



STANDING COMMITTEE ON CROWN AND CENTRAL AGENCIES

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STANDING COMMITTEE ON CROWN AND CENTRAL AGENCIES

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Mr. Buckley Belanger, Deputy Chair
Athabasca

Mr. Denis Allchurch
Rosthern-Shellbrook

Mr. Fred Bradshaw
Carrot River Valley

Mr. Dan D'Autremont
Cannington

Mr. Randy Weekes
Biggar

Mr. Trent Wotherspoon
Regina Rosemont

[The committee met at 10:00.]

The Chair: — Good morning. I'd like to welcome everyone here today. Today is the 17th day of our meetings by the Standing Committee on Crown and Central Agencies into Saskatchewan's energy needs. I'm Tim McMillan, Chair of the committee, and I would like to introduce the other members: Mr. Weekes, Mr. D'Autremont, Mr. Allchurch, Mr. Bradshaw, Mr. Belanger. And Ms. Morin is joining us today.

All of the committee's public documents and other information pertaining to the inquiry are posted daily to the committee's website. The committee's website can be accessed by going to the Legislative Assembly of Saskatchewan website at legassembly.sk.ca, and clicking on "What's New" on the Standing Committee on Crown and Central Agencies.

The hearings will be televised across the province on the legislative television network, with audio streaming available for meetings outside of Regina. Check the website for information regarding locations, cable companies, and channels. The meetings will also be available live on the website with past proceedings archived there as well.

Before we hear from our first witness this morning, I would like to advise witnesses of the process of presentation. I'll be asking all witnesses to introduce themselves and anyone else that may be presenting with them. Please state your name and, if applicable, your position within the organization you represent. If you have written submissions, please advise the committee. And these submissions will become public documents and will be posted to our website.

The committee is asking all submissions and presentations to be in answer to the following question. The question is: how should the government best meet the growing energy needs of the province in a manner that is safe, reliable, and environmentally sustainable, while meeting any current and expected federal environmental standards and regulations and maintaining a focus on affordability for Saskatchewan residents today and into the future?

Each presentation should be limited to 15 minutes, with time set aside for question-and-answer to follow. I will be directing questioning and recognizing each member that is to speak. Members are not permitted to engage witnesses in debate and witnesses are not permitted to ask questions of committee members.

I would also like to remind witnesses that any written submissions presented to the committee will become public documents and will be posted to the committee's website for public viewing.

With that, please introduce yourselves and go ahead with your presentation. Thank you.

**Presenter: Communications, Energy and Paperworkers
Union of Canada**

Ms. Sol: — Thank you. Wendy Sol, administrative vice-president with CEP [Communications, Energy and

Paperworkers Union of Canada]. And with me today is local president 649, Dan Bailey.

The Communications, Energy and Paperworkers Union of Canada, CEP, would like to thank the Standing Committee on Crown and Central Agencies for the opportunity to address you regarding electricity generation in Saskatchewan. CEP is Saskatchewan's energy union. It represents 2,500 workers at SaskPower, SaskEnergy, the co-op refinery, Moose Jaw Refinery, other oil and gas workers, and uranium miners. We also represent workers in telecom at SaskTel, potash miners, and others — in all, 10,000 workers in Saskatchewan.

The committee has requested comments regarding the future sources of electricity for Saskatchewan. We have consulted the SaskPower's document entitled *Powering a Sustainable Energy Future*, and would like to share our reflections with you.

CEP has an energy policy that promotes major reductions to the environmental impact of consumer and industrial society. Greenhouse gas emissions are transforming our climate in ways that endanger the survival of much of life on earth, including ourselves. Greenhouse gases and toxic pollution should be reduced to the lowest levels possible, with near-zero emissions as the ultimate goal. This should come through reduced emissions at source and not through capture of pollutants.

Until technology and new habits take root, a transition period will be required to gradually but relentlessly bring down these emissions. It will certainly be a challenge but we see it as an opportunity to develop new industries and a way to lead healthier lives for ourselves, our children, and our grandchildren.

In *Powering a Sustainable Energy Future*, we note that SaskPower predicts substantial growth of power demand compared to the recent past. In the past 10 years, demand has grown by 1.3 per cent yearly whereas projection is for 3.5 per cent growth yearly for the next 10 years. This is mostly accounted for by a 6.7 per cent annual average growth for industrial use, as far as we can tell from the information provided. This means that industrial use is expected to nearly double over the next 10 years. This is a surprisingly high growth rate but unfortunately no specifics are provided regarding the source of that growth.

Economic projections are notoriously uncertain, and lack of specifics in this case makes it difficult to judge the likelihood of this key projection. We can only hope that excessive generating capacity is not added at great expense only to find it lies idle due to overly optimistic projections.

The sources of generating capacity. SaskPower currently has a total generating capacity of 3641 megawatts of electricity, of which coal-fired capacity provides 45 per cent, constituting the foundation of the system. This is not only cheap and reliable but also supports mining jobs in the province. Unfortunately it also emits large quantities of greenhouse gas and considerable amounts of toxic pollutants such as sulphur dioxide, nitrogen oxides, mercury, and particulates.

Understandably this dilemma has led SaskPower and the

provincial government to seriously consider so-called clean coal technology. However this technology remains unproven and the share of energy required to liquefy and store the greenhouse gases is very large, up to 35 per cent, making this method energy-inefficient. As a result it is very difficult to justify building additional coal-fired power plants. At best, clean coal is a way to keep existing plants operating while the transition is made to low-carbon electricity generation.

Over the past decade, SaskPower has met growth in electricity demand from sources other than coal. Since 1999 it has added 458 megawatts of cogeneration of industrial facilities, 172 megawatts of wind power, and 168 megawatts of natural gas generation. As a result, coal has fallen from 60 per cent to the current 45 per cent of Saskatchewan's electrical capacity.

CEP supports SaskPower's move to less polluting, lower carbon-generating sources, and believes this should be accelerated. Ideally all electricity generation should come from renewable sources, but this will not be possible for some years. Nonetheless the priority should be to promote these sources as much as possible.

Conservation. The most efficient and cost-effective way to reduce the environmental impact of electricity generation is to use less. On this score, SaskPower must be commended for its programs for conservation, increased efficiency in energy use, and the shift toward low-impact energy sources.

CEP encourages SaskPower to expand these efforts and set much more ambitious goals for itself than the current very modest goal of conserving 100 megawatts through the more efficient uses outlined, empowering a sustainable energy future.

Gas generation. Electricity generation from natural gas emits a little more than one-half of the greenhouse gases of coal. It can be generated in stand-alone facilities or connected to industrial sites where waste heat from gas turbines is harnessed for thermal use. Currently nearly 13 per cent of Saskatchewan's generation capacity is from natural gas. Since it is a much more efficient means of producing electricity than coal, it should be preferred to coal-fired plants during the current period of transition to a low carbon emitting society. Nonetheless, it is a greenhouse-gas-producing fossil fuel that will eventually need to be replaced in the long run.

Wind energy. Currently nearly 5 per cent of Saskatchewan's generation capacity is from wind. Wind power is a completely renewable, low-impact electricity generation source, and Saskatchewan certainly is a windy province. It also has a relatively new industry with considerable potential for industrial development in the future. We should produce components for wind power generating equipment here in Saskatchewan as part of an integrated approach to electricity generation.

Last October the government unveiled plans to expand wind power to 400 megawatts by 2013 or about 8.5 per cent of total generating capacity. This is a modest step in the right direction, but has two serious flaws. For one, it's not nearly ambitious enough. CEP supports a minimum goal of 20 per cent of wind-generating capacity associated with a program to produce equipment in the province.

Unfortunately the government's plan is to outsource wind generation of electricity to a private interest instead of doing it in-house at SaskPower. This is a mistake that reduces revenues to the province, increases cost, and precludes leveraging the investment to generate more jobs.

We note that the government is participating in a \$1.4 billion research project to sequester and store emissions from coal-fired plants in a generating source that one day soon will have to be phased out. CEP would like to see significant resources devoted to develop wind energy — a growing and reasonably priced power source for the future. Wind energy also has the advantage that it can be produced directly on site where it is needed, dispensing with the need for long power lines.

One objection to wind power is that it's intermittent and it must be backed up by other types of generation. While this may be true, at least for now, technologies are being developed to store wind-generated energy, as noted in *Powering a Sustainable Energy Future*. SaskPower indicates as well that turbines cannot operate safely when the temperatures fall below 30 degrees Celsius. Witnesses at earlier sittings of these hearings have pointed out that windmills generate electricity in Alaska, the Yukon, northern Scandinavia, and Antarctica. It seems unlikely that technical problems related to cold cannot be overcome.

Economist John Warnock reports that several US [United States] states close to Saskatchewan have turned to wind power in a much bigger way than we have. In North Dakota, a state already producing 1000 megawatts of wind-generated electricity, formal applications were being considered for constructing an additional 1,412 turbines with a capacity of 5540 megawatts of electricity. Factories there manufacture turbine blades and towers employing 1,000 workers. So what are we waiting for?

Hydroelectricity is also a potential avenue to expand. Currently Saskatchewan derives 23 per cent of its electricity from hydro. Reservoir hydro is extremely reliable and costs almost nothing to operate once the dam has been built. But since large hydro dams cause harm to aquatic environment, flood large areas of land, and cause the release of organic mercury and methane into the atmosphere, CEP can only endorse small-scale hydro projects.

Run-of-the-river hydro should also be expanded since its environmental impact is small and it can provide economic benefits to remote communities. Expansion of hydro power would also enable a larger expansion of wind power since hydro provides the balance for intermittent wind. When the wind is blowing, SaskPower could close the hydro turbines and allow water to build up behind the dam. When the wind is not blowing, it could open the turbines to replace that lost electricity.

Electricity buybacks. SaskPower should also consider the implementation of a buyback program for electricity generated from small solar, wind, water, or other renewable energy projects. Such a program exists in Ontario and is modelled after similar schemes in Europe that have spawned a boom in small clean energy projects.

Ownership. CEP strongly supports public ownership of large-scale electricity-generating facilities, as well as the power distribution system. Electricity is not a commodity like any other. It is an essential public service. The provision of electricity should not be left to market forces with their fundamental drive for short-term profit regardless of social costs, environmental impact, or worker health and safety.

From time to time suggestions are made that the electricity system should be deregulated and privatized. Typically a promise is made that power would be cheaper if the system was private, but this makes no sense at all. Private electricity must include the many additional costs of profits for private generators, distributors, and retailers, dividends to investors, and commissions to commodity brokers.

Occasionally arguments heard are that we need to privatize to gain access to private capital and expertise. Again these are untrue. The cost of capital for the province of Saskatchewan is lower than the cost for a private electricity generator. The province does not need third parties to fund its capital projects. It can fund them itself by issuing low-interest bonds that will find plenty of takers. If technical expertise is required, it can be obtained from consultants.

SaskPower is an efficient producer, ultimately controlled by the people of Saskatchewan with all profits going into the coffers of the province. Why in the world would anyone with the interests of Saskatchewan at heart consider selling off such a fine asset?

Imports from other provinces. CEP recommends that SaskPower build a high-voltage line to bring hydroelectricity from Manitoba into Saskatchewan. This could alleviate much of the pressure the province is experiencing for its future power needs and would provide clean electricity that produces no greenhouse gases.

[10:15]

Saskatchewan could greatly benefit if it could be part of a much larger cross-Canada grid. Canada has yet to fully realize the national benefits of interprovincial electricity trade because electricity transmission systems have been developed on a provincial basis with the primary focus on meeting individual provincial needs and not broader regional and national interests.

Nonetheless there has been increasing interest by certain provinces to linking our electricity grid. Indeed Manitoba and Ontario have come to an agreement on this score. CEP strongly supports the development of a Canada-wide, east-west electricity grid and urges Saskatchewan to promote it as well. It would result in better integration among all provinces and territories of power projects within a national electricity network.

Benefits would include increased access to large- and small-scale renewable electricity sources across the country thereby reducing greenhouse gas and toxic pollution emissions, diversification of supply by generation type and by geographic site, reduced capacity requirements resulting from increased regional coordination and planning, and increased security and reliability.

Thank you.

The Chair: — Thank you for your presentation. We have some questions. Mr. D'Autremont.

Mr. D'Autremont: — Thank you. Thank you very much for your presentation. I was interested in your comments on the cross-Canada grid. I think that's a good idea that we should have been dealing with a long time ago. But one of the problems is, as you likely know, the different phases that we have in generation across Canada which will cause us some problems.

But we have very, up until now, we've had very few connections with the other jurisdictions on any side of us. I know we have a connection of 150 megawatts with the US, I think about 100 into Alberta, perhaps less, and I think about 150 into Manitoba. And we have our northern connect coming from the generation, comes around through Manitoba and then back into Saskatchewan. And there's a line running from Boundary to Brandon as well.

So if that was a possibility to happen, which is a good idea, are you concerned at all though with who was allowed access to that system? Would that be available to all producers across Canada regardless of their ownership status?

Ms. Sol: — As long as the system . . . And I realize there's a patchwork across the country, but we have to have a national vision when it comes to power and electricity in Canada. And as long as it is owned by the people and controlled by the people and is transparent, we support that.

We need to think about the energy and the loads that we put on. Right now it doesn't seem to make a lot of sense to have a north-south grid when everybody's cooking dinner at the same time, everybody's doing their getting up and getting ready for work at the same time, so all the power is and pressure is on the grid at the same time. So it makes a lot more sense to have a diversified west-east grid, but at the same time to have a Canadian and national vision that currently is lacking.

Mr. D'Autremont: — Thank you. On the issue of ownership. We've received a lot of presentation from people, various people, during these hearings, and quite a bit of discussion on cogeneration from the environmental movement in particular, wanting to see industry utilize their excess heat, their steam generation, to produce electricity and allowing them to have access then to sell it back on to the grid.

As well, calls for small producers to be able to provide wind power or solar or biomass or geothermal and to allow them to sell back on to the grid, as well as a number of First Nations have approached this committee as well, seeking to have generation capacity allowing them to sell back on to the grid.

And I look at some of the past efforts that have taken place in this province. SunBridge is a private sector wind producer that SaskPower purchases power from. The Husky Upgrader has, I think, 200 megawatts of generation there that they sell on to the grid as well as Cory mine with ATCO providing electricity through cogeneration.

So would you suggest then that we ignore the concerns that are being brought forward to us by particularly the environmental movement in allowing individuals and companies through cogeneration, etc., to have access to the grid?

Ms. Sol: — No. In fact CEP has many examples where we have industries that have cogen operations that actually do go back into the main grid. And so no, we totally support that. And you'll see in our presentation that we support First Nations groups, that the wind generation stand-alone, it would be a real good solution for them. And to be able to create their own generation and be able to sell it back to the grid is something that CEP supports. And we have many examples where we currently do it today.

The Chair: — Mr. Weekes.

Mr. Weekes: — Thank you, Mr. Chair. Good morning. Thank you for your presentation. I guess I just want to . . . Much of what you've laid out as far as the future of power generation, other than the privatization side I guess, I would agree with. I think we know where we want to get it. It's from getting from today to there and the time frame and the cost. The concern, I guess, we are being told is, you know, from SaskPower but other utilities and people, is the mix and what's sustainable in our province as well. And there's a bit of a discrepancy about how much wind power generation that our system can handle.

That's something that needs to be clarified because there's some groups and individuals say — well you've stated it — and we should do much more than what's been announced. SaskPower's kind of saying well that's about the maximum we can do. So that's an interesting point that we need to have clarified.

Getting from A to B, I think everyone agrees that the cost of power generation is going to go up. We have the cheapest source of electricity is, you know, coal burning generation plants, but there's a huge environmental issue with carbon, as we all know, and so over time that's going to have to be phased out or clean coal will have to, technology's going to have to come into play.

Could you give an idea what is your . . . What do your members say or what is your feeling, if you've done any surveys or polling, concerning what the people of Saskatchewan, what's their expectations of power prices in the future? And what will they accept? Because it's obviously going up to a certain extent. And what is your feeling on the price increases in the future and what's going to be acceptable to not only the individual residential users but also businesses in the province?

Mr. Bailey: — I guess it's been clear in the past that there's going to be probably some cost increases regardless of what routes we go down from all the many different possibilities of generation sources. We've done surveys and, you know, what's the number? No, we don't have a number, but I think that's the reality is if we're going to deal with the coals and the natural gases which are fossil fuels, we need to put some work and emphasis into sustaining us into the future.

Ms. Sol: — Now if I could add, the people of Saskatchewan realize that they need to move away from the dirty coal, and

they're also prepared to protect their environment and if that's going to cost a little bit, they're also prepared to do that. But they also know that the only way that can happen — and they're prepared to do it — is if it's with the government who is publicly accountable and transparent. They won't accept increases if they haven't access to that information, and that's what would happen under a private industry. So the people of Saskatchewan are prepared to have a clean environment and affordable and accessible energy, but through a Crown corporation that is transparent and publicly accountable to them.

Mr. Weekes: — Okay. Could you just clarify that? I don't follow how the process wouldn't be accountable. Right now we have private entities producing power. I mean that's all part of the mix. I'm not sure . . . Is there something that isn't transparent right now as far as cogen projects and wind projects?

Ms. Sol: — Just want to ensure that any future development, that in partnership that they are full transparencies, and that private industry doesn't take over the energy needs and therefore the public doesn't have access to the information and how it's being spent.

We know that with new transitions that there's going to be some costs, but those costs have to be minimized, and those costs can be minimized when there's no profit having to be generated. So, you know, we appreciate that there's going to be some partnerships, but those partnerships have to be fully accountable and transparent. And when we're using public money, that has to be a matter of course.

Mr. Weekes: — I guess the assumption you're making is that if private industry has anything to do with power generation, it's going to be more money. I don't follow that logic. Generally it's the other way around. But right now, as I'd said, we have private enterprise involved with producing power.

A bit moving away from that topic, but we had a presentation from Meadow Lake Tribal Council and their economical arm. And they have plans for power generation. Biomass is one of the things that they're talking about. It's always the assumption is everything but dirty coal is going to be higher cost. Like I think that's true; I think I would agree with that.

So we go to biomass and that's going to be part of the power mix in the province. And they want to own and operate it, so that would be a private venture. I guess the question is, how . . . what is your feeling about how that should be distributed through the system as far as pricing? You know, we have the Green Power plan where it's open to individuals, but most of the power is purchased by government or universities so it really wasn't . . . Not a lot of private people took part in that. So how do you feel, as an example, biomass from Meadow Lake Tribal Council, how would that be charged to the system? It should be a blanket, just an incremental increase across the board, or how should that happen?

Ms. Sol: — Well there's many examples in Europe and there is an example right in Ontario through the buyback program. And there's many different models and different rates, but the idea is that . . . And in some cases people are actually getting a cheque from the power company for generating their own power and there's enough to go back into the grid.

So there's many examples that the government could generate here to encourage people to bring on their own systems and through buyback programs. So there's lots of examples, and there's not one case for everybody, but lots of examples where it certainly encourages people to build their own systems. And for the First Nations, it might be a very good way of solving their energy serious conditions out there. Thanks.

The Chair: — Ms. Morin.

Ms. Morin: — Thank you very, very much for this obviously very thoughtful and investigative report that you've presented to the committee this morning. I found it very, very interesting.

Just to build on the points that Mr. Weekes made. In your report on page 8, you talk about evidence of higher costs of privatization and deregulation. I'm just wondering if you could give us perhaps an example or some examples of how that entered into your report in terms of some of the evidence of that.

Ms. Sol: — Thank you for that. I know it's not a secret what happened in Alberta with the whole energy crisis there and the fact that they believed that the market would solve their energy situations. And that was just turned out to be a very crisis and a disaster. So we don't have to look very far. The same can be said in Ontario where they were having some very serious energy issues because they were trying to dismantle the system and privatize pieces of it.

Ms. Morin: — And so you have evidence then of higher energy costs to the consumers in those provinces, for instance.

Ms. Sol: — Exactly. And if you looked right to Manitoba, where it's totally controlled and owned by the public, I believe they are the lowest in North America.

Ms. Morin: — And so in those two particular examples, for Alberta and Ontario for instance, had the situation of privatization and deregulation not happened but yet still gone forward on a low-carbon basis, you feel that the energy costs in those two provinces would be lower. Is that correct?

Ms. Sol: — Absolutely. Absolutely. They've had seriousnesses of brownouts even, because they couldn't control the capacity and there was arguing on the grid. And it just didn't work for the people.

Ms. Morin: — Thank you very much for that. I found it very interesting with your presentation on wind generation and the sentiment by your organization and its members that the minimum goal should be 20 per cent. And I think that we've heard that from a number of other presenters as well, that that's felt that that should be the minimum goal for the province to be achieving.

But what's very interesting is on page 7 where you talk about participation in the green economy in terms of production of the manufacturing of turbine blades and towers and such, and how that can increase the green economy in the province in terms of quality employment, full-time employment and things like that.

I'm assuming you've obviously got, took this from evidence

from elsewhere. I know obviously the evidence from a place that I tend to visit on the odd occasion because my family lives in Germany, but I'm wondering what other evidence you might want to provide to that effect as well.

[10:30]

Ms. Sol: — Well as we said in our report, we have right in North Dakota, and as I said, this industry employs right in North Dakota 1,000 workers building those big turbines. So it is a real emerging industry that we could really capitalize on. And for a prairie province that hasn't had a lot of obstacles for the wind, we should be harnessing that and creating a new energy source. And we'll have a diversified energy source in the province and create jobs at the same time and not wait for other countries, foreign countries, where we have to import that equipment.

Ms. Morin: — And I guess we, I mean we only have to look to the company in Ontario that ended up having to relocate outside of the country, because of the obstacles that he was facing in terms of producing and manufacturing parts for wind energy here in the country, to see that it is possible and that there is huge opportunities involved in doing so. And that like you said, it's not something we want to be the last one on the docket to be moving forward on this, but rather we should be at the cutting edge with the ingenuity and creativity that we've seen in this province with respect to agricultural implements, in terms of inventions and creations. It's something I think that the Saskatchewan people would have an enjoyable time embracing and moving forward on as well.

