STANDING COMMITTEE ON CROWN AND CENTRAL AGENCIES

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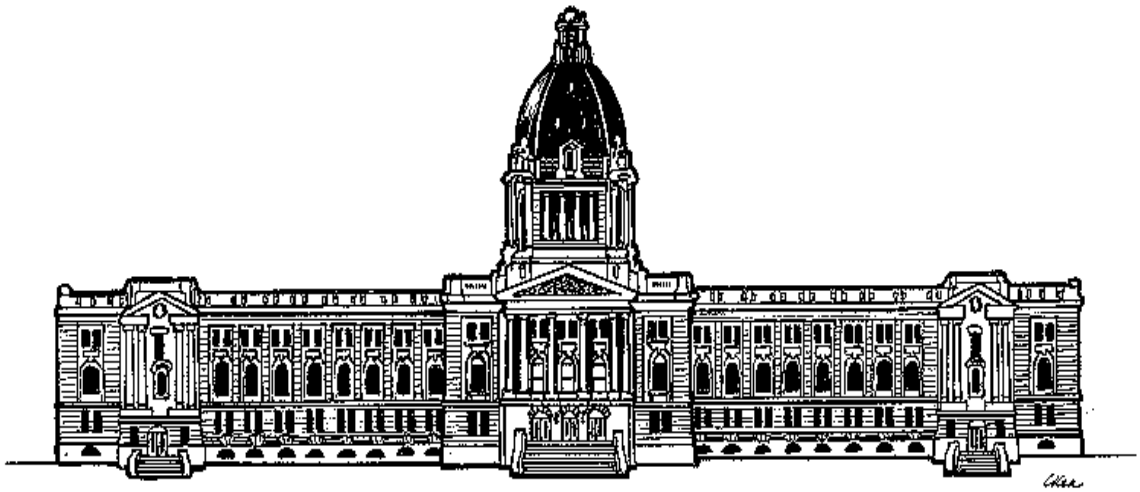

Legislative Assembly of Saskatchewan

Twenty-sixth Legislature

STANDING COMMITTEE ON CROWN AND CENTRAL AGENCIES

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Mr. Trent Wotherspoon
Regina Rosemont

Published under the authority of The Honourable Don Toth, Speaker

[The committee met at 10:00.]

Inquiry into the Province's Energy Needs

The Chair: — Well good morning. Welcome, everyone. Today we are in the eighth day of the Standing Committee on Crown and Central Agencies inquiry into Saskatchewan's energy needs. I am Tim McMillan, Chair of the committee. I would also like to introduce the other members of the committee: Mr. D'Autremont, Mr. Allchurch, Mr. Bradshaw. Substituting in today we have Mr. Hickie and Mr. Hart. We have Mr. Bradshaw, and substituting in today is Mr. Yates . . . Mr. Wotherspoon, and substituting in today is Mr. Yates.

All the committee's public documents and other information pertaining to this inquiry are posted daily to the committee's website. The committee website can be accessed by going to the Legislative Assembly of Saskatchewan website at legassembly.sk.ca under What's New and clicking on the link to 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. Click on the website for information regarding locations, cable companies, and channels. The meetings will also be available live on the website with past proceedings archived on the website as well.

Before we hear from our first witness this morning, I would like to advise witnesses of the process of presentations. I will 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 with the organization you represent.

If you have written submissions, please advise that you would like to table your submissions. Once this occurs, your submissions will be available to the public. Electronic copies of tabled submissions will be available on the committee's website.

The committee has asked all presenters to present an answer to the following question, and that 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. Once your presentation is complete, members may have questions for you. I will direct questions 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 committee's website.

I believe we have our next presenter scheduled for 11 o'clock. Our practice has been fairly strictly at 5 to 11, we will be ending this presentation to allow the next presenter to get set up. Committee members have been going about five minutes with questioning before we move on to our next questioner.

Another note is, we do have more documents that will be tabled today from presenters and submissions that we've received in the past few days so those have now been tabled and will be put up on the website. With that I ask our presenters here this morning to please carry on with their presentation.

Presenter: Saskatchewan Mining Association

Ms. Schwann: — Thank you. Good morning, Chair McMillan, and other members of the standing committee. We would like to table our submission with the committee and I do actually have an electronic file that I can leave with you to make things a little easier.

My name is Pam Schwann. I'm executive director of the Saskatchewan Mining Association. And today I'm here with Steve Fortney who is Chair of the potash section of the Saskatchewan Mining Association and also is general manager of PotashCorp Rocanville mine. And we are here on behalf of the Saskatchewan Mining Association.

A little bit about the background of our organization so you know a little bit about us. The SMA [Saskatchewan Mining Association] is considered to be the voice of the mining industry in Saskatchewan. We have over 40 member companies including producers and exploration companies, including PotashCorp, Cameco, Mosaic, Agrium, AREVA, Sherritt Coal, Claude Resources, Hudson Bay Mining and Smelting, Golden Band Resources, and dozens of exploration companies.

Our companies have mine operations throughout Saskatchewan, north, south, east, and west, and they are dispersed over a large geographic area that is very similar to the power distribution grid in Saskatchewan. And that similarity is not a coincidence. The mining industry has been fundamentally a provider of much of the power distribution system in the North in particular.

We thank you for this opportunity to participate in the public consultation process of the Standing Committee on Crown and Central Agencies regarding the growing energy needs of the province of Saskatchewan.

Mr. Fortney: — Our objective here today is to underscore the need for significant new infrastructure investment in baseline power generation, transmission, and distribution capacity. Companies making multi-billion dollar investments in the province, as our companies are doing, need to have the confidence that the required baseload power generation, transmission, and distribution infrastructure is in place to support their investment and operations.

Many of our companies are major clients of SaskPower and would be included in the 35 companies that utilize 45 per cent of the energy used in the province. We are also the clients that pay for a significant portion of SaskPower's annual revenues.

The issue of stable and secure power generation, transmission, and distribution system is fundamental for the growth of our

industry and the growth of Saskatchewan. We respectfully suggest that as the economy of the province prospers as a result of increased activity in our sector, that the question posed by this committee be amended to reflect the focus on affordability for Saskatchewan residents and businesses.

Ms. Schwann: — A little bit about the background of the Saskatchewan mineral sector. As you're probably very well aware now, mining companies operating in the province place Saskatchewan as Canada's number one mineral producing jurisdiction in 2008 with mineral production valued at a record $9.7 billion. In 2008 the Saskatchewan government received more revenues from the mineral sector than any other government in Canada — if you exclude the oil sands and we were pretty close to that as well. So it's a very significant contribution. A recent survey for the Mining Association of Canada has this information.

Saskatchewan is a significant player in the global mining scene and we are currently the world's largest producer of both potash and uranium, although Kazakhstan is posed to become the world leader in uranium production in 2009.

Mining is a major contributor to Saskatchewan's economy, directly contributing almost $2 billion in revenue to the provincial government in 2008. These revenues represented about 20 per cent of the government revenues; support government programs and services such as health care, education, and infrastructure development.

Mining activities — direct, indirect, and induced — accounted for $7.7 billion in GDP [gross domestic product] or 12 per cent of the total provincial economy in 2008, and that's a significant increase over previous years.

Direct, indirect, and induced mining jobs, employment, accounted for 30,500 jobs or almost 1 in every 16 jobs last year.

Saskatchewan public recognizes the significant contributions of the mining industry. In a poll that we conducted last December, 1,000 Saskatchewan residents indicated that 92 per cent were either somewhat supportive or very supportive of the Saskatchewan mining industry.

While the revenues from the mining sector will decrease in 2009, we are confident that the government will continue to receive a significant portion of their revenue from the Saskatchewan mining industry in future years.

Mr. Fortney: — Over the course of 2008 to 2028, proposed industry expansion plans will see mining's contribution to the provincial GDP increase to the 17 to 20 per cent range. In addition, if all expansion plans are met, the industry will add an average $9.5 billion per year to the provincial GDP.

Finally, the industry can expect to generate an additional $1.4 billion per year in provincial revenues. All of these impacts are incremental to the existing mining activity. The Saskatchewan Mining Association is currently undertaking an assessment of key infrastructure requirements to support the growth of our sector. While this report isn't complete, we can state with confidence that there will be a significantly increased demand for baseload power as well as increased pressure on the transmission and distribution capacity of the system.

As previously noted, the mining sector is a major contributor to the provincial economy, supporting the quality of life of Saskatchewan residents by funding government program services such as health care, education, and infrastructure development. Although a significant contributor to the province's GDP and the government's direct revenue stream, the mining industry continues to experience significant power generation, transmission, and distribution infrastructure deficits as the increased mine expenditures, decreased revenues negatively impact future project feasibilities.

It's a point to note that one of our member companies said that last year they suffered $20 million in losses from power pumps alone. And this is before these expansions have really hit the road, and that's one company alone. I know our company's experienced some losses but not to the extent that they are. But if we keep stretching the infrastructure of SaskPower, we are going to see significant problems as well.

Ms. Schwann: — I just might add too, I know Buckley is not here right now, but in the North, there is no additional room for growth of the industry because we're tapped out. So that's a real significant deterrent and something that needs to be addressed.

[10:15]

Mr. Fortney: — With over 10 billion of investment committed to Saskatchewan mining projects in the next five years, a medium- and long-term plan for secure, reliable, and affordable power generation, transmission, and distribution for all of Saskatchewan is required.

The Government of Saskatchewan has repeatedly expressed its goal to support economic growth in the province by providing the supporting infrastructure for growth. However there are no comprehensive plans in place to support the growth of industry over the next five to twenty years.

While SaskPower has stated that the short-term, five-year electrical supply is secure primarily through the installation of natural gas turbines and energy conservation initiatives, the medium- 10-year to long-term 20-year plans are sitting in the evaluation stage. At the same time SaskPower has indicated that they will have to replace, rebuild, or acquire 4100 megawatts of electricity by 2030, which represents over 100 per cent of Saskatchewan's existing capacity of 3641 megawatts.

SaskPower's 2008 energy and demand forecast report identifies a 6.7 increase in energy growth for the power class, which includes the mining sector, compared to the overall annual growth rate of 3.1 per cent. In the next five years SaskPower's identified that the mining sector load of the power class is expanding at an extraordinary rate and will increase by 2000 gigawatts. And this will become clear later on. We changed that to 285 megawatts based on 7,000 operating hours in a year. We have to convert between gigawatt hours and megawatts, so we did the conversion here.

Preliminary results from the Saskatchewan Mining Association infrastructure study suggests that this number is a minimum.

And with that moderate growth, the mining sector load is forecast to increase by 377 megawatts over the next five years, 486 megawatts over the next 10 years, and 648 megawatts over the next 20 years.

The Saskatchewan Mining Association is confident that the Government of Saskatchewan will recognize the risks that the infrastructure deficits related to power generation, transmission, and distribution pose to the growth of the economy, and that the government will look with the mining industry to fund short-, medium-, and long-term infrastructure solutions that will support the sustainability and significant projected growth of the mining industry over the next 20 years and beyond.

At this time we would like to offer some comments with respect to energy efficiency and conservation. The SMA supports initiatives for energy efficiency and conservation. Member companies actively adopt these practices as energy costs are a significant part of our business, and improved efficiency means reduced costs. Simply put, as good mining companies, we've already made significant investments in energy efficiencies and additional improvements will be minimum. Examples of some of these initiatives can be provided to the committee members upon request.

Also with respect to conservation, while companies are able to operate on interruptible power for short duration of two to three hours in emergency situations, it is not feasible to have the industry cut back their power consumption to compensate for a weak, inadequate power generating system. Reduced power consumption represents reduced productivity and significantly increases costs for the industry.

Mining operations are set up to operate at an optimum level. Fluctuations in that optimum level through lack of power, through other interruptions, are one of the things that we pursue in a major way. As we interrupt the process, we suffer significant losses in recovery and additional costs. What we're saying is we need a system that we can count on 24-7. All of our operations run 24-7. It's a significant impact for us to have to reduce or cut back our operations.

As the top 35 customers represent 45 per cent of the power requirement, 670 million, if you look at SaskPower's revenues in 2008, all these companies would represent $670 million worth of electrical demand. This is a significant number. And all of these companies are looking very seriously at what they can do to reduce that $670 million that they pay to SaskPower. And so to think that we've been spending $670 million a year and not looked at how to cut that back in a significant way would be folly. We've been through this, and there are not significant reductions available.

Recommendations: that the province research and develop options to acquire additional secure baseline power generation, transmission, and distribution capacity as a priority. We would ask that the committee pay particular attention to the viable baseload power options, as this is what the power class customers, which represent 45 per cent of the energy used in the province, requires.

As the prosperity of the province is directly related to the success of the mineral resource sector, the province should immediately take action to ensure that baseload power generation, transmission, and generation infrastructure is in place to ensure the industry's sustainability and growth.

It is noted that timelines for reliable baseload power options require a minimum of five years lead time, with most large-scale projects requiring a 10- to 15-year time frame.

Wind has definitely been discussed, and the Saskatchewan Mining Association is definitely in favour of the province pursuing wind options. Last year, when Alberta hit their peaked power demand, they had 200 megawatts of wind power available to them in the system. At the time that the peak load hit, only 3 megawatts were available. So of the proposed 200 megawatts, there was a 197-megawatt shortfall. That 197-megawatt shortfall would represent shutting down the entire Potash Corporation to make up for that shortfall. So there are some weaknesses in that area.

Ms. Schwann: — Now particularly as the baseload option, and that is what our particular interest is, in ensuring that there's a viable baseload operation that will continue to supply power.

Mr. Fortney: — We are in no way opposed to wind generation, but we need 24-7 power.

That SaskPower make public: medium- 10-year and long-term 20-year plans with associated timelines for power generation, transmission, and distribution. This will provide investors with confidence that the infrastructure will be in place to support their significant investments.

That government prioritize the re-investment of power infrastructure as a foundation for economic growth of the province.

In conclusion, the minerals sector in Saskatchewan is a key foundation for the province's prosperity, with demonstrated strong public support throughout the province. Continued growth of this sector translates into improved quality of life for all Saskatchewan residents. A prerequisite for continued growth is ensuring that there is safe, reliable, and affordable infrastructure in place.

Thank you for providing us with this opportunity to present our perspective on the importance on the Government of Saskatchewan investing in baseload power generation, transmission, and distribution infrastructure. That concludes our presentation.

The Chair: — Well thank you very much. I have questions from the members. Mr. D'Autremont.

Mr. D'Autremont: — Thank you very much. Thank you for coming in today. It was an interesting presentation.

I note through your presentation that you've underlined or highlighted the word baseload quite often. One of the presenters the other day suggested to us that there was no longer a need for baseload, that wind, solar, biomass could supply all of that need for Saskatchewan and that we should be looking to move away from coal-fired or nuclear or any of the other baseload. Oh I forgot to include hydro and that would be continued as well.

So obviously you would not support that kind of a position, that you seem to feel that we do need to continue to maintain a baseload capacity in the province. And based on your, though, last comments, do you feel then as well that the mining industry should continue to receive power on the same basis as all the other power users in Saskatchewan, and that industry should not be shut down if there is a problem?

Mr. Fortney: — We have assisted SaskPower in peak emergency times — obviously we don't want to interrupt people's suppers and stuff like that — and we will continue to support them when there's power shortages.

But repeated power shortages or having a method of operation whereby we're expected to cut back 20 per cent or 40 per cent or 10 per cent means that if you want to generate a potash mine with 2 million tonnes, you effectively have to build a 3-million-tonne operation. Your capital investment increases dramatically to get the same amount of production out of it, and some of these projects are marginal as it is. Saying that we need another 30 per cent of infrastructure because of lack of reliable power would drive those projects elsewhere in the province.

We definitely need baseload. These projects are all dependent on 24-7 operations. And interruptible power, power that's cut back is not an option that's going to make a viable mining industry in Saskatchewan.

We will continue to support the province in emergency situations. We think that's our duty as a good corporate citizen.

Mr. D'Autremont: — Thank you. I was interested in your comment that there's no room for expansion in the North when it comes to mining because of the current constraints on power generation.

We had a presenter yesterday that was talking about cogeneration in combination with the mining industry that . . . and I don't know the needs of the mining industry, but in a combined-cycle process where the electricity would be placed on to the grid for use by the mining company, but that the excess heat would be used for steam for purposes of the mine itself. Is the mining industry looking at those kind of arrangements, and are they prepared to — if it's economically feasible — partner with someone else to do cogeneration?

Mr. Fortney: — As a matter of fact, PotashCorp at the Cory division already does that. And definitely we'd be interested in supporting additional cogeneration projects. It makes good sense if they can provide a reliable power source up at the northern part. The predominant issue in the North is that the grid system cannot support transmission from the South to the North, and that's where the one customer lost $20 million last year from power interruptions. But no, we'd be definitely in favour of supporting cogeneration projects.

Mr. D'Autremont: — My last question deals with transmission. There's been concerns about who pays for transmission. Our system is aging in the South. If we go to a large amount of wind in particular but solar as well, a need for a smart grid, who should pay for that? Should that be a charge against new generation, or should that be a charge against the entire system as a whole?

