning a phone call.

Mr. Brad Trost:

Why then are the smaller and medium players the dominant—maybe I don't mean dominant. They're not quite a majority, but when you look at the overall players, why are they such a high percentage? What are they doing right, and what can they do better to get that R and D into more application and get more products out the door?

Ms. Céline Bak:

It's important to note that this industry is only 15 years old. The average age of the company is actually 16. The aerospace industry, as a comparative, is over 40.

Mr. Brad Trost:

As that matures, will it change?

Ms. Céline Bak:

Things will evolve over time. However, I'd like to note that our ability to incubate companies in Canada is quite strong. Our ability to integrate those companies into our economy is still to be developed.

Mr. Brad Trost:

Another thing you said earlier caught my attention. A couple of us sat on the international trade committee when it debated the Panama-Canada treaty, so we're somewhat familiar with it.

What other markets out there are of particular interest to your segment? Where else would Canadian trade deals be of use? We're doing one with the EU right now. I suspect that might be it. Where in the trade agenda could government policy be useful to your industry?

Ms. Céline Bak:

I'll speak about renewable energy just because Panama is an example of that. Canada has a real niche in small-scale hydroelectricity and small-scale wind, as an example. Panama has actually a number of hydroelectricity projects that haven't been developed because they require changing the course of rivers. We have technology that doesn't require that and works in a very complementary way with aboriginal communities in Panama.

The Caribbean is obviously a place where energy is very expensive. Again, we have some very nice, globally competitive technologies that would be relevant there as well.

Eastern Europe offers other opportunities. There's a lot of infrastructure that needs to be built there. As we build our relationship with the EU—

Mr. Brad Trost:

Trade deals with the Caribbean, Eastern Europe, and smaller countries in Latin America would all be—

Ms. Céline Bak:

I haven't spoken about Asia. In Japan, everybody's talking about VIP, Vietnam, Indonesia, and the Philippines. We need to actually engage with the Asian Development Bank and have a say at that table.

Mr. Brad Trost:

Basically, trade agreements and free trade around the world would be useful to your sector.

Ms. Céline Bak:

Yes, if we actually combine that with engagement with the international financial institutions, to which we lend money in a very responsible and regular way.

Mr. Mike Allen (Tobique—Mactaquac, CPC):

Thank you, Mr. Chair.

Thank you to our witnesses for being here.

Ms. Bak, I'd like to start with you, please. I'm going to pick up where Mr. Trost left off.

I'm not going to put words in your mouth, but I think I heard you say “a CMHC for technical risk”, and you also talked about bidding into these foreign markets and winning. I want to get some clarity around what you mean by “technical risk”. Typically I see technical risk as technology, if you will, or whatnot, as opposed to some other risk in the area, so if you're bidding on these projects and winning, are you bidding proven technologies in these foreign markets? What does “technical risk” then mean if you're bidding proven technology?

Ms. Céline Bak:

That's a very helpful question.

Bankers will look at a project in terms of different elements of the project. If you're working on renewable energy, for example, you need to have an agreement in place for your municipal waste if you're going to do waste to energy, so you need tipping fee agreements and things like that, and you need an off-take agreement, someone who will take the electricity.

If the technology has not been in place and doesn't have, let's say, two years of operating data, they will see that as being a technical risk. It may be that the technology is proven in the sense that it has been operating for a year or something like that, but banks take no risk technically.

It depends on how our government decides to proceed, but if, for example, under the negotiations for the next approach on climate change we decided to participate in that, the technologies that Canada has will generally be viewed as having technical risk even though they are deployed at some level. This means that the next round of climate-related technologies could all be from China because there is no technical risk associated with five megawatt turbines, wind turbines, and Chinese-produced solar panels. We need to think about what we're going to do, if we want some of the more novel technologies deployed.

Mr. Mike Allen:

In essence when you're bidding on these projects, the countries you are bidding in don't put a square around the technology and whether it's proven or not. They are entertaining everything. Is that true?

Ms. Céline Bak:

That's right. As an example, Panama would be in-river hydroelectricity, but if you have not proven in-river hydroelectricity, it has technical risks.

Mr. Mike Allen:

You also talked a little about it being hard to sell stuff at home sometimes. When you look at some of the changes, and Mr. Lavoie talked a little about the accelerated depreciation and accelerated capital cost allowance for generation and other types of equipment, are any of those types of policies helping, from a Canadian standpoint, to adopt some of the technologies of your companies?

Ms. Céline Bak:

Yes, they help absolutely, but I would suggest we need to consider looking at some other classes of energy efficiency assets that can be deployed.

You had a presentation earlier on district heating and others, some broader—

Mr. Mike Allen:

Okay.

Mr. Costas Menegakis (Richmond Hill, CPC):

Thank you very much.

In the minute I have left in my questions, I'd like to direct this to you, Madam Bak.

You commented in your opening remarks that policies in place are definitely attracting capital. Can you elaborate a little on one of those policies and how it's attracting capital?

Ms. Céline Bak:

There are two different things, I guess. We have STDC, which is attracting three to one. I expect that the EDC, in some of its investment rules, will also be attracting capital. To the extent that we engage in a more proactive way with the International Finance Corporation, that will definitely attract capital. Also, I would suggest that our companies should be joint venturing with emerging country companies to get equity capital and then to attract the debt financing that the World Bank can provide. As I mentioned earlier, project finance will become an issue.

The Chair:

Thanks very much to all of you for a very interesting meeting today, witnesses: Mr. Morin, representing the Association of International Automobile Manufacturers of Canada; Mr. Lavoie, representing Canadian Manufacturers and Exporters; Ms. Bak, representing the Canadian Clean Technology Coalition; Mr. Dick, representing Pelee Hydroponics; and Mr. Haughton, representing Waste to Energy Canada Inc.

Thank you so much, all of you, for your presentations and for answering questions here today. It was another very informative meeting. We appreciate your input.

The meeting is adjourned.