I guess the last thing I want to touch on is with respect to the issue of higher costs. And I know that there's something . . . Obviously you can't speak on behalf of your members in terms of having surveyed them or anything to that effect. I'm just wanting to get your sentiment if there is, which it seems likely, a higher cost to be involved with renewable technologies and energy production. Is there a sentiment on behalf of your organization as to how perhaps policies have to be evolved to assist those who clearly wouldn't be able to absorb a higher cost versus others who might have more means to do so?

Ms. Sol: — Well and that's exactly why the Crown was created in the first place, because they anticipated . . . You know, we only have a million citizens in Saskatchewan all over the corners of the province. So it really doesn't become economically feasible, a business case if you will. And so in order to have everybody, every citizen, have accessible and affordable . . . it needs to remain in the control of the government. And at the same time, there needs to be a transition for workers from those industries that are going to be evolving into a more cleaner environment.

Ms. Morin: — Thank you very much for answering my questions. I appreciate it.

The Chair: — Mr. Bradshaw.

Mr. Bradshaw: — Thank you, and thank you for your presentation today. I was wondering, like where you've got in here about the wind energy, and you say that it has the advantage it can be produced directly on site where it's needed,

I don't know. Have you seen the wind map of Saskatchewan?

Ms. Sol: — No. I haven't.

Mr. Bradshaw: — Okay. There is a wind map out there where they've actually gone around the province, and they've checked the wind. And basically anywhere north of Saskatoon, there isn't enough feasible wind to be able to run wind generation. Now I'm from Carrot River which is quite a way north, and we just don't get the wind that you get down south here, especially around the Legislative Building.

So consequently, what would you suggest in a case like that? Like, because then you know that that you are going to be running the transmission lines a long way, and so what would you suggest in a case like that for us people who are north of Saskatoon?

Ms. Sol: — Well and as you know, north of Saskatoon is where you have the rivers, and so you would be able to . . . When we say about the wind, it's only going to be 20 per cent of the whole grid, and so that we would be able to suggest that we use other alternatives like the river, the east-west grid, and gas that we were going to be . . .

You know at this point, Canada has, they have no national energy policy and you cannot get fuel east and west. We're digging it out of Alberta, but we're pumping it straight south. There isn't a pipeline that can go to a refinery in the East. So it all comes down to that all the provinces need to get together. And we need to have a national strategy instead of just provincial ones because you're going to have those pockets in all provinces where you're not going to have real accessible energy sources.

Mr. Bradshaw: — And I guess I realize that. But the fact is that you do not want any . . . And actually we just don't have the river source to put up very many more large-scale hydro projects as far as large scale. Now my understanding is on run of the river, they don't really dam the water up, so you can't use that as a backup system, correct?

Ms. Sol: — No. What run of the river does is it uses a tube that forces the water through and then creates electricity through the force of that water. And it uses the natural grade of the river to produce that. So you may not have the wind, but we may be able to . . . And I don't have the knowledge of the river systems and the grades of it, but what I can say to you is that you have accessible energy from Manitoba if you built a grid, and that would be clean and certainly help with the environment.

Mr. Bradshaw: — Well and I can just go back to my area for example. Of course we have the Carrot River that runs through there, but the middle of the summer it doesn't run very fast. Depends on the year — some years we get quite a bit; some years we don't. But if we're pulling it from Manitoba, then we're working on large-scale hydroelectricity. So you're just really, all you're doing is moving the environmental end of it from Saskatchewan to Manitoba, correct?

Ms. Sol: — I was going to say, I don't think there's any debate about the benefits of an east-west grid. And those capital projects are already under way in Manitoba. And I appreciate

that the two governments aren't in discussions, but there has been nothing that has been concrete or decided on. And so we just encourage that there be east-west transmission that would go nationally and that would solve a lot of those challenges that each of the individual provinces have with their energy sources.

Mr. Bradshaw: — Okay, thank you.

The Chair: — Mr. Belanger.

Mr. Belanger: — Thank you very much, and thanks so much for your presentation. Just to point out, I was quite pleased that you made a reference to the Ontario model in terms of what they're doing to look at the power generation option. And certainly the other point I was quite pleased with that you've pointed out was the national vision, national policy.

You have to be careful when you look at different scenarios as this committee is undertaking because you have what I think is folks that have a large corporate mentality when it comes to power and control of that power. And of course we've been quite clear that we want to strengthen our Crowns, and it's not a political speech; it's a fact of life. We have to keep those entities within public control to serve the people. It's not a commodity as you mentioned.

So when we start talking about different joint ventures, there is a significant difference between an MLTC [Meadow Lake Tribal Council] proposal versus a Bruce Power proposal. And a lot of people aren't separating that, and what I think we have to do is put our thinking caps on. And a lot of political logic I don't follow, but we certainly follow what the people are trying to tell us in this alternative energy symposium. They're trying to tell us, look, we can strengthen the Crowns. We can look at different options on strengthening the Crowns without giving the power and control of our Crowns away to the large corporate sector.

Now this is a really tough question, I think, for you. I'm in definite support of having a very strong corporate presence in SaskPower. No question, we've got to have that control. We can't sell it. It's got to stay within the people's control. The same token, if you really want to strengthen the Crown, we have to appreciate its challenges. And if we let every corporate customer that they have right now generate their own power, that's 45 per cent of their income. So you've got to have a balance there. You've got to be careful because any CEO [chief executive officer] worth their salt in the corporate world doesn't want to lose 45 per cent of their revenues.

So be very careful because I agree with you, what we think is going to happen, there may be different ways that the government could benefit from corporate experience in power generation that they could easily manipulate to have it come back to government in forms of a royalty scheme or some kind of sweetheart deal. Power rates stay the same. Payments stay the same, but guess what, we'll get this through the back door kind of thing. So people ought to be very careful of that because you're playing with numbers and not being transparent, because it's different politically as it is corporately as you can imagine.

So my point being very clearly is that where is the line drawn between allowing the corporate sector to generate their own

revenues? How does it impact SaskPower's bottom line? And like anything else, whether it's SaskTel or SaskPower, they don't want just the average customer. They want the big corporate customers as well to strengthen their Crowns. Now that's the first question.

And the second question I have is, I believe that in order for us to strengthen our Crowns, we have to somehow adapt to the changing environmental problems that we're going to encounter. And one of the messages that we've been hearing through this symposium is, hey, guess what? We can generate power through wind, through non-invasive dams, through cogeneration. And some of them are coming from the Aboriginal group.

Now what worries me is when I hear some folks, some folks talk about corporate power generation and MLTC in the same direction, in the same tone, in the same sentence. No, no. I don't think they get it. I think that there's an opportunity for smaller producers of power — whether it's cogen, wind, through strategic alliances with SaskPower — strengthening SaskPower through these partnerships so they can find some way and means in which it could help meet that demand for power through environmentally friendly options. And that's what we've been hearing.

The last thing I want to do is use the good intentions of some really good ideas and community-based efforts and Aboriginal-based efforts to help solve this problem, turn around and say, okay now we're going to just sell off everything and to heck with it because we want to take the corporate, private approach. Well, no. No. That's not what people are saying. My goodness, I want to clear the air on that front.

So the second question is, how would you — I don't know if cleaver is a word — but how would you cleaver out the intent of this effort, this exercise, to engage Aboriginal groups, smaller scale producers, the general public, to add, to find, to find some solutions in which we could really, truly meet the power demands through the green energy options? And secondly, how do you cut the line from the corporate perspective to make sure we don't weaken SaskPower too much?

Ms. Sol: — Well I'll answer your second question first. And I think it does go into the first question. There's been a huge challenge in the East, in Atlantic Canada, and in Ontario where businesses actually had to pack up and leave because they could not afford to do business simply because of high energy prices.

And so there has to be a way that the government can work with business, and if it is harnessing the energy within their own operation and creating a cogen and having the ability to sell it back into the grid, it does two things. It preserves and encourages businesses to come to the province because they'll have more affordable and accessible energy, and that the public would not be hurt by it because any excess then would be put back onto the grid, so everybody would be a win-win. And so I think . . . And that would be same for the First Nations groups as well.

So to encourage businesses to come to Saskatchewan, you would have some sort of, you know, buyback program where

they can have their cogen operations and put it back into the grid. Because if you don't have affordable energy sources, that translates to businesses going elsewhere.

So for strengthening the Crowns, for your first question, I think that will help in building relationships with business and small communities and small businesses so they can have those projects to create affordable energy in their locations. And at the same time, the Crowns cannot be denied the ability to grow and to expand and invest in new resources and new energy sources. And that is not trampling on private industry because I said earlier, this is not a commodity. This is something that needs to be all citizens of the province, regardless of where you live and what your means are, to have affordable, accessible energy. I hope that answers your question.

[10:45]

Mr. Belanger: — The other question, and please note when my time is up there, Mr. Chair, the other question I have is that I understand that you represent some SaskPower workers as part of your membership base — is that correct? — to your brief. And is it 2,500 total?

Mr. Bailey: — No. The 2,500 number is province-wide of our members that are involved in energy. You know, the refinery are CEP members. SaskEnergy are CEP members. My local share jurisdiction with the IBEW [International Brotherhood of Electrical Workers] members, we're in the offices, so to speak. We're the meter readers. We're the customer service representatives that you talk to on the phone regarding your bill, mechanics, and those other trades and professions.

Mr. Belanger: — And that certainly clarifies, you know, your base of support. Over the next several years, you're going to hear a lot of bantering and bickering over this issue of the Crowns. Our former administration undertook an effort with SunBridge to try and look at wind energy.

And now what's going to happen, these guys across the way are going to say, okay now it's full-scale privatization. No, no, no. There was some discussion and options on renewable resource industry; there was some tinkering; there was some examination; and there was a partnership. But it's got to be a lot more an intelligent argument than what is A or B. There's C, D, E, F, G. There's 26 letters in the alphabet, so look at all the options.

So that's why I don't follow a lot of the logic as being presented on the Crowns today. And I would point out my final question is that how is SaskPower feeling — like the membership base in discussions with the people that are working in the current coal industry — how are they feeling about this ongoing discussion because there's a lot of fearmongering happening over there. If we do this, then it's going to cost jobs in Estevan and Weyburn over coal. We can't fearmonger. We have to have factual discussion and hard discussion.

Well how do the members feel about the transition from not necessarily coal overnight to new energies, but over a period of time?

Mr. Bailey: — Well we don't specifically have anyone

working in the coal, but the little bit of talk where I've tried to speak with some members is coal's not going to go away overnight. This is a long-term effort of process and planning. And like you said, there's 26 letters in the alphabet. It's going to take that 26 different versions to get a mix, to get a national program, and it may make 26 different energy solutions in this province to serve all members or all the communities of this province. Wind power may not be sustainable in Carrot River, but we can find another source that can sustain in Carrot River and supplement each other through those various sources.

Ms. Sol: — And if I could just finish, the CEP has a — and I encourage you to go on our website, CEP.ca — and look at our just transition policy. Because we know and we believe that industries are evolving, and the workers and the communities need to be considered in the equation when industry and government is looking to new, emerging industry so we can have a clean, safe future for ourselves and our children.

Mr. Belanger: — While I have the floor, and I just want to also ask the questions on the whole notion of hydro. Obviously the North is the target because there's a lot of rivers and it's a beautiful piece of land. It's something that a lot of people don't realize that the geographical centre of Saskatchewan is about 30 miles north of P.A. [Prince Albert]. You know it's an amazing, amazing piece of land. And I think the notion of hydro development, the Black Lake Indian Band are looking at options. And they say non-invasive, I'm assuming that they're underground and the current turns the turbine, so it's not really holding water back. There's a number of things you have to look up.

But my only message is one of caution. When you start talking large-scale dams and reservoirs and so on and so forth, I appreciate you know this, but just a word of caution. The North really, really is going to be watching those developments. And I think there's more and more a sense of anger and a sense of people wanting to rebel against what is happening in northern Saskatchewan because we have brownouts, we have blackouts, we have these kind of activities. And there's been a lot of investment to the system over the years, but basically nothing has happened since then.

But I would point out that in northern Saskatchewan, I'd be very careful when you start talking about large-scale hydro projects because people typically resent that. And a good example of that would be in the Sandy Bay area where there's been some very hard feelings over the dam. And so I would just as a word of caution . . .

Now getting back to the notion the CEP endorse and support the idea as presented by different groups. One good example is Meadow Lake Tribal Council. When you make reference to the Aboriginal people, I think it's very important you say First Nations and Métis. There are a lot of people that say First Nations, and all due respect to First Nations, there's another group out there as well called the Métis. And they want to make sure people know that there are two distinct groups with two different agendas. So I often add a little note in there, just to make sure people know.

But the First Nations and Aboriginal groups and the Métis as well, when they have proposals, do you think there should be

special considerations given, concessions given in this new era of developing renewable sources of power generation that would stimulate their economies in some of the areas that need stimulation such as northern Saskatchewan?

Ms. Sol: — First of all, I wouldn't phrase it as a concession. I would encourage First Nations, Métis groups working with government — I couldn't even sit here and suggest what they would need — but I would have the government have to consult with the groups and make sure that their needs are met. And I certainly wouldn't phrase it as concessions because everybody deserves to have affordable and accessible energy and clean energy, and that they be consulted when any of those projects are undertaken.

The Chair: — Mr. D'Autremont.

Mr. D'Autremont: — Thank you very much. I'm wondering what your definitions are of small producers and large producers. Yesterday we had the George Gordon Reserve come in with a presentation looking for 175 megawatts of wind energy. Mr. Belanger mentioned Sandy Bay, that there was some difficulties up there with the hydro dam. And yet the Sandy Bay band came and made a presentation to us looking to increase the size of the dam by another 40 to 45 megawatts. So what's your definition of small and large?

Ms. Sol: — Can I get back to you? And I can go back to our research department and make sure that I give you a full answer on that? I'd love to do that. So if you have an email address of the committee, I'll send it to the Chair. Okay?

Mr. D'Autremont: — I would have made the assumption that you had at least a broad idea. Was 100 large, or 250?

Ms. Sol: — I don't want to make that assumption. I'll get the exact answer for you, a thorough one. Thank you.

Mr. D'Autremont: — Okay. A second point, I believe in your presentation you suggested that there should be no profit allowed for the generation of electricity. Are you suggesting then that SaskPower should not be allowed to generate any kind of a return whatsoever? It should be strictly on an on-cost basis, and that they not pay any dividends to the province, which would be a substantive change from the inception of SaskPower where they have always paid a dividend return to the province.

Ms. Sol: — No. To be clear is that we appreciate that Crowns currently . . . We estimate that there's probably \$1,000 per citizen, it's actually in excess of \$1,000 per citizen, that benefits from the revenues generated from the Crowns. What we mean by that is that the Crown's mandate is not to make a profit. There's a big difference. We know that they need to be efficient. They need to be producing, and they're doing it for the benefit of the people, and any revenues that they generate will go back to the people. But a mandate of building profit that's in . . . because their expenses will be eliminated because it's a Crown corporation.

The Chair: — We're out of time. So thank you very much for your presentation and taking the questions. The committee will now recess for five minutes.

[The committee recessed for a period of time.]

The Chair: — Before we hear from our next witness, I'd like to advise witnesses of the process of presentation. I'll be asking all witnesses to introduce themselves and anyone else that may be presenting with them. Please state your name and, if applicable, the position within the organization you represent.

If you have written submissions please be advised that, please advise the committee you would like them to be tabled. Once this occurs they will be published to the website and will be available to the public.

The committee is asking for submissions and presentations that will be in answer to the following question. The question is: how should the government best meet the growing energy needs of the province in a manner that is safe, reliable, and environmentally sustainable, while meeting any current and expected federal environmental standards and regulations and maintaining a focus on affordability for Saskatchewan residents today and into the future?

Each presentation should be limited to 15 minutes and we have set aside time to follow for question-and-answer. I will direct questioning and recognize each member that is to speak. Members are not permitted to engage witnesses in debate and witnesses are not permitted to ask questions of committee members.

I would also like to remind witnesses that any written submissions presented to the committee will become public documents and will be posted to the committee's website. With that I would ask our next presenters to please introduce yourself and go ahead with your presentation.

Presenter: EnCana Corporation

Mr. Marsh: — Good morning, Mr. Chairman, and the Standing Committee on Crown and Central Agencies. It is my pleasure to present to you this morning. I am Eric Marsh, executive vice-president of EnCana Corporation, and with me today is Wayne Geis, vice-president of EnCana Corporation. Wayne previously worked at Saskoil and he is a former geophysicist, has a great understanding of the hydrocarbon system here. And so I've brought him along to be a bit of my technical expertise on subsurface questions, so feel free to ask those. With that we'll get started.

As with all corporations, we have our disclosure protocols. And there's a lot of words there, and so I would suggest that you read that perhaps before you go to bed because there's a lot of information in there. But it basically says the way we report as a public company and so it's there.

Well many of you know EnCana from Weyburn and the work we've done in Saskatchewan. But for those who don't, we are a leading North America company based in Calgary, Canada. We are one of the largest producers of natural gas in North America. We've recently split our company and in doing that we split it into a natural gas company and an oil company and in doing that we are no longer the largest producer of natural gas in North America. We are about the third largest producer, significant, and we continue to have the expertise to understand

the natural gas markets.

One hundred per cent of our production is in North America. We work in the United States and in Canada and we choose to work there because we believe in the domestic story. We have had one difference in the last year and that is we are taking on a leading role in increasing the use of natural gas for transportation vehicles and power generation. And so for the last year, it has been my privilege to lead a team that has looked at the opportunities to use natural gas for these areas. And so today we would enjoy the opportunity to present to you.

There are many opportunities to expand the use of natural gas in Saskatchewan. In doing so, it can help deliver targeted reductions in greenhouse gas emissions. We believe it can create jobs. It can increase the revenues that the provincial government will get from royalties and taxes; we've estimated it to be about \$20 million annually. We think it can maintain a very competitive energy cost for the consumers. And lastly, it really uses some advanced technology that we have — but it's very low-risk — in order to provide cheaper fuel for both power generation and transportation.

What's really changed things in the last probably three to four years is the technology that's existed in North America, phenomenal change in the last three or four years in our ability to drill horizontally and then hydraulically fracture that lateral repeatedly. We are now drilling wells that have horizontal laterals 3500 metres in length and hydraulically fracturing that lateral 25 to 30 times. Wells that used to produce 3 million cubic feet of gas per day now routinely produce 20 million cubic feet of gas per day, and it's not uncommon for us to see 30-million-a-day rates.

But what really has happened in this technology change is our recovery of the gas in place is increasing over time. Where we used to have relatively low recovery factors, this technology is allowing us to increase the recovery factor of the gas that exists in the ground. And the third part really is, is that we're now being able to apply it to horizons that used to not be economic to produce, but today with this technology has allowed it to become economic.

So the map you see on the left is a resource map of North America. These are all the new shale plays that have occurred over about the last three to four years. And as you can notice, three of the most massive plays are in Canada. They're the Horn River, the Montney, and the deep basin of Alberta provide just abundant supplies of natural gas.

As we look at North America, we see about a 100-year supply of natural gas at its current production levels. And every month that goes by, it changes. So the graph on the right shows the increasing of all these different studies that have been conducted. And we will have a new supply study which will detail Canada very well out in the first quarter of 2010. We expect it to go up another 10 or 15 per cent, so the message here is that natural gas is in abundance.

So when you look at Saskatchewan it's obviously been a natural gas producing province for quite some time. It produces about 671 million cubic feet per day, has about 5.3 trillion cubic feet of gas that is available to be produced. It gives you about a

22-year reserve life at the current production level. I think that overall the technologies that have advanced in the rest of North America are starting to be applied in Saskatchewan, especially in the tight gas sands, and we welcome any questions on that later on.

When we look at Canada as whole, Canada's had very stable natural gas production over the last seven or eight, nine years and as we look into the future as the shale plays begin to develop, we see Canada's production going from between 15 and 16 bcf a day or billion cubic feet per day to over 20 bcf a day or 20 billion cubic feet per day, so we think there's a great opportunity to increase the availability of natural gas.

This is a busy graph but it's a very important one. When you look at natural gas prices, you can see that from 2003 until today natural gas is the only commodity that has very stable gas prices. You often hear that it's more volatile than others and we would probably disagree with that in that we believe that when you look at the standard deviation of those three commodities — coal, oil, and natural gas — natural gas is the one that does not have an increasing slope over time. So as you look at it, what we think natural gas provides because of the abundance, we believe natural gas will be even less expensive than it's been in the past.

And so as you look at the graph, you can see that it's a very flat profile. As oil continues to increase in price, we see this decoupling between the two commodities. And so that decoupling allows that natural gas use as a transportation fuel becomes much more competitive and actually very favourable as we look into the future. We also believe that longer natural gas contracts with this stable supply can be achieved now, which we couldn't do probably four and five years ago. And so I think it bodes well for the future.

With all of that I think it's important to get to why we want to discuss the energy opportunities that we have with natural gas. And we've talked about the abundance of it. We've talked about the pricing of it. We think it's going to be abundant. We believe that it'll be affordable for the future. And the third most important thing to talk about is really the opportunity to reduce emissions with the use of natural gas.

The pie chart on the left indicates the three segments of our energy portfolio that use different types of energy. We've converted this to a natural gas number so that everything in the presentation is consistent, but when you look at it, the three categories that we really have to work on are the industrial, the transportation sector, and the electrical sector. On the right, on the pie chart on the right, you can see that those sectors shown on the graph create about 43 million metric tons of greenhouse gas effects every year. And so our challenge as a society is to look at how do we reduce those.

And you can see that the largest percentage of those emissions is from the electrical sector, followed by the industrial sector and then the transport sector. And as we bear down a little bit more into the electrical sector, you can see that coal in Saskatchewan provides 59 per cent of the electricity; natural gas is 14 per cent. But when you look at the emissions, 88 per cent of all the emissions come from coal-fired power plants, or roughly 13.3 million metric tons. So the opportunity that we

have is to reduce those emissions by looking at cleaner fuels.