Mr. Fortney: — That's a tough question. I think what makes political sense . . . Obviously if you've got a new project that's invested in all new infrastructure in terms of a plant up north, and then they see a significant penalty in terms of having to pay all of the infrastructure for a new power grid, that would make the project less viable. I'm ducking your question, obviously. That's really a lot more of a political decision, you know, as to how that is incurred.

Obviously we would like to not see significant penalties for investment in the North when they start. Some sort of payback in terms of electrical rates may be applicable. In the end, the customer ends up paying all the power for all the demands for what SaskPower invested anyhow. But I think as an initial goal, with what the province can see in future revenues, obviously an investment from the province in securing those future revenues isn't out of the question.

Mr. D'Autremont: — Thank you.

Ms. Schwann: — May I just add a couple comments on to that? A large part of the transmission infrastructure in the North was paid by the mining industry, period. That system now serves the northern communities such as Wollaston, Black Lake, Fond-du-Lac, you know, etc., and so, you know, we have paid in the past. We don't know that it's really a fair distribution that the mining companies pay for everything. And then there's, you know, second party on pays or third party on pays nothing.

We'd also note that the mining companies do pay significant revenues to the government already, directly and indirectly. And we'd like that to be part of the consideration.

The Chair: — Mr. Wotherspoon.

Mr. Wotherspoon: — Thank you so much, Pam and Steve, for coming here today. And certainly the mining association and the mining industry within this province is essential to our prosperity as a province and fundamental to the revenues that supply all sorts of important programs in this province. And very glad that you're part of this discussion here today.

The initial suggestion that, I believe, Steve made was that we look at an amendment as it relates to the question at hand about making power affordable for residents and business. And I think it's actually a reasonable consideration and something that we might want to look at. I, you know, certainly think that one of the important competitive advantages that I hope we can retain in Saskatchewan is on the cost of utilities. So good point, and I think that will bring other discussions at this committee table.

Now you talked a little bit about the strong programs that are in place, and I'm aware of some of them as well, with the efficiencies and conservation investments that companies have made. And certainly that makes a lot of sense for your bottom line.

[10:30]

Some of the stuff we are hearing as well from some of the presenters is that there seems to be very good dollar for value for even government to be making investments into these kinds

of efficiencies and conservation. In fact, I think there was a discussion that showed that for every dollar invested in one jurisdiction by government, it saved ratepayers or taxpayers — however you want to look at it — $1.70. So is there a role for the government or SaskPower to work with the industry on this front as a partner?

I know there was mention that there's maybe minimal efficiencies that could be found at this point in time. But if there's a role for government, would the Mining Association come to the table?

Mr. Fortney: — Definitely. We'd be interested in working with the government on reducing power loads and being more efficient. As I said, our electrical costs and energy costs are a significant portion of what we do already, and we've pursued those quite vigorously.

It should be noted that the prosperity in the mining industry right now leads to more energy conservation, not less, because we look at some of these projects and we have this extra money and we want to secure our long-term future. So with the funds that we've had in the last while, we've actually invested more heavily in reducing energy consumption.

Mr. Wotherspoon: — Yes. As we look at historical utility rates, understanding that those are going to be higher for new generation likely, kind of whatever source we look to, there's, you know, a role I think for residents, a role for industry, and a role for government or SaskPower. And that's interesting.

Now you mentioned the Cory cogeneration project. This is, I think, something that has proven itself as a very strong project. You expressed interest in further potential cogeneration projects. Is this something that we can count on, the Mining Association and industry working with SaskPower and with the Assembly on, going forward?

Mr. Fortney: — Yes, definitely. The Cory is somewhat unique. They have large heat requirements so cogeneration there was far more practical than at other locations. Definitely up north we'll be very interested in cogeneration as well.

Mr. Wotherspoon: — Good. And I guess going back to the efficiency and conservation, you offered to table some of the examples that might be useful to highlight some of the work that's already gone on and for us to have that. So I guess I request that you table a document with some of those programs.

Mr. Fortney: — Okay, definitely.

Mr. Wotherspoon: — And then just specifically this $20 million in losses — and I know you had described a little more to Mr. D'Autremont, but I wasn't clued in at the exact moment when the information was being shared there — the $20 million that was lost, I guess with interruptions, what specifically was the problem last year on that front?

Ms. Schwann: — Well particularly the northern mine sites, whenever the power goes off, their fans underground also go off, and because there's radon issues, everybody has to clear the mine site for a certain period of time underground. And so you lose your production time. And they had 23 outages.

Just as a personal aside, we went out to one of the sites this summer . . . Well we go up every summer, but we were up at Rabbit this year, and unfortunately we couldn't go underground because they had three power outages in the time we were there. And they have to keep the, you know, they have to clear the mine, get everybody out from underground, and allow a certain time to pass so the radon isn't building up before you can go back underground. So that's its lost production of the equivalent of 20 million in revenue.

Mr. Fortney: — Even in the southern part of the province in our own industry, the potash industry, a five-second interruption, we pump 10,000 gallons a minute of slurry about a mile out to our tailings area. And a 10-second operation or power bump, those lines, the solids in them will settle to the bottom of the lines. And then it can take you 8 to 12 hours to get them flowing again. So even in the southern part, interruptions are a major issue.

Mr. Wotherspoon: — Thank you very much.

The Chair: — Mr. Hart.

Mr. Hart: — Thank you, Mr. Chair. Welcome to both of you. I'd like to touch on the part of your presentation where you talked about expansion in the mining industry. We have seen a number of announcements over the last 18 to 24 months and it had been particularly in the potash industry. Are any of those proposed expansions being delayed or on hold or what is the status of the most recent announcements? And then if you could just expand a bit on some of the things you talked about further out as far as potential expansion in the industry.

Mr. Fortney: — Right now PotashCorp itself has $5 billion committed, and all of those projects are full speed ahead. The $10 billion that we talked about are committed projects. They're not announced projects or proposals. You have to realize that the Jansen project alone would probably in the end constitute 5 to $8 billion of additional investment, and that is not an announced project.

Ms. Schwann: — That's the project that BHP is involved in.

Mr. Fortney: — Yes. And that's a big player. If they decide to go ahead, that will proceed. Even with our projects, we go to SaskPower. They do the best that they can. They said, well we can give it to you, but it's an interruptible power resource. And that's on our expansion. We were one of the earlier ones in the queue. Some of our other member companies are having a lot of difficulty getting commitment from SaskPower that they will get power.

SaskPower has been as active and proactive as they can. They've installed the turbines to get over this hump at this point in time. Natural gas right now is relatively cheap. But even at that, the power generated by those natural gas turbines is going to be relatively expensive. And we can foresee the gas supply tightening and that the power coming from those natural gas turbines becoming very expensive. So for those natural gas turbines to be translated into the baseload is going to mean significant increases in electrical rates for everyone in the province. And we applaud SaskPower for taking the initiative and getting through this, but what they really need is baseline

generation, baseload generation.

Mr. Hart: — You mentioned SaskPower talks about interruptible supply of electricity. And you had mentioned a bit about some bumps and so on, and I'm a little bit familiar with some of the things — certainly not on your scale, but when we have a power bump and our aeration fans cut out overnight and that sort of thing, I mean, that's just a small thing. Nothing on the scale that you and your industry are dealing with. But could you expand on the interruptible? Like what do they mean by that, and what does that mean for your industry?

Mr. Fortney: — Well interruptible is a newer term. When I first heard it, I thought it meant that they were going to cut our power back like they do sometimes. It actually means that a single point of failure can put us down in the transmission system. It actually represents a weakness in the transmission grids that they have now. They're trying to maintain a standard of, we can lose a line or we can lose a generator and still maintain you. But what they're saying is, no we can't make those commitments.

The Chair: — Mr. Yates.

Mr. Yates: — Thank you very much, Mr. Chairman. My questions are following a similar line. I'm trying to get some sense of what the interruptions mean and what the cause of those interruptions are so, as you look at them, what are some of the potential solutions.

So generally the interruptions come during peak demand time throughout the province. Or are they as a result of a system failure in a particular area of the province, or is it a combination of both?

Mr. Fortney: — A lot of the interruptions that occur now are due to lightning and not having redundant transmission capacities where you lose one line and, you know, when a lightning strike hits, rather than let the surge of electricity damage equipment, they will close down the line to protect the equipment and what happens is it interrupts our process.

We've got thousands of horsepower. At our operation, we would typically run with 40,000 horsepower operating and all those machines come to a grinding halt. And then you have to flush out the system and, at 1000 tonnes an hour of feed coming in, you've got 1000 tonnes of ore and even more tonnes of brine in the system. And you've got to get that all cleaned out and then you can start up. Yes.

Mr. Yates: — That gives me some insight. But we often hear referred to, in peak summer hours, when air conditioners are in demand across the province, that that is often when you hit those peak days for power consumption. Do those ultimate peaks interfere with your operations or do they require a demand to shut down part of your operations at any time? Or is it always sort of the weather-related issues?

Mr. Fortney: — SaskPower phones us up and puts us on notice often: can you do something to help us? And throughout the industry, we'll do different things. We'll say, well you know, we've got one more day to load that train so we won't load that train today; we'll load it later on.

One advantage in the peak summer months that helps is a lot of the mines take their maintenance periods, so we are shut down in the summer. More importantly that affects us when they hit bigger demands is in the winter months. Because they would phone us in the summer months and ask us to shut down, but we're already shut down to a great extent.

We've done some tweaking to help them. We'll change our product split. Some of our products are very energy intensive, and we'll change them for the two or three hours that they need it. But to go beyond what we do now is going to represent a significant problem. Our markets only want certain products and sometimes they're the energy-intensive ones. And for us to cut back our power is a big impact.

We're in good shape now. SaskPower does an admirable job and we're glad that they put in the 100-megawatt or the extra gas turbines, but to go forward on a basis and not have significant infrastructure and baseload is going to cause a lot of problems. And as I said, if a lot of our generation came from wind, and it wasn't windy the day that the province hit its peak, to meet those demands would represent shutting down all of PotashCorp until the wind came back up, which isn't going to be a viable option for the province.

Mr. Yates: — Thank you very much.

The Chair: — I have a couple questions. I'm presuming the daily usage profile of most of your operations would be similar. And from what I'm hearing, I'm presuming that your power usage is fairly flat lined all day. You don't have large peaks or valleys in a daily operation when things are working normally.

Mr. Fortney: — We do have valleys at shift changes because our underground operations when they leave the mining machines and return to them, although we are taking steps with automation to ensure that those machines can operate through shift changes. Also mines have been looking at staggering start shifts so that half of the guys go down sooner and half of them come up later. But basically speaking, our load is fairly flat lined, you know, but there are definitely fluctuations at shift changes and stuff like that.

The Chair: — We also hear that 35 companies represent almost half of the power use in the province. Of those 35 companies, your organization, I'm presuming, represents most.

Mr. Fortney: — Yes, I would assume so.

Ms. Schwann: — And the pipeline is also fairly significant, and oil and gas users. But the mining industry is one of the key ones, yes, in the power class.

Mr. Fortney: — IPSCO would be in there as well, I would assume.

The Chair: — So 25 of the 35 would be a reasonable estimation?

Mr. Fortney: — Twenty for sure.

The Chair: — Twenty for sure.

Mr. Fortney: — Yes.

The Chair: — And again maybe to reiterate back a little bit but just so I have my head wrapped around it completely, your organization and the people you represent have, you know, through the economies of it, have really been looking for the efficiencies up to this point. I guess we've been hearing from other presenters that in different jurisdictions which in all likelihood have very different industries and footprints, but they have found substantial savings on the conservation side.

Here in Saskatchewan where half of our power usage is coming from a small group who have, if I'm reading you correctly, have already been really looking for those efficiencies. You know, not that we shouldn't set our sights as high as we possibly can, but you're telling us that we've been working in this direction from the private sector already. Is that kind of what I'm hearing?

Mr. Fortney: — Yes, definitely. Just from a straight economics point of view, energy consumption represents 25 per cent of our budget, and so for us not to pursue that in a very active fashion would be folly. I mean, you just don't have 25 per cent of your expenditures going and not look at them.

The Chair: — We've been hearing from several people that cogeneration is going to be something that people in the past have approached SaskPower with. I know in Lloydminster we have the cogen plant there where they can use the excess heat. At the Cory mine they're currently doing that. They have specific heat requirements that other mines don't.

Mr. Fortney: — Yes, they do. They do a crystallization process and produce a white product only. And Belle Plaine does as well, but they do cogeneration as well. They do it with their own group, but this was a partnership with another company where we did the cogeneration at Cory. We would like to partner with anybody that . . . There are other projects that won't be as practical as the Cory project, but there's definitely more out there. If other companies say we can partner with you in different ways than what we're normally used to, we'd be definitely interested.

[10:45]

The Chair: — In the Cory situation, is it the actual mine that has the generating facility? Are they the same company or is it a third party that provides both power to and heat going in each direction?

Mr. Fortney: — I have a vague idea. I don't want to mislead you. Cory is a big heat requirement so we use the waste heat from the process. Normally we'd use the natural gas and generated our own heat. What they found was that they could take the natural gas and, instead of just generating heat, they could take that heat, generate electricity, and then the waste heat from generating electricity would be suitable for Cory's loads. So that was the biggest difference there. And I don't know the whole legal ramifications. I know that there's . . . I don't know the legal set-up of that arrangement. I know we have PotashCorp employees in the plant. I don't know specifically who owns the plant. I know it was a joint deal. Sorry. I can get you that information later.

The Chair: — And that probably isn't critical. I'm just kind of looking at the business model of how it's worked in the past. I guess I'm just glad to hear that conservation has been part of your plan up to this point. I think that's a very positive thing for industry to be leading on. Mr. D'Autremont.

Mr. D'Autremont: — Thank you. One of the issues that was raised with us yesterday dealt with smaller mines and cogeneration. So a place like the Potash Corporation at Lanigan — or I'm not even sure if that's yours but — utilize certainly a lot of power. But some of the hard rock mines up in the North don't have near the power consumption — somebody's using a Rogers telephone — don't have the same power needs that some of the larger locations have.

What kind of a size would be . . . What kind of power needs do some of these mines, like the gold mines or that, what kind of needs could a smaller generation be available to them?

Mr. Fortney: — I got a comment back that the 300 megawatts at the Cory was sort of the break point, that that was . . . And I don't know if that's still applicable, and I don't know how expert he was and unfortunately I'm not an expert on cogeneration. This was a comment made about 10 years ago, maybe. And gas was high at that, gas prices were high at that point in time. Maybe it's a lot more favourable now. I don't know what the smallest economical value is, but I know the statement was made at the time that the 300 megawatts at Cory was marginal.

Mr. D'Autremont: — What the presentation yesterday was looking at was not gas. Gas isn't available in the North at the mines, where the locations would be. It was a biomass generation, and they were talking, I think it was 10 megawatts.

So would 10 megawatts satisfy most northern mining operations, you know, excluding the large ones like McClean Lake and McArthur River and, you know, some of those, but say some of the smaller hard rock mines?

Mr. Fortney: — I believe so. Our demand is about 40 megawatts at our place. So it would have to be something a quarter of the size of what our demand is, just to give you a relative scale.

Mr. D'Autremont: — There would be a need for that kind of a service if it could be done economically.

Mr. Fortney: — Yes. It would fit into the system, yes.

Ms. Schwann: — The potential mine that the Golden Band has just north of Missinipe might be a suitable candidate for something like that.

Mr. D'Autremont: — In the North as well, there would be a need for space heat which could be a part of the combined cycle. So there could be other uses for the residual heat coming from that kind of a cogen operation. There could be more value there than just the electrical generation.

Mr. Fortney: — Yes, definitely. Forty below, you don't want to pump that air into the mine so we, I think . . . All mines have to heat their air. The potash mines particularly are going

through water bearing regions and they're steel lined so we can't let that steel lining hit 40 below or even below freezing. So we definitely heat. And just for personal comfort, I believe all the northern mines have to heat their air for the people underground in the winter months. Summer months would be a different story.

Mr. D'Autremont: — Okay. Thank you. When I look at your presentation and look at the power infrastructure requirements — five years, 377; 10-year, 486; and 20-year, 648 — does this generation requirement encompass all of the current mining proposals for the next 5, 10, 20 years?

Mr. Fortney: — This is based on the medium-size prediction, not the optimum prediction.

Mr. D'Autremont: — And so how much larger would the optimum predictions be?

Mr. Fortney: — Pam will look that up if you want to continue on with other questions.

Mr. D'Autremont: — Okay, thank you. Yes. I think it's important that we have some idea of what the mining industry expects to be doing. So if we're looking at making determination — whether it's wind, whether it's solar, whether it's biomass, whether it's baseload capacity that's needed — I think it's important to look at what kind of demand there will be out there. And with mining, mining is not concentrated in one location; it's scattered throughout the province. So to meet this need, there would also be a need for transmission as well.

Mr. Fortney: — Right. Yes.

Mr. D'Autremont: — So have you looked at what kind of transmission needs are going to be needed as well to meet these kinds of demands?