This is the go green Saskatchewan climate action plan. It's quite similar to many of the other plans that exist across North America, whether it be the Waxman-Markey or the turning the corner plan in Canada. And for the most part you have . . . Our goals are to try to reduce our emissions by about 20 per cent over the current case by 2020, or perhaps as much as 80 per cent over the 2006 case by 2050. And when you look at the three sectors that exist in Saskatchewan, it would mean that we would have to reduce all of our emissions by 45 per cent from the business-as-usual growth case.

Saskatchewan has been blessed with a tremendous economic motor here, you know, in the province. We estimate that the economy has been growing at around 2.6 per cent, compound annual growth rate, you know, so because of that you see the increase in the, you know, greenhouse gas emissions. So Saskatchewan will actually have to reduce its emissions by 45 per cent from the business-as-usual case or 20 per cent below the 2006.

So we need to reduce our emissions by about 26 million metric tons and if you were to charge a \$30 a tonne carbon tax to that, it would work out to be about \$816 million — nearly \$1 billion — in the year 2020. So overall it's important that we actually physically reduce the emissions and not just pay the tax for that because that would be a very strong burden on the province.

So what we've looked at here, and this is a busy chart but it really shows the different solutions that you have in Saskatchewan to look at reductions by 2020. As I mentioned earlier, we need to reduce the total emissions by 27 per cent. So our first case, the first scenario, is really if we looked at the use of natural gas for all new power generation and then as you retire the coal-fired plants that you have, you would replace those with natural gas. And in this case, the first case, you have two coal-fired power plants that would be retired by 2020, replaced with natural gas. You're able to meet the electrical sector emissions goal of 20 per cent.

You then would go to the transportation sector — we call them column C and D. You would look at the use of natural gas for vehicles and electrical vehicles in the transportation sector. So we were able to meet the objectives there.

The biggest challenge that I think really exists is the residential and industrial sector. We still have to reduce the emissions by 20 per cent by 2020 from the 2006 case, and I think that's going to be a real challenge to do when you look at residential-type things. It's very difficult to all of a sudden, you know, create 20 per cent savings in emissions in a home or in some of the industrial things, in a restaurant or whatever.

Consistently as we've looked at these plans, we think that's probably one of the greatest challenges. And because of that challenge, I think what has to happen is you have to end up getting a disproportionate share out of the electrical generation and out of the transportation sector.

[11:15]

So as you go down the line, you look at natural gas, the second

column, we now introduce 10 per cent of the power generation is with renewables such as wind. The remaining amount is natural gas. We now are able to reduce that sector's emissions by 45 per cent, which then takes the burden off the residential and industrial sector. We still use 10 per cent of the vehicles running on natural gas or electricity, but overall we meet our goal of 27 million metric tons.

The third column is if we more aggressively move in and replace all of the coal-fired power plants by 2020 and we have that 10 per cent with renewables, you're able to reduce your emissions by 53 per cent in the electrical sector, which makes it fairly, you know, comfortable to reduce your emissions in the transportation and the residential sector. So overall I think these are some outcomes of what could be done.

So as we looked at that, if you were to use 230 million a day of the 700 million approximate amounts of gas that you had in displacing coal, you would reduce your emissions by over 50 per cent, approximately, in greenhouse gases.

But I might also add that one of the most important emission that we need to work on is nitrous oxide and sulphur dioxide, which are the bar charts in the bottom. When you look at sulphur dioxide, it's what causes acid rain. And nitrous oxide is an issue around ozone. So certain areas, as the nitrous oxide levels increase in atmosphere, ozone becomes more of a challenge to manage. So I think overall you have to reduce those emissions as well.

As we looked at power generation, this chart is a chart of your all-in cost to generate electricity with different types of energy sources. In this case, we include the capital cost and the fuel cost or the variable cost. And as you can see, natural gas advanced cycle, combined cycle plants is the cheapest way to generate power that we have, especially if you take into account the capital investment that's necessary.

So lastly we've done our best to model this. Again this is simply a model. We've looked at the three scenarios that we showed you and we see that there's a great opportunity to increase jobs through the use of natural gas, primarily in drilling additional wells, pipelining, putting in the natural gas power generation facilities. You also increase the revenues to the province greater with natural gas than you do, say for instance, coal. So it's another advantage because of the royalties and the taxes on natural gas. So it's another way to increase revenues for the province and create jobs, and we think that's a very honourable thing to do as well, especially in these economic times.

So lastly, you know, we have, you know, put together what we consider a low emissions policy plan, presented it for you today. Certainly it's just a model. There's a lot of ways to do that. We think it should involve natural gas. It allows natural gas to have a great opportunity to reduce emissions, create jobs, use fuel that you have here in the province, and it's a very good partner for some of the renewables such as wind.

And so with that, I believe we've completed our presentation, hopefully close to being on time. And I welcome any questions that you might have.

The Chair: — Well thank you very much for your presentation, and we do have some questions. Mr. D'Autremont.

Mr. D'Autremont: — Thank you very much. Thank you for your presentation. Lots of numbers there. And you're one of the few that have come forward with an actual number for carbon, which is an issue for this committee, is what are we really talking about as far as price is concerned. So thank you for coming forward with a number. I don't know how valid that number is because of what's happening in the US, but at least it's a number.

My question for you is related in part to that number, but to cap and trade and to carbon sequestration, and I know EnCana's involved in carbon sequestration. Under cap and trade, what percentage reduction of emissions are there of CO₂? And under carbon capture and sequestration, what reduction of carbon is there?

Mr. Marsh: — This will have to be from memory. Are you talking about, say, cap and trade such as the turning the corner plan? Is that what you're . . .

Mr. D'Autremont: — Cap and trade in general.

Mr. Marsh: — In general. You know, if you were to look at Waxman-Markey . . . Are you talking about physical reduction in emissions?

Mr. D'Autremont: — Yes.

Mr. Marsh: — It's really a function of what the carbon tax component is in the initial years because in the modelling that we did for Waxman-Markey, it worked out to be less than \$20 a tonne. It was like \$18 a tonne is what the actual, you know, penalty was for CCS [carbon capture and storage]. And because of that, it really would not force much switching from, say, coal to natural gas. We felt that, in the Waxman-Markey plan, there would be nominal amounts of switching and that the penalty wasn't really severe enough to cause that to happen as a society. So that's the best I can answer you without, you know, actually having the numbers in front of me. But I remember that part.

Your second part, as far as CCS is concerned, carbon capture and sequestration, the studies that we've read — of course, you know Alberta has done a pretty good study on one — would suggest that you would be between 150 and \$200 a tonne for CCS. You can buy CO₂. CO₂ in the world is . . . In North America, there's large CO₂ reservoirs. All right? So you can actually buy CO₂.

So for instance, the process that we used at Weyburn, we'd get CO₂ up to Weyburn at approximately 20 to \$30 a tonne. So when you compare the two processes, do you take the CCS and spend 150 or \$200 a tonne or do you buy CO₂ for secondary recovery at 20 or \$30 a tonne? To me, it seems like it makes more sense to buy the CO₂. There's some huge reservoirs that I actually worked on as a young engineer and there's an abundance of CO₂ in North America.

Mr. D'Autremont: — Thank you. Perhaps you didn't quite understand my question.

Mr. Marsh: — Perhaps I didn't.

Mr. D'Autremont: — Under cap and trade, is there any actual reduction in the emission of CO₂? Under carbon capture and sequestration what percentage of that CO₂ is reduced in the atmosphere?

Mr. Marsh: — In cap and trade I would say there would be nominal amount of actual CO₂ reduction. Okay, I don't know the number. All right, nominal amount, because the penalty on it, it was not severe enough. Under CCS you can capture whatever you decide to put CCS on, you know, but it will be very expensive.

Mr. D'Autremont: — Okay, thank you. Second question. We had a previous presenter here this morning that suggested private enterprise was not a way to go for electrical generation, that it was a better return to the government if government owned the electrical generation. From EnCana's point of view, what kind of benefit would Saskatchewan incur if you were providing us with that electrical generation when you take into consideration property taxes paid, capital taxes paid, corporate income taxes paid, PST [provincial sales tax], GST [goods and services tax] paid?

Mr. Marsh: — Well EnCana would not be the builder of a power plant, likely. We would provide the power plants with natural gas if you so desired, but for the most part we wouldn't build the power plant. We'd provide the province, if the province chose to build a natural gas power plant, we could enter into a contract with you to sell you the natural gas. And that's where EnCana, the expertise is. Yes. Good questions. Thank you.

Mr. D'Autremont: — Thank you.

The Chair: — Mr. Bradshaw.

Mr. Bradshaw: — Well thank you and thank you for your presentation. You got a lot of different things in here. One of the things, and I was just curious, what is tight gas?

Mr. Marsh: — Tight gas. That's a great question. So there's sandstones that are very low in permeability, okay, is what we would refer to as tight gas. And it's different than shale which is more of a mudstone that's been compacted that has almost no porosity and permeability at all. But tight gas is what you would see more in the deep basin of Alberta. It typically means less than a certain permeable. Permeability is how well the pore spaces are connected. It would refer to rocks that are very low in permeability. And so I would say that in the past, say 20 years ago, the majority of the production, say in Alberta and Saskatchewan, would not have been qualified as tight gas. Probably in the last 10 years, probably the last five years, the majority of the production would be considered tight gas because we're working with poorer quality reservoirs, lower permeability reservoirs. Does that help you?

Mr. Bradshaw: — Yes. So then you would have to fracture them more often?

Mr. Marsh: — Yes, that's correct. Or to a horizontally or fracture them.

Mr. Bradshaw: — Okay. And you said your new map was going to be out the first quarter. Because just looking at it, I happen to know some drilling that's been going on where they found some gas that's not on the map.

Mr. Marsh: — One of the challenges with all those studies, in my opinion, is that they really haven't appreciated the new plays in Canada as well as what we think the new study will. Internally we actually think that the resource is greater than what you have on that map.

Mr. Bradshaw: — Thank you. And there's one more thing, I guess. And looking at your graphs, and you had transportation, and really you didn't have the transportation very high at all.

I was at The Energy Council meeting last month down in Colorado Springs and Boone Pickens was there talking about changing the trucking around to natural gas across the US. And what do you think . . . How far along . . . I guess what I'm trying to say is, if this were to happen — obviously it's not going to happen tomorrow — if this were to happen, what difference would that make on the reserves of the natural gas? You know, because your transportation graph isn't there very high. And maybe it's pie in the sky. I don't know, but what . . .

Mr. Marsh: — I don't think so. I think you're right on there. As a matter of fact I was just in Ottawa yesterday talking with Minister Prentice about that very specific item EnCana has proposed. And Wayne and his team has been working with some of the federal government to try to come up with a plan for the use of natural gas for especially the larger engine vehicles.

There's no technology today that exists to drive an 18-wheeler on batteries very far. And so what we've been working on in a variety of places is to use natural gas in the form of LNG, liquefied natural gas, for transportation. We've met with numbers of trucking companies. Perhaps two weeks ago we met with Robert Trucking and they're interested in putting trucks on the road running LNG. It's about 20 to 25 per cent cleaner, and it's between 30 and probably between 25 and 40 per cent cheaper. So there's a great opportunity to do that.

Boone has worked fairly hard in the United States on the issue. We've been working very hard in Canada to do something that's similar to that. How much would it use? It's a slow build-out. As you look at both cars and trucks, our best estimate — and we're using Europe as a model — in the world there's 10 million vehicles running on natural gas. So it's not a new technology. Seven hundred thousand in Italy alone. And when we model Italy, you see Italy over about a 10-year period is up to about 7 per cent of their vehicles running on natural gas. In these models today, we were up to 10 per cent using natural gas for the big trucks, for the big vehicles, and I think it's a great opportunity to use natural gas.

Will it impact the resource? Very little in the early years. You know, obviously the transportation sector 's huge, but we in our wildest dreams don't think we're going to get beyond, you know, 20, 30, 40 per cent of the vehicles running on that by say 2050. It's just what happens with trucks is it takes longer to turn them over, so they're going to buy a new truck, a new engine, every four to five years so the turnover rate to go to LNG takes

a while. But we've actually modelled that in there.

[11:30]

Mr. Bradshaw: — So that is, that actually is . . .

Mr. Marsh: — You bet.

Mr. Geis: — If I may add in, in this plan we've got by 2020, 10 per cent of all vehicles — both commercial trucking vehicles and a small amount of passenger vehicles — on the road in Saskatchewan that would run on natural gas.

Mr. Marsh: — Those are the only two ways really to reduce the emissions in that sector — electric vehicles and then natural gas for the big vehicles, which actually make the most emissions.

The Chair: — Okay, thank you.

Mr. Marsh: — You bet.

The Chair: — Mr. Weekes.

Mr. Weekes: — Thank you, Mr. Chair. Thank you very much for your presentation. Just under your graphs — you know, wind, hydro, zero emissions — that wouldn't include the manufacturing of turbines and the construction of the hydro dam, so there'd be some carbon there, but once it's under production, I assume zero emissions.

Mr. Marsh: — That's correct.

Mr. Weekes: — Yes. And then we have coal. I'm assuming in your charts that you're talking dirty coal.

Mr. Marsh: — Correct.

Mr. Weekes: — Okay. And you're comparing natural gas to those. My question to you is, I mean we talk about we're going to have a pilot project developed in Saskatchewan for clean coal, developing the technologies around clean coal.

Natural gas. When you're talking about natural gas and comparing emissions, I think you just said there's 25 per cent less emissions for natural gas than gasoline or diesel. Is that what you meant in your last . . .

Mr. Marsh: — For transportation, for trucks.

Mr. Weekes: — Okay. Is there any way of cleaning up further, natural gas?

Mr. Marsh: — Correct. Yes.

Mr. Weekes: — What is it?

Mr. Marsh: — It's CCS, carbon capture and storage for natural gas. And there's a pilot project going on in California, just beginning. We think that's a great opportunity for natural gas. We think that's the next level, so you'd probably switch to natural gas and then the next step would be to capture the emissions off of the natural gas plant. The advantage of that is

you have a lot less carbon to capture.

When we studied North America, North America produces 74 billion cubic feet of natural gas. When we've studied the capture of all of the power plants in North America, it's more than double that amount.

So when you think about the pipeline systems and the infrastructure you would need to build to capture 100 per cent of the CO₂ off the power plants in North America, it's massive. It's just, you know, from an engineering perspective, difficult to get my head around. It took us 40, 50 years to really build the natural gas system that we have today. I think it's going to take something . . . You know maybe we're better today, maybe it's half that time. But it would be a massive system. So for us it's, to capture the emissions off a natural gas plant, it's certainly a doable deal. And it's leading technology, a lot like the CCS on coal is. Yes.

Mr. Weekes: — So you say there's a pilot project in California right now?

Mr. Marsh: — Just got announced, yes.

Mr. Weekes: — Just got announced. Oh, yes. So how far away are we with that technology to implement that on new natural gas power plants here in Saskatchewan?

Mr. Marsh: — It's basically the same process that you use for CCS; it's just simpler. You don't have as many different, you know, materials in natural gas because for the most part your natural gas has been cleaned up at a processing plant. So our pipeline specs have 2 per cent CO₂ in them, perhaps 1 per cent or less nitrogen. So the process to use it as a fuel and then to capture it is really relatively simple.

What the negative is, is that when you look at how much, you know, you capture 100 per cent of it, but it's a smaller amount of CO₂, which I think is a good thing. But when you look at the cost of it on a per unit basis, it's going to be similar to coal or perhaps slightly higher because there's less of it, and it still costs you the same amount of equipment to put on it, if you understand what I'm trying to get at there. It's just a smaller amount of CO₂ to capture.

Mr. Weekes: — Thank you very much.

Mr. Marsh: — You bet.

The Chair: — Mr. Belanger.

Mr. Belanger: — Thank you very much. I just want to confirm the figure that I received from your impressive presentation. You mentioned that you believe that 88 per cent of our greenhouse gas emissions are from coal-fired plants. Was that the correct amount?

Mr. Marsh: — I believe that was in the electrical sector. Yes.

Mr. Belanger: — Right. Okay. I just want to confirm that amount. The other thing is that in layman's terms, when people ask me as a member of this committee on addressing the greenhouse gas challenge and alternative energies and so on and

so forth, in very simple terms — because I'm just a hockey player dabbling in politics here — very simple terms, what is the benefit in natural gas versus coal?

If somebody were to say to me, well what if we burn wood? What if you burn gas? What if you burn coal? What is the difference in what we're emitting in the atmosphere, both in terms of the amount and the content? And you see how it can get really convoluted if we don't do it right. So I just want to keep it as simple as possible.

Mr. Marsh: — The simplest way to look at for me is that if you take the most advanced technology you have on a coal plant today, if you were just, snap my fingers and we've got the newest, greatest coal plant that has the greatest scrubbing systems on it that it has, and you take the most advanced natural gas plant, best technology today, natural gas is typically between 40 and 50 per cent cleaner from an emissions perspective than coal. And so it's cleaner than coal.

As far as your question on what's in it, probably the biggest difference is that natural gas for the most part has carbon, just has carbon and hydrogen. So you end up with water, carbon dioxide, and so natural gas is fairly clean from a, you know, other perspective. It does not typically have sulphur dioxide on it. It has to be removed before it even goes into the pipeline if it was, quote, sour gas.

But for the most part, natural gas has none of the by-products that coal does, like for instance, sulphur dioxide, some of the hydrogen sulphide that gets emitted. So when you look at a coal stack, the emissions that come off of there are very, to me, they're very complex. I'm used to working on natural gas. Natural gas is a simpler, it's just simpler all around as far as what it emits. And coal is much more complicated because you're burning all these different organic things, you know. So sulphur dioxide comes off of it. You got the nitrous oxide type, level stuff.

And probably the thing that's most important is mercury. Best study I've looked at is in the high-altitude lakes in Colorado. Colorado is similar to Saskatchewan in that it uses a lot of coal. For quite a number of years — and I'll be off a little bit here — but say upwards of 30 years, we've seen an increase in the mercury levels in the high-altitude lakes. They relate it to coal. They relate it to the coal-fired power plants nearby. So I think it's going to be an issue that we'll all be talking about in the next few years.

Mr. Belanger: — Now shifting gears a bit, you noted on your presentation that there was 1,156 gas wells drilled in '07. Have we seen that number flatten or diminish?

Mr. Marsh: — Wayne actually looked at that here.

Mr. Geis: — Yes, I did. Thank you. Like most places in North America over the last couple of years, natural gas well drilling has gone down because the price has come down. So the producers aren't drilling as many wells.

So I think through the years of say 2004 to 2006, you saw a market increase in natural gas drilling in Saskatchewan. Then with the price reduction that occurred kind of with the

economic collapse 18 months ago, drilling rigs have gone down.

But as Eric mentioned earlier now, we anticipate the drilling will go up in Saskatchewan because a lot of technological breakthroughs that we're learning in other places on the continent — Alberta, Texas, Louisiana — can be applied to Saskatchewan. So I suspect that explorers and producers in Saskatchewan will start drilling more wells as the price recovers.

Mr. Belanger: — The other question in terms of in your — I don't want to use the word world because it is our world — but in your world, if you had the conversion of natural gas creating more electricity, cleaner and less intrusive in the environment, and SaskPower said, okay, we're not going to do the coal any more; we're going to do gas, natural gas. Please don't paste that all over the place, you guys. And if we did that, who would get the carbon credit, if there was a carbon credit scenario unveiled for Canada. Would SaskPower get it? Or would you guys get it? How would you make that deal from the carbon credit perspective?

Mr. Marsh: — Obviously I think it's going to be by the way the regulations get set, I mean, and depending on . . . You know, that's the real answer. I think it's likely that the power, in most of the things that we've seen so far from British Columbia to all of the different plans, the power generator would probably get the credit for the switching from coal to natural gas. But that's going to be something that'll probably have to be legislated at the end of the day, be part of the Bills.

The Chair: — I have Mr. D'Autremont.

Mr. D'Autremont: — Thank you very much. We've had a number of presenters make presentations to us about carbon sequestration — some for, some against. One of the presenters the other day presented us with a chart that showed that carbon sequestration was not a safe procedure, that because of fractures in the formations, the CO₂ would leak out, get into the groundwater, pollute people's wells, and simply escape to the atmosphere.

I think Wayne as a geophysicist and perhaps a reservoir engineer could answer that question. Is that likely to happen? What's the possibilities or probabilities of that happen? And I know that Eric mentioned that there are large reservoirs of CO₂, and I'm familiar with some of them, that haven't yet escaped. So what's the possibilities and probabilities of any sequestration happening that would escape from the reservoirs?

Mr. Geis: — The first comment I would make is that it would be certainly site- and reservoir-dependent, but there's no question that you can do safe carbon capture, in our opinion. We do it really in our enhanced oil recovery scheme in Weyburn. So it's hard for me to comment specifically on the safety of any given project, you know, until I really understood the geology.

But I think there are certain reservoirs across North America that we can do that and they're deep enough, they're contained enough by the surrounding impermeable rock, that certainly over the geologic time scale that we all can comprehend, there

should be no risk in leakage. Having said that though, there could be areas where people are proposing to do this and there may be risk factors that aren't as good. So again my response would be it's going to be variable depending on the nature of the geology.

Mr. Marsh: — I think the deep reservoirs are going to be good candidates for those, where we've seen some ideas around what they call deep saline aquifers, which aren't really very deep by our standards. They're relatively shallow, meaning 1,000 or 500 metres. Those are more of a challenge.

And what he might've been talking about is, is that by putting the CO₂ in there, a lot of those shallower aquifers outcrop somewhere. And in that case, I think we need to be very specific and very careful geologically on where we put the CO₂. Certain reservoirs are going to do better at containing it than others, but I would agree with Wayne. We've demonstrated, you look across Alberta or you look in Saskatchewan, you look in west Texas, we've done a very good job of containing the CO₂ in the deep reservoirs.

Mr. Geis: — And I guess that's the essence of the whole notion of carbon sequestration. There's only the select places on the continent that you can do this, that you really can have the certainty that we need as a society to make sure that you don't have escape of CO₂.

Mr. D'Autremont: — So like most other operations, it's simply a matter of doing it right. It's not that the whole concept is flawed and unworkable. Okay, thank you.

The Chair: — Ms. Morin.

Ms. Morin: — Thank you for your presentation today. I appreciate that. I'm interested in the notion of using natural gas in the mode of transportation obviously. So you had mentioned that there has been a significant amount of work done in Italy on this already. I'm wondering if you have any measurement of reduction of greenhouse gases as it came out of that situation with the advancement of natural gas in the mode of transportation in Italy.

Mr. Marsh: — I don't have a specific number for you on that. We just know that it represents a phenomenal growing market share. About 30 per cent per year compound annual growth rate is the percentage increase in the number of natural gas powered vehicles.

In some of our presentations I have a picture of Europe's greenest car of the year, just recently came out. It's a Volkswagen Passat that runs on natural gas. They have 40 different manufactured vehicles — BMW, Mercedes — all make dedicated natural gas vehicles.

[11:45]

Unfortunately North America is behind. In the United States you can get one natural gas vehicle, a Honda Civic GX. We have quite a number of them. They run fine; they run great. But you know not everybody's going to drive a Honda Civic, so we need to get to that point where we begin to use, you know, get some additional vehicles in.

We need to build some infrastructure. For instance in Calgary, you have three places you can fuel up with natural gas for a vehicle. We will propose and we will have built additional ones probably by the end of the year. We think it's where it's going. We believe the market's going to push that way.

We need governments, both provincial and federal, to help us get this whole thing organized. The truckers want it. Society wants it. And the challenge you have is this chicken-and-egg thing where there's not a lot of vehicles to choose from right now and there's not a lot of refuelling centres, so how do I do this? Nobody's going to build a natural gas station unless we get some more vehicles running on it, and nobody wants to buy a vehicle unless you can have convenience of getting natural gas in your vehicle.

So we're working on that right now very hard at the federal level. We're working in some of the provinces right now. So we're getting there.

Ms. Morin: — So in Italy for instance, who's the supplier of natural gas for Italy? Or where is the supplier, I should say? Because I mean we have the abundance of natural gas, and yet we're extremely behind the situation in Europe. So I'm curious as to how this all transpired in Europe, given that they don't have the abundance of supply that we do. And yet the chicken-and-egg argument obviously somehow or another was dealt with there in a more expedited fashion.

Mr. Marsh: — It was done through incentives. What they actually did was increase the tax on diesel and gasoline, and they left no taxes on natural gas. They then implemented tailpipe emission standards that were based on the amount of carbon your car creates. So if the standard was 135 grams per kilometre travel, and as you went higher than that, you paid a very high licensing tax, is basically what it . . . So an SUV [sport-utility vehicle] that would maybe be 500 grams of CO₂ would pay a whole lot more than the Honda Civic would. And so they used those two, you know, toggles to really get the thing running.

The other thing to note is that in Europe, natural gas is 59 per cent cheaper. Even though it's imported from Russia, it's 59 per cent cheaper than diesel and gasoline. So the economic value is driving it. All the other things drive it as well.

Mr. Geis: — There's also a bit of a social conscience there too as well. So the consumers, you've got to work with the consumers as well, and there's been some really successful campaigns to make that happen. You know, we all make our decisions in part by economics, but also consumer choice.

Ms. Morin: — That's actually where I was going to go next. Obviously there's been a strong awareness of the advantages of going to a different form of energy, in terms of the advantages to the greenhouse gas emissions and the environment and such.

But I'm curious because you seem to know a bit more about Italy's situation. There are obviously some policies that were driven by the government, in terms of making sure that this is something that was promoted and moved forward in a more aggressive fashion. And I'm assuming that some of those policies would also be incentives. Am I correct on that?

Mr. Marsh: — That's correct, yes. And those are the things we've been meeting about and discussing, and how do we use some of those tools to move it forward.

Ms. Morin: — Because clearly I mean again the new technologies tend to be more expensive. So I'm assuming that these vehicles would also have a bit of a premium cost to them, so there would have to be some incentive for a consumer to want to purchase the more expensive technology vehicle outside of just the good conscience issue.

Mr. Marsh: — So they are. They come at a slight premium though in Europe. I mean we looked at the other day, I think it was a Mercedes B-Class that was about a \$40,000 car, and it cost about 3,000, \$3,500 more to buy the natural gas than it did the diesel or gasoline. So when you looked at the payout of those, it was fairly rapid. Most of the payoffs of the vehicles, like the trucks and the pickups that we're converting, we have 150 trucks we're converting right now. The payouts on those are about a year and a half versus running them on gasoline. So it's getting to where it's, yes it's economic, but it's also like as Wayne said, it's also got a bit of social decision as well.

Ms. Morin: — Well my last question because I'm running out of time here. We could go for a while. You had mentioned also that by 2020, 10 per cent of all the vehicles in Saskatchewan are going to be, or there's an expectation that 10 per cent will be converted to natural gas. Is that right?

Mr. Marsh: — That's the way we modelled. We've modelled that we would grow, from now until then, up to 10 per cent would be natural gas vehicles and/or electric vehicles where appropriate.

Ms. Morin: — Is that based on the fact, on the basis that there is no further incentives done by the province?

Mr. Marsh: — Yes.

Ms. Morin: — Yes. Okay. Well thank you very much for answering my questions.

The Chair: — Mr. Weekes.

Mr. Weekes: — Thank you. Just some technical questions on shale gas production. Could you just in a layman's terms explain how shale gas is developed? And I'm assuming it's more costly to develop than the traditional natural gas well.

Mr. Marsh: — Well this is what I have done for 30 years prior to this job. So actually to answer your question, it's actually we've driven the cost down to where whether it's shale or tight sand, it's all the same. And we've been able to . . . Shale gas is just reservoirs that we have to drill through to get to the higher quality reservoirs below it.

The shales are what capped the natural gas in the sandstone. And so what we do is, is we come in and we drill horizontally in those areas. And so you have laterals like that, and then you would start at the tip of the lateral and then fracture it repeatedly this way, back towards what we call the heel, back towards the well bore that's started. And so you would then complete it like that.

What we're up to right now is we're able to, we have places where we have as many as 16 wells on a specific pad. So you've got a one- to two-acre area that you could drill. We've drilled as many as 16 wells on that pad, where this well would go off this way and this well would go off that way. And so it's all directional drill now, and we're able to really reduce the footprint.

One of the greatest things about using natural gas is the fact that our footprint is materially less than all the other energies. And you know when you look at how much energy we can create over that very small area, it's very beneficial. So like our Haynesville development in Louisiana right now, we're looking at 8 wells per section, and all eight wells right now come from the same pad. So we reduce the amount of . . . It's almost like you have a little mini factory on every pad.

So you've got the drilling rig. You've got a completion rig. We call them simultaneous operations. So you have the drilling rig, a completion rig, you're hydraulically fracturing. You're perforating, you're doing all this stuff simultaneously on that pad so that you get in, you do the work, and then you leave. And the well produces for 30 years. And so it's a one-time inconvenience to the land, and then after that, it's 30 years of production.

Mr. Weekes: — Just clarify fracturing. What do you mean by that?

Mr. Marsh: — Hydraulic fracturing is, is you actually take and you pump water — and it's basically water with a little bit of sand in it where, you know, just a little bit of regular sand, sandbox-like sand — and you pump it at high rates. So you would pump, you know, you perforate the casing, and you pump that water and sand out those perforations out into the rock. And the faster you can pump it, the more it actually creates fractures in the rock. And so it breaks up the rock into fracture plains, and that's what allows the gas to migrate through the rock back to the well bore and then be produced.

In most areas, probably in North America today, 90 per cent of all wells are hydraulically fractured. It's a process we've been doing for 60 years. In my 30 years, it's evolved. It's changed; it's better than it used to be. But for the most part it's water and sand getting pushed in there really fast and hard, some relatively high pressure to break up the rock and allow the gas to migrate to the well bore.

Mr. Weekes: — Thanks.

Mr. Geis: — I'd just add one thing. You asked about the cost of shale gas. And through the process that Eric just described there, we don't drill any dry holes any more. So in actual fact when you exploit shale gas, through economies of scale through the manufacturing process, the natural gas is actually cheaper than trying to explore for what we'll call conventional gas. Because again, we don't drill any dry holes.

Mr. Weekes: — Thank you.

Mr. Geis: — Yes.

The Chair: — Mr. Belanger.

Mr. Belanger: — So if one whole town sinks around your wells, then you guys are to blame for breaking up all those rocks underneath. No, just kidding.

Just very quickly, in terms of the Weyburn project, like some people say, well why are we paying to bring this CO₂ into our jurisdiction to pump out more gas as you swell up the molecule of the gas — I learned that yesterday — and you get more oil? Is there an added benefit of actually the carbon credit from the greenhouse gas or the carbon that you're importing from the States? Because obviously when you get more oil, it's of benefit to you. More gas, right?

But is there eventual benefit of a carbon capture credit as a result of some of the efforts being undertaken in some of the oil fields there?

Mr. Marsh: — Well I think on CO₂, the first thing you mentioned is CO₂ for a secondary recovery needs to be pure CO₂. It cannot be poor quality CO₂, so to speak. So to bring CO₂ through pipelines is a relatively, you know, I'd say inexpensive way to do it. Whereas carbon capture and storage, to get the quality of the CO₂ out of CCS, takes a lot of processing of the emissions to get that quantity of CO₂. You still have to deal with all the other gases with CCS. So you've got to deal with hydrogen sulphide and others, all the nitrogen components. Those have to be dealt with and pushed away. They've got to go somewhere as well. Then the CO₂ comes out in a pure enough form that you can use it for secondary recovery.

As far as the carbon tax, it's an interesting idea that you would give a credit for those using CCS. You would have to give a very large credit for CCS to make it competitive with, say, buying CO₂ from other sources. You know, you'd have to make it a very large credit, and so it would be a bit of a burden on the province or on the federal government.

Mr. Belanger: — Thank you.

The Chair: — Well thank you very much for your presentation and taking the time to answer our questions. With that we will recess until 1 o'clock.

Mr. Marsh: — Thank you very much.

[The committee recessed for a period of time.]

The Chair: — Welcome back. Before we hear from our first witnesses this afternoon, I'd like to advise witnesses of the process of presentations. I'll be asking all witnesses to introduce themselves and anyone that may be presenting with them. Please state your name and, if applicable, the position within the organization you represent. If you have any written submissions, please advise the committee. Once these submissions are tabled, they will be available on the committee's website and will be public documents.

The committee is asking for all submissions and presentations to be in answer to the following question. And the question is: how should the government best meet the growing energy needs of the province in a manner that is safe, reliable, and environmentally sustainable while meeting any current and expected federal environmental standards and regulations and

maintaining a focus on affordability for Saskatchewan residents today and into the future?

Each presentation should be limited to 15 minutes. We have set aside time to follow for question and answer. I will direct questioning and recognize each member that is to speak. Members are not permitted to engage witnesses in any debate and witnesses are not permitted to ask questions of committee members.

I would also like to remind witnesses that any written submissions presented to the committee will become public documents.

With that, please introduce yourself and go ahead with your presentation.

Presenter: Clean Green Regina

Ms. Grass: — Mr. Chairman and committee members, thank you for allowing us the opportunity to share our views and ideas with you this afternoon.

Clean Green Regina is a non-partisan coalition of organizations and individuals. We promote clean green energy as an alternative to the expansion of the nuclear industry in Saskatchewan. At present organizational members from this growing coalition are Regina Citizens for a Nuclear-Free Society, Regina EcoLiving, Council of Canadians Regina chapter, Regina Public Interest Research Group, and Kairos Regina. Clean Green Regina also works with the larger provincial coalition, Clean Green Saskatchewan. My name is Elaine Grass and with me is Cathy Gibson and Sylvie Roy.

Each of us had different careers in the health field — nursing, nutrition, and pharmacy. It was not our similar chosen fields that brought us together but our divergent interests and our volunteer experiences. To the best of my knowledge, we do not stand to gain materially no matter what forms of energy are recommended by the committee.

Ms. Gibson: — I'm going to read our vision statement. We have a vision of Saskatchewan with the lowest per capita greenhouse gases by 2030. We have a vision of a unique centre of excellence in green energy in each SIAST [Saskatchewan Institute of Applied Science and Technology] and university campus to enhance the potential of the best form of sustainable energy, be it wind, solar — either passive or photovoltaic — biomass, hydroelectric, or geothermal for each region. This vision includes stable, local jobs in all fields of green energy from design to manufacture to installation and to maintenance. It includes financial stability for those who have the energy installations on their land.

We have a vision of Saskatchewan in which the mining and export of rare earth minerals replace the mining and export of uranium. We have a vision of a province that embraces the four distinct seasons and lives in harmony with nature. We have a vision of Saskatchewan with no one living in poverty and at the other end of the scale, where 6 of the top 10 earners are not professional athletes employed outside of the province. This is a vision that can only be achieved with forward-thinking political will and a decision to invest in energy that is green instead of

pouring billions of dollars into trying to clean the energy from the fossil fuels.

Our presentation outline is: the question asked; conservation and efficiency; the lack of an energy policy; the main objective as we see it; the nuclear issue; and a conclusion.

The question as presented completely discounts the importance of conservation and efficiency. European countries that have four, five, or more times the population of Saskatchewan use equal or less amounts of electric power than we do. From childhood, they have learned to not waste resources. Here in Saskatchewan we leave lights on unnecessarily; take 30-minute long, hot showers; drive gas guzzlers, let them idle too long; and in the hot weather, we run our air conditioners set so low that occupants of buildings and vehicles have to wear long-sleeved sweaters.

We need to change our behaviour and we need various types of incentives that have overall appeal. In the October 12 to 19, 2009 edition of *MacLean's*, the question is asked:

Are higher water, [electric] and food bills just what we need to force us to conserve?

... For starters, we should stop government subsidies that actively encourage people to waste resources. If something is cheap, we waste it — so why do governments insist on policies that keep prices low for water, electricity and food?

... The truth is, when we implore people to adopt sustainable practices, what we're really suggesting is that they voluntarily lower their standard of living now for the sake of future generations they will likely never know.

Now this very final sentence is one that we do not agree with, unless the reality is that a lower standard of living equates to a higher quality of life. Sustainability and quality of life are not and should not be mutually exclusive.

Looking elsewhere, California is 40 per cent more energy efficient than any other state. Who knew? Its energy mix includes 23 per cent renewables and 15 per cent coal. Although it has the highest price per unit of energy, Californians have the lowest bills due to their efficiencies. Sweden put a price on carbon emissions of \$120 per tonne and achieved reductions of 8 per cent below their 1990 emission levels while growing their economy by 44 per cent. This is a quote from David Suzuki when he was interviewed on CBC [Canadian Broadcasting Corporation] National. He reminded us that nature does not know boundaries and that CO₂ pollution is international no matter how hard countries try to be protectionist. There are many more examples that show that you do not have to choose between the environment and the economy.

The question we are to answer refers to potential regulations and cap and trade and carbon credits. The Government of Saskatchewan should be applauded for its aim to keep these transactions within the province. In other countries, there already are situations of unscrupulous carbon trading practices making millionaires into billionaires with no new carbon sinks being created and no benefit to the environment.

Okay. In the original form, the question talks about growing energy needs. Now pay attention, this is a long sentence: how should the government best address areas of conservation and efficiency to lower the present energy consumption and meet growth requirements within the current level of production in a manner that is safe, reliable, environmentally sustainable while meeting any current and expected federal environmental standards and regulations and maintaining a focus on affordability for Saskatchewan residents today and in the future?

Okay. So we're going to talk about conservation and efficiency. If we conserve energy, it follows that we will reduce greenhouse gas emissions and save money. However if we want to improve efficiency and not have to revert to a spartan lifestyle, there will be some one-time extra expenses in the process of going green. There are already in place incentive programs, including rebates and no PST, for energy-efficient purchases.

What else could be done? Well we could have building permits that require a minimum from a choice of examples of energy-efficient systems that need to be in the plans, as well as a minimum from another group of examples that could be roughed-in for the future. The cost of the building permits could be inversely proportional to the number of energy-efficient systems contained in the plans.

The highway speed limit could be reduced. There could be increased public transportation and a return to the use of rail. There could be high-speed passenger trains between the downtowns of major cities, starting with Regina and Saskatoon. There are many exciting examples of innovative energy-efficient systems in place or in the works, systems such as the district heating service project that is proposed for Maple Leaf Park here in Regina.

Another aspect of conservation might be rethinking the premise that it is necessary to accommodate winter sports in summer and summer sports in winter. How many people really benefit because the Stanley Cup playoffs run into June? Does it not take more energy to keep ice conditions optimal in June as compared with February? Likewise why was the 2009 Grey Cup game played six weeks later than it was 33 years ago? It would be much simpler to lobby for an earlier start to a slightly shorter season than to build domed stadiums.

We should stop insisting on having every item of food, no matter how exotic, available 12 months of the year. We don't consider the cause and effect when we pay four times the price for food items that have travelled halfway around the world and that taste like mouldy cardboard. There is a really good reason for trying to eat local foods in season.

We recognize that our proposal of conservation and efficiency will only go so far. We will need new renewable sources of energy and smart grids to complete our vision. There are many forms of green energy, each with a set of conditions in which they perform to the greatest advantage. What works well in the southwest of the province may not work at all in the northwest.

It is fortunate that many jurisdictions are miles ahead of Saskatchewan in a lot of these areas. Hopefully we can learn

from the successes as well as from the failures of others. The diversion of corn from food and feed industries to ethanol production is a good example of what not to do. Not only did it play havoc with the bottom line for the farmers who raised corn-fed cattle and chickens, but the overall reduction in greenhouse gases was less than expected. On the other hand, ethanol made from the cellulosic remains of the cornstalks has a much better picture.

How can we best use our energy resources? Individuals and corporations and various forms of government should approach problems in general and this issue in particular by examining our motives and being careful to distinguish our needs from our wants. We need a certain amount of energy for light and heat and reasonable electronics uses and at a reasonable price.

In order to protect our environment and at the same time reduce greenhouse gas emissions, we should be prepared to pay a higher rate to satisfy our wants, especially when it involves the use of fossil fuels. The concept of a lowering of cost, unit cost for those who consume the most has no place here.

This inquiry on energy has received presentations from SaskPower, but to my knowledge, there has not been a presentation from SaskEnergy. But it has the name energy. Where does it fit in?

Okay. We believe there is a lack of an energy policy. We agree with other presenters who have recommended that the Saskatchewan energy policy should be a seven-generation one, for it is the generations to come that will be responsible for seeing it through. We do not want the decisions of today to be the burden of the future. We do not want our selfish disinterest in what will happen in the future to be our legacy to our children and our children's children. So as many of those seven generations as possible should be involved in formulating this energy policy.

And we offer the Earth Charter as a starting point. We agree with other presenters that the policy on energy needs to be integrated with policies on food, water, transportation, and other related areas. We know we could make a much bigger impact on reducing emissions if we were allowed to tackle the area of transportation, particularly air travel.

[13:15]

As for food, few of us follow that 100-mile diet even during the short growing season in our province. Most of us follow the 1,500-mile diet which is the average distance between a producer and a grocer all year round. Backyard gardens, root cellars, and home canning are but a distant memory. Back in those good old days when the sun provided most of the energy for growing food, it took one calorie of fossil fuels to grow two calories of food. Today fossil fuels for transportation and fertilizer dominate this industry, and it takes 10 calories of fossil fuels to produce one calorie of food.

The importance of having integrated policies cannot be overstated. So our recommendations for our energy policy are we recommend that it be established in broad strokes. However the specifics should be fluid enough to reflect the rapidly changing economics of renewables.

We recommend the establishment of a minimum reserve of fossil fuels below which there will be no out-of-province exportation. We urge Saskatchewan to lead the return to a Canada-first energy policy. Why are we exporting huge percentages of our crude oil and natural gas to the US while Eastern Canada is importing from the Middle East?

We want renewable sources of energy to be incorporated in a well-planned manner and with the objective of being the predominant source of energy by 2020. Would it be possible to get all energy from renewables? Yes, according to an article in the November 2009 issue of *Scientific American* in the feature piece which was entitled, "A Plan for a Sustainable Future: how to get all energy from wind, water and solar power by 2030." Here's where Saskatchewan would be in a good position because of having really good mines with the rare earth minerals in, and that was the one scarcity that they note would be a hurdle in going sustainable.

We suggest looking at Ontario's green energy plans, particularly in the area of helping small — that is under 100 kilowatt — producers, the farmers, First Nations, rural municipalities to sell, initially at a premium, their excess green power to SaskPower. This would further enhance SaskPower's green initiatives and provide some income stability where it is greatly needed.

We acknowledge that the current — pun intended — infrastructure in this province is badly in need of treatment, and the cost for this will be high. The timing however couldn't be better, and the upgrade can reflect the needs of the future.

The past practice of neglecting ongoing maintenance must change. We want the government to establish a minimum annual percentage of energy revenue to be earmarked and used for ongoing maintenance, with a small amount going to a contingency sub-fund. It is far too easy to lose track of revenue when it all goes into the general funds and is disbursed for other uses. Over to you.

Ms. Roy: — The main objective as we see it. The amount of electricity generated from coal ranges between 45 and 70 per cent, with 63 per cent figure that I saw by the Natural Resources Canada, depending upon the reference used.

Burning coal produces carbon dioxide and also sulphur and nitrous oxides and other particulates that contribute to climate change, pollution, and health problems. Two-thirds of the energy from the lignite is lost through the smokestack. Phasing out coal should be a top priority in this province, but phasing out coal should not diminish the important role that coal miners worldwide have played for centuries. Gradually closing the doors on coal must be matched with opening the doors to stable jobs and green energy projects in the coal belt.

We applaud the initiative from SaskPower in helping consumers with retrofitting and lowering their consumption of energy, in net metering, and for the plans to increase the percentage of wind power. In order of importance and with the view to invest value, our recommendations are to increase efficiency and decrease consumption, increase the dependence on renewable energy, and increase the decentralization of energy sources, but maintain a strong provincial government

policies.

The first recommendation is virtually free, and the other two can be achieved with the \$23 billion it would take to make the current coal power clean. To start with, the government needs to change policies that undermine efforts at energy conservation. It must also ensure that public policies and incentives reflect the importance of the role we must accept in dealing with the global climate crisis; start rewarding and stop penalizing those who embrace green energy; and start penalizing and stop rewarding, with for example a lower per kilowatt rate, for increased consumption; and start charging more for higher use.