Mr. Fortney: — SaskPower, surprisingly enough . . . Like the Jansen project, the expansion at the Allan mine and the Cory mine and all of these current mines happen to all fall along the, basically, along the Yellowhead highway. So we're sort of along a corridor there. And even the new Agrium proposition is down by Melville, and it's relatively close to other mines. And even our expansion is along an existing grid area — so SaskPower has made proposals as to how they're going to address sort of this corridor.

Potash mines are quite high users of energy. The northern mines though, they definitely don't have enough infrastructure. They don't have reliable power and they don't have enough of it. And any projects that are going on up in that area can't be met at all. Yes.

Mr. D'Autremont: — Has this been an ongoing problem or is it just a new problem?

Mr. Fortney: — No, it's been an ongoing problem. But when these people are looking at, well now there's going to be two new mines, and I'm already having lots of issues, we felt we have to make a presentation.

Ms. Schwann: — To answer your question, Mr. D'Autremont, it's about 200 megawatts more of power compared to the moderate growth on that.

Mr. D'Autremont: — And where would this come in — 5, 10, 20 years, or is . . .

Ms. Schwann: — You add another 200 megawatts over 5 years, over 10, and it looks like . . . This is very rough. These are preliminary results. We should have a final report by the end of October with some numbers.

Mr. D'Autremont: — Okay. Thank you very much.

The Chair: — If you could make that report available to the committee at that time, it would be valuable — probably not for our interim report, but for our final report.

Ms. Schwann: — I don't know that I can actually commit to make the full report to you, but certainly we can make parts of it available.

The Chair: — Sure. I think that the concern we've been hearing from presenters over the last week and a half that maybe industry has been overly ambitious in the numbers they've put forward. If you have information that has some specifics to it, I think we would find it valuable.

With that, I would like to thank you for making your presentation today. To hear from someone that's using the amounts of power you are, I think it's very valuable to our committee, and you've shed a lot of light on it for us. Thank you very much.

The committee will recess momentarily and allow our next presenter to get set up for the top of the hour.

[The committee recessed for a period of time.]

The Chair: — Before we hear from our next witness, I would like to advise the witness of the presentation process. I'll be asking all witnesses to introduce themselves, and please state your name and if applicable the position you represent within the organization. If you have written submissions, please advise that you would like to table your submission. Once this occurs, your submission will be available to the public. Electronic copies of tabled submissions will be available on the committee's website.

The committee has asked that all submissions be in answer to the following question: 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. Once your presentation is complete, the committee members may have questions for you. I will direct the 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 witness submissions presented to the

committee will become public documents and will be posted to the committee's website for public viewing.

I would like to say for the record that we were having a little bit of technical difficulties, and that is what has pushed us back a little bit. Our presenter I think is going to go ahead with copies which he has provided to the committee, and unfortunately I don't think we're going to get his presentation up right now. Potentially he will table that and viewers can check it out online. With that I turn it over to our next presenter.

Presenter: Wade Zawalski

Mr. Zawalski: — Hi. My name is Wade Zawalski. I'm here as a private citizen; I don't represent an organization. My background is engineering physics. I worked in the semiconductor industry.

And why I'm here is I've watched with considerable interest the development of solar technology over the last several years around the world and particular interest with the ongoing debate in Saskatchewan on how we're going to meet our energy needs in the future.

And I'm here, quite frankly, because I'm a little disappointed that I'm not hearing any serious noises from SaskPower that solar energy is an option that might meet even a little bit of our electrical needs because all throughout the world right now, we're starting to see that utilities are spending money investigating how to integrate photovoltaics through programs to help consumers put panels on their roof, or through industrial-scale farms, through incentives, through all kinds of programs that will help meet part of our electrical needs.

And from the onset, I just want to say, you know, I'm not against nuclear power. I have no agenda into how we're going to meet our baseload. But I do think that solar power could meet 10 to 15 per cent of Saskatchewan's long-term energy needs in a clean and reliable, safe and cost-effective way.

[11:15]

And so I want to start — and unfortunately I don't have the map of here, here — but I want to start by showing that Saskatchewan is actually Canada's solar capital. We have more solar resources than any other place in Canada, and it seems to me that we should not. . . You know, we're an energy superpower in so many different ways. A province that has uranium, coal, oil, gas. We have lots of wind.

But we don't really understand that we actually have more sun on an average year than any other place in Canada. Ontario has now recently started to adopt a very aggressive strategy to promote solar energy. And the same solar panels installed in Ontario would now produce 20 per cent more power if they were put in Saskatchewan because of our location. So we have on average 20 per cent more solar resources than any other place in Canada.

And if you compare Saskatchewan to famous places like Italy, we have more resource in Regina than Rome. We have more than Rio de Janeiro.

So compared on a provincial basis, I have a graph here that users will be able to, viewers will be able to check later if they want. It shows that we're also blessed as the solar capital of Canada.

And when you look at a map of the radiation that hits the planet on an annual basis, you'll see that Saskatchewan actually comes up. And for some reason the solar radiation in North America is favourable for us here in the province, and we stand well on a global scale.

And if you look at the growth of photovoltaics, and I use the word PV, I should define that, that's photovoltaics. I'm not talking about other forms of solar energy like hot water, I'm talking about direct conversion of electricity through semiconductor technology and that's called photovoltaics. And the growth in the industry in Canada has been quite dramatic — a minimum of 23 per cent since the early '90s — and it's projected to grow quite extensively in the future as well as mirror the dynamic growth that's in some cases reaching 50 to 60 per cent a year around the world.

And as far as I know, we really have almost no capacity in Saskatchewan. There's two firms, two or three firms, that are serious. You've heard from one of them earlier this week, Mr. Anderson, who did a nice presentation. And later this afternoon, Mr. Ken Kelln will also be presenting. He's another professional that's been working in the solar business here in Saskatchewan for a number of years.

So I have a graph here that of course you can't see — the viewers — but what you can see is that up until now there's been a steady growth of about 20 per cent a year. And in the next two years in Canada, we're about to see an explosive growth of the installed capacity of photovoltaics. And most of that's due to a program in Ontario that was started in 2007, which has now been modified — a feed-in tariff program — that basically pays anybody very attractive rates to feed solar power into the grid. So for instance people that install rooftop solar cells are going to get 82 cents a kilowatt hour.

This is one of the most attractive feed-in tariffs in the world. And to make it even more interesting, this is actually unlimited. The Government of Ontario has put no limits on how many systems could actually be used and installed. And solar farms that are 10 megawatts for instance would get about 44 cents a kilowatt hour. At these rates, it's extremely attractive to start to invest in photovoltaics. And there's a profit, so private industry has stepped in.

But what I'm hoping to be able to show to you to by the time that I leave is that soon we're not going to need such tariffs. And these tariffs are our transition right now to get the industry working so that economies of scale and all kinds of business practices that we all know drive down the cost.

My background is plasma physics. I worked in the semiconductor industry. I work for the company that was responsible for driving down the price of flat panel technologies. When I started in the '90s working on plasma tools, we were making tabletop machines that would layer semiconductor materials on glass plates to build flat panels. Today these are two storey machines that you have to climb up

a ladder, and they process pieces of glass that we would have trouble fitting between the committee tables. And these scales of economy — large sizes, throughputs, manufacturing efficiencies — are what drove down the costs as a flat panel display.

And as I show and talk about later, that same company's now taking its flat panel equipment and now trying to make the largest solar panels in the world — four times bigger than any other company — to try to further drive down the price. And not only that, they've actually taken their technology and they've made it so that it's a turnkey operation so that you can sell this fab line to a utility so that they could produce the solar cells extremely cost effectively without the middlemen and then drive them out of the factory and install them on a farm.

But before I go into that, I just want to give you a little kind of overview of the kind of technologies that can generate electricity. And the first thing I want to say is that there's two essential ways of generating electricity. One is to use the heat from the sun to boil water, like we're accustomed to with coal and nuclear technologies. And the other one is to actually directly convert it through quantum mechanic processes or, you know, exotic reactions on the surface of a wafer.

Now because of Saskatchewan's climate, it doesn't really make a lot of sense for us to use the hot water technology because you really need high temperatures, and it's not as effective in the wintertime. It does work a little bit, but also really the technology that would work best for Saskatchewan is the photovoltaics. There's less moving parts. They could sit in fields. And by coincidence of our climate, as you get to colder temperatures, you actually get the cells working better. For every temperature drop, a half a per cent more light energy comes out of the panel.

So I'm going to only talk about photovoltaics as I told you before. And there's two major . . . In order to understand why the technology is dropping in price, you've got to have and understand the technology. And there's two major ways or technologies that are competing in the marketplace. One is to basically take solid silicon, slice it into wafers, pattern that with the solar semi-conductor junctions, and then cut them up and put them on big panels. And you see them with all those little solar cells that are attached to a panel.

The other is to take the equipment — like I told you a minute ago that Applied Materials is now making; the company I work for in California — and coat thin films on glass substrates, and then you use much less material. These processes are not as efficient — it's a much newer type of technology — but it has the potential to dramatically lower the cost because there's so much less expensive materials that are being put into the solar cell.

Recently there's been an incredible spike in the cost of silicon. In fact it went up almost a factor of 10 depending on where, how you were purchasing the material which resulted in the . . . Since most cells are made with these solid polysilicon or silicon crystals that are cut in and polished, there's a lot of material that's needed. And since the cost of that material went up, there's been a recent stabilization of the price of solar cells over the last three or four years, coupled with a high demand that the industry couldn't meet.

So a long-term price decrease that we were seeing kind of stalled for a while, and people have been kind of, you know, affected by that. It's helped the thin-film technology because they don't need as much material, and it's kind of kick-started that process.

And there's also other thin films that have actually developed, even printing processes, where you could actually print solar cells now on aluminium. And I'm going to talk about a couple of companies later on that are doing exciting things that are dramatically ready to alter the landscape for solar technology.

And the thing that I want to get across, and my numbers, you know, people could argue about what the real costs of a solar farm might be, but the technology is changing dramatically. And what we have seen in the past, we've seen a steady decrease in the cost of solar cells. We're about to regain that decrease — that trend — and we're about to see it in the future.

So to get to the real numbers, though, the National Research Council publishes an annual survey of what it costs to put a photovoltaic installation in. And they've tracked it for a number of years, and you can see that in 1999 it was like $17 off grid to put a complete per-watt installed, which is quite expensive. That would produce like over $1 — well actually a kilowatt hour of electricity — on a long term when you amortize the cost of the capital. But you can see that $17 hasn't stabilized too much off grid because you need batteries and stuff like that. You don't need that anymore if you're going to attach to the grid through net weaving and stuff like that. And you can see the cost of a grid connected system is now down to $6 — 6 to $8 a watt. And what I'm going to try to convince you is that that's about to drop further in the next few years.

And if you look at the price trends in Canada since 1999, there's been a steady drop in the price of the solar module, and the solar module makes up only part of the cost of the entire system. The system is made up of the cost of the module, the inverter that takes it to the line voltage. It's also the cabling, the wires, the installation, everything.

And obviously everything is affected by a scale of manufacturing and the economy of scale, but one thing that's been dropping is the installation and cost. And you could see that it's dropped over the last few years while the price of the modules has basically levelized . But like I said, that was due to the spike in the cost of silicon, which will be much less of a problem in the future as the technology starts to go more and more to the thin films which don't depend so much on silicon, and the price of silicon comes down even further as more supply comes on the market.

Now there's a company called Solarbuzz, which is an industry-leading research market firm and consulting firm, and they publish a monthly index of electricity costs. And they poll 70 to 80 companies on a monthly basis, and they report what the prices of electricity are in the solar industry. And you can see from the table that in the small category, where you're basically having a system with batteries and less than 2000 watt system, it's still about 35 cents a kilowatt hour to generate electricity if you're off grid. If you go on the grid and you get

rid of the batteries and stuff like that, today with the best technology for small 50-kilowatt systems, the going rate for electricity on the market with the costs of the technology is about 25 cents a kilowatt hour. And if you go to the industrial large-scale solar farms that are now being produced in which you have over 500 kilowatts of peak power being produced, the amortized operating costs and operating costs of solar electricity is about 20 cents a kilowatt hour.

Now of course there's going to be legacy systems in the pipeline that are still going to be producing electricity from the previous costs because solar-style technology tends to last at least 20 to 25 years, maybe even longer depending on the type of materials that are used. So if you install a system today that costs quite a bit, it's going to continue to cost expensive electricity for a long time.

So in Europe and America the cost of electricity has been slowly increasing, but not nearly as much as the decrease in the price of photovoltaic technology. And it's hard to say exactly how much a solar-style system is going to — a photovoltaic system — is going to produce when you install it because it depends on the location. Some sunny locations will generate more for the system than the more northern, colder climates.

So what you have to do is you have to really know the location. You have to understand the local market to find out when this solar energy starts to really become competitive with, you know, the legacy conventional systems. And we're just at that cusp. For the last 20, 25 years the price has been going down, and we're at the point where in Europe and America, 20 per cent of the electricity being generated is now competitive or as expensive to the retail customer as it costs to make the solar technology.

That's not the case for Saskatchewan. If you generate electricity with solar cells today, it's going to cost you more than you can do with the legacy systems. But in places like California right now, New York, New Jersey, it's actually just as cheap to make electricity with solar cells as it is for what people are paying, and especially when you start to consider the subsidies that exist.

But as a historical cost reduction curve begins to kick in as the supply and the production starts to skyrocket, we're going to see a dramatic decrease again in the price. And the investment in solar industry is dramatic. It's growing, you know, at annual rates of — between 2000 and 2008 — of 99 per cent. And the investment level now is $20 million a year annually.

The production trends are equally staggering. If you look at what we've been producing in the past little while, it's been almost nothing compared to what's going to be happening in the next few years. And the projected number of photovoltaic systems will start to produce a significant portion of the world's electricity, and different sources have actually indicated as much 10 to 15 per cent by 2025 or 2030 could be photovoltaic. And it really depends locally on the sensitivity of the market.

But in the US [United States] right now, with incentives factored in, you have 20 per cent of the market competitive with solar, or solar competitive with 20 per cent of the market. And in 2015 that'll be 50 per cent. Okay? So I think I've kind of hammered that point effectively — I mean, not effectively but I've made that point.

What I want to talk about is a couple of the companies that are making a difference. This is a story of government incentives and private innovation and technology. And the largest company right now making solar cells is a company called First Solar. It doesn't use the normal silicon technology, but it uses a cadmium tellurium technology. But as you can see, the price has been dropping of their technology dramatically, from about in 2004 to $2.94 a watt for every solar cell that they manufacture, and I can say today that they filed with Securities and Exchange Commission that they're manufacturing now for 87 cents a kilowatt hour, a kilowatt peak. So we've been talking in the past about 6 to $7 a watt peak of electrical cost for solar cells. Now that includes installation, all the other items. But the module price itself has dropped, is set right now on a utility scale to drop to less than a dollar.

[11:30]

And another company that's of note, that's actually is even more interesting, is a company called Nanosolar which is kind of creating a lot of interest around the world because they're actually going to be . . . And they have a manufacturing plant in San Jose, California, that prints solar cells on aluminium foil. It gets rid of a lot of the expensive manufacturing processes that use these expensive two-storey equipment like I was talking about.

And I can't say with any authority of what exactly the cost that their solar cells is because it's all private investors who are maybe set to make a lot of money when they start to go public. But they do publicly announce that their manufacturing cost is less than $1 per watt. And they are publicly hinting that their costs might be as low as 33 cents a watt peak which . . . disruptive in terms of what this will mean for solar technology going into the future. And we'll find out within the next six months to a year whether they're really going to meet the 33 cents or 50-cent goal, so I guess I'm now in business.

So as you can see with the Nanosolar, the solar cells are actually being run on industrial equipment that's the same equipment that is used to print newspapers. So the capital costs of these factories is enormously lower than the expensive machinery that's used to make silicon-based wafer, solar cells. And as you can see from the previous slide that — I'm not going to try play with the computer right now — but as you can see from the previous slide, the cost of the technology has been dropping dramatically.

So I talked about Applied Materials. I used to work, I have no connection with the company any more, but I admire their foresight. Two years ago, they decided to become a player in the solar business and bought a few small, little solar companies and decided that they were going to assemble their equipment from flat panels to make a turnkey operation they could sell to utilities, so that any company without any expertise, anywhere in the world could build a manufacturing plant to create local jobs, create local industry — instead of importing solar cells, say, from China or other places like that — and produce solar cells that would be shipped out of the back door and mounted on a farm.

And to lower the cost even further, they built the mounting into the panels, and that lowered the cost of the final installation 17 per cent. And I've talked to them on the phone and read some of their technical papers and visited, had conversations with some of the people, from their customers who tell me that they are really manufacturing now for $3.50 installed for watt peak, which means that you're now dealing with electricity that can be made with solar cells in Saskatchewan for less than 20 cent a kilowatt hour, if you had one of these factories producing solar cells, you know, in Regina or Swift Current or somewhere else and being shipped to a field and be installed.

So the 13 systems or 13 of these prefabricated manufacturing lines that has been shipped around the world . . . And one of the firms that is using their technology is committing itself to getting that down to about $2, $2.25 a watt installed, which would then start to get their electricity down to 10 to 15 cents a kilowatt hour.