Invest in a study to develop sustainable energy best suited for Saskatchewan. The Pembina Institute, as an example, works with communities to help them achieve their goals of a clean and green future. There is not one magic bullet that will overnight replace coal. Instead a diversification of energy sources with strong central public policies as was suggested by Schumacher, an economist who wrote *Small is Beautiful*, is the direction we should take.

The rudder of a ship is small, and yet it has the power to change the direction of that ship. So public policies are the rudder of our energy ship. The issue of clean coal and carbon capture and sequestering are hugely expensive and largely uncharted. So for a start, an additional 30 per cent coal has to be burned just to capture the carbon. This is an issue that can be left on the back burner while immediate efforts go into addressing the need for green energy.

The advantages of green are many. The ongoing costs are lower and predictable and not subject to market volatility. It is environmentally safe and friendly, and the energy input costs are a small fraction of the energy output.

Ms. Gibson: — The last one is the nuclear issue. A question that was asked, usually in the first phase of these sessions, related to the possible role for nuclear power. If we were to be asked our opinion, the answer would be: when the sun no longer shines, when the winds cease to blow, when the lakes and the rivers dry up, then and only then there might be a place for nuclear power. And this applies, no matter the size.

Hopefully this answer will save the people of Saskatchewan from having to fund another ill-conceived uranium development partnership in 2020 to look again at the nuclear power. Should the government of that future day not heed this suggestion, I hope it would give only its blessing to a study and let the proponents pay. That is certainly what should have been done in 2008-09. Not only did the study just look at uranium. Okay, granted, that was the mandate. It failed to make the case that it would be economically attractive or that it was technically sound and feasible. It did not even address the aspects of it being environmentally appropriate and socially acceptable. I think the Minister of Finance should be asking for our money back.

The use of uranium from Saskatchewan to produce atomic energy was born in secrecy. There is very little in the line of openness and transparency until circumstances such as a news leak about a reactor leak bring it to our attention.

Proponents of nuclear power take advantage of the lack of published literature on the dangers of radiation in all phases of the uranium cycle. Few would admit to knowing that the International Atomic Energy Agency for over 50 years has had the power to prevent World Health Organization from publishing studies on the dangers of radiation. In addition jurisdictions that do have nuclear power plants had neither the time nor possibly the foresight to establish the baseline cancer incidence or cancer death rate prior to installation of their power plants.

What we do have, however, is information on the decrease in childhood cancer incidence and the decrease in infant death rates after reactors are closed. The area measured was up to 40 miles downwind of a reactor. The average decrease of cancer incidence was 23.9 per cent as compared with an overall US increase of point three per cent. And the average decrease of infant deaths in the study was 17.3 per cent compared with an overall US decrease due to the improved treatment protocols of 5.6 per cent. These are compelling numbers. I would not want any of my family members living near a nuclear power plant.

And at this point I would like to say that when I heard about the possibility of nuclear power in Saskatchewan, I wasn't entirely against it nor was I avidly for it. I have spent many months in the United Kingdom where nuclear power plants, with the distinctive but ugly cooling towers, dot the countryside. I've toured Pickering installation, and I've always known about the Chalk River reactor. I have even been to Los Alamos, home of the famous atomic bomb.

Yet I still wanted to learn more about nuclear. The more I learned, the less I liked it. I was fortunate to be directed to material written by authors who had nothing to gain and a lot to lose, and indeed lost a lot — a farm, a business, health, wealth, and marriage. Yet they persisted in bringing an unbiased perspective to print.

The issue of nuclear waste management recently was brought back to the attention of the citizens of Saskatchewan and presented as possibly an attractive financial boon to some willing community. Granted it was well presented, and there are extensive criteria, mainly geological, that must be met.

The fact is, there is nuclear waste, mostly in the form of spent fuel rods, and that needs to be dealt with. The fact also is that 90 per cent of it is in the province of Ontario. It makes no sense to truck the 5 per cent from New Brunswick and then pick up the 5 per cent in Quebec and the 90 per cent in Ontario and then take it through Manitoba and bring it to Saskatchewan.

But more importantly than that, coming to Saskatchewan could open the door to having all the uranium originally from Saskatchewan being returned to Saskatchewan. We would have to have our license plates changed from the Land of Living Skies to world's biggest nuclear dump. Someone even raised a more horrific picture. What if we had to accept the waste of every single product exported by our province?

So in conclusion, let us reduce our dependence on fossil fuels. Let us get our energy from sustainable and green technology that has no . . . negligible amounts of greenhouse and other noxious gases. My tongue is tangled. Let us not pour billions of

dollars into trying to make carbon-producing energy green. Let us close the chapter on nuclear. Let us consider the effects of our actions on the generations that follow. Let us leave a legacy wherein our needs will be taken care of, and wants can be identified for what they are and then prioritized, and greed no longer exists. Thank you.

The Chair: — Thank you very much for your presentation. You're a group of people who can speak very quickly and articulately. I thought you were joking when you were telling me how fast you had to talk, but well done.

As Chair I've learned that if I don't go first, I don't get in at the end, so I'm going to lead off. Earlier on you talked about the conservation angle and unless people are paying . . . unless you're charging a large amount, people aren't going to conserve.

A presentation that we had earlier stuck with me. There was someone that said in the olden days they carried their water from the well into their house, and when you do that, you don't waste it. And I had an uncle years ago told me that to this day when he fills up his sink, he fills it up about this much and just can't bring himself, because he spent his youth carrying water, even now it comes through the tap, he doesn't waste it.

And another theme that we've had is many presenters have pointed the finger at their children, that they have to run around the house turning the lights off from the rooms their children are in, and I think that probably is a generational divide.

And I guess I want to throw it back to you for maybe some more comments as to, one, we can as a society or as the decision-makers or as a committee make recommendations that we increase the price of electricity substantially. And we'll certainly have the mothers and fathers more vigilantly chasing their children around the house getting them to turn off the lights. But you know, we're transitioning from a generation that hauled water to one that has never done that.

Educating our youth or what mechanism . . . I say charging adults more for electricity, you still might not be getting to the root of the problem with the next generation that hasn't had that experience. Do you have suggestions? Have you seen it work anywhere else where . . .

Ms. Gibson: — I do. I spent a lot of time camping, and when you had a shower you had to put money in. You learned to shower within the quarter or the dollar or whatever it was.

Thinking, for myself, if we even charged more at certain times of the day, like I find myself running the dishwasher, making supper. I have a television set on that I can't hardly see, but I can maybe hear. And if I knew that between 6 and 7 I was going to be paying three times the amount, I would think twice. I would hold off on the dishwasher. I wouldn't bother with the television, and I would just stick to getting the meal made.

Another thought that I had is that I know that the libraries lend pedometers. I believe they're supplied by the health unit so that people can start learning how to use a pedometer and seeing how far they have to walk to do their 10,000 steps or whatever.

There's also those \$100 Black & Decker little machines that you can take into the various rooms in your house and find out whether you're using a lot of unknown electricity. I think this would be a wonderful thing for SaskPower to provide to the libraries because once you know where your problems are, you solve them. Why should you have this \$100 machine? So that would be a suggestion.

I'd like to see timers put on lights. That would save the parents from running around afterward. And I think we've got a couple of hotels in the city where, when you walk into the washroom the lights come on and hopefully stay on until you're finished, and then they go off when you leave. So that would be ideas that I would have. Do you have any?

Ms. Roy: — Well one of the ideas I thought was when I was looking at the rates for example, and the residential rates are slightly higher. The business rates were about 8 cents per kilowatt hours, but then beyond a certain level — I think it was 50 000 kilowatt hour — then the fee, the rate had dropped to about half. So I thought okay, here we have . . . And then I was talking to my son who's interested in economics. And he said, well it's the economy of scale. You know, if you use more, it's cheaper for SaskPower to use it. And the cheapest fees were actually in the oilfield. That's where the cheapest rate of electricity is.

But looking at it in a different way where, you know, there is . . . we have a built-in incentive in here to have people say, well why . . . On one hand SaskPower is saying, let's encourage people to save. On the other, the rebates are the more you use, the cheaper the energy is per rate.

[13:30]

So a suggestion would be to increase the rate as people use or provide incentive for people to use less. So instead of saying I will give it to you cheaper, it could be that the base energy would be a cheaper rate. And as people use more, then they would pay a higher rate for the more energy that they use.

And also maybe incentive in terms of, you know, the size of houses. A lot of people have large houses for two people. And you know, I live in a family of . . . There is six people living in my family. It's not that big, but a few years ago I had an audit done. And they were saying the base, that the average family of four was using about twice as much energy as my family of six. And this was assuming the fact that most people were gone during the day, and I was home with young children. So I thought, well I don't know what people were doing, but there almost built in a fact that we don't really . . . Sometimes penalizing is not a very good way, but providing incentives to do what we want, that's the way to go.

So if we put, you know . . . Everybody maybe needs basic electricity so we say, okay, for a family of four what's the cheapest, you know, what's the smallest amount of money that you can function and that energy could be cheap? And then, you know, then penalize the people who are leaving their lights on and all that by providing, you know, a scale fee — the more you use for things that are not necessary then the more you have to pay. Anyway so that's one of the things that I think that could be encouraging.

And then providing incentive for people also. Like I know we changed our furnace to a high-energy furnace. It was kind of a program there and we got a rebate to buy it and it came . . . With the rebate actually it was not more expensive to buy a 95 per cent furnace efficient as opposed to an 80 per cent. So then, you know, that's what we did. So I think providing really strong incentives for people to do the right thing is another good way.

And then it's not like, you know, nobody wants to be policing everybody's energy but, you know, if we have scale fee . . . Because when people have to pay then they pay attention. Anyway that's my view, suggestion.

Ms. Grass: — I think getting children involved in the process is very important. I think if children in schools had to prepare sort of mock presentations to a committee to reduce the amount of electricity that they would get really interested and they would come up with a lot of innovative ideas. So what's missing in this whole process are the young people that have very good ideas and really care about the Earth and really want to do something.

The Chair: — Okay. Thank you. Mr. Weekes.

Mr. Weekes: — Thank you, Mr. Chair. Thank you for your presentation. You're so right on, you know. Our society is a consumer society and very wasteful. There's no doubt about that, but it's obviously going to be part of what we have to do is to go back to some old ways, I think, in conserving but it's certainly not a . . . You know, education is a big part of that, and incentives.

I guess my next point is about the cost of electricity and what the consumer and industry is going to be willing to pay or should pay. Part of this whole mix is the cost to SaskPower now. As you noted, the infrastructure has been neglected during the NDP [New Democratic Party] years of rule and so now as our new government . . . Well we have to play with the cards that we've been dealt and that's part of the huge investment that has to take place in SaskPower. I believe SaskPower's is \$15 billion worth of investment. So you take that cost in and the whole issue around carbon, the environment. There's some very difficult choices to be made and, you know, we have to go from today's world to the ideal world, which I think most people would agree on we need to get. But how do we get there? And it's obviously going to be a major investment.

So I guess I'd just love for you to have an answer, X number of dollars everyone's willing to pay. But in general, what are your thoughts on that? I mean how much . . . You also talked about incentive to conserve by raising prices, but at some point it becomes counterproductive. What are your thoughts on the range of what people are willing to pay for power, electricity?

Ms. Roy: — You know, I would sometimes wonder with electricity if the way we look at it . . . Okay, I grew up . . . There were no computers. And you guys are all, well probably you remember in the days when there were no computers; there was a computer in one of the main rooms. And we were thinking of it as, if they had told me then that you could go at some point when I was like 50 years old and take my little laptop here and go somewhere and I'd be in contact with all sorts of other people, everybody would have said, are you

crazy? This is not possible. That was impossible.

And sometimes I wonder the energy problem that we have — no, not an energy problem, but the energy question that we ask — we keep thinking maybe of it in the same way that we thought of computers. It needs to be in one place. It needs to be big. But maybe the solution is it needs to be decentralized and, you know, it needs to be on a smaller scale.

So I think all the suggestions that we have, we're not going to find one major, you know . . . And this I've read over and over: there's not one source of energy that's going to fit the bill for coal or fit the bill for something. But we need to start thinking of energy needs maybe in a different way.

You know, when we look at lights for example, and we have now new energy, well there's these lights . . . I know my husband goes and changes all the lights, and those lights take very little energy to run. And yet we still have lights. And so there's kind of a question where people don't want to be dining, like we don't want to be living in the dark with cold houses. But there are solutions that are there.

There's a man called Amory Lovins who has, you know, has an institute in the States where if you go see his place, he said, I like cold beer and I like warm water. You know, hot baths and cold beer — it's important to have those. And his whole house and his whole institute, it's amazing technology that they find . . . that they run the place. It's comfortable, and yet it's all based on different things that can be recycled, reused, and, you know, new way of looking at things.

So I think sometimes it's . . . I don't really have an answer here. You're saying, like how much are people willing to pay? But I think maybe what we need is kind of leadership into looking at the question in a different way. How can everybody have, you know, how can we be comfortable and what are these new technologies?

And I think you had Tim Weis who presented here. And he was a presenter . . . He works for the Pembina Institute. And have him come and, you know, look at what can be done in this province. He goes and works with communities. That's what the Pembina Institute do. They go and work with a community to see how they can make them sustainable and, you know, answer their energy needs. So I think there's a lot of answers that are out there.

And I think people are ready to pay something. Like when the wind power was brought in, then there was some people who said, well I'm ready to pay for that because this is important. But in some ways what that did was, the people who believe in clean energy had to pay more and the people using dirty energy paid less. So the day that we see that this is very important and we're ready to put energy . . . I think people want to be able to have a, you know, a decent way of living. They want to pay something but we should also see that, you know, there are many, that we should encourage the conservation and encourage the savings like that and, you know, putting in the infrastructure and seeing the savings in the future too.

So if we do have a windmill, okay it costs, but we have windmill running and, you know, the wind is still free, so in the

long run it's going to be cost-effective. So those are the kind of thing that we should, I think, put the money in.

Ms. Gibson: — Okay. Did you want another . . .

Mr. Weekes: — If you have another comment, sure.

Ms. Gibson: — Yes. I've been sort of tracking my energy, gas and electricity, and every year I use less and every year I pay more. So I'm already used to that. So you can, you know . . . I mean if I thought what I used this past year and I took it to the prices of this year to the use of 2000, then I'd have a better idea. And maybe we have to do that. Maybe we have to show people that if we start using less, the prices are going up so you don't really see a monetary change but you do see a usage change. And if you just compare . . . No, I guess you'd have to do the use of 2000 in today's prices to see the difference.

That's one thing. But this example we gave of California, their energy per unit is the highest price but the people pay the least amount of money because they have the efficiencies.

And I can just give you a little bit of a reference to a man named Bill Wong. He came to City Hall in Regina a couple of months ago. He was doing that presentation on the Maple Leaf Park estates where they want to use reclaimed water and have district heating. And in part of his presentation, they had figured out how much people were willing to pay. I think it's 10 per cent. But it might be 10 per cent . . . It's more likely to be 10 per cent higher on the price of their house to have the energy-efficient things in there. So people are willing to pay.

Ms. Grass: — I was just going to add that remember, keep in mind that the technology for renewables is becoming so efficient and the advances are growing so fast that the renewables is becoming cheaper where the fossil fuels are becoming more expensive. And certainly as we start running out of fossil fuels, they're going to be even more expensive. Like how much do we expect to be paying for gas and oil in the future?

So I think if we just get behind the renewables and put some money into it, we'll find that it isn't as expensive as we think and we aren't going to have to pay that much more after we change the infrastructure. And that's going to happen no matter what. So we really can't look at that as a cost to one or the other, I guess.

Mr. Weekes: — Thanks.

The Chair: — Mr. Belanger.

Mr. Belanger: — Yes, thank you very much. I want to thank you for your presentation because it's really important that we let people know that the information that you present at these forums are valuable, and they are making a significant difference to those that are trying to grapple with this whole issue of power generation.

And what is insulting to the whole process is when people try and politicize it by saying, well the NDP didn't do these things when they were in power. And I apologize for that because this is too important to be partisan. It's really too important to be

partisan.

And quite frankly, when you look at the notion of power generation — whether it's telephone companies or it's a city's infrastructure or if it's power generation — right across the country, every jurisdiction in North America is struggling to try and design a new system for delivery of those services. So Saskatchewan is not immune to it. And it's not about, oh these guys didn't do that then, you know. We could easily argue that it took us 14 years to clean up their mess, but I'm not going to go there.

The point that's important, I think, is that under the UDP process, \$3 million was spent. Zero dollars was spent on this process of looking at the renewable energy options. And some of the ideas that you've presented today, other groups have presented as well. But what happens when you come and you complement that, it really strengthens the case for the renewable energy conservation and so on and so forth. All these arguments are really starting to hit home.

So I guess the question that I would ask of you today in terms of the resources necessary to really undertake the studies that you're talking about, the cleaner green city and the province, what kind of resources do you think would be adequate for meeting some of those needs?

Ms. Gibson: — Do you mean money resources or people resources?

Mr. Belanger: — Money. Like the awareness campaign you're talking about, the metering campaign you're talking about, have you done any research in that regard? Because others have. I just wanted to see if you have as well.

Ms. Gibson: — Not actually, except that we look at the amount of money that's been spent on other foolish things. And if it's going to take \$23 billion to make the coal green and clean, then that money could be better spent going into the renewables.

But there's a lot . . . I'm amazed. When I started looking into this part, I was totally amazed at how much is going on and how many programs are on television and showing farmers getting together and having a wind farm among them.

[13:45]

And one that I just watched out of Minnesota they had . . . In about two years the farmers had recovered their investment. The farmers actually did some investment, and then they had another bigger investor who could use the tax credits that the farmers couldn't use, so he got his money with the tax credit. And at the end of 10 years, these windmills are all owned by the farmers, and they're operated by them. And one industry said, we're going to come in and you can make blades here in this little, small town in midwest Minnesota or something like that.

So obstacles are just problems that we haven't yet solved, and I think of all provinces, Saskatchewan has the highest per capita innovative thinkers.

Mr. Belanger: — The challenge on the innovation front is we're also probably one of the highest greenhouse gas emitters

per capita as well. So in that regard, I think what's important is that we understand the possibilities but also the challenges.

And I think one of the things that I want to point out as a result of your presentation is, you're right. There's amazing possibilities out there. There are amazing people that are trying to make a difference and it's important that people try and listen to their message. And that's why I say to you today I'm very encouraged by your message. You've complemented other people. So we're getting, time and time again, groups such as yourselves saying, hold it, we need to look at this power generation possibility as a \$15 billion investment and not a \$15 billion environmental deficit. That's, I think, the message that's becoming crystal clear. And I just want to encourage you on that front to continue fighting for that because it is working and it is having a positive effect. So thank you very much.

Ms. Gibson: — Thank you.

The Chair: — Mr. Weekes.

Mr. Weekes: — Just the next topic. It's interesting. You speak of Sweden having . . . putting a price on carbon and reducing their carbon emissions 8 per cent below 1990. But they did it though on the back of nuclear power, didn't they? I'm sure that they have a lot of nuclear production, electrical production, and that's how they did it. I don't have the numbers in front of me.

Ms. Gibson: — Yes.

Mr. Weekes: — But I'm sure that's how they did it.

Ms. Gibson: — I don't know. And I don't think David Suzuki is actually a fan of nuclear power so I doubt very much that he would have used them as an example. But possibly, you know, that could possibly be it. I mean if they already had some nuclear power going and then that might be the way they do it, but in which case they haven't taken the environmental costs of radiation into effect or the health costs anyways.

Mr. Weekes: — Just to move on to your comments about the — well you didn't state it — but the UDP [Uranium Development Partnership] process, Perrins report and this legislative committee and the cost. I guess I want to make the comment that democracy doesn't come cheap or inexpensive. And there was a process the government went into and I think most people were under the impression that we were hell-bent on building this nuclear power plant, and as it turned out we're not at all.

So I just want to comment on that the whole public consultation process was definitely valuable. Now you can argue about the dollars involved but nothing comes inexpensive. And so I just want to make that comment that I think it was very valuable and, you know, a lot of people had preconceived notions about the government's intention were dead wrong as we stated on a government's response to the UDP.

And you know anything . . . And even on the nuclear waste file, you know, our government's been pretty firm on that. We're not going to be a dumping . . . have no intention of being a dumping place for nuclear waste. If you have a nuclear power plant, you have to do something with the waste that you

produce — internally, obviously. But I think our government's response to the UDP we're quite clear on all those areas that we're not going to rush head-on to anything.

I disagree with your concern about safety about nuclear power plants. France produces 80 per cent of its electricity with nuclear power and they store the waste right beside the plant, usually within or near the city limits of their major cities. So certainly we all know about the horror stories about Chernobyl and all those but the new generation plants are very safe. I mean, one of the major drawbacks to nuclear power was the cost of building a nuclear power plant and of upgrading the infrastructure around having one massive generation site and how to get the electricity out to wherever it was going to go, whether domestically in Saskatchewan or Alberta oil sands or export to the United States.

I guess I don't have a question. But if you want to comment on that, go ahead.

Ms. Roy: — I'd like to comment. I think one of the reasons why we mentioned the UDP report, and we were involved with that, is we just said there were \$2 million that went in the question of what we can do with the uranium because we do produce uranium here. So that money was put and, you know, there was a committee that was put together and they used that public money.

And whether I agree with it or not, I realize that, you know, there was a process there and I have to admit that the public consultation process was very fair. Dan Perrins did a very good job of reporting what people had said. And I read the report and it did show that the people who commented on it, most of them — you know, 85 to 99 per cent of the people depending on what part of the process — were actually against the whole development of the nuclear power based on the cost and also based on, you know, the question of safety. Depending on what you read or depending on what you believe, but, you know, there is still the question of everybody would agree, yes, if there was not a question of nuclear waste and all that, you know, nuclear power would be great.

So, but I think the reason why we mentioned the UDP is we said there was \$3 million that was given for that committee to see what could be done with uranium. And we don't say that you have to give and, you know, that we should have another 3 million to go into renewables, but what we're saying is we believe that the renewables has an important contribution to make in terms of the problem that we have. I mean, we do have cheap, you know, cheap coal here as long as we keep it dirty, but once we start cleaning it or, you know, we have to do something with it, we have the problem of the emissions. Then when we start looking at that and we start looking at the costs of nuclear and we're saying, you know, renewable, you know, maybe it's time.

We haven't had, as far as we know, a study that has been dedicated to what can the province, what can we do with the renewable in the province. And I know Tim Weis presented earlier with the Pembina Institute and that's why we said, you know, some money could go . . . It doesn't have to be to Pembina. It could be to another organization. But there are, I believe that there are organizations that could come and say,

you know, given this, this is what could be done. So it was not necessarily to say, well the UDP was a waste of money or anything like that. That was a decision that was made. But maybe the decision that can be made now is to allocate some money to look at, really seriously, at the question of the renewable rather than, you know . . . Us, yes, I mean we believe in that.

But I don't have the technical expertise really to tell you this is what you should do. But I know that some of the people do have that expertise and, you know, there could be a committee put together to really look at it seriously and see what . . . you know, how much it would cost in the province and what it is that we could do.

A Member: — One more?

The Chair: — No, I have Mr. Bradshaw.

Mr. Bradshaw: — Thank you, and thank you for coming here with your report. And I guess I wanted to touch on the nuclear end too. In your report you are obviously . . . well you didn't want to have the nuclear end of it. So would you say that we should just quit nuclear completely? Like you were talking about going to . . . rather than going to mining uranium, going to rare earth materials and then change all that around? Is that what you would like to see?

Ms. Gibson: — Me personally, yes. I would like to see the entire uranium industries shut down. And so having closed that door, the door I open is the one on the rare earth elements because they're required for the photovoltaics and we've got apparently an excellent source in northern Saskatchewan. If you've got the geological map, it's about seven-eighths of an inch east of Uranium City on the map. So I mean my feeling is uranium should be left in the ground. It causes nothing but problems. There's so much radon in this province because of the mining of uranium. It travels in the air very quickly.

And if I could do a really political thing and change things around, what I said about the UDP report was that they did not make the case for it being economically attractive, technically sound, and feasible, and that they didn't even address the environmental appropriateness or the social acceptability. These were the four tenets that Richard Florizone said they were meant to have done, and he admitted they didn't try — they didn't even attempt to do the last two. Well they certainly didn't show that it was economically feasible. So that is why I thought it would be a nice idea to ask them for the money back, please.

Mr. Bradshaw: — Can I get one real quick one?

The Chair: — We do have presentations scheduled for the rest of the afternoon. I'm hoping that our presenters, if we do have questions, the committee members on either side could follow up. But for the time being I'd like to thank you very much for your presentation . . .

Ms. Morin: — [Inaudible] . . . possibly stay on for a few extra minutes if the next presenters wouldn't mind waiting for a few extra minutes? The other presenters are in the room. Would you mind waiting an extra few minutes?

The Chair: — We have a presentation now and following. The committee has set aside a certain amount of time for each presentation and it would be inappropriate to continue on. So I thank you very much for your presentation and . . .

Ms. Morin: — Mr. Chair, I'd like a point of order.

The Chair: — Go ahead.

Ms. Morin: — Mr. Chair, you allowed the government members to ask questions twice in this presentation whereas the opposition members raised their hands to ask questions and were not allowed to speak on the microphone once. I find that highly unusual, highly inappropriate.

There is no question that the opposition should have the opportunity to ask questions of these presenters as well as the government members, and in this particular session the time was monopolized by the government members again. So I am asking for a point of order to have a five-minute extension so that the questions can be asked of the presenters with the approval of the next presenters who have already nodded their head and said yes, that they would allow an extension of five minutes into this presentation.

The Chair: — Mr. D'Autremont.

Mr. D'Autremont: — Thank you, Mr. Chairman. On the point of order, I would submit that the member's point of order is not well taken because both of the opposition members were five minutes late in arriving to the meeting. Therefore, that five minutes has already been used up by those members, Mr. Chairman.

The Chair: — Mr. Belanger.

Mr. Belanger: — Well first of all, Mr. Chair, as you are aware for the member to say that we're late five minutes is absolutely false. I arrived here at two minutes to 1. I asked for a quick break to the washroom and I was back here and the proceedings had not begun. So why would the member from Cannington make up such a blatant mistruth here today? Why would he do that?

Primarily because, Mr. Chair . . . We'll ask the Chair to rule on whether we were five minutes late or not and if he says we weren't, I want an apology off you, sir. I want an apology off you because that's unfair and you've been doing that pretty steady, making up these accusations.

I will ask the Chair to rule whether we were five minutes late, and if the Chair rules we were, we accept that . . . [inaudible interjection] . . . No, we'll accept that. And if not, I want an apology off you, sir.

[14:00]

The Chair: — I will state for the record we've had an issue, very rarely but somewhat, a couple of times, on a number of questions getting back and forth. The Vice-Chair and I have made a gentleman's agreement, and it has been stuck to very closely, that no questioner can ask a question after their five minutes has expired. The witnesses may answer the question as

thoroughly as they like and obviously we're not going to cut them off.

As a Chair I've made a point of . . . As people raise their hands, I write their name here along with the time they put their first question in. For the entire day, it is laid out here when hands were raised. Both sides have ended many of our sessions with questions unanswered. And often, if you raise your hand within the first five minutes, you will get in. That's been established.

That being said, I thank our presenters for coming today, presenting to us, and answering our questions. So thank you again.

We will recess for a short two minutes and try and be back at the top of the hour.

[The committee recessed for a period of time.]

The Chair: — Before we hear from our next witness, I'd like to advise witnesses of the process of presentations. I'll be asking all witnesses to introduce themselves and anyone else that may be presenting with them. Please state your name and, if applicable, the position within the organization you represent. If you have written submissions, please advise the committee of them, and they will be tabled and put on our website for public viewing.

The committee has asked all submissions and presentations to be in answer to the following question. The question is: how should the government best meet the growing energy needs of the province in a manner that is safe, reliable, and environmentally sustainable while meeting current and expected federal environmental standards and regulations and maintaining a focus on affordability for Saskatchewan residents today and into the future?

Each presentation should be limited to 15 minutes with question and answer time set aside. I will direct questioning and recognize each member that is to speak. Members are not permitted to engage witnesses in debate, and witnesses are not permitted to ask questions of committee members.

I would also like to remind witnesses that any written submissions presented to the committee will become public documents and will be posted to the committee's website.

With that, please introduce yourselves and go ahead with your presentation.

**Presenter: Regional Centre of Expertise on Education
for Sustainable Development**

Ms. Dahms: — Thank you very much. Today I'm here representing the Saskatchewan Regional Centre of Expertise on Education for Sustainable Development. I'm also a university professor at the University of Regina. And perhaps I'll let my colleagues introduce themselves.

Ms. Arbuthnott: — I'm Katherine Arbuthnott, also a member of the Regional Centre of Expertise, and I'm a professor of psychology at the University of Regina.

Mr. Ellis: — I'm Vic Ellis. And I'm involved with Sustainable Concepts Inc. and I've been in the conservation energy business for 30 years now.

Ms. Dahms: — And I'm delighted that these individuals would accompany me today. So first of all, I wanted to thank you for the opportunity to speak here today. In preparing this presentation, I did a lot of research and I learned a lot. So it was really exciting. And I tried to put myself in the shoes of MLAs [Member of the Legislative Assembly] in which you have to weigh the needs of a number of different constituents. And I realize this is a big job, and so I've tried to come up with a positive solution to the question that was proposed to us today.

I'll give you a very brief outline of the RCE [Regional Centre of Expertise on Education for Sustainable Development] shown if you look at the back screen . . . And I do have a written presentation that you should have all received. On the back screen there you can see a map of Saskatchewan, and the RCE encompasses the area that's shown there in red. It was established in 2007. It started out as an ad hoc committee, at the university, of people that were interested in sustainability. And then it grew into a UN [United Nations] initiative that was coinciding at the same time — oh, okay, sorry; you're having problems hearing me — that was coinciding at the same time.

And so what we're trying to do is transform education on sustainability for the province. And we do this in formal, non-formal, informal ways, and this would include the universities as well as, you know, hands-on workshops, practical applications, and so on. And you can find out more information from that slide.

There's seven areas that initially, before we established the RCE, a number of people got together and identified, things that we thought were of concern to the general public in Saskatchewan. And these included climate change. And you can see the list and how this applies to the question that you're asking today. Sustaining rural communities was an overall arching theme, and also education for sustainable development.

So the question posed to us today, we really appreciate the invitation to be able to answer this question. And we think that our presentation will show you how energy conservation and renewable energy is poised for a safe, reliable, and environmentally sustainable answer to meeting the needs of Saskatchewan energy demands today and into the future.

So first I'll talk a little bit about energy conservation — of which the government, I'm sure, is very well aware and actually has programs related to this — renewable energy generation, and then finally energy transmission and storage.

So I actually didn't know this, that every dollar spent on conserving energy is a savings of approximately \$5 in power generation. And so I think this is quite telling. So the goal is to educate citizens to act responsibly with respect to conservation. And so we can do this by broad-scale educational programs, also through free workshops which the RCE has already engaged in, and practical projects with which my colleague Vic Ellis has a lot of experience.

But we have to reinforce this behaviour somehow. And Dr.

Arbutnott can tell us all about how this becomes a bit of a challenge. And so one of the things that we can think about is possibly tax incentives. I realize that this effectively is bribery, but if you want to have something done, then providing a monetary incentive is often a good way to go.

So I was also interested to learn that buildings are actually responsible, half the world's greenhouse gas emissions and also one-third of the material that flows worldwide. So the idea here is now to retrofit homes, businesses, government buildings with a whole series of renewable energy sources. And you can have a look at appendix A for guidelines related to that.

This becomes, you know, something that could be implemented by the government. We could come up with provincial programs to assess the energy efficiency, with which Mr. Ellis has a great deal of experience, for existing buildings and then making improvements based on this. This ultimately is going to provide jobs and stimulate the economy.

And further, you know, the government could say, look if you're going to build a new building, it has to be sustainable. And I think if the builders are not willing to make that commitment, then you can say, well then I'm sorry; you can't build that building. So if you can't make the building sustainable, then don't build at all. And I think again this is something provincially that we could implement as a regulation within the province.

So we can also, you know, the government could capitalize on higher educational organizations to be able to come up with, you know, educational opportunities and also research opportunities in renewable energy — so you know, install geothermal, solar, and so on at campuses of U of R [University of Regina] and U of S [University of Saskatchewan] — and then you have researchers look at how that reduces the energy load in those places.

When we talk about renewable energy generation, we can take lessons from biodiversity. So here's a picture of the prairie showing the wide biodiversity. In ecological systems, monoculture is a killer. So just like that we can use the same model. So for energy needs, we can use a number of different renewable energy sources to come up with, to meet our needs of energy generation.

Mark Jacobson is a professor at Stanford University who's done a lot of analysis on how to meet the energy needs in the US, and he comes up with a series of renewable sources including solar, geothermal, and wind as excellent options to meet these needs. Unfortunately he finds that coal and carbon capture storage and nuclear offer less benefit and represent an opportunity cost loss — so a loss of cost — and biofuel options actually have the most negative impacts. So that's what his research finds.

So with respect to renewable energy generation, we have wind, solar, micro hydro, biomass — all those viable options — in Saskatchewan. The power that we use for heating for instance can be complemented by ground source heating, geothermal, and solar water heating. And then I'll talk about the implementation and actually baseload.

So with respect to wind, this renewable energy source has the

lowest footprint with respect to all renewable energy sources. And this is what Mark Jacobson finds. The critics will point out that wind does not blow continuously. But if you sample it from different areas within Saskatchewan, have a distributed network, then you have a much better opportunity to have continuous energy flow.

So currently now it's limited to the Southwest region in the province, which is an excellent choice because there's high wind velocities there. But this exaggerates unreliability, and if we just expand to different areas within the province, then we can overcome some unreliability issues.

My colleague at the University of Winnipeg studies bats and birds. And obviously there's a problem with wind generation; it's killing bats and birds. But there are some really simple solutions to these fatalities by putting wind turbines in situations where they're not coinciding with migration paths, restricting the height and the size, rotor size, for the wind turbines. And fortunately these fatalities actually happen when wind speeds are the lowest. So you can just cut the wind turbine at that point or reduce the feed-in speeds of the turbines, raise the cut-in speeds of the turbines, and this will actually reduce or eliminate loss of wildlife.

Noise issues can be solved by using electric gearing systems as well, and that's work by Hansen.

[14:15]

I think one of the really exciting things is solar. This is actually an image of a planned community in Alberta, and you can see the solar panels implemented into this scheme. And so you can use this both for electricity generation and also for heating through water.

So what if we install a solar panel in every house, building in Saskatchewan? Certainly the Saskatchewan Research Council is providing financial and facilitation incentives for larger facilities to implement solar power. Everything that the SRC [Saskatchewan Research Council] learns from this project can be directly applied to Saskatchewan's residential sector.

The really exciting thing is that you're going to have an economy boost because you're going to be training professionals, retraining professionals in installation. And then once installations are largely complete, then you can have repair and replacement. So you can have a continual upgrade of skills, localized jobs so people do not have to leave their communities to pursue those jobs.

Another really exciting opportunity for agricultural and lumber sectors is biomass. So you can actually take biomass and burn it, or you can create gas from the biomass through the conversion through micro-organisms, and then you can burn that gas and you can create both electricity and heat. So you can see that cogeneration actually sort of follows out of the biomass idea.

There's a pig farm in which they take the manure, produces methane. They trap the gas. They use that to generate all their electricity, all their heating for their entire hog farm, and then they actually sell energy back to the grid. Okay? And then what

comes out of this is that the manure turns into an environmentally friendly fertilizer that has already lost a significant amount of its carbon to methane.

So we have a massive potential through waste products in Saskatchewan of the agricultural and the lumber sector to in fact take advantage of this. And this I've really already sort of talked about. If there's CO₂ generated, we do have the technology in Saskatchewan to capture and sequester. And I think the really exciting thing here is when you combine the knowledge of the engineers with the microbiologists and you use micro-organisms to convert the CO₂ to something else that's also usable.

Micro-hydro has been incredibly successful in British Columbia and we have lots of opportunity in northern Saskatchewan. This is one of the most benign impacts to the environment because, unlike large-scale hydro, you don't actually disturb the flow of the river. And so you know, numbers have been thrown around, but let's say around 150 . . . [inaudible] . . . of power could be generated from this in northern Saskatchewan. Most of this area is Crown land or First Nations traditional land use areas, and so policies would have to be developed. But ultimately it would provide the potential to stimulate First Nations economies.

Cogeneration, which I've already sort of touched on with respect to biogas, it's a thermodynamically efficient use of fuel, is the way scientists would talk about it. So when electricity is actually produced, some of that energy is actually always lost as heat. And so cogeneration uses this thermal energy either to heat water and fuel turbines or just for heating. So cogeneration reduces greenhouse gas emissions, eliminates waste. It's a cost-effective business model. And so it's actually been adopted by a number of, and I'm sure you're all aware, number of different corporations in Saskatchewan.

But further training of cogeneration and refitting would again create jobs, stimulate economic activity across the province. Some of the energy that we use relates to, you know, furnace fans, electric heaters, and so on. So if we can actually bypass the energy that we use for that, it can go back into the needs, other needs, other electrical needs.

So one of the ideas is ground source heating, geothermal and solar water heating. And this is just an image showing district heating where you have a geothermal source that's actually supplying a whole area of a downtown core through a heat exchanger that heats water and sends, pipes that water to buildings for heating. And so this would be a great model, let's say, for U of R or U of S. You have an entire campus and you can, you know, heat essentially all the buildings relatively passively.

Implementation. So if you have distributed energy then you can have citizens, co-operatives, communities, or Crown utility companies working independently or all together to implement these renewable energy grids. And the thing that's worked the best are feed-in tariffs, which are not to be confused with taxes. They're just a set payment per kilowatt hour for the electricity generated by a renewable resource, and this has been incredibly successful in Germany and Denmark for them to meet their targets. And the components are just guaranteed grid access, long-term electricity producer contracts, and purchase prices

based on the actual cost of renewable energy generation. And everyone is obligated to purchase under those auspices.

And finally, baseload. I guess there's been a lot of talk and argument about whether or not renewable energy could actually be responsible for the baseload. So what we can do is we can actually reduce transmission requirements. So if you distribute the resources, renewable sources of energy, then this is a viable method now to produce baseload power through wind.

You can have multiple energy sources making up the baseload power. So for instance in Saskatchewan, when it's minus 31 a wind generator's not going to be working or when it's not very windy, if it's a clear, cold day in Saskatchewan, you bet the sun's going to be shining. So solar can take over. So you can have realistically, you know, baseload power from wind, solar, and biomass.

And we could also, as backup, coordinate with Manitoba, their hydro production, and then we can provide power to them during their low times. In the short term, I wanted to think about how could we transition, you know. So if we want to transition through natural gas fired cogeneration, but starting from coal and carbon capture and storage, we have that technologies. Okay? So that's where we start, and then we continue through natural gas or biomass and then we move completely into a renewable energy situation.

Finally, smart grids. These are really exciting. Collaborative network technology, what you're doing is you're decreasing the discrepancy between peak and off-peak demand, and these use superconductive transmission lines, which incidentally use rare earth metals. I noticed in the last presentation someone talked about mining rare earth metals. So you have less power loss because you have less resistance in the lines because you're using a superconductor.

You have this built-in intelligent monitoring system that says okay, well when we have a lot of electricity and people are sleeping, we can run our washing machines, and vice versa. SaskTel is a leading innovator in communications industry and they could work with SaskPower and the higher education organizations to actually develop and implement this technology. And so this would provide a situation where you would be training people in Saskatchewan with the latest energy technology. This would be incredibly exciting, students could be involved, you know, paid, unpaid through co-ops or internships.

And then finally, distribution is a no-brainer to look at the use of wind on agricultural land, so here you see some happy cows working with the wind turbines and a geographically distributed system of the wind turbines. And this would provide off-farm work for farmers.

And then storage. As we move into an economy where we'll have more and more electric cars, the Volt electric car is actually capable of storing energy and actually releasing energy back to a smart grid. And so this would be an ideal situation in Saskatchewan where you'd no longer have to worry about starting your car in the morning because the oil is not going to be all gummed up because you don't have any. And so the development of this type of technology in Saskatchewan

provides an incredible research opportunity. Some researchers at MIT [Massachusetts Institute of Technology] have actually just recently developed battery technology, but there's all sorts of other options for storage.

Advantages. What if, in this snowstorm, we had had distributed energy in Saskatchewan? Would we have experienced as much power loss in a decentralized situation?

Recommendations. First of all, energy conservation. This is twofold — motivational and technological. So if motivational is government programs, tax incentives, education programs; technological, development and implementation of smart grids, renewable energy, lots of opportunity for the government to be involved, government-sponsored retraining programs in renewable energy, installation of widely distributed wind farms. And this can be collaborative between individuals, Crown, community, co-operative.

Let's put a solar panel on every single building in Saskatchewan and see what happens to our energy demand.

Incentives for waste biomass generators in the agricultural sectors and the lumber sectors and establish provincial micro-hydro development policy first of all, and then for long-term implementation as we transition fully into a renewable energy system. And then finally, you know, to develop research and training programs.

And I thank you very much for your attention. I realize that is a lot of information, and we would love to entertain questions.

The Chair: — Thank you very much for your presentation. We have some questions. First up is Ms. Morin, then I have Mr. Weekes.

Ms. Morin: — Thank you very much for your presentation here today. I appreciate the fact that you've taken the time to put this together and come and present before us. It's nice to see the wonderful industries and concerned citizens across the province that are taking part in this democratic process of being able to present to their elected officials what their opinions are about the state of the energy economy in the province and what the future of our energy needs should look like going forward.

To build on what was brought up in previous presentations, I just want to reiterate how we got to this process to begin with, and that was the government decided to spend \$3 million on a process called the Uranium Development Partnership, which only examined the energy potential of uranium in the province. It was then when the opposition asked for an energy development partnership rather than just a uranium development partnership to actually look at all of the energy possibilities that we could possibly be pursuing in the province, not just looking at uranium and not just spending \$3 million to look at uranium. And if it was the case that the government wanted to spend \$3 million to look at uranium, that they should also spend \$3 million then to look at all of the alternative energy sources that are possible in the province.

That also the — how should I say? — the issue that was brought forward by the opposition at that time also called for looking at a significant amount of money to be looked at in

terms of energy and conservation. Because, as you have already alluded to, for every dollar on conservation it saves approximately \$5 in energy generation. That is obviously the most cost-effective method for reducing greenhouse gas emissions in the province, not to mention becoming better global citizens in terms of our energy usage.

We also wanted to look at what are the true and . . . well or the most accurate I should say, needs of the province going forward in terms of our energy needs into the future. Clearly that means that the energy needs going forward into the future have to take into account again the energy and conservation incentives that should come from the government in terms of education and in terms of whereas . . . Two different things I guess. One would be the enticement through an incentive and the other one might be the stick, so the carrot and the stick syndrome. I guess one can call it that.

So I just wanted to just, you know, encapsulate how we even came to this democratic process. It was out of the government's response to our call for an energy development partnership that they then agreed to have these public hearings on the future energy needs of the province of Saskatchewan.

I notice in your presentation that you didn't touch on what the previous speakers did, but I'm curious if I may just to pick your brain on this particular issue, and that is the issue of greenhouse gas emission reductions in the province. In the past two years unfortunately we haven't seen any attempt by the government to make any sort of viable move or attempt to reduce the greenhouse gas emissions in the province, despite the fact that there were plans in place already when they came into government in 2007. So we've gone over two years now with any solid plan on reducing greenhouse gas emissions in the province. We've seen the government move from what was a 32 per cent target down to a 20 per cent reduction rate with still no plan attached.

[14:30]

I'm wondering how you feel, how the plan you're bringing forward today, or the concepts I should say that you're bringing forward today and the suggestions, how that will affect reduction of greenhouse gas emissions in the province. Do you feel that it will possibly reach the 20 per cent? Do you think it could even exceed the 20 per cent by the year 2020? What are your thoughts on that?