So you know, their model is basically sell the fab to the utility, have the utility put them out on the farm and then have the electricity fed into the grid.

But then, you know, you start to hear things from SaskPower that they're planning to meet the demand to 2030, and they're claiming the cost will be 40 to $1.40 a kilowatt hour. And I know that, have a lot of respect for SaskPower and the engineers who work there. I mean I'm not trying to criticize them. I understand, as a person with an engineering degree, how conservative and important it is to make sure that you have a reliable grid and that you can meet the demand of the system. And that's an overriding concern.

And there's a perception with technologies like wind and solar that you don't have the control that you have by burning coal or nuclear power plants. So there's a reticence to invest in new technologies like this that are especially new to Saskatchewan. There's a perception that these things won't be able to deliver and then you guys won't be very happy, of course.

So they are however admitting an 8 per cent year increase for the next decade. They have a very expensive projection of what electricity will cost to install a system. And they will not report what they're paying for the marginal cost of peak electricity today, so we can't compare what they're paying at the peak demand time in the afternoon for their low-cost . . . their extra generation for peaking because they're not telling us a number. But if you go to other utilities and markets, sometimes it's as much as 30 to 40 cents a kilowatt hour at peak times because you only need to run the generating stations an hour a day.

So under some of these scenarios, if you consider some of this information, I think you could start to see that maybe there's a role for solar to play, especially when . . .

The Chair: — Can I just stop you. We have run over the time that we've been allotting, but if it's all right with the committee, I think this is probably the most valuable way to get it. If it's acceptable for the committee, we'll carry on. Please go ahead. If you could leave time for questions, I am pretty sure there will be, but this has been very valuable, I think.

Mr. Zawalski: — I can close right now. Essentially if you look at the demand daily profile of electricity — and I appreciate SaskPower for providing this — we use more electricity during the daytime than we do at night, so solar would fit into the matrix. Now it can't provide our baseload, but a distributed network of solar cells could easily provide 500 megawatts of power in the afternoon. And you know the peaking capacity that's there already could fill in for times when it's dark and we have more predictability of solar cycles. You know, there's never anything perfect.

But also when you start to consider how solar could work in with things like our hydro, we could run the hydro a little more at nighttime when the sun isn't shining. It tends to be the fact that the wind, which is actually just another form of solar energy, blows more at nighttime than it does in the daytime, so the two when you connect them together create a more even source of power. But it's not a perfect solution and it's not going to meet our baseload.

But I think we could on a long-term basis and a cost-effective means if we had some political direction and some kind of experience . . . Here, you know, there's really no research. There's nothing in Saskatchewan. Nobody's doing work in solar and solar technology. And so we don't really have any of the people that are comfortable with trying things and then figuring how to do it here.

The last thing I'm going to say before I go is, the clean coal, SaskPower and clean coal with respect to the Shand retrofit of unit — I think it's unit 3, not unit 2 — but this is a $1.4 billion project that's going to reduce one of the existing coal-fired generating units by 139 megawatts to 100 megawatts as a kind of a tax on capturing all this CO_2 which will amount to about, I say 1000 tonnes in the slide. It's 1000 million tonnes. And the CO_2 will then be given to industry, the oil industry, to extract 3 million additional barrels of oil annually. And that will require a further investment of $400 million from the oil industry in order to get that. And there'll be revenues to the province and to the oil companies from that extra activity.

But in the end, that electricity from that unit will end up costing us 58 cents a kilowatt hour if you apply the same methodology that's being used for solar energy because of the capital cost that has to be amortized over the lifetime of the plant and the operating costs. And then that 3 million barrels of oil, well you burn that in cars; it's going to produce exactly the same amount of CO_2 that you've sequestered in the ground. So why are we doing it?

I mean, it just doesn't make any sense if the goal in the end is to lower the amount of greenhouse. And I do support the oil industry. I just think that in this particular instance, what's the goal? Is it to reduce greenhouse gas or is it to just produce some, you know, more energy that basically ends up, you know . . .

Anyway, so my conclusion is that Saskatchewan has a lot of solar potential. It's one of the best places in Canada, and it stacks up well against other places in the world. And the technology is developing so quickly that we can't look past at what costs were, you know, a few years ago. We have to basically go forward and, given SaskPower's mandate to look for costs going into the next 20 years, we'd be missing an

opportunity not to commission or search into how to do this, not to get some experiments into how to put this power into the grid. And I think long-term it could meet 10 per cent of our needs — whether the other power is provided by nuclear or clean coal, if it works, or other forms.

So I'd like to thank the committee for giving me the chance to speak and putting up with the technical problems here.

The Chair: — Thank you very much for your presentation. Mr. D'Autremont?

Mr. D'Autremont: — Well thank you. It was a very interesting presentation and certainly on the leading edge of the technologies that are coming forward. And I suspect that's why — as you yourself commented — SaskPower's being very conservative on their cost estimates. Because I believe the number they gave us was 43 to 180 cents a kilowatt hour for the costs for solar compared to 8 to 13 cents for all the other generation — wind, coal, whatever. And like computers, I remember buying my first calculator; it was about 90 bucks and all it did was add, subtract, multiply, and divide. And now they give those away.

So what kind of a time frame do you think it'll take for solar production and then therefore the generation of electricity to come down into a range that would be comparable to the other types of generation.

Mr. Zawalski: — Well you know, that's looking into the crystal ball. I wish I could say that I knew definitively that in 10 years, you know, we could be producing electricity for 15 cents a kilowatt hour with solar power here in Saskatchewan. I think that's a possibility. That's reasonable given the technological shifts that are happening right now and the events that are happening in Silicon Valley and in China and all around the world.

But even if it doesn't end up being 15 cents in a couple of years, it's going to take a number of years for us locally to get used to putting solar panels on roofs and to understanding how solar fits into the grid and getting used to the timing.

There's work being done at other utilities right now within the interconnect systems to model solar power as part of the overall mix. And I guess the reason I'm here is I just don't see that happening in Saskatchewan. I'm not advocating that we could go to 10 per cent power with solar voltaics next year or in five years. But this is a gradual process that'll be unrolled over many years, but it kind of grows exponentially. Just like, you know, when the tar sands were being researched, it took 30, 40 years before we got to any sizable oil production. But we had to start somewhere, and I don't see us starting right now in Saskatchewan yet.

Mr. D'Autremont: — The reason I chuckle when you mention the tar sands, I was in university in Calgary at the time the real development started there, and they were projecting $60 a barrel oil at the time when the price of oil was two bucks, to make it pay. So you have to have some vision to go ahead with those kind of things. And yes, that was just right after the earth cooled.

One of the issues, your graph that you had with SaskPower usage showed really the peak loads were basically from 5 o'clock in the evening till about 8 o'clock in the evening. You know, for half of the year that would work good with solar, but for half of the year that wouldn't because the sun's already gone down.

What is happening in the storage industry for electricity, which would be a huge boon to both solar and wind if there were changes happening there?

Mr. Zawalski: — Oh well there's a lot of people working in their basements or back in labs and in companies that they're not telling us, but there's been, you know, announcements that some really exciting storage technologies are being developed right now in terms of hydrogen storage. There's even serious . . . and I mean credible engineering studies are done that when we start to become electric car, get electric cars, that the electric cars themselves on the grid could actually become a storage mechanism for solar energy so that when you plug in, you become part of the storage for the solar grid.

But there's also things like pumped hydro which are being aggressively pursued in California. There is people doing work on how to modulate hydroelectricity. You're only getting a certain amount of hydro through your generating stations. If you could taper that during the daytime or when the sun is shining and then up that during the evening so that over a short period of time you're not disrupting the water balance, there's a potential to work those two together so that you could accommodate fluctuations in the solar output, especially if you were to work in partnership with someplace like Manitoba which is 96 or something per cent hydroelectric — if they could modulate that kind of stuff.

But the truth is that we don't really know what is going to be the magic bullet for the storage. I do know, I'm convinced based on the history of the price falling and just knowing every time I go look at a flat-panel display, and kind of thinking to myself, yes, I could have seen that when they were $20,000; I knew they were going to come down. Just like we've seen and we know that solar panel costs are going to come down and as the economy of scale goes up, the cost is going to come down. And once the storage technology gets cheap, a lot of the problems that you're, you know, SaskPower and other places have about the intermittency, those are going to disappear.

But again, I don't think realistically we're looking at more than 10 per cent of our overall supply. Maybe residential people, you know, as Mr. Anderson said the other day, all the roofs in Saskatchewan could cover basically all residential electricity use based on a National Research Council study.

[11:45]

Mr. D'Autremont: — Thank you. My last question deals with the transmission grid. If you have all of these geographically dispersed generation stations, obviously you're going to need a lot smarter grid operation than we currently have. That's going to come at a cost. Who should be paying for that? You probably didn't hear me ask the question of the previous presenters. But who should pay for this additional transmission cost? Should it be new generation, solar, or should it be spread across the entire

usage?

Mr. Zawalski: — Actually you raise a very important point, and a good point. I think that one that could be addressed . . . One of the advantages of smart metering and the newer technology that connects local electricity production to the grid is that it actually makes the grid much more intelligent and able to adapt to changes in the usage and demand and failures. And so adapting a widespread solar program could be part of just normal demand load charges that maybe will be implemented in the future for customers because you'll need smart technology to be able to tell when people are using electricity. And the fact that solar power can be put where you're basically using it — you don't need as much of an electrical infrastructure — means that actually solar energy could complement the modernization that shouldn't happen anyway of the grid, and ultimately make the grid a little more stable and safer — especially as things get more distributed.

But again, you know, because it's not going to be one large plant and one big place, it's a little different, and you need people to actually spend some time and work on it.

I phoned and talked to some of the electrical engineering professors at the university about this, and they were talking about how there's a lot of work now being done on wind that's being commissioned because of our wind farms. But nobody's doing anything in Saskatchewan with respect to solar. There's nothing. And yet there's a need, potentially up North where there's expensive diesel that goes in on ice roads, you know, in the wintertime, and then it's used for the year. And that electricity's costing 50, 60 cents a kilowatt hour. So maybe solar can make an impact even at its most expensive side.

But I think your point is good in terms of how solar could complement the smartening up of the grid, so to speak, and that it could be part of long-term, ongoing kind of infrastructure renewal.

The Chair: — I just was reading through Ontario's new energy plan and the new Bill they brought in, and you commented that they're paying 44 cents a kilowatt hour if you're up to 10 megawatts, and as much as 80 cents if you're less than 10 kilowatts. You know, those are eye-popping numbers, especially if you can start producing it at 13 cents. And I believe that you can sign that up and lock it in for 20 years. You know, that is rather eye-popping, I know.

My question, the member from the Pembina Institute represented himself and his organization here that, why isn't everybody jumping on that? And if they do, will the people of Ontario be paying 80 cents a kilowatt hour for their electricity if that's what the supplier is? You know, I'm glad to hear that you think that we're coming down from that into the range where it starts getting competitive with traditional technologies.

You had mentioned that, you know, once the electric car, you know, all these new technologies . . . When we start talking about electricity needs, if we do go towards an electric car type culture where electricity is replacing gasoline, you know, that I think would probably open the door even further to dramatic increases in the amount of electricity. Do you have any thoughts on that?

Mr. Zawalski: — There are two things. First of all, thanks for the first point about the 82-cent feed-in for Ontario, and I need to do some . . . I don't want to categorically state this, but my understanding is that that's the net amount of electricity you feed back to the utility at the end of the month after your own usage. Hence for somebody who's put a small system on their roof, they first use it locally to power their own needs and they're not getting a rebate of 82 cents a kilowatt hour. So by the time they've used their own needs and then are feeding back to the grid, it's not nearly as attractive on a net monthly basis and so that it looks a lot better than it really is. And you need that rate for it to start to actually make sense for the person, on a roof.

And as far as the electric car, the electric car — in fact, if you look at how much electricity it uses for the same amount of distance that you would use using ethanol or gasoline — it's a much more efficient process. So it's really four times more efficient than a gasoline-powered car because there's not all that heat being lost.

So the grid could . . . You know, you're right about the fact that we'll need more electricity. But the great part of solar power is that you could have car parks that have their own solar panels mounted on it that feed into the . . . charge the electric cars. And you know, the reality is when our society starts to get to the part where everybody's got electric cars, I'm pretty sure there's going to be a lot more solar panels all over the place. So it's not like we have to tomorrow do this. Please don't think that this is something that I'm expecting is going happen in one or two or three or four years.

I just want us to start to take the baby steps and to show that we — as a sophisticated part of the world — really understand where it's going, and we're not just going to stay in the old technologies, and we're going to move forward.

The Chair: — Okay. Well thank you very much. Mr. Wotherspoon.

Mr. Wotherspoon: — Just a question to tie in to the question from the Chair as relating to the Ontario feed-in tariff program, and the question just about how much electricity then might be purchased for this 82 cents a kilowatt . . . in that hypothetical circumstance.

Do you know then . . . So you've explained that you believe that the program works, that of course you'd use the power for your own consumption, then your excess power would be sold back to the grid. Are there constraints on an individual customer or subscriber to this program then in how much solar power they can actually generate? Is it meant to be targeted to their actual own consumption?

Mr. Zawalski: — That's a good question. There's a lot of little caveats — and sensible caveats. For instance, there's restrictions on what kind of land can be used. You can't take class 1 land away from farm usage. You're limited physically by how much roof space you have if you're in the city, for instance.

You're limited by, you know, the . . . Primarily, for a small residential consumer, you've got to balance between how much

space you have on your roof and how much do you need. So by the time you put the maximum sized system on your roof and then, at the end of the month, feed a net back in, you're not going to be going, you know, making your annual income solely on the solar panels.

It looks much more attractive because this is actually 10 times what SaskPower is paying for the feed-in rate if you actually compare the two. Right?

And when you get to the big industrial users, you're talking about 40 cents a kilowatt hour, 44 cents, and that's corresponding to installed . . . The solar cell costs about 6 to $7 — $7 installed — which basically is about equal to what the official line is for how much it costs to install a solar farm. But the reality is now if you're buying 100 megawatts of solar panels from First Solar, they're going to be able to sell it to you rather cheap, and the installation costs on a large scale. And if you believe Applied Materials — that they could sell you the manufacturing plant and the equipment so that you can manufacture 40 megawatts a year on solar panels for $3.50 a kilowatt hour, a watt peak — you're going to make a profit. And maybe they'll have to revise that, but the people that are signing in right now, I would say they're doing a good job. But they're paying on the market today what solar energy, you know, the solar technology costs. In a couple of years as the cost goes down, they might have to revisit that for the newer installations.

Mr. Wotherspoon: — That's something we might want to look into more just as a committee is how the feed-in tariff works and whether it's for commercial purpose or whether it's meant for someone to sort of create enough power for, and what kind of caveats or constraints are placed on that, because that might put in a new context the 82 cents that, you know, that I think the Chair certainly identifies, and I certainly identify, that could certainly be a very large cost back to ratepayers. But if there's sort of constraints around it where you're meant to be producing for your own need and then just, I guess, nominal excess sold back, maybe then it is an investment that is seen to support the industry and, I guess, get to the efficiencies of scale and higher volume of solar that should be achieved through a higher volume of solar power.

Mr. Zawalski: — There's one thing I . . . Yes, you're totally right. The 82 cents is only for the smaller installations, for rooftops of residential-type installations. As you get to bigger systems, the price goes down to 44 cents for large 100 . . . You know, 20-megawatt farms for instance would only be at 44 cents an hour.

And another important thing — and this is a catch that's really kind of important right now — 50 per cent of the cost of that system has to be from Ontario production. So that's meant to spur on an Ontario solar voltaic industry because right now there's a large growth in jobs around the world in the solar industry. And we have none in Saskatchewan and there's very little in Ontario. But there's going to be a lot of companies considering seriously putting their manufacturing plants in Ontario or setting one up just because they'll be the only company. There's only one company in Ontario now that could take advantage of that. And it's going to go up to 60 per cent in 2011. So there are jobs in green economic development that could come from this as well.

Mr. Wotherspoon: — Thank you very much.

The Chair: — Mr. Bradshaw. We are getting close to our time, so if we're just conscious of the clock. But I think we will indulge a couple questions if you have them. Thank you.

Mr. Bradshaw: — I had a few questions but I'll just take it down and make it very short. The last presenter we had in here this morning was the Mining Association which needed power 24-7, and they explained that they really had a hard time with power interruptions and how much it was costing their companies. Now in the growing mining sector in Saskatchewan, in our growing economy here in the province, they wanted something that was very stable.

Now you've mentioned about maybe backing off on the hydro end, you know, through the day to supply some of that power usage later on. I kind of wonder how this would work in the wintertime because, especially in the wintertime when we have very little sun, where these mining outfits basically have a flat line on their power, which means that we're going to have to have baseload of some type sitting back there to back that up, what would you suggest on the baseload end of it, and has anybody ever looked at the costs of just keeping spare baseload out there just then to continue operating at night?

Mr. Zawalski: — Well that's a good question. I'm not advocating that solar is going to become the solution that's going to meet the needs of industrial customers. First of all, industry's very sensitive to cost, right, because they consume enormous amounts of electricity. Our entire residential electric base in Saskatchewan is only 15 per cent of everything we use, and residential customers are pretty predictable. They use electricity in the daytime and in the evening, and it depends on the weather. So that's why I'm not going to, you know, with a straight face say that it's going to be more than 10 per cent ever of our energy needs. It would take a lot of work even to get to that point.

But with respect to what would be a good baseload, I think the answer to that is that we always have excess capacity in a system that exists today. If you look at the nighttime, for instance, 500 to 1000 megawatts less of electricity are being used in the evening than during the peak in the day or the late afternoon or the early evening. So we already have a system that can accommodate the fluctuations in the daytime. The system's designed to idle down the plants, the baseload, and bring it back up.

Solar has the advantage that, you know, provided you . . . And luckily it distributes itself over a wide area, you know. As long as you don't have it all in one place, you're not going to get one cloud coming and turning off your panels. And some of the different technologies actually respond differently to cloudy days than others. Amorphous technology for instance will give you a lot more electricity on a cloudy day than the crystalline, which is where the industry is headed.

And so I think it's possible to, you know, with experience . . . And this is where the learning curve comes in and the will to integrate more and more solar slowly, just like Denmark did

more and more wind until they got to 25 per cent, just like SaskPower is now getting more experience with wind so that they can actually add to the grid. As you get accustomed to how it works and how the system is . . . [inaudible] . . . you could design the grid and the system to work better. The message I'm trying to get is that we're not even talking about solar. And so at some point we're going to see the technology really is cheap, and we're going to scramble, and it's going be another five years before SaskPower has the expertise and the infrastructure to be able to take advantage of it.

And that could be being gained right now through programs that as a committee you could design to encourage private individuals and private enterprises to hook up to the grid, or through direction to SaskPower to say, hey maybe you should seriously hire a few engineers that are really comfortable, from other utilities, dealing with this and educate us because it is a learning curve. And like I said, these people have an awesome responsibility to make sure that the power doesn't go dead for industry, for residential customers. And that's an important responsibility and one they don't take lightly. So they may need a little bit of coaxing to take those tentative steps, and that's kind of what I'm hoping that could come out of these hearings, and not just, you know, biomass.

I have no problem with nuclear power. I've no problem with clean coal if it's really clean. I just think that at some point in the future of mankind, we're going to look at the solar energy coming down from that thermonuclear reactor — which, by the way, every hour produces enough electricity to power all of mankind's needs for an entire year — and they're going to wonder, why have we built all of these complicated, polluting devices and stuff when we had all this energy around us for free? But I don't want to stop industry. I don't want to stop business from being successful in Saskatchewan.

[12:00]

So I don't think any of the solar strategy would affect the industrial customers. And in utilities like California, they're very aggressively pursuing large-scale solar integration. As much as 30 gigawatts right now are on the pipeline for Ontario. Within a matter of two or three years . . . not Ontario. California. I'm sorry. Within two or three years, Ontario will have a gigawatt of solar power hooked up to its grid. The system could accommodate that if it's designed and there's an adequate baseload, if the electricity being produced is competitive, you know, its total cost.

You don't want all the generators all the time, so I think there's room for everybody here. And I think people would actually be . . . I'd feel good driving down the road and seeing a nice solar farm here and there, you know. It would kind of inspire me a little bit. You're always going to have people complaining like they complain about wind farms and stuff like that, right?

So you know, with residential customers you could charge more. Maybe people would be willing to pay a little more if they got their electricity from solar power. I don't know. We don't really have it here in Saskatchewan on any scale. People don't really, you know . . . You've got to see things to believe it in a way.

But you could go now to places where there are farmers driving their tractors — and I should have shown pictures — driving their tractors in between solar panels, rows and rows of solar panels. And to put it in perspective, it would take one of these applied materials manufacturing plants 10 or 15 years, running at full tilt, producing over 100,000 panels a year of these big panels, just to make a 5 per cent dent in our electricity. And it wouldn't take that much land. So it's a big effort, so that's why I don't see us becoming this huge. It's not a threat. It's not a threat to the conventional generation right now.

But in the long term it's going to be important, and I think we should be doing that work now on a small scale and moving there. And Ontario has the confidence to do it, and they're doing it rather quick. New Jersey in the United States is doing it. Germany has 6 gigawatts installed right now today. And they have half, 60 per cent of the sunlight we have, so that same system in Germany would be 9 gigawatts here in Saskatchewan.

The Chair: — Great. Well thank you very much for your presentation. You know, if we've learned anything from our hearings, it's that there's no shortage of good ideas and possibilities out there. And hearing from yourself that has some knowledge and expertise is very helpful, so thank you very much.

Mr. Zawalski: — I appreciate the opportunity to speak to you guys.

The Chair: — The committee will now recess until 1 o'clock.

[The committee recessed for a period of time.]

[13:00]

The Chair: — I'd like to welcome everyone back. Before we begin, I would have more documents to table. Written submissions have come in since we tabled our documents this morning.

Before we hear from our next witness, I would like to advise the witness of the process for presentations. I'll be asking all witnesses to introduce themselves and to please give their name and, if applicable, position of the organization they represent.

If you have a written submission, please advise that you would like to table your submission. Once this occurs, your submission is available to the public. Electronic copies of tabled submissions will be available on the committee's website.

The committee has also asked that all presentations be an answer to the following question: 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. Once your presentation is complete, the committee members may have questions for you. 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 and will be posted to the committee's website for public viewing.

And with that I turn it over to our presenter.

Presenter: Saskatchewan Association of Rural Municipalities

Mr. Marit: — Well thank you, Mr. Chair. First of all, my name is David Marit. I'm president of the Saskatchewan Association of Rural Municipalities and I want to take this opportunity to thank the Standing Committee on Crown and Central Agencies for allowing SARM [Saskatchewan Association of Rural Municipalities] to appear here today.

As you know, SARM is an independent organization which represents all of Saskatchewan's 296 rural municipalities. Our strengths come from the fact that our membership in our association is voluntary and it's membership which guides and directs us on our policy issues.

There has been much debate this year about finding new sources of energy for Saskatchewan, and SARM welcomes this opportunity to participate in this public forum. SARM feels that Saskatchewan's commitment to coal-fired electrical plants as a baseload power source must continue. Coal-generated electricity is now and will remain for the immediate future the single most important energy option available to the people of Saskatchewan because of its security and reliability.

This does not mean that SARM does not embrace and advocate the development of renewable sources of energy. We only mean to suggest that the primary source for baseload power should continue to be coal, hydro, and natural gas, and that alternative sources of power, whether it be wind, solar, or nuclear, could be developed over time. The development of these alternative sources of power could accommodate the expected increase in demand.

The infrastructure which currently produces almost 70 per cent of our electricity needs is already in place and can be readily adapted, upgraded, and retrofitted. Additionally, our province has 5 billion metric tons of known and inferred coal deposits, and work has begun on development of coalfields recently discovered near Hudson Bay for which the province issued 176 exploration permits last year. And we must take advantage of our natural advantages.

At the same time as SARM supports continued use of coal and natural gas as a baseload power source, we also recognize the need to examine all options for our electrical power supply. Of these, none is more divisive than nuclear power. SARM participated in the discussions surrounding the possible development of nuclear energy in Saskatchewan, and we feel that it is appropriate here to restate that our membership supports the exploration of the nuclear option. But this does not necessarily mean that we embrace the development of a nuclear reactor to provide the majority of our province's energy needs.

This summer's hearings of the UDP [Uranium Development Partnership] report, for example, a small but perhaps crucial part of the report was all but ignored by the media and those who spoke at public forums. The UDP report indicates that one possible option for nuclear power lay in the development of small reactors which could be used for targeted applications. These local reactors would not be a supplement to baseload power but rather they would be used as separate power sources for remote communities and industrial sites and perhaps even the more sparsely populated regions of the province. On the face of it, it seems that the limited and targeted development of nuclear power would not only ease the demands for more energy but would also be an appropriate use of our limited uranium reserves.

Wind energy is often cited as a possible energy source for Saskatchewan and SARM looks with favour upon the development and expansion of this source as well. Saskatchewan currently has three wind farms producing 170 megawatts of power. This falls well short of anticipated demands but we would urge the province to explore wind energy as a supplementary option.

Like nuclear power though, wind power comes with its own problems and complexities. The world's largest wind farm is located in Texas. It can produce 781 megawatts of power. It features 627 wind turbines and is spread over 100,000 acres. In other words, more than $1 billion was spent to spoiling 100,000 acres of land to produce what amounts to less than one-quarter of the power Saskatchewan will need in the near future.

We must also point out that Saskatchewan's climate may actually argue against the development of wind energy as a supplementary source. We live in a province where the temperature frequently falls below minus 30 degrees Celsius. Since wind energy is only generated when the wind is blowing, it is a worry to think that in the middle of a cold snap, the warmth of our homes would be dependent even in part on the wind. Jurisdictions like Texas can easily develop wind energy because it does not have to deal with Saskatchewan winters.

There's no single option for power generation in Saskatchewan. There is no magic bullet which will address everyone's needs and concerns. There will be consequences for whatever options are chosen. For wind power, the consequences will be an unreliability and landscape degradation. For solar power, it will be high costs and unreliability. For hydroelectricity, it will be high capital costs, a sustainable environmental impact, and the short life cycle of its infrastructure. For nuclear power, it will be cost and health hazards. Each option contains its own hazards, problems, and challenges.

SaskPower's coal-fired and natural gas electrical plants, by contrast, can be maintained, adapted, and retrofitted to be made more eco-friendly and efficient. France for example recently became the first country in the world to retrofit a traditional gas-fired power plant, capable of capturing and storing carbon, at a cost of $1 billion. Using and developing what we have would be the best and most appropriate use of the public funds. Pursuing unproven, unreliable, billion dollar energy alternatives which would only satisfy small portions of our overall energy demands, simply because the conventional wisdom of the day demands we do that, does not make sense.

The Poplar River power station at Coronach is one of three coal-fired generating plants in Saskatchewan. The station and the nearby mine employ hundreds of people. The power station itself is responsible for generating 615 megawatts of power per year. Six million dollars was recently spent on alterations to the plant which reduce by 90 per cent the amount of fly ash emitted by the generator. Recent land reclamation policies ensure that when land ceases to be used by the mine, it can be easily reverted back to its agriculture use. The generator, established in the 1970s, is responsible — and I would stress this — it is very much responsible in large part for halting the population declines which had plagued the community and surrounding area.

The maintenance and adaptation of our current facilities to the new realities must be the first priority, and this is what we would urge the province to do — secure and develop and adapt what we already possess. Continued population increase in Saskatchewan, combined with potential resource development exceeding $100 billion, will greatly increase the stress of our power system. It is an inevitable situation, true, but also one which we must be ready for.

SARM recognizes the great strides this provincial government has already undertaken to achieve a greener province and a greener power generating industry. The government is admirably committed to reducing greenhouse gas emissions by 20 per cent. In addition the province has committed funding to a number of research and other green initiatives like the grow green fund, the technology fund, and the Climate Change Foundation, all of which contribute in their own way to the development of sustainable energy sources.

We ask the province to use its best considered judgment in arriving at some firm and positive direction and, once it has a direction, we ask that the province pursue that goal and address the problems. The solution, as we see it, is the continued use of modified and adapted coal, hydro, and natural gas generators with the consistent and gradual introduction of alternative energy sources over the long term which will satisfy the expected increase in demand. This is the safest and most secure option for the people of Saskatchewan.

I also want to stress at this time that we feel it's imperative that one of the first things that must be addressed if we're going to enhance the energy industry in this province is we first of all have to look at the distribution system. It is in total disrepair and there is a lot that has to be done to upgrade the distribution system in this province, and that is a key if we want to grow the energy industry.

I want to take this time now, Mr. Chairman, to thank you for hearing our presentation. I am open for questions.

The Chair: — Thank you very much. Mr. D'Autremont has some questions.

Mr. D'Autremont: — Thank you. Thank you for coming in. I think we all know SARM and that they represent a significant portion of the province through the 297 municipalities which a good many of us are residents in.

Listening to your presentation, you focus considerably on the baseload needs of the province. We've heard presentations this morning about the need for securing baseload. We've heard presentations from other presenters that we don't need baseload any more. Looking at your presentation, clearly you indicate that there is a continuing need for us to ensure that baseload is maintained and enhanced. From what you, from the people at SARM and what you yourself personally have seen, do you feel that Saskatchewan is doing a good job in providing for that baseload? Is SaskPower doing what they need to be doing to secure the baseload and to provide options for alternatives as well?

Mr. Marit: — I would think from our membership that it hasn't been addressed. I think if you look at the expansion that is needed from the industry sector in this province and what is needed and required, we definitely have to look at increasing that baseload. And that's where I go right back to transmission.

The example that I can give that I know very well is the Coronach situation. There is two major power lines coming out of that power plant. They don't have the capacity to take the power that is generated out of that plant. They are in the process of adding another one to it now, but for years it's been that way.

We don't know what the power requirements are going to be from industry players. But if we have to start importing the power and buying power elsewhere to meet those demands, industry doesn't want to come and have to wait for power requirements to come to them; they want it there. So we feel that the baseload has to be significantly increased that it can be there, and, as we said in the presentation, alternative energy will be there as a backup to that. But we have to increase the baseload. And when you look at the dynamics of coal-fired and hydro, you can moderate that power output.

Mr. D'Autremont: — One of the issues that has been presented to the committee is the effects of CO_2, what effect it will have on climate change — either global cooling or global warming, whatever the case may be. Coal-fired plants are notorious for the emissions of CO_2. SaskPower, as you commented, is looking at things that it can do to capture and sequester carbon but obviously that's an expensive situation.

According to SaskPower, all of these potential energy sources are roughly . . . come in at the same costs except for solar which they're projecting considerably more — the gentleman before you this morning was arguing that over time that will decrease — but 8 to 13 cents roughly a kilowatt.

Should Saskatchewan continue then to pursue clean coal options knowing that the costs are considerable? Or should we be pursuing alternatives — biomass, solar, wind — which are all coming in at about the same costs?

Mr. Marit: — One thing we have discussed at the board level of course is these alternate sources. And wind comes to play with most of the board members. Clean coal, as we see it, is an alternative that must be addressed anyway with our coal production, and we know there's a huge cost that comes with that. And I think that is for the experts to decide on the cost per kilowatt on how that should be derived.

[13:15]

Wind energy, when we see what's happening around the world and what we're hearing from companies that provide that resource are saying, that Saskatchewan has huge potential for wind. But on the same token, if we're relying on those alternate sources to maintain our baseload, it could have an impact on the industry.

Mr. D'Autremont: — Thank you. One of the issues that have been raised by a number of presenters is how SaskPower operates, and whether that is good, bad, or indifferent. One of the concerns raised was the net metering of alternative energy sources, that it's only applicable to the location where the net metering takes place. From your experience, from SARM's experience, what is operating and working with SaskPower like, from the municipalities' perspective?

Mr. Marit: — From our point of view, SaskPower is a good corporation, but we have issues with it. And we've been trying to address this for years and nobody has addressed it and it has to be addressed.

The Crown corporations do not pay property tax to rural municipalities for infrastructure they have in RMs [rural municipality]. That is totally unfair. And they pay grant in lieu to cities, but they do not pay grant in lieu or taxes in rural municipalities. SaskTel will pay on some, on towers, and some . . . SaskPower pay none.

And if you talk about issues of the private landowner versus the Crowns, it is very difficult. You only have to go to a farmer or a landowner — doesn't have to be a farmer, a landowner — that will deal with a private company coming across their line versus a Crown corporation.

A Crown corporation comes to you, and I'm speaking from very good experience as of this year. SaskPower crossed my property with a fibre optics line; came to me and said, here's what we'll compensate you for. And that's it. There was no discussion, no debate, no counter-offer, no anything. That's the way it is. They do not have a good reputation in rural Saskatchewan in dealing with landowners. That is unfair. Some may argue that, well if they pay taxes, that has to be picked up in the rates or something. Somebody has to pay. That is a very bogus argument. It is not an argument. They are no different than any other company. They should be treating landowners and municipalities fair.

The Chair: — Mr. Bradshaw.

Mr. Bradshaw: — I thank you very much, Dave, for your presentation and your thoughts on continuing on with the coal and natural gas and as to how the landowners should be treated, and I totally agree with you and I think that's great. And truthfully, you're the first person to put this forward.

One question I do have that would work with the municipal organization and that is, we all know that there is the big fear of the carbon footprint being left by both coal and natural gas. Now there's been talk, but somehow it seems to be stalled, about the farmers of Saskatchewan have a huge carbon sink in the crops that they put in every year.

Have you talked or have you pursued anything with the federal government, with other organizations throughout the world as to how the farmers could be included on a carbon sink if we were to stick to the coal, natural gas generation? I'm not going to say we would, but looking at that end of it.

Mr. Marit: — We have. We have presented both provincially and federally on carbon credits on agriculture land. That debate is ongoing.

And the value, I think, is the issue here. On agriculture land, we have a huge concern on the compensation and what could happen down the road, in 5 to 10 years, on that same land, whether it still would be seen as a carbon capture or whether it may be, at that time, maxed out and then become a source. So we have some concerns.

At one time there was discussion that the agriculture land could be leased to someone and the credit could be leased and that way come back to the farmer down the road. There's a lot of debate around the CO_2 credit and where that goes.

But we are watching this one very closely and also in discussion with the province. We sit on a climate change committee. And nationally, we watch this closely on where the federal government want to go with carbon credits.

Mr. Bradshaw: — That was it for now.

The Chair: — Mr. Wotherspoon.

Mr. Wotherspoon: — Thank you, David. Thanks for the presentation and certainly articulating the importance of the rural municipalities and having baseload and predictable, dependable power. And of course that's very important.

If we're looking at some of the alternatives for a mix of some of the supply, as you've highlighted in your report, can you talk a little bit if there's been discussion around some of the value or economic spin-off or value that might come in some of the decentralized aspects for a portion of that mix. And that might come through biomass or through hydro or through wind, you know, for various parts of the province. Have your members talked about this a bit?

Mr. Marit: — We have, and we feel that it would be advantageous to the province if we can look at alternate sources and spreading throughout the province.

The issue here comes right back to what I just said earlier: who is going to own that? If it's the private sector that owns it, then we as municipalities would greatly welcome that for one reason — and this is the big one — is it's taxable. We can assess it and we can tax it. And we can use that revenue within our municipal system to operate. If it's owned by a Crown, we cannot. And that's unfair. So that is the big one. If the provincial government wants to deal with that issue, then we'd look at all sources.

Wind, to give you an example, we know of what the revenue is to municipalities in Alberta and Manitoba from wind owned by private companies. It's phenomenal. But you also have to remember that we have to provide an infrastructure to every one of those towers. So that's the reason why that has to be really looked at.

Mr. Wotherspoon: — No, that's a good issue. And certainly if you're looking at distributing power, certainly that's something that will have to be worked in partnership and, you know, what relationship or what contractual benefit might exist with municipalities or landowners.

We hear about the number of jobs that come with some of these technologies that, I guess, if you're looking at some of the decentralization for a portion of our power, your municipalities, have they spoken a bit about having some of those jobs in their community and of course taxpaying residents on property and consumption and everything else?

Mr. Marit: — Very much so, and I beg the committee's indulgence here. I'm speaking from personal experience because at this time we do have a wind company that wants to come into our municipality in a huge way. It's a huge economic driver for our municipality which is basically all agricultural land. They will employ 8 to 10 people year-round for the maintenance of these wind turbines. It will add to our municipal tax base — double — so it has a huge impact. Not only that, it also adds a revenue stream to the landowners, and that cannot be forgotten about.

Our municipality has embraced it. We're supporting it. We're working with the company to get it, and we feel it's important to us. And those types of projects spread throughout the province — and we know there's issues with transmission; that's what they're looking for — are key to growing economic development in rural Saskatchewan. So thank you for that.

Mr. Wotherspoon: — Thank you.

The Chair: — Mr. Hickie.

Mr. Hickie: — Thank you, Mr. Chair. Just one question, Dave, and kind of touch on the issue of SaskPower and how they've been in the rural sectors of our province with transmission lines and such, and how they deal with the landowners. I guess to begin with, the current wind farms that we have right now, how are your members benefiting or are they not benefiting from those particular infrastructure?

Mr. Marit: — I could say that in some cases they're not benefiting at all, on the SaskPower ones. On the joint ownership, they are.

Mr. Hickie: — Okay. I guess the next thing, and I guess Mr. Wotherspoon hit on it, looking at the idea of having compensation, fair compensation, for our rural land base. And your members, a very large representative group of our province that has, you know, really for the most part stuck with the province through all the bad times . . . Because now there are good times, which is good. So they're a hardy bunch of people out there in the farms, I know. But the current thing that I want to mention is that, what kind of recourse or redress did you have with SaskPower when they were not giving fair compensation? Has there ever been a legal challenge?

Mr. Marit: — No. And I had no recourse. I either accepted it or they would expropriate the property.

Mr. Hickie: — Okay. And I guess one more point just to ask, within your group then, looking at issues of entrepreneurship, would the members you represent, Dave, think about going together and trying to start their own wind generating farms, and maybe having SaskPower could be actively encouraged to use that and have a resource or revenue base for your membership throughout the province? Because of course you have a large base and we'd be looking at distribution that works across the province.

Mr. Marit: — We haven't even thought of that one. I think we're just trying to look after our membership in other regards that we're really . . . We have enough infrastructure right now to look after when we consider that we're looking after 98 per cent of the land base in this province. That's a challenge within itself. And more than half of all the arable land in Canada is in our province of which we have to provide a service to that land. And we're having a difficult time with that on the infrastructure side. So to look at this side of it, it would take a lot of work.

Mr. Hickie: — I guess one last thing. You said SaskTel does seem to have a fair, equitable remuneration for the landowners. Would you be able to tell us off the top of your head what that is? Because in comparison with what SaskPower is, I'm kind of curious why one Crown would be more willing to pay for the inconvenience versus another. Of course, we see an extensive network of transmission lines and now fibre optics are a big thing in our province.

But it would be good for this committee to look at that as being a more fair, equitable position for all of our Crowns to have to compensate the rural land base, I would think, as we move forward with this issue of our energy needs, if we go to the more broadly based wind power, solar power grid system as well.

Mr. Marit: — I think on the SaskTel side on the . . . Like I know they pay on towers. I don't know what that percentage of taxation is, but they do pay on it. I think for the most part in rural Saskatchewan we welcome that because we do need the communication for emergency side. And the same with power. You know, we understand SaskPower's needs and their roles.

It's just unfair sometimes on the way they treat RMs versus cities. I mean, they pay grant in lieu to the cities, but they don't . . . On the power station in Coronach, they don't pay anything to that municipality. And yet they still have to have a service, whether it's a road or a paved road or snow removal or what it may be.

So that has to be looked at. If some Crowns are willing to do that, why aren't they all? And why are we treated any differently than the cities? We know the cities provide a service to those buildings and, rightfully so, they pay a grant in lieu. Why are we treated any differently?

Mr. Hickie: — Thank you.

The Chair: — Mr. Yates.

Mr. Yates: — Thank you very much, Mr. Chair. I would like to follow up in the same line of questioning. Just not being aware of how some of this has operated in the past, when you're looking at compensation from the various Crowns, you

mentioned SaskTel and SaskPower. What does SaskEnergy do?

Mr. Marit: — My understanding is that they pay on the buildings like a pump station or anything above ground, they pay on. All the pipeline companies pay, of course, the private natural gas. On the underground pipe, I'm not sure on SaskEnergy. I'm not sure.

[13:30]

Mr. Yates: — Okay. And you know I'm not trying to ask questions that are difficult here, but it would be nice to get some sort of context to think of this thing. What about SaskWater? In two or three areas they have water pipelines running. It's not necessary a province-wide issue, but I'm wondering what . . .

Mr. Marit: — Usually they're owned locally by Watershed Authority. And I don't believe they pay the taxes then. I don't know. I honestly wouldn't want to answer that, Mr. Yates, just on the grounds that I would have to get some background to you.

Mr. Yates: — Okay. Yes. And my last question in this area is, is there any difference in charging for installation of infrastructure or anything that they would argue as a compensation that . . . Again I don't know.

Mr. Marit: — They might say it's that. I know of instances where a farmer or rancher wanted power put in across the road, and the costs were in excess of $10,000. Whether their actual costs are that, I'm not sure. The same could be said of SaskTel. I know of a feedlot operation that had SaskTel come in. They charged him X amount — hundreds of dollars — for the line, and for a second line it was like 10 or $15,000. They've already plowed it in, but to get that second line then they're recouping their . . . To me it made no rhyme or reason. But maybe they felt they're subsidizing the first one, but they weren't going to subsidize the second one. You would have to speak to SaskTel about that, but that's the case. So that doesn't help economic development.

Mr. Yates: — No. Thank you very much. It's just good to try to understand some of these things that we may not have had the opportunity to hear about in the past.

Getting back to the concept of regional wind generation, and you talk about the potential in your particular area of the province, that there's a company that would like to come in and generate wind power. Has SARM had any look at, collectively looking at, how they may play some sort of supportive role in the development of regional wind, or what role they might play in enhancing the possibility of wind development in Saskatchewan?

Mr. Marit: — We haven't. I think we've looked at other things, not specifically to wind, but looking at regional partnerships and working together for economic development in other sectors — both oil and gas — in trying to come to ways that we can have a smooth transition with industry and with municipalities as far as how that can flow into an area. And we've done that. But to look at establishment of regional wind and the role that we would play, no we haven't.

Mr. Yates: — The reason I ask that question — and maybe I should have said it before I asked the question — but the reason I asked it was, one of the things that we've heard in the past that was a negative towards economic development in some regions of the province was, different RMs [rural municipality] charged different total amounts and the inconsistency created all types of business opportunity problems, right? And so one of the ways to get around that is the collective organization or umbrella organization to look at those issues to avoid those type of problems in development in the future.

Mr. Marit: — Yes, and thank you for the question. And as an organization, two years ago we recognized that when we did what we instigated what was called our Clearing the Path initiative and looking at impediments for economic development in rural Saskatchewan . . . And this one came out very strongly to us from the industry players. We are in the process now of trying to deal with that and trying to find ways that we can make it a lot easier for industry to move in.

And we look at industry — whether it's potash mining or oil exploration or coal mining or that type, as what we call a sector — and what we're trying to do, and working with our members, is trying to find ways that if a sector comes into an area, that the rules would be the same for them all.

The problem you have with it, and we have to really . . . It's not a problem. It's the way it is, is one of the biggest expenses for municipalities is road maintenance and gravel. You can, in this province — and it's a dynamic this way — but you can go 20 miles in any given direction, and you can go from an abundant amount of gravel to no gravel. And if that's the fundamental reason is the cost . . . And also in soil types. My municipality, we can go 6 inches down, and we've got 15 feet of clay. So I mean, our roads are a loss. And we just have to go to the north of us, to the next municipality, and they don't have it. And that's the situation you have. So we have to deal with that. That's what we're trying to deal with, is the costs of infrastructure. And we're trying to work through that.

But I appreciate the question, and it is a concern with industry. We know it is, and we're trying to find ways to mitigate that and make it easier for them.

Mr. Yates: — Thank you very much. Those are my questions.

The Chair: — Mr. D'Autremont.

Mr. D'Autremont: — Thank you. I was interested in the discussion on the taxation for locations. I believe that Sunbridge operates in the Gull Lake area, and that's a private concern. Do you happen to know what kind of a taxation level each one of the towers would be charged?

Mr. Marit: — I don't. I'm sorry, Mr. D'Autremont. I don't know what the exact level . . . I don't know how many towers are there. And all I've ever heard is one municipality gets about 80,000, but I don't know how many towers that is.

Mr. D'Autremont: — Yes, I think Sunbridge is 11 megawatts of generation, and SaskPower's Rush Lake in Cypress is 160, 170, something like that. And we also have Red Lily supposedly coming on stream here, I believe, in 2010-2011 in

the Moosomin area, and I think that's a partnership between SaskPower and some other generator.

So there is the potential for some significant revenues to be held. One of the presenters in Saskatoon earlier this week indicated in one of the American locations there was a return of $4,000 per year to the landowner per tower. I think most landowners, if that was the offer for 10 acres, would be grabbing it.

Mr. Marit: — I've heard a lot higher.

Mr. D'Autremont: — Yes, well perhaps a lot higher. But this is some location in the US that he . . . So that would have been US dollars but they're almost on par now.

Mr. Marit: — Yes, we'll take that.

Mr. D'Autremont: — So you know, I think that is perhaps an issue that we need to look at to raise with SaskPower to encourage more use.

The other issue that I noted in your presentation here, you talked about small nuclear reactors. I know nothing about them whatsoever, so I don't know what small means in this term. But I noted that you said here that it wouldn't supplement baseload power. Yet from my limited understanding of nuclear, you keep it running. You don't stop and start. So wouldn't it in reality be baseload power?

Mr. Marit: — Well it would be baseload but specific to that industry where it would be . . . and I think some of the examples we're giving is a reactor for a mining operation that would be huge, like a potash mining operation that may use 300 megawatts of power or whatever. Something like that I would think would be some of the discussion that I have heard around the table. A baseload unit would be a nuclear reactor in a situation like the tar sands that would be dedicated to that industry and wouldn't be for other use.

Mr. D'Autremont: — Okay. Thank you.

The Chair: — Well I think that's the questions we've got for you today. I just would like to thank you on behalf of the committee. Thank you very much for taking the time and coming out and giving your perspective.

Mr. Marit: — I want to thank you, Mr. Chairman, and the committee. And I would hope that the committee really does look at, if they're looking at alternatives, that they really look at economic development and how that will have a huge impact in communities in rural Saskatchewan. Thank you.

The Chair: — Thank you. The committee will now recess until the top of the hour.

[The committee recessed for a period of time.]

[14:00]

The Chair: — Before we hear from our next witness, I'd like to advise the witness of the procedure for presentations. I'll be asking all witnesses to introduce themselves. Please state your name and, if applicable, the position you hold within the organization you represent. If you have a written submission, please advise that you would like to table your submission. Once this occurs, it will be made available to the public. Electronic copies of tabled submissions will be available on the committee's website.

The committee has asked that all presentations be in answer to the following question: how should the government best meet the growing energy needs for 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 power customers, for Saskatchewan residents, today and into the future?

Each presentation should be limited to 15 minutes. Once your presentation is completed, the committee members may have questions for you. I'll 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 and will be posted to the committee's website for public viewing.

With that, I would ask our presenter to go ahead.

Presenter: Kelln Solar

Mr. Kelln: — Hi, I'm Ken Kelln. I'm the president of Kelln Consulting Ltd. and we have a solar manufacturing plant in Lumsden, Saskatchewan.

I've been around the solar industry for a lot of years, and I've had various government jobs as well. I was chairman of SaskTel's energy conservation committee in 1978. I was manager of commercial customer conservation programs in SaskPower from '81 to '84. And in '84 I set up my own solar company when the direction of the government changed.

So I'll just start my presentation and we'll try to go through it. Yes, I think it'll be very interesting. Let's just go on to the next slide. I'm going to talk about photovoltaic power, solar thermal generation, passive solar, and demand-side management. And these will fit into SaskPower's energy future, and I think they've been totally ignored to date. But first I'm going to talk about my specialty — photovoltaic power.

The last 40 years solar energy has not been a priority with the governments in Canada, neither locally, provincially, or federally. There was very little subsidies going into the renewable energy industry which was pretty sad when the nuclear industry was getting billions of dollars over the last 40 years and probably millions for the solar industry. Now there's been some excellent presentations on photovoltaic power. I've got the oldest solar company in Canada right now, so I've been around solar energy for a long time. And I hopefully . . . This reiterates some of their points, but try and give you the current costs on some of their energy and where we're going with solar energy.

So basically photovoltaic power refers to the direct conversion

of the sun's rays into electrical energy, and solar panels produce DC [direct current] electrical power. Photovoltaic panels are typically nowadays 10 to 24 per cent efficiency. Amorphous panels are less than 10 per cent typically. Solar thermal is the conversion of sun's energy to thermal or heat energy, and it's typically 50 to 80 per cent and even 90 per cent in some cases in the summertime.

I have a quiz for you gentlemen. The amount of solar energy reaching one square kilometre of desert annually is equal to the energy output of one million barrels of oil, so I really want this . . . This has really put solar energy in perspective. We've got a lot of deserts in this world and, you know, SaskPower talks about lack of interconnection. And I'll show you a solar thermal system now. And if we can get some property in Arizona and fire that energy up here with solar energy, it's pretty amazing stuff. It's not new technology. It's been around for 25 years.

Solar panels are versatile and permanent. And you can see right along our railroad tracks. This is in Germany. SMA, who loaned me the slide, is the largest inverter manufacturer in the world, and they're now around 750,000 inverters for photovoltaic systems. So you can put solar energy on existing construction or on new construction. This relatively old house put 3 kilowatts and generates . . . there's a zero missing on . . . too many zeros on it — it's only 3600 kilowatt hours a year, which is about $360. Because this one has battery backup, it was about $42,000.

Now most of you remember the ice storm we had in Quebec a few years ago. And there were half a dozen guys in there with solar energy, and they didn't go out of power when the ice storm hit and knocked the power lines out.

This one is really to show you the costs of photovoltaics. Now I mentioned earlier, the efficiencies are 10 to 24 per cent, and that's usually the individual cells in production. And when they put them into modules, the module efficiency goes down. Amorphous cells — and I'll go into amorphous a little bit more in detail — it's a faster way to produce electricity and less costly. And they're 4 to 12 per cent efficiency.

Both of these systems have their own pluses and minuses when it comes to utilization. In 1969 when I did my thesis on solar cells, it was $10,000 a watt. In 1999, it was 4 to $6 a watt. This is my costs, I guess, as a consumer. Now we're running into, in 2009, a big drop in solar panels running from $2 to $4 a watt. My cost, amorphous panels, even less.

One of the things to remember about solar cells is that . . . A famous guy once said if you took the Sears catalogue and divided it — the dollars by the weight — you'd find this relationship, and the relationship is that the heavier you are the more money they cost. And so we're running close to what they're going to be at.

This slide is for Gary Wilkinson from SaskPower. This is a 64 kilowatt manufacturing plant of Solarex panels where they produce about 10 megawatts of solar panels a year. This was quite an old plant; it's been about 1978 when it was built, and the cells were only ranked 8 or 10 per cent efficient back then. But the energy used to produce the solar cells is all from photovoltaics, and in essence it's a breeder reactor because it's continually generating more equipment that produces electricity, right? Typical cells in the true sense, where they use an electricity, have a payback of energy under two years, especially in Saskatchewan where it may even be 1.8 years. But as the energy used in constructing those cells is recovered by the solar generation in less than two years and some cases one year when it's amorphous solar panels . . .

This is a really good table because this is some costs I use and recent costs that I developed for . . . Let me see if I've got a laser pointer. Okay. Great. So we're going to start up here. Solar cells will typically last in excess of 30 years, and I believe Sharp are warranting their panels for 30 years. And what they say, after 30 years, is that they'll be at 80 per cent of their rated output. And I've been using amorphous cells now for oh about 18 years, and they have not decreased anything.

It's interesting. That 175 watt module, you know, produces about 11.5 to 12.9 watts per square foot depending on which model they have. It has a module efficiency of 13 per cent. The cell efficiency is actually about . . . [inaudible] . . . . This table is based on a 92 cent US . . . our Canadian dollar is 92 cents US.

Now on this first slide we're saying that if we use 1875 watt panels with a Sunny Boy 3000 US inverter, the capital costs to the subscriber is $19,000. Now this is something that's annoying to me, is that we're taxing one of the best remedies to the carbon problem, and we're discouraging people to use it. And if we could take this out, it would be great.

So we have to do an installation. Now sometimes the consumer will actually do an installation. So basically this is your total cost, with taxes, of $24,000. With the new current grant, it'll cost you $16,000. It'll produce about 4095 kilowatt hours a year, which is $409. It gives you a 2.4 per cent return on your investment based on this figure. If this cell produces that much electricity for 30 years and we divide — this is 122 850 kilowatt hours — and we divide that by the price . . . or divide the price by this amount, it'll come up to about 13 cents a kilowatt hour. And I heard someone mention that earlier, that you've heard the figure, a levelized cost of 16 cents. And that's a really good figure. And you'll notice that as the systems get a little bigger, you'll notice that the rate of return goes up slightly and the dollar per kilowatt actually goes down.

Let me just go on to the next slide, see if I've got it. Okay. So it's levelized cost of 13 cents a kilowatt hour without inflation. And if we escalate SaskPower's rates at 8 per cent per year, sometime we're going to see in the next 8 to 10 years the levelized costs being the same as SaskPower, which is going to be a substantial milestone for photovoltaics. We're going to now be in a position, without subsidies, to have people put their own power on their house.

I talked about Sharp panels and Sanyo and everybody. This is a Sanyo computer, so it's Sanyo . . . I have a rule of thumb when I'm selling the solar equipment. I use name brand equipment because usually it's going to be around for a while. Sanyo makes . . . who was recently bought out by Panasonic, with the solar industry division of it. They're 15 watts per square foot, and the Sharp were around 13. And Sanyo uses proprietary technology of both polycrystalline and amorphous — 15 watts

per square foot, 15 per cent more efficiency. And that's about 3 per cent higher than Sharp. And also because they have a coefficient of degradation of only point three compared to Sharp which is about point four nine, it'll produce 10 per cent more watts per year compared to a panel of equal wattage. So this is pretty well state of the art, and they typically do cost me about 25 per cent more.

And this is my Sanyo panels that are on my house in Lumsden. We have 3700 watts. This morning it turned on at 7 o'clock, but at noon time it was only 1 kilowatt hour because of the cloudy day. These are a special panel. They produce solar energy on both sides of the panel, and it gives me about a 10 per cent boost. They're primarily used on parking lots where they'll have a cover over the parking lot, and it'll direct sunshine on the top and on the rear side, diffuse light coming in, and typically will give you an extra 10 per cent. This is really where we are with the state of the art.

[14:15]

The next slide I have here is a company I've been working with for a number of years called United Solar, and it's owned by United Solar Ovonics. And this is amorphous solar cells and Uni-Solar. A fellow by the name of Stan Ovshinsky predicted and developed the amorphous solar cells in the '80s. And of course, Uni-Solar is one of his offshoots.

So it's easily integrated. It's unbreakable and flexible, superior kilowatt hour per kilowatt performance. So amorphous panels have a low-light response and don't degrade in hot water, hot weather like other panels. It's lightweight, thin, aesthetically pleasing, no frame-in required. There was a shortage of silicon. There's no longer a shortage.

And it's a low cost, roll-to-roll manufacturing process. If you toured the UNI-SOLAR plant, you'd notice a lack of people in the plant because everything is automated.

So better shade tolerant, better in diffused light, better in real world operating temperatures. It's about 10.3 for Sanyo and point two on . . . This is the other advantage of amorphous. And the reason I'm telling you about this is I've heard some people say that we could build solar cells in Saskatchewan. I think it's unrealistic because our labour costs are too high. I get two emails a day from China offering me solar panels at ridiculously low prices. They're not CSA [Canadian Standards Association] approved yet.

But amorphous is the way to go because it uses lower temperatures. And this is the amount of material that you'd use in polycrystalline type cells and this is what amorphous takes, about 1 per cent or 2 per cent of the . . . Now solar cells respond to different wavelengths, and the Uni-Solar panel picks the blue and green and the red and is able to get the efficiency of about 8 per cent on the cells which . . . So this is what I'm trying to really show you here is that Uni-Solar panels will produce 22 per cent more power than equivalent polycrystalline cells because of their low-light response.

But they occupy three times as much area. And this is how they apply them. It's a peel-and-stick process. It's CSA approved and ready to go. So any standing seam roof we can put on a 19-foot panel that's 136 watts with a 25-year warranty.

And of course, you've probably seen dozens of slides world over on the amount of solar panels being installed in the world. United Solar's biggest project was in Spain where they have a feed-in tariff. And it was 10.1 megawatts on one roof owned by General Motors in Spain, and that was over 85,000 panels.

This is the same technology, only framed, and this is a project I did at Prince Albert National Park. Our park situation is readily adaptable to solar energy because you only use the energy in the summertime when we have lots of sunshine. You notice the shadow on the panels here. This technology is less susceptible to degradation due to shading than any of the other technologies.

This is an old slide of one of the first 2-megawatt, utility-scale, photovoltaic power systems. This is actually on a tracking system that follows the sun. The difficulty with tracking systems is that they have more maintenance than non-tracking and so you could add more solar panels for the price of the tracker. But this doesn't go east and west. It just goes summer and winter type of tracking.

It's another job we did in one of Saskatchewan's near net zero buildings. This is the Visitor Information Centre at Fort Battleford. We put up a 66-kilowatt wind machine, and it's actually 11 kilowatts of PV. We put another 2 kilowatts on it a couple of years ago. It was super-insulated building, heat pump technology to heat it and cool it. Almost net zero and pretty easily achieved, just needs a couple of renovations already because the engineers in Saskatchewan are learning how to make net zero buildings.

Of course — and this is one of my main thrusts here — I don't want to build buildings that are net zero. I want to build them so they breed energy. That is, they produce more energy than they consume in the year. And there are several buildings in the world doing that — not just commercial buildings, but residential condominiums in Germany.

You have heating panels on the roof and the photovoltaic panels are on the south side. That's not the best location for them because they're not at right angles to the sun when they maximize the amount of energy they produce.

I'm hoping my house, by the end of this next year, will be net zero where we're not using any more energy outputs from my panels. The net energy consumption will be zero, including my natural gas. But this is where we are around two thirteen to two fifteen that they're predicting grid parity where we think we'll see solar panels going their own way.

So worldwide, solar energy is a $16 billion industry. In photovoltaics alone there's 50,000 employees, and most of those are still in China, unfortunately. Germany is very big in solar energy. It's tough, but they're forming partnerships with China to get the lower wages so they can offer them.

This is subsidies that we're in in the world. This is in US dollars — no, sorry, it's in Canadian dollars — almost $1 per kilowatt in Austria; Germany, point nine two cents; and you've heard Ontario is now point eight two cents per kilowatt hour. And that

subsidy is only on homes, residential places that use 10 kilowatts or less. And what that does for them is give them about a 10 per cent return on their investment.

I just want to talk quickly about concentrating solar power. It's the conversion of solar energy to electrical energy by heating oil to 370 degrees Celsius. And you can also use it on rooftops. There's an outfit in Ontario, actually making them out of Ottawa, where they make a concentrating solar collector and they also have photovoltaics on it. It would be more a commercial application, not a residential because you have this great big aluminium structure in your yard that may take more . . .

This is not a new technology. Kramer Junction, this is a solar thermal system built in the United States about 22 years ago with 274 megawatts, and it's consistently worked for all of that period. One of the things about it . . . So these reflectors focus on a tube here and produce, increase the heat. And what's happening is that it's 370-degree oil, and they are going into a standard conventional steam turbine like we have at Coronach and generating electricity.

And what's really nice about this system is that we know how to store heat, right? So we can run this system at night as well. And this particular situation has a natural gas backup system, so when they go to the utility, they can get a better rate for firm power, right? And all over the world . . . the Germans, the Spanish people are all betting that this is going to be one of the biggest mainstays for electrical generation. And they're building plants in Spain right now, and I think the Germans are looking at the Sahara Desert to put cables across the Mediterranean Sea.

Okay, I'll finish with this slide. This slide shows an evacuated tube solar collector installation we did at Campbell Collegiate, but what I really wanted to show you was the roof space. It's about four football fields of roof here that have a very poor surface on it. And the surface could be painted white to reflect the light. It would reduce the air conditioning load, and this is commonplace in United States. Or you could make it green.

But this is a perfect place to put photovoltaic panels, right? They could be mounted probably at 45 degrees. This is about 60 degrees, and we could put, I would say, maybe 5 megawatts on this roof and generate power back on the grid. And why not? One of the problems we have in schools, or one of the lack of understanding in schools is that right now we can use light pipes to take the light . . . The school is used from 9 until 3 basically, and that's when we can use solar energy for ventilation air. We can use light pipes to channel in the light for hallways, even with fibre optics which is the norm now. And so, without a word of a lie, we could reduce the energy consumption in the school by 80 per cent with a little bit of engineering.

This classroom here, as a conservation engineer and a utility engineer, this building we're in, well 1200 watts could be reduced without a penalty in light level in this building. And I don't know why it wasn't done right, but it should have been done right, right? We're engineers and we do things right the first time. And it's a simple technology called specular reflectors.

So in summing up, SaskPower has 10,947 customers coded as electric heat customers. This is what SaskPower needs to put their money into, either with solar hot water heating systems or insulation, right? This is the worst load SaskPower has that has a load factor of 27 per cent. The average load factor for SaskPower is about 70 per cent right now. Let's get rid of these guys. Let's put solar hot water heating systems in all their homes either at a subsidized rate or . . .

Two years ago I said that they should give them to SaskPower. It'd be cheaper than building power plants, but this is approximately 250 to 500 megawatts.

The difficulty we have is we're building hotels in Saskatchewan that are electric heated. That's the worst. And these people building these hotels that are electric heated are putting in two-by-six walls and double-glazed windows. They're not making them the best in the world. And what it's doing to us as consumers is that it's forcing SaskPower to build more power plants. And I think they should be penalized or we should establish minimum building levels in these buildings because I don't want my rates to go up because some people aren't doing their homework and building their buildings more energy efficient. Thank you.

The Chair: — Well thank you very much for your presentation. That last slide I found very telling when you talk about finding efficiencies. Over 10,000 people using electric heat — that's interesting.

I'm going to lead off with a couple of questions. You made the comment that you don't think it's realistic Saskatchewan could get in making solar panels. Could you flesh that out for me a little more?

Mr. Kelln: — Sure. The problem we have is that we're so far away from markets and it's very expensive to ship solar panels out. And, you know, I'd like to be proven wrong because I did try to bring an amorphous plant here just to assemble panels and I couldn't get the co-operation I needed from the company I was dealing with.

You know, it's not that we can't produce them efficiently. There's a company in British Columbia called Day4 Energy and they are making panels here and they are competitive on the market, but they're also in Vancouver where there is a baseload there where there's, you know, population of BC is — what? — 3 or 4 million now, and we're still only at a million.

We have to bring the materials here. We're not really a manufacturing base, and this is what Ontario is aiming for. They're trying to get 50,000 jobs and maintain their manufacturing base by putting photovoltaics in.

I would think if we were going to build anything, we could build amorphous. You know, our wages that we have to pay our people right now . . . I think they can get jobs at IPSCO or co-op upgrader at 25, $30 an hour. Boy, I sure wish I could match those wages, but it's tough to compete when they've got lots of good jobs. Even the upgrader and the Saskferco and this ethanol plant are paying a lot of money for wages. And if we're paying high wages, we've got to reflect that in the products we produce. And it's tough, I think, to do that. And maybe we need

a task force to look at that and say, can we, well, how do we reduce costs?

And, you know, one of the companies in Canada that's making, assembling — it's call EnerWorks — and they're assembling a solar hot water heating panel, one of the best in the world. They're getting the plates electroplated in Germany, and then they're just assembling them in Ontario. And they're shipping them all over there. Boy, they've come a long ways in 10 years. So yes, things can be done if we work together I guess.

[14:30]

The Chair: — Going back to that last slide where you said there's 10,000 people that are coded in SaskPower's documents as being . . . We heard this morning from the major users of electricity — the mines — and they say that, you know, in their companies, because that's such a large portion of their costs is electricity, they have really invested heavily in efficiencies, and they don't know how much further they can go. But you know, you hear stuff like this. Is there any other . . . Like I look at that and I think that's a bit of a obvious jump out at you. Is there any other jump out at you kind of . . .

Mr. Kelln: — Yes. In Saskatchewan we probably could cut 200 megawatts off our generation right today by banning the T12 fluorescent light bulb. And that's an obvious one. I think the feds are talking about 2012. To hell with 2012, let's ban it today. Get it out of . . . All the small grocery stores in rural Saskatchewan have the T12 fluorescent lights. You can put them in with T5s or T8s. Like each fixture here, we can reduce by 30 watts. And this is the new technology. It would be reducing it by 60 watts on the existing technology — 200 megawatts. Boy, there's a lot of other things that can and should be done.

Because why are we building a gas power plant when we can get 200 megawatts by just . . . And then we're, you know, we're creating jobs for the electricians in the province to get them out. And I'm pretty close on that figure. I used to work for SaskPower, so I know there's buildings still going up with T12 fluorescent lights and shouldn't be.

The Chair: — Yes. My last question is . . . You know, the industry you're in, you're putting solar electricity on the grid today. We heard from a presenter in Saskatoon that's doing probably similar stuff in some wind. Can you just talk to us? How is that relationship . . . As a consumer that asks you to come out and put on solar panels to get my box and my connection to the grid, is there efficiencies that we can make there? Do you have any comments as to how SaskPower integrates with the homeowner that wants to do this?

Mr. Kelln: — Actually it's pretty slick. You know, one of the first ones I did in early, I guess, about 2000 . . . you know, there was more infrastructure required. We had to put in more equipment, but the inverter manufacturer sprung to the . . . [inaudible] . . . And what they did was they combined some of the disconnects into their equipment so that we could quickly hook up a system. And I suspect that if I got going on a lot of installations, you know, less than two days on every installation, assuming we can put roof racking on it.

The panels are high voltage and low current so that's pretty slick. Like they'll go up to 500 volts per string, and they're called string inverters. So we'll put, like the panels I've got on my roof, I have strings of five panels and four strings going down to the inverter which ties into a disconnect — it is so slick and simple — and goes right into the inverter and from the inverter through a disconnect that SaskPower requires, through some metering that the SRC [Saskatchewan Research Council] requires, and into my breaker box. And it's really, there's nothing simpler, I think, than doing that.

The only other thing I'd like to see is that we make our houses solar ready. You know, 1980 Saskatchewan had the largest number of low-energy, passive solar houses in the world. And the change in government in '82 put a stop to that, so we quit promoting passive solar energy. But typically passive solar energy will produce 30 per cent of your heating requirements in a house, and all it is is south facing windows. And if you can handle that heat, you know, you can distribute it in different parts of your house. But you also want to have the roof solar rated.

I know the subdivisions in Lumsden have gone up recently. They totally ignore the sun, and they put in bigger air conditioners and bigger heating systems. I know my house is passive solarly heated, and we eliminate about a third of our heating bill a year because of that technology.

So what we need to do is we need to . . . And the city of Saskatoon is going to develop a subdivision where it's more energy-efficient demonstration, where everybody has access to the sun and all the buildings are solar ready. That's really important for us because if we're going to put solar on roofs, let's do our homework in advance and let's get the job done.

The Chair: — Thank you. Mr. Wotherspoon has some questions.

Mr. Wotherspoon: — Thank you, Ken. I appreciate your presentation here today. Just back to — you created more questions as you were speaking here with the Chair — back to the T12 fluorescent light bulb. You suggest that about 200 megawatts would be able to be from a demand-side management kind of a . . .

Mr. Kelln: — Yes, for sure.

Mr. Wotherspoon: — Now what kind of a process are we looking at to change T12s to . . .

Mr. Kelln: — Well it just needs an electronic balance and either T5 technology or T8 technology. The fixtures are on the market with specular reflectors. A specular reflector is a device that focuses, just like that concentrating collector you saw on . . . So what it's doing, it's taking the light. The fluorescent tube emits light 360 degrees, and so if you can better put that light down onto where it's going . . .

These fixtures up above — and I'm pretty sure there's no specular reflectors in there, but until you open them you really don't know — the two light bulbs interfere with each other and let light out of there. So if you take them out of there and put the specular reflector in there, the studies I did with Saskmont

Engineering show that the light levels were the same — actually increased — over two tubes versus one tube with a specular reflector.

You know we've got to do our engineering better. And 200 megawatts, we're wasting. I go into these schools, and there's a lot . . . I used to do commercial energy audits for both SaskPower and a number of schools and I've audited over 200 schools. Without spending a nickel, we could save $20,000 in most school divisions, and then turning off lights that aren't required; reducing light levels and such. And then when you start spending money, of course you can do much better.

And I hate to say it, but most of the construction we're building in Saskatchewan is still behind the times. We need to build LEEDs [leadership in energy and environmental design] accredited or better and we can do that.

Mr. Wotherspoon: — Thank you. I don't know if myself and the member from Carrot River assist the room with our cranium reflectors as relates to lighting, but we both assist that way.

If we're looking specifically again at these T12s, what kind of a cost would we be looking at to actually change over?

Mr. Kelln: — We're lucky now because the T8s have dropped substantially in price now. I think they're under $2 or $2.50, so it's not a big expense.

But what the problem is, you know, Wolf's General Store in Craven put in used fixtures. They're an 8-foot T12. Worst thing he can do, because if he's putting in the fixtures, the labour is the big cost and he could put in the T8s. He didn't know about them and didn't put them in. And, you know, 2 or 3 kilowatts will be dropped right in his store and make him work . . . And that translates into less than a two-year payback on stores like that. So it's 50 per cent return on your investment. Plus you get to writeoff the expense, so it's not a hell of a lot of money.

Mr. Wotherspoon: — That's a practical solution. And I know we're hearing from other presenters that investment in demand-side management or conservation, in fact even there's a role for either government or for utilities on these fronts particularly possibly a Crown corporation. And we talk about return on investment of investing a dollar into conservation or demand-side management having returns of $1.70 back to ratepayers or taxpayers, and practical solutions like this. There might be a role for government or the Crown to lead such an initiative and work with those groups. And you mentioned here about passive solar, and some of the stuff is new to me here, but when you talked about they totally ignore the roof, were you meaning the construction . . .

Mr. Kelln: — Yes. Windows face east and west instead of south where you could put some overhang on to shade your south-facing windows that have full sun access in the wintertime and no sun access in the summertime. So it's a really simple technology.

And like I said, in 1980 we were putting on seminars. I put on a seminar in Yorkton with Rob Dumont in the '80s. We put on some in Regina. And we were promoting these low-energy, passive solar homes. And there was a big take-up on it. We were filling the halls with people wanting to save energy and do it right.

So we need to . . . What I'd like to see SaskPower do is build or help finance 10 net zero houses in every location in every major city in Saskatchewan and also, you know, build a demonstration rink that has heat recovery on the system that we . . . So here's the best in the world, and here's where you are today. To the rink owner, how do we get from there to there? And then we can identify all the trade-off so when they're building that new rink, they know what they need to do, right?

Mr. Wotherspoon: — So what specifically would you make as far as a recommendation to this committee? We know we've looked a little bit at Ontario's feed-in tariff system and you've referenced it here. You also looked at a whole bunch of different systems. What should we be considering as it relates to solar if we're trying to see growth within the industry?

Mr. Kelln: — I'd sure like to see the PST [provincial sales tax] taken off it. And I would like to see a few more demonstration buildings for sure. You know, you do get to write solar off if you're a commercial building, but the residential people don't get to write it off.

Mr. Wotherspoon: — You don't advocate for a feed-in tariff or something of the . . .

Mr. Kelln: — Yes, I do. And it certainly would . . . In Ontario right now, the 82 cents is about a 10 per cent return on our investment. We're already at two. You know, we do have an incentive there. Well, removing those taxes would give us another 2 per cent and maybe an additional feed-in tariff.

I know SaskPower has looked at feed-in tariffs of another 15 cents a kilowatt hour. Boy, it is a green technology and it's certainly the place to go. You know, it's tough though for some people to come up with the money even at 50 per cent funding to put on solar energy, and SaskPower has offered to loan people money at their interest rate. I mentioned about the electric heat customers, and if we loaned these people the money at cost to upgrade their house with thermal efficiencies, replace their windows, and put in solar hot water heating, I think that's a right step in the right direction, because we can, you know, free up a lot of energy to be used by our industrial customers. And what makes Saskatchewan, you know . . . If we keep the electrical rates low, we should attract more industry, right?

Mr. Wotherspoon: — Well thank you, Ken. Thanks for your answers. And you're certainly a pioneer in our province on this front, and thanks for your leadership on that front.

Mr. Kelln: — Thank you.

The Chair: — Mr. Hart.

Mr. Hart: — Thank you, Mr. Chair. I'm particularly interested in the almost 11,000 customers you've identified that are currently heating their homes with electric heat. And you're advocating . . .

Mr. Kelln: — It may be . . . like, SaskPower told me that was

11,000 customers quoted at electric heat. They forgot to tell me if they're residences. I'm sure most of them are residences.

Mr. Hart: — Well let's, just for our discussion purposes, assume that they are. And you're advocating that the heating systems, well first of all, that they retrofit their homes with additional insulation and triple glazed windows — all those sorts of things — and then replacing the system with solar hot water heat which would, I'm just imagining would . . . To an existing home, would there be a fair bit of retrofitting to accommodate electric heat? Would not wind energy be a better system, a better fit for these people? I would like your thoughts on that.

Mr. Kelln: — Sure. Okay. I better make sure I'm not blasting SaskPower because they are doing something with geothermal, right? And if we go into these houses and put in geothermal . . . I'm not an advocate of geothermal because it puts the same emissions out as a condensing gas furnace but . . . And it puts coal emissions out where the natural gas is a little bit cleaner.

One of the problems with wind is that we have a line between Yorkton and North Battleford where, if you're on the north of that side, wind is not very good. It's about an average of 8 miles an hour where south of that line, you know, the Swift Current area is of course around 14 miles per hour. And yes anything, you know, south of the Trans-Canada, I would say yes, that's a prime candidate for wind. But the other problem with wind is that it does require maintenance.

You know, I do sell wind machines and I do advocate it, and there's a good return on their investment. But it's like anything; it's going to require some maintenance. Some of them are better than others, and the consumer has to be aware that that's the case. But even a 6 kilowatt unit which in southern Saskatchewan will produce about 20 000 kilowatt hours a year, that will displace a lot of heat for electrical heat customer. But I think it's more important to get houses better insulated because if the power does go out, heaven forbid, your house . . . Like my house, I think we can go for three days at 35 below with no problems, so a lot of houses can't go four hours without heat. So I hope I've answered your question.

[14:45]

Mr. Hart: — That's fine. I appreciate your comment.

The Chair: — Well thank you very much. Your presentation, like almost every other, has given us something to mull over and some information we want to take back to SaskPower on Monday that we can ask them some questions based on what we've heard here today.

Mr. Kelln: — They actually do a good job. I think they need a little bit . . . Well there's some expertise lacking in a few areas; that's all I can say. Thank you.

The Chair: — Yes, I sure appreciate your time and I think the members do as well, so thank you very much. Committee will now recess until 3 o'clock.

[The committee recessed for a period of time.]

[15:00]

The Chair: — Well welcome back. Before we hear from our next witness, I'd like to advise the witness of the process for presentations. I'll be asking all witnesses to introduce themselves and please state your name and, if applicable, the position you hold within the organization you represent. If you have a written submission, please advise us that you would like to table your submission. Once this occurs, it will become available to the public. Electronic copies of tabled submissions will be available on the committee's website.

The committee has asked that all submissions be in answer to the following question: 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. Once your presentation is complete, the committee members may have questions for you. I will direct the 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 committee's website for public viewing. With that I would ask our next presenter to please go ahead with their presentation.

Presenter: Pedersen Apiaries Ltd.

Ms. Pedersen: — Okay my name is Karen Pedersen and I am president of Pedersen Apiaries which is a family-run, beekeeping operation at Cut Knife, Saskatchewan. What we wanted to . . . Well no, sorry. I need to, one more housekeeping thing. We did give you guys all a written submission, and I have passed it on to be tabled so it's there.

When we looked at the question that the committee was asking, we thought that what had happened in our situation was relevant, and so that's why we decided to request a spot. And we titled this a small case study because we're not trying to give you a policy document. We're just trying to give you the figures and facts that we found out as a small case study in Saskatchewan as what is happening right now or what's doable right now.

You need to be very aware of the fact that my education is a Bachelor of Arts. I am neither an engineer nor an economist, and so when I go through some of this stuff, I don't have fancy calculations. The positive of that is that anyone can kind of understand my line of thought. The negative is that I am sure that there are fancy calculations that I should follow that I have not. So yes, and I've tried to compensate for that by ranges and trying to point out where I recognize that there are weaknesses.

So we knew that we were going to need to replace energy infrastructure. We've known this for a while. We've been kind of looking into it. But like anything else, you know, that's kind of expensive, so we kind of stalled on it. And last summer the

furnace started leaking again, and we realized we'd hit a wall, that we didn't have any time to kind of pedal our feet on this one any more. And so we started looking consciously into what were we going to replace it with.

It was an incredibly steep learning curve, and where I thought I was going to begin with is not where I ended, and so I just want to share with you what we found out. A lot of that is financial stuff because that's how we were making a decision. Like, we're a business. I found out that — and I don't think I'm unusual as a business owner or Saskatchewan resident — I found out that I don't know an awful lot about my energy. I turn on a switch and it's there. And I don't particularly pay attention, or at least I didn't and now I've learned a lot.

So I'm going to skip the executive summary because we'll get to that at the end in terms of the conclusions.

I guess the other thing too that I should say is Pedersen Apiaries, when we're extracting, we're running an extracting line three days a week for about three months of the year which is usually a crew of six specifically in there running that line. In the wintertime, we're manufacturing equipment, and so we have saws and a dust control system going. And you know, it's again significant, but it tends to be three to four people going, except that would be six days a week. So that's what we're looking at. We own two yard sites with four residences, all of which are rented out to the people living in them, and then there's one main production building.

I'm only going to be looking at the one yard site because that was where we hit the wall. We haven't hit the wall on the other yard sites, so we're talking about the one particular yard site with the production building in it. I've put a picture on there just so you have an idea because sometimes you talk numbers and people just don't quite, you know, the numbers don't mean anything. If you look at that picture, that is the honey house and shop. It is 9,000 square feet, 6,000 of which we heat. So yes, it's a big building just so that you know that.

It's mostly heated with in-floor heating. It was built in three sections. The section that we built in 1983, in-floor heating was a new technology at that time, and it was expensive. And we're trying to manage risk. We only put it in half of the building at that time. It's something we've regretted ever since because it's been amazing. So you know, since then we've put in floor heating and the rest of it.

Half of that building is a 1998 construction. We built it out of structurally insulated panels or SIPs. At the time, it was the first building that Plasti-Fab had built in Saskatchewan. Again it was a new technology but we felt it was worth pursuing. And it's significantly better insulated. They're both supposed to be R-20, but those SIPs are way better than the standard construction.

The house that I live in was built in 1966, so obviously it wasn't particularly built well, and it's about 1,700 square feet. And then we have a house trailer that employees live in which is a little over 500 square feet and, as we have since learned, is basically a black hole in terms of energy consumption.

So we had installed an outdoor furnace in 1994. It was for wood burning because at the time it just made sense. We had wood to burn; we generated waste wood in our manufacturing process. But we've since ran out of wood and so we converted to coal. We converted that outdoor furnace to coal, thought it was a good idea. It wasn't. It turns out not to be cheap, and it turns out not to be maintenance free.

So the first thing that I guess perhaps is, what really annoys me is we can only access the coal from one mine. That mine, the quality of the coal is declining. The coal is wet and so it freezes above the auger. And there may be some people who like monitoring a furnace — an outdoor furnace — in minus 30 weather every three or four hours to knock the coal down. I'm not one of them. So it's very expensive in terms of labour that way. And we've tried agitation. We've tried insulation to solve that problem, and we can't solve it.

The furnaces are supposed to last longer. Both of them lasted seven years. That's an awful lot of money to put into something that only lasts seven years. So it doesn't make a lot of sense.

Farther on — and we'll get to that graph later on — I've put a graph in here comparing costs of all of the different systems. Because obviously we did, like we did price out, well what would it be like to continue on what we're doing? The house also uses backup propane heat because the coal doesn't quite generate enough, and it has a propane water heater so that's part of it as well.

There are also graphs in here at the back that we've done the current price that we've paid for coal and the current price that we've paid for trucking the coal, the current price of propane. And that one I even got the computer to do a projection because I can't do the fancy calculations, but it kind of scared me, what the computer did. And so it was a major problem and we thought continuing on and doing more of the same would be stupid.

So we looked at different options. And the ones that we priced out were ones that were obviously possible for our situation. My father's cousin's house in Denmark is heated by waste heat from an industry in a town nearby, obviously not possible on my farm, but I think it would make a lot of sense in Saskatchewan. So yes, we priced out the cost of continuing on, and that's there. We came up with around $165,000 in 25 years.

All of these things, when I priced them out, I didn't make any allowance for the price increasing of anything. I calculated them on only what the most current price that we paid was, so that assumes that the price of coal does not continue to go up, and the price of propane. Like everything was based on it being flat lined. There's no inflation in there. There's no cost for labour. There's no cost for maintenance. I realize those are all wrong assumptions, but that's how we priced them.

Natural gas, I asked SaskEnergy how much it would be to put natural gas at our place. We're looking at somewhere between $18,000 and $20,000 just to trench it to our place. They told me that a furnace would cost more than the outdoor furnace that we have which is $14,000. But I haven't been able to get an exact price. I've tried to find that out and I haven't been able to get one. And I've made the assumption that we would only need one furnace which, again, I think is highly questionable given

the way the other furnaces last.

I took natural gas from a house that I knew and I took their consumption and I figured it out per square foot over two years, and that's how I then kind of figured out a range of consumption for us. There's inherent problems in that because the house that I took it off of is poorer insulated than the honey house. However it's insulated probably equivalent to the house and much better than the house trailer. However the other difference is, is that that house doesn't have big doors with a dust-control system that have a lot of air leakage and that house does not have summer heating loads which, as a business, we do. We heat a warm room. We heat a honey sump out of our coal furnace. And so then I took the range and I went okay, so let's assume 60 per cent of their consumption to 100 per cent of their consumption, and those are the two pieces that I kind of picked. Again I assumed the price of natural gas would not increase.

We looked at geothermal, a ground source heat pump, and I got three different quotes in the end, two of which were possible. All of those quotes did not include sort of some essential things like trenching. They didn't price out trenching, which is a fairly significant piece. They didn't price out doing electrical upgrading. They didn't price out doing the duct work, like changing . . . And all of those things are going to be expensive.

Perhaps what was the most interesting for me in terms of geothermal because that was where I thought I probably was going to end; that was where I thought I was going to land. But the one contractor who I actually thought was the most trustworthy or most experienced of the two, he provided me a sheet that showed me how much I would save on heating in my house given its square footage, given the age that it was built, all of that kind of stuff. And it looked pretty impressive. Something like $600 a year was all I would spend on heating it. And this was going to heat it, this was going to cool it, and this was going to do my hot water.

And again I'm a little bit cynical and I like working with numbers. And so I took this sheet and I started going over it and trying to understand it. When I figured it out, their electrical rate that they had based this on was 4.6 cents a kilowatt hour. And so I took my SaskPower bills and I went, that's not what I'm paying. And so I phoned SaskPower because I thought, well maybe I'm getting ripped off. So that was a question.

But the other thing that was particularly important there is it said, that sheet said that my house would use almost 14 000 kilowatt hours per year to do that. Well my house has a propane hot water heater. I'm never in it. I'm always in the honey house, so I don't use the appliances over there a lot. There's not a lot of electrical. You know, when I figured out that ovens, clothes dryers, hot water heaters, those are kind of what the heating loads are, there's not a lot of those. So the house isn't using a lot of electricity right now.

Our yard site — again, SaskPower told me this — consistently uses about 30 000 kilowatt hours a year. So to all of a sudden take 50 per cent of that and put it towards the house I went, huh? And so I did a square footage thing on that one as well and my question became, well does that mean we're going to spend 50 000 kilowatt hours on the honey house? And you know, again I did a range on that one.

[15:15]

And so when you look at the graph, there's