Ms. Dahms: — Certainly. Oh, and I wanted to mention one thing that we didn't actually mention the UDP. We know that we're probably here because of that, our response to the UDP report, but nuclear is not a renewable option so we didn't even include it in the brief.

With respect to reducing greenhouse gas emissions, yes, I mean it's really exciting going through the literature because when you look at some of the analyses, there's actually, in certain cases, there's sort of negative . . . So you're going carbon debt to the other side. So there's a possibility to come up with a, you know, negative CO₂ production and that's through, generally right now through the biomass industries. You'll have massive reductions in greenhouse gas emissions in this.

And certainly carbon taxes are probably coming down the pipeline from the federal government. So I think that, you know, this is something that we have to consider now. And I think that although, you know, the talks in Copenhagen effectively failed to come up with reasonable targets, I think that it will be happening within the next five years.

So this is something that we have to address now. And if we address it now in Saskatchewan, then we're primed and we're in an excellent position, and we'll end up with an economy in Saskatchewan based on renewable energies. We'll have reduced greenhouse gas emissions and we'll be able to meet targets that will be ultimately set in Canada.

Ms. Morin: — Well my time is up so I'm going to have to defer to one of my other colleagues to ask some more questions. Thank you for answering.

The Chair: — Mr. Weekes.

Mr. Weekes: — Thank you, Mr. Chair. Thank you very much for your presentation. I raised this many times. It's no argument about where we want to be in 10 or 15 or 20 years; it's how to get there. And you spoke a lot about, in your presentation, about baseload, how we have to deal with that. The thing about our province, it is all about baseload — 45 per cent of our electricity is used by, I believe, 50 businesses or industries — not industries but businesses . . . [inaudible] . . . Potash mines are . . . So that baseload is much more important in our province than maybe other jurisdictions.

Just to go back. Talking about baseload, there was a comment about Sweden's power and electricity and reducing their greenhouse gases, and I've got some information on how they've achieved their reductions. Of course they have 10 nuclear power plants producing 40 per cent of the electricity and much of the balance of their electricity is through hydro. So they're able to meet those requirements — one nuclear and the other is hydro.

And certainly shifting a bit from that, but in the Rocky Mountain states — and we have a potential here too — when you have hydro as your baseload and then you can convert a lot to wind, and that's a nice mix, you just turn the hydro on and off as you please. But we just don't have that much hydro to do that.

Ms. Dahms: — No but certainly . . . I didn't actually mention Sweden but I did mention backups being, you know, gas-fired. You could have certain technology that would be quick backups so in that way you have a stockpile of, let's say, gas that you're not using. So you're not generating emissions, but it is a quick backup in case of emergency.

With respect to the nuclear, I mean I did append in the brief — and I asked Stacey not to print it out because it would have been an extra 15 pages — but I did include our analysis of the UDP report in here. And one of the big issues is that . . . Well public versus private, that's a big issue, but also centralized power generation. And so you actually experience an incredible loss of electricity that you've generated through transmission. And that's why the smart grids use the superconductors that include the rare earth metals, because then you have less resistance and

you lose less electricity.

But if you have a distributed system, then you don't have the electricity travelling as far as you would from one base source. So ultimately again, I guess kind of through the principle of conservation in a way, what you're doing with that distributed and smart grid is that you're keeping everything close to where it needs to be. And the idea of having a solar panel on a house, that's exactly where the electricity needs to be. And so then you mitigate some of those issues.

And then I think probably Vic Ellis can speak to some of the baseload for industry, because you've been working with industries maybe . . .

Mr. Ellis: — Yes. Probably till tomorrow at this time if I wanted to really get into it.

Just in the onset, I've been in this business for approximately 30 years now and my first exposure was in Europe. I spent three weeks in Europe in 1978 — Finland, Sweden, and Austria — and that was where my interest was first generated in terms of energy systems. And one of the biggest problems we've got in North America is that we grew up with abundant sources of energy and we grew up with an industry that their prime concern was selling our energy. Conservation was never on the agenda.

And we are doing projects right now . . . Matter of fact, we did a dormitory for Areva Resources. Incidentally, uranium's not my favourite source of energy. But nonetheless, during the design process of this building, the design people wanted between 20 and 30 BTUs [British thermal unit] per square foot for heating this building. I said 10 BTUs per square foot is all we need, and after the first full years of operation it's seven and a half BTUs.

We haven't even scratched the surface of conservation. And believe me, if we need . . . I would put a totally different dimension — not a totally different dimension, but certainly a different dimension — on this. Our concentration to begin with must be on conservation. You look at houses today. If we set up a program of thermally upgrading houses, we'd employ every unemployed person in Canada. And it does nothing but make money, save money.

When we start assessing North America, again we start looking at mechanical equipment. We don't have mechanical equipment for Saskatchewan. Nobody builds mechanical equipment for this climate. If we went over to the Scandinavian countries, we could get it certainly. Not available here.

And I've been at this for many years, and I tell you it's disgusting that we stay in the backwoods. You know, we could and should be the leading jurisdiction in North America. We've got the climate for it. We've got the manpower. We've got the brains, and there's no reason why we can't develop as the leading jurisdiction in North America. I mean, it is not difficult to do.

The types of things, like thermal envelopes for an example, a lot of the stuff we talk about isn't accepted here. It is in Finland and Sweden and so on. For some strange reason there's a

change in physics between North America and Canada, I guess. Because the things they do there . . . If we just followed bin codes in North America, we'd reduce our energy consumption in houses by 50 per cent.

And I want to say another thing. The housing industry is never going to be the leading jurisdiction in terms of conservation. We can reduce energy consumption in buildings by 90 per cent. They may cost slightly more, but whenever you're talking about conservation, it isn't a matter of what you can afford. We can't afford not to.

If we don't start doing something about this, this whole planet is in serious trouble. Population expansion for one, you know. I think it took 10,000 years for the earth to reach a billion population. We're now at seven, and I think that's in somewhere around 200 years. It's all part of the same game. Like I said, I could talk about this till tomorrow at this time, but I'll take it easy.

Mr. Weekes: — Thank you.

The Chair: — Mr. Belanger.

Mr. Belanger: — Yes, again thank you for your presentation. But going back to your question, Vic, and I was going to ask you this question. In terms of the solar panel and the efforts of trying to conserve, you mentioned dealing with the construction industry. We talked about LEEDs [leadership in energy and environmental design] here as well, the standards associated with LEEDs, and you answered part of the question. But I guess I would say, why wouldn't the construction association or LEEDs in general embrace the notion of better insulation in your homes, the option of solar panels? Like all these things that we're trying to do in terms of energy conservation and alternative energies, I sense that they're not embracing it. Correct me if I'm wrong, but why wouldn't they embrace that notion?

Mr. Ellis: — Well for one thing, we have a standard in terms of codes, and home builders aren't building . . . They're building to a minimum standard. They're not going to overbuild. There's a market out there, and a huge market is developing for highly energy-efficient buildings.

The system that we use — and I realize I don't have a lot of time here — but you know, when we look at R-factor as an example, as a measure of thermal efficiency, it's one of the worst measures of thermal efficiency for heating there is. And we don't seem to understand the difference between radiation and convection heating. Again I don't want to get into too much detail here, but there are so many things that we don't even consider, and it's just absolutely disgusting.

You know, I spent that three weeks in Europe and that's where I got started in this. Because after I looked at some of these things, I said, man, this is what we need to be doing. And I started in a process 30 years ago, and I've been fighting the jurisdictions having authority for 30 years. I don't think I've ever lost a fight with them, but it hasn't made me much money. I can guarantee you that.

Mr. Belanger: — The second point, and that's why we raise

the point all the time, that SaskPower's looking at expanding — \$15 billion over X amount of years — it's got to be an investment. It can't be an environmental deficit. That's the whole notion.

Now when you talk about the whole notion of solar panels, how many houses have you retrofitted with solar panels? What is the cost? How have the customers been in terms of the response to your product? And obviously it saves them money. But how is the general feel from the Saskatchewan people in relation to solar panels and solar heating?

Mr. Ellis: — Well there's a huge demand developing, and it's growing more every day. Again I should get back to one of the biggest problems we've got in North America is this whole fact that we have never really seriously considered conservation to any great degree.

You know, when we look at mechanical systems, we want mechanical control of everything. But what we have been doing is we've been using every possible source of natural energy. And of course we're not into wind in any degree. But the ground, you know, six feet below the ground is the earth's average temperature year-round, 60 degrees Fahrenheit. I mean, we don't use that.

Ground source ventilation systems, we've been doing ground source ventilation systems now for 18 years and they work phenomenally well, but they're not approved in . . . The only way I can put a ground source ventilation system in is if it's stamped by an engineer. And I don't mind that. That's fine, but we've got the industry that's putting in air-to-air heat exchangers. They don't have to have it stamped by an engineer. And industry is leading too much of the process.

And again, if we come back to Saskatchewan, some of the most innovative people in North America are in Saskatchewan. I think there was a book done a few years ago that 75 per cent of the world's dry land farm machinery came from the prairie region of North America, and 65 per cent of that came from Saskatchewan.

But we don't have access to . . . myself, I have no letters after my name and I don't have access to the academic community. Like I can put hosts of systems together and we've done lots. We've built solar wood kilns. We've done roof zone control, greenhouse systems. We designed the tree nursery for Weyerhaeuser at Henribourg years ago. They had three to five times the growth rate.

[14:45]

There's no reason in the world why we have to haul food from California. We throw more waste. You go out to the crop refinery. How many billion BTUs in there have flowed off into the sky? Look at every recreation centre in Saskatchewan. You know, you've got a 100 tonne ice plant dumping 1.3 million BTUs an hour into the sky, and down at the other end of the building you've got a 500,000 BTU boiler heating it. Let's think a little bit.

Mr. Belanger: — Yes, my final question is how has SaskPower — and although it's probably difficult for you to answer — but

how has SaskPower been to the whole notion of solar panels in some of the homes? Have they been helpful? Have they been neutral? Have they been discouraging? Like how would you characterize their relationship to not just the solar panels . . .

Mr. Ellis: — They're not standing at my door. I can tell you that. But however I have to acknowledge that, quite recently, that there's one of the people in SaskPower has wanted to have a meeting with us and I know that we've had some indirect communication. One in particular is with community rinks and so on, because a lot of these things that we built are absolute disasters because they were built to consume energy. We really haven't given very serious consideration to the conservation side of it.

You know, the other thing about this whole thing is that the energy we now lose or waste is the most cost-effective energy we're ever going to see in the future. And there's no question we can reduce our energy consumption by 75 per cent with no change in lifestyle or production. And I'm not an authority.

Ms. Dahms: — You're probably the best authority, actually.

The Chair: — Ms. Morin.

Ms. Morin: — Thank you very much. I appreciate the opportunity of being able to ask some more questions.

With respect to feed-in tariffs . . . Because clearly if we're talking about micro-hydro and solar and wind farms and communities and First Nations and Métis communities, feed-in tariffs are going to be an important component of that. We heard yesterday from a presenter that his concern is that SaskPower has a fixed feed-in tariff of 9.4 per cent, regardless of what the technology is, and I noticed in your presentation you're saying that the purchase price has to be based on actual renewable energy service costs. So I'm just wondering if you might want to comment on that. Because as I said, this one presenter we had yesterday was quite upset about the fact that the purchase price from SaskPower is fixed regardless of the technology.

Ms. Dahms: — I think that, you know, there's been lots . . . I've found a lot of analyses on this in the literature and certainly with respect to Denmark and Germany, and they actually compared the feed-in tariff to other methods as well. But certainly you don't want to penalize people for putting back into the grid, right? So you don't want to be giving them back money that's less than what it's costing them to generate the energy in the first place. And so you have to do a reasonable evaluation of the renewable energy, you know, because we certainly do not want to be penalizing people for reducing their greenhouse gas emissions and contributing to, you know, our carbon credit for the rest of the province.

And so yes, that becomes a big issue and that's what's really . . . [inaudible] . . . the literature in the last two years is that you have to come up with a price that's reasonable based on the different types of technology. So it's not a one, you know, cost FIT [feed-in tariff]. It's got to be specific to the different types of energy.

Ms. Morin: — So this would then be the reason that I'm seeing

more and more townships, or I should say really small communities, sometimes in hamlets in, for instance, Germany, popping up with three windmills at a time because . . . Am I correct in assuming then that this is not only providing an energy source for the community, but the community is also deriving some sort of profitability by being able to sell the excess power back to the grid? And am I correct in assuming that that's what going on in places like Germany?

Ms. Dahms: — It's an investment, right? So now you're in a situation where this community can invest in their future. What they're guaranteeing is they're guaranteeing local jobs. They're guaranteeing energy security. And in some cases, they're guaranteeing food security as well because there's so much energy that we expend in agriculture. And certainly if it's biomass then, you know, you also have the possibility of taking the heat from the biomass generation and using that for greenhouses and actually producing food.

And in the brief, I didn't mention it in the presentation, but in the brief I've talked about the Saskatchewan local food initiatives and this is to work with farmers to try to use local food as much as possible. We use incredible amounts of energy. But I didn't talk about it in great detail because it's less related to electricity and it's more related to energy and fossil fuels.

Ms. Morin: — So to sum it up then, because I know this is my last question again, but when we're talking about . . . Again getting back to energy and conservation being the most efficient way for us to save money and to reduce our greenhouse gas emissions in the province, there's a number of things clearly that need to take place, one of them obviously being a substantial educational component. So it ends up being a social conscience for society to understand the benefits of investment and a higher degree of consciousness about reduction of consumption and things like that.

The other part of it then obviously is incentives. I mean, so we're talking about . . . So there's two things that I see here is an educational component and an incentive component. Because obviously these townships and these communities and these First Nations and these Métis communities have to feel that there is an incentive to be able to invest in these technologies and then see a return on their investment, or have the incentive there to begin with in terms of making that investment into the technologies that are available. Am I correct in that?

Ms. Dahms: — Absolutely. And you know, that can be developed as long-term plans for those communities. One of the roles of the RCE is connecting different communities within Saskatchewan but also across the world, and so we learn from each other. It's a network. And so as you develop, you know, goals, policies, and plans for one regional community, that can be shared with other communities.

And certainly with respect to, you know, conservation, as Vic's pointed out, there's this nice diagram of a pyramid. And ultimately the top of the pyramid is don't use energy, and then the bottom of the pyramid is generate energy. It's optimal to be up here. And as Vic pointed out, I mean, the energy that we have now that we're wasting, it is some of the cheapest energy that we'll ever have. Our fossil fuels are running out.

Ms. Arbuthnott: — The other thing to think about is some analysis of what are the barriers. So just coming in with education about what we think is preventing people from using conservation or developing the, you know, the construction industry developing different standards, etc., is not as effective as actually asking them to do a bit of research — community, conversation, democracy basically — to find out what's stopping people, what prevents them from doing what they know is the right thing to do. And then you can target those incentives and target that education much more efficiently and assist people in moving towards conservation and other things.

The Chair: — Mr. Weekes.

Mr. Weekes: — I want to go back to baseload, which will take longer than one minute to answer but we'll go there anyway. Saskatchewan has asked for a RFP [request for proposal] for wind generation to, really, to double the amount of wind generation in the province. So it's going to be interesting how that's going to shake out and where those wind turbines are going to be located. But going back to your distributive electrical system, that's going to be very important to have. Hopefully wind, one or the other, if not both.

The province also is going to construct 400 megawatts of natural gas and you raise that as a backup for baseload. But the concerns, two concerns about that is the cost of that backup, you know. You know what I mean. If you have wind as a big factor but you have to have a backup system in place, that gets pretty costly. Because I asked many of my other presenters about what you're feeling about, you know, what are people willing to pay. I know there's a cost to the environment. That's been raised many times. But there is . . . You know, we can't ignore the cost to the user or the taxpayer while we develop this new energy world.

Ms. Dahms: — Yes. And interestingly I was really surprised when I read a paper that came out of Spain in 2008 that when they consider, you know, obviously economic cost, socio-economic, a number of different factors, they actually. . . The cost was less for renewables, you know, maybe not on an initial output basis, but if you look from a . . . in a long-term schematic, ultimately the cost to the consumer is less. And if you compare, let's say, nuclear with renewable ultimately in a long-term . . . Because renewables don't suffer from cost overrun and so forth.

So I think it's actually exciting for the consumer because then the consumer can also become the producer. And also I think, you know, there's gas and I think you can also look at, you know, coal with carbon capture in the interim. We already have it. We're using it. We've established the CO₂ capture and people are coming up with ways to convert that CO₂. So I don't know if . . . Am I answering your question?

Mr. Weekes: — Yes. We ran out of time. If I may, could you give our researchers the name of that study so it could be tabled?

Ms. Dahms: — Oh, actually it's in the brief. And what I'd like to do is . . . At 11 o'clock last night one of my colleagues added a paragraph to the brief that I didn't get to you, but I would like to . . . and I also noticed that mis-referenced something, so I

wondered if I could send you the final copy. Would that be okay? Would you like a copy of the presentation as well? Thank you very much.

Mr. Weekes: — Thank you.

The Chair: — Thank you very much for putting a presentation together and taking the time to answer our questions. Thank you. The committee will recess for five minutes.

[The committee recessed for a period of time.]

The Chair: — Before we hear from our next witness, I'd like to advise witnesses of the process of presentations. I'll be asking all witnesses to introduce themselves and anyone else that may be presenting with them. Please state your name and, if applicable, your position within the organization you represent. If you have a written submission that you would like to table, please inform us and a copy of that submission will be put on our website.

The committee is asking all submissions and presentations to be in answer to the following question. That question is: how should the government best meet the growing energy needs of the province in a manner that is safe, reliable, and environmentally sustainable, while meeting any current and expected federal environmental standards and regulations and maintaining a focus on the affordability of Saskatchewan residents today and into the future?

Each presentation should be limited to 15 minutes with question-and-answer to follow. I'll be directing questioning and recognize each member that is to speak. Members are not permitted to engage witnesses in any debate and witnesses are not permitted to ask questions of committee members.

I would also like to remind witnesses that any written submissions presented to the committee will become public documents and will be posted to the website.

With that, please introduce yourself and go ahead with your presentation.

Presenter: Al Taylor

Mr. Taylor: — Hi. My name's Al Taylor. I sent in a sort of a bio to Stacey which outlined my, I guess, my work history, so I won't go into that at all. I would like to say thank you very much for putting me on your agenda, first off all. And I'm happy to see that this committee is meeting because I was somewhat upset with the uranium development project or program because it didn't consider anything else other than uranium.

Unfortunately I left my statement at home and so I've got a bunch of other stuff here I wanted to talk about, but I left my original statement at home and so this is sort of what I remember that I put down.

To answer the question — safe, reliable, environmentally sustainable — my first recommendation was that we practise serious conservation in this province. We had an example from Mr. Ellis just here, and I've got some examples in what I'm

going to present, how conservation is the biggest way to save energy. And it's being wasted in many, many places. But it has to be serious conservation and I would argue that you have to have some . . . There has to be incentives in the road as a start. There's got to be serious incentives to get serious conservation.

The second recommendation I was to make, that the government, which is all of us, should state a clear vision that will phase out coal-fired plants within 20 years. And once you do that, then SPC [Saskatchewan Power Corporation] and the all the rest of us are going to sort of get excited about not having any electricity from coal plants, and with serious conservation and incentives for environmentally friendly energy will explode. But there has to be a vision. There has to be an end in sight and I would argue 20 years is long enough.

The third thing that I think has to be done to make that vision work is to have feed-in tariffs. And I think it was fairly well explained by the last people, so you don't need me. I don't quite understand it actually, except the one thing that does come out is that people that are producing electricity, more electricity than they need, have to have the option of putting it into the grid at a price that will pay them over time. Like, make it a five-year payback which is what good investment is supposed to be, or a 10-year payback. But it has to pay them back or else it doesn't make any sense to do it.

Like you can keep buying it cheaper, but if you have feed-in tariffs, then if I put in a bunch of . . . I have a south facing roof. So if I put a bunch of solar panels on my roof, that's going to cost me. That is also going to save SPC from having to have any capital expenditures, which is important, because when they start spending capital dollars, they're spending big bucks. We're not talking, you know, 3 or \$4,000 for a guy like me and like all of you to put solar panels on your roof. So it has to be profitable to the individual or the corporation that's going to produce excess electricity for themselves or produce their own electricity, but produce excess so they can sell it back.

Cogeneration, I would argue, is something that SPC should be forced to deal with and that they should . . . I know they're doing it a little bit. But somebody suggested in the last question period that the potash plants, and I imagine the steel plant out here, uses super amounts of electricity. And if there was cogeneration, basically you can call that the cogeneration is carbon-free electricity. Like I mean they've already burned and SPC has burned it up for the steel mill. They've created that carbon. The steel mill uses the electricity and creates incredible amounts of heat, and it goes up.

It is the same as Vic was saying. Like there's incredible amounts of energy there that can be used for . . . It's probably hot enough over there at the steel plant and also in the potash plants — I think one is already cogenerating — to generate more electricity. That would be carbon-free electricity. You've already done it once. Here's a second time.

I think you have to change SPC's mandate. No, that's not what I want to say. I think somebody has to take over demand side. Jimmy Elliott suggested a new department. I don't know if it needs a department or an arm's-length corporation or something to take over demand-side and conservation programs in Saskatchewan. SPC was designed and it still is designed to

produce electricity and sell it. And it's pretty hard to get folks that are selling, that their mandate is to grow, sell more, make more money on selling it, because with conservation their income is going to go down, and they ain't going to like that. So I think you have to set up something different to look at demand-side generation.

Well the other point that I was going to make . . . This is inviting, so I'm sorry for wandering around all over the place. New nuclear. I know you've said you're not, the government has said they're not going to look at nuke for at least 10 years.

Just to give you a bit of history, I've been anti-nuke ever since President Nixon exploded a nuclear weapon on Amchitka Island off the coast of Alaska. And everything so associated with uranium is dangerous, but it's sure as hell dangerous when you put it in an atomic bomb or a hydrogen bomb. And sooner we get rid of it, the better. And we can't put it in one thing without having . . . Look at the problem we're having with Iran, you know, and other folks. Like India and Pakistan have both got nuclear bombs and they're starting to fight again. So let's get rid of that.

Anyway that was the thing. I'll try and bring you . . . I will as a matter of fact bring you my presentation or at least the first things I was going to read because from that I want to pass around a bunch of stuff or talk . . . I'll comment first. And you've heard most of this, but I thought pictures really send a good indication of what's going on. I think I'll have to stand up for this.

Plugging in the sun. Oh, you want me to sit down. Okay. Plugging in the sun. And this happens to be in Spain. Oh, does everybody got one of them? Oh, great. Well the next picture is, lo and behold, it's California Edison, and that's the roof of their head office. And son of a gun, look at they're going for . . . I'm just thinking. How about SPC's building, all that spare stuff that's facing south, just be coating with these? They would probably supply all the electricity for that place — the heating and cooling and their lights.

The next page is just wonderful as far I'm concerned. It's got solar cells, PVs, photovoltaics — I prefer solar cells so people know what I'm talking about — that are so thin that you can wrap them up. They're almost paper thin. You can put them anywhere. They're available.

Oh, forget that page.

Next one — you've got it — is using a Stirling engine. I'm not sure I understand how Stirling engines work, but there it is. They've got the mirrors all concentrated. It heats the air, spins a turbine; out comes electricity just using the sun.

Well the next page tells you where all the possibilities are for solar. The last page — no, I guess it isn't the last page — is a farm in Germany, a Bavarian farm producing electricity. There's all the buildings got solar cells all over them. They're producing their own electricity. And Germany has feed-in tariffs so those guys put that on and they know that, number one, their excess electricity is going to be accepted, and it's going to be accepted at a price that will pay them to put that in. Just like your place or your farm. Maybe you need a bunch of

photovoltaics to run those fans that you need to dry your grain. We had a little discussion yesterday. I thought I should bring that up.

On the next page is, again in Spain, where they're using a different method of collecting solar energy, and the mirrors are all computer-run so that as the sun moves, the mirrors move. They concentrate the sun on the tower and it produces incredible heat which makes steam, which turns the generator.

The next one is a field in Nevada, Solar One, near Las Vegas. And it's a different way of capturing the heat because they use oil. And the light is focused on the oil. The oil heats up and we make boiling water again.

The next picture is another one of Andalusian farms and it shows you . . . I guess Andalusian. Anyway you can see one field is a massive amount of mirrors and another one that's going up. So it isn't that solar cell doesn't work. It isn't that solar cell is some kooky-do environmental technology when, I mean, us environmental kooks are pushing on you. It's there and it's being developed over . . . worldwide actually. So that's number one.

[15:15]

Number two is all about feed-in tariffs — the homegrown juice. I'll just read a couple of things. While Freiburg, I guess it's German, is held to be the warmest city in Germany, their country is hardly famed for its sunniness. Yet the solar panels on this guy's roof are not all that unusual, thanks to German energy policy called feed-in tariffs. FITs have democratized energy policy, allowing both ordinary homeowners and corporations to invest directly in renewables.

And that's the other thing about FITs. It has to work for renewables. If we're going to get rid of coal and ultimately . . . Well I think you're always going to have some natural gas backup. Some 46 countries worldwide have implemented FITs. FITs are now the most commonly used mechanism for the promotion of renewables.

And that's another building. That's an apartment block. You look at the apartment blocks in Regina. They got those south walls. Line them up with solar cells. They'd be able to sell SPC electricity.

Another one is wind turbines, and there's another picture of turbines on page 21. Nevada for instance has mandated that 20 per cent of electricity be derived from renewables by 2015. California wants 20 per cent by 2018. Texas has set a target at an absolute amount of 5800 megawatts of capacity by 2015 — and theirs is mostly wind energy and that's nearly twice as much energy as Saskatchewan uses in total. In round numbers it's 6000 megawatts. These guys are wanting just about 6000 megawatts from wind energy and we've got as good — if not a better — wind energy regime than Texas.

We're talking about carbon sequestration and climate change, and particularly in an agricultural province like we are, livestock and climate change. One of the key actors in climate change are cows, pigs, and chickens. And I'll give you the authors of this; you'll have it. These folks, Robert Goodland,

the writer of this article, retired lead environmental advisor of the World Bank Group after serving there for 20 years. In 2008 he was awarded the Coolidge Memorial Medal by the International Union for Conservation of Nature for outstanding contributions to environmental conservation. And Jeff Anhang is a research officer, environmental specialist at the World Bank Group's International Finance Corporation which provides private sector financing and advice to developing countries. So there's good research in that about the amount of CO₂ that agriculture actually produces. So while we're trying to cut down CO₂ in some places, maybe a recommendation to the Department of Agriculture to start looking seriously at the way we raise cattle and pigs and chickens.

The next article I'd like you to — I really hope you'll read it all; I'm just going to read a little bit of it — is "A Bridge to the Renewable Energy Future," and basically what it talks about is cogeneration. What it does, it sets out and shows how in this particular case how certain industries are losing so much heat that they're now not only producing all their own heat for warmth and water and that sort of thing, they're also producing all their own electricity. And if there was a feed-in tariff in this particular example, they would be selling to a plant across the street. And what these guys say is carbon-free energy, because the coal is being burnt or the coke in this case is being burnt. You're producing the carbon, but by capturing all the excess, all the heat that's wasted up into the sky basically, and along with the CO₂ of course, but they're capturing all that and so they're producing more energy or electricity without . . . just by simply capturing. They're not burning any more coal or coke.

Another way to seriously think about energy or conservation, "Water efficiency is key to saving energy, expert says." And I'd just like to quote:

In regions where distributing water requires significant electricity use . . .

Oh, Regina, Saskatoon, nearly every town in Saskatchewan all has a pump to push the water around and get pressure.

. . . policies that help save water could address climate change more efficiently than requiring consumers to use less energy, according to water expert Peter Gleick. "Some of the cheapest greenhouse gas emission reductions available seem to be not energy-efficiency programs, but water-efficiency programs," said Gleick, president of the California-based Pacific Institute.

So whatever we can do to reduce the energy required to meet water needs reduces greenhouse gases and that's conservation again all over. So to reiterate, I've heard the comment that they're going to cost. Things are going to cost money. Yes. The environment, if we don't fix up the environment pretty soon, there's going to be a big, big cost. Thank you. We'll have to move in a hurry.

Anyway I just wanted to point out that the value of global arms deliveries in 2007, the latest statistics available, were \$30.9 billion. Makes \$2 billion, you know, to fix things up, to have incentive programs or grants or that sort of thing, sounds like chicken feed to me. But anyway that's also in there.

I'd like to recommend that you don't seriously consider big hydro power. Green washing hydro power like big dams are very destructive of the environment. Small head hydro, what the last folks mentioned, industry and hydro, I've always wondered why there wasn't a generation, a little generator at the end of the flues at our three power dams. Like, you know, it starts up here and goes through the generator; it's still moving like everything when it hits the end. Why isn't there a small generator there? Even 5 megawatts, even 1 megawatt is a big improvement. And it's there. I mean the water's going through there. It'll turn that turbine, especially small ones. That was that . . .

And oh, it was mentioned, the last folks mentioned . . . And I really want you to read this. I won't do anything, just I'll read one. Energy wasted in the United States via embodied energy and waste and other solid waste each year is 1.6 quadrillion BTUs. Somebody will have to interpret that for me. But that is an incredible amount of energy. And these folks were saying the same thing. Like, we're just wasting so much just because we don't want to deal with it. And because we don't want to deal with it, we're screwing up our environment.

I mean, the CO₂ is there. Look at this pile we've got in Regina. You don't need to go to any other city. Just look at it. And what are we doing now in Regina? We're flaring off. There's methane there that could be used, made to heat. Turn a generator, provide some electricity, and we're flaring it. So do most of the oil wells, unfortunately. They should be brought to task on that too.

"Energy Efficiency, Rediscovered." One of the ways you can force SPC, if you don't want to follow my advice and set up a corporation or a Crown corporation to look at demand-side and conservation, all the conservation strategies that are available for Saskatchewan, okay, is to just simply tell SPC they can't get any more money for capital expenditures. But we still want the electricity. I'll tell you, even though they are in the process of producing electricity, they would quickly decide that we have to figure out a way to get a bunch of electricity.

Two other quick things. One, "China powers the global green tech revolution." They've just signed a deal to something like 2000 megawatts of electricity from a solar plant. Ontario has passed feed-in tariffs. India, the mission calls for 200 gigawatts — gigawatts, not megawatts, gigawatts — of solar capacity in India by 2020, eventually resulting in 200 gigawatts . . . There's obviously a misprint there. Oh no, sorry, 20 gigawatts, which is a lot more than Saskatchewan already uses, and 200 gigawatts by 2050.

Just the last quick thing; it's just a little shorty. Nuclear juggernaut. I'd like everybody to read this. It's short. I'm going to read it though:

To the province's credit [this is about Ontario], it required bidders to internalize cost overruns rather than externalize them through the electricity rate base or direct government subsidy [which is exactly what Bruce Power was wanting to do]. In effect, the bids had to reflect the real costs of building new nuclear facilities. The result, confirming the predictions of bond-rating agencies and non-governmental critics [I hold up my hand], was cost estimates more than

three times those used by the Ontario Power Authority . . . Indeed, at between \$23-billion and \$26-billion, the projected cost of the first two reactors roughly equalled the power authority's cost estimates for replacing or refurbishing the bulk of the province's 20-reactor fleet. The results of this exercise in real price "discovery" should give pause to those who embrace nuclear energy as a cost-effective response to climate change.

Last picture. It isn't Saskatchewan, folks, but there they are. There's a wheat field with the generators. I rest my case.

The Chair: — Well thank you very much for your presentation. And I apologize for letting you know it was getting close to 20 minutes, but I know that many of the members have some questions and I didn't want to limit that time either. So thank you for indulging me with my hand signals.

Mr. Taylor: — Thank you for indulging me. You could have cut me off.

The Chair: — No, no. Ms. Morin.

Ms. Morin: — Thank you very much, Mr. Taylor. I certainly appreciate the investment in the work that you've done and the information that you've brought to us and the materials that you've given us. It's very interesting reading and I'm looking forward to snuggling in tonight and having a good thorough read, instead of this skimming over I've done so far, but . . . [inaudible interjection] . . . That's fine. I'm going to enjoy that.

But in the skimming over I've done so far quickly, I just want to raise a couple of quotes and, you know, have some discussion around that. When we were talking about the gentleman that put the solar panels up on his building where he lived, it talks about the fact that:

. . . Germany's leadership in solar energy stems not just from large utility plants but from the roofs of ordinary homeowners like Georg Schürer.

So they're saying that it's individuals that have really caused a lot of the shift in the energy plans of Germany, right? And:

Other nations have taken notice. With rising energy prices and an increasingly precarious supply of oil, a diverse group of nations has turned to FITs to promote renewable energy . . . FITs are now the most commonly used mechanism for the promotion of renewables.

So what I found very interesting was it goes on to say, because Germany had actually borrowed the idea from something that, the policy that happened in California many years previous, but wasn't designed to deal with renewables at that time but they used that idea and they:

Expanded in 2000 to cover all renewables, [and] this energy policy has made Germany the current leader in both solar and wind and has invigorated its biomass sector.

And then it goes on to say, "Now . . . 17 years after Germany implemented its first FIT, 18 of 25 European Union (EU) countries have adopted the policy." Now what's interesting

about all this, Mr. Taylor, is that it says:

And Germany is moving fastest of all [countries in our global economy.] A country with only moderate wind and solar potential has become a global leader not only in renewable energy generation but also the manufacture of related hardware — a success largely attributed to the FITs in the German Renewable Energy Act.

So, Al, it seems like everything comes down to one core issue again and that all of this has been possible to the introduction of feed-in tariffs that work. In other words, a feed-in tariff that has strong viability in encouraging the average homeowner to have solar panels on their homes, or a farmer to decide to do biomass, or a community to decide to put up some windmills to provide wind energy. All of this seems to tie right back to the whole issue of having viable feed-in tariffs.

I'm just wondering if I could get your comment on that, because that seems to be what I've gathered quickly from my quick overview of what you've provided us so far.

[15:30]

Mr. Taylor: — Well what Germany did . . . My understanding of what Germany did is they didn't say oh, we want all solar or we didn't want all wind. What was done is the cost of, let's say, biomass was figured out and so if you've got biomass then you can build a feed-in tariff and make some money off it. And if you want to put solar cells on your house, okay, we'll take the excess.

And so it comes back to what, I guess, what I said practically at the beginning is that feed-in tariffs are really important, but they have to take into consideration the cost of that. And part of figuring out the cost has to be how much the corporation — in this case, SPC — can save over time.

Because if you don't have to build a new power plant, which I imagine is half a billion now . . . I don't know what they cost. They're pretty darn expensive. So if you can get enough people in Saskatchewan to invest a couple thousand dollars in their house or, I don't know, on solar panels, it might be more than that. But a lot of people have 10,000 bucks that they'd be happy not to have to pay an electric bill.

Ms. Morin: — I also found . . . Oh sorry, I thought you were finished, Mr. Taylor.

Mr. Taylor: — Well I was just going to say, so what Germany did was didn't pick out a winner. If you can make electricity and you've got excess, we'll buy it.

Ms. Morin: — So I also found it interesting that you mentioned, you know, the original structure and set-up of SaskPower was designed to sell power. And so I'm wondering if I could get your opinion on a previous policy that did exist in this province, and that was to have an Office of Energy Conservation, a stand-alone Office of Energy Conservation to drive the notion of conservation and efficiency and to make sure that that was their sole responsibility and key area of interest in terms of investigating and researching and promoting the issue of conservation and efficiencies.

We no longer have that stand-alone office any more. I'm wondering what your opinion is on whether that should be reintroduced.

Mr. Taylor: — Bring it back right now. Basically that's what I said. It's not because I think . . . I've a relative working for SPC and he likes his salary. But SPC is set up to generate electricity and to sell it and to make sure that they produce it. And we want them to be good, efficient producers. But coming with that is, as Vic said, conservation's the last thing on their mind. Not that they're bad people; they're just in the business of producing electricity.

Ms. Morin: — It's a different focus and it's a different mindset in terms of what their area of concern has to be.

Well I just want to say thank you very much. My time is up. I guess on top of the last point I just made, I guess the issue of having a stand-alone climate change secretariat would have assisted in some of the issues that you've addressed here today as well, but unfortunately we don't have that any more either. So thank you again for your presentation.

Mr. Taylor: — You're welcome. Thank you.

The Chair: — Mr. Bradshaw.

Mr. Bradshaw: — Thank you, Mr. Taylor, and appreciate your presentation and bringing this stuff here. Part of this committee is to . . . What we have to do is we have to weed through obviously a lot of numbers and getting various different things from a lot of different presenters.

And I was just quickly running through your literature here, and on your homegrown juice on page 23, which you had given to us, you have it marked in here that it's talking about the . . . Nevada wanted to get 20 per cent of its electricity derived from renewables by 2015. California wants 20 per cent by 2018, which is commendable, except that like I said, we get a lot of numbers, and sometimes you actually have to question some of the numbers.

Now we have had a presentation by a previous organization today. And I'll just read in there that "California is 40% more energy efficient than any other state. Its energy mix includes 23% renewables . . ." Now here in this publication, which was done in 2008, it says, California wants 20 per cent by 2018. And this one we had from the presenters says that California already has 23 per cent.

Mr. Taylor: — I wish I could answer the question, but I'm quoting most of my information or a lot of the information comes from the *State of the World*, Worldwatch Institute. It's considered to be a very good research organization. And I think over the 20 years I've been getting the magazine, I've only seen about three retractions where they made a mistake and they published it immediately. Why that number differs from your folks, I just couldn't say.

Mr. Bradshaw: — Well it wasn't us. It was a presenter that was here. So you see some of our dilemma in trying to weed through all of this.

And I also was wondering on your feed-in tariff, now you were talking, okay, some people should actually be making, possibly making money on this because they're producing more electricity than what they're actually using. Now SaskPower has the transmission lines of course going throughout the province. They're the exclusively on the transmissions lines at the present time. Who should be paying for the capital for those transmissions lines?

Mr. Taylor: — Well I would argue that we've already paid for them.

Mr. Bradshaw: — There is ongoing cost to the lines though, to the upkeep, and somebody has to be paying for that person that's going to climb up the power pole. Somebody has to be, you know, to have stuff going on this line. Who, where should this money come from?

Mr. Taylor: — Well ultimately it's going to come from the consumer. But right now I would argue that if you built a new coal plant and you have to replace those lines, I guess it's going to be us again. So I can't see why you would pick out, you know, here's a farmer . . . Well you're a farmer. Let's pick you out. And you've got wind and you've got more than you need. And you've got some solar as your backup. You've got more than you need. And here's a line running past you, and SPC says, we need another 50 megawatts, we'll say, and all you've got is 5. But there's 10 other people around there that have got 5 megawatts. So do you want to give it to them? No, you've made an investment, and you've got more megawatts than you need so you put it back into the grid. The grid's already there. You've paid for the grid, one way or the other, you know. That's the way the system works. We've all paid for the grid over time. It's even included in our baseload price, I'm told.

So why do you want . . . You know, if you need a bigger line someplace, then whoever needs the bigger line is probably going to pay for it. But you don't need a bigger line to put another 50 megawatts in, do you? Sorry. I'm debating, am I?

The Chair: — Yes. You would have crossed that line.

Mr. Taylor: — I'd like to cross it.

The Chair: — Mr. Belanger.

Mr. Belanger: — Thank you very much for your presentation. I just wanted to talk about the whole notion of recapturing waste energy, which of course is another incredible source of opportunity for Saskatchewan. We had a presentation talking about irrigation around the Saskatoon area, saying that we were only irrigating X amount of land. And you talk about waste energy. And I guess that compels me to ask the question . . . I'm not sure if you can answer this, but certainly give me some insight that'll be helpful.

What's the arguments of irrigation, where you use energy to pump water which is another resource that's valuable to us, versus a greenhouse style of growing crop? A large greenhouse using waste heat . . . I'm thinking about for example seedlings for forestry operations and so on and so forth. Have you done any comparisons of irrigation versus the greenhouse using waste heat as a model?

Mr. Taylor: — No, I haven't. I would argue that before you go down the road of increasing irrigation — and the farm folks are going to be mad and angry at me for this — but we're facing a serious water shortage in this province, and any more irrigation is just going to create real trouble. And we don't know how many years, but it's not very many years down the road when there's not going to be any water for irrigation. And all that expenditure is not going to be recovered.

So I would argue that it's much better to do what Mr. Ellis said, and Tanya Dahms, is to use biomass to heat your greenhouses and grow a lot more food here than we can. When you stop to think of it, this is an agriculture province, and we import 90 per cent of our food.

We don't import wheat. Last time I looked at it was many years ago because I was working then. I could do things like that. The last time I looked at it was we import everything but wheat, butter, and I can't remember what else. Everything else, we import into this province, and here we are an agriculture province.

Our cities don't, as far as I know, our cities don't have a food security policy, you know. And here we've some of the best land north of, well all around Regina, number one. We've got the Qu'Appelle Valley which can grow food all over the place. And we don't have a system where we figure out how to get those guys, or how to get the community of Regina, the city of Regina particularly, to have local food purchasing and to help us out in that, to help those guys out there. All we're doing is helping the folks in California and Florida, importing the food we do. And we're creating incredible amounts of CO₂ in transportation.

Mr. Belanger: — My grandfather was French. And he used to say, that's the best way to speak, is with your hands, he says. So don't apologize for hitting the mike there.

But I'd just point out that this whole notion . . . Again, I'm trying to figure this out here because energy conservation, we talk about recapturing waste energy. There's an incredible amount out there as Mr. Ellis has indicated. Now is there technology, is there opportunity, is there somehow that you can use those greenhouse gas emissions in either a research phase or a pilot project phase?

And I use the growing forestry seedlings as an example. Because if you have a large greenhouse that produces hundreds and thousands of tree seedlings using recaptured energy, then is that a possibility? Is that a much better and more attractive offer for Saskatchewan as opposed to irrigation?

Mr. Taylor: — Yes. I would argue yes. But you're already doing it. SPC is already doing it. Unfortunately Trico which was set up with an incredible heat loser, our oil plant, Trico set up to use the waste heat to keep . . . It was a great idea. It had a greenhouse. We had practically fresh grown tomatoes in Regina. And they decided to expand the thing and they kicked Trico out. Bad sighting someplace.

Mr. Belanger: — Yes. No. I was aware that SaskPower was doing some of the tree seedlings. But I'm talking about on a larger scale basis, and we're hearing some of the compelling

arguments in Saskatoon about irrigation. So in my little mind I say, well can we look at the expansion of the greenhouse option that SaskPower is doing for tree seedlings to look at other crop, using waste energy?

And again this is all about conservation and so on and so forth, so it really ties into the point that I was trying to make. Is that a possibility and does anybody do any research? Is there a leading person on this particular file that you're aware of, or is it just another pie-in-the-sky scenario that I've dreamt up . . .

Mr. Taylor: — Not pie in the sky. They used to have one in Calgary and it moved to Newfoundland. And the one got kicked out of Calgary because they were on a environmentally dangerous waste site, and there was some serious gases leaking into it. I don't know why it didn't work in Newfoundland, but I presume, again, it would be transportation of the product. Newfoundland's a heck of a long ways away, and so to transport stuff, particularly for Newfoundland . . . Have you ever tried to buy a ticket to Newfoundland? It costs more than to go to Mexico.

Mr. Belanger: — Thank you.

The Chair: — With that, thank you very much for your presentation and answering our questions today. It was very helpful.

Mr. Taylor: — Thank you very much.

The Chair: — With that this committee . . .

Mr. Taylor: — I've been fighting this battle for over 40 years so . . .

The Chair: — Thank you.

Mr. Taylor: — I'm nearly finished.

The Chair: — With that our committee will stand adjourned until 10 a.m. tomorrow morning.

Mr. Taylor: — Thank you very much, Mr. Chairman. Thank you, ladies and gentlemen also.

[The committee adjourned at 15:45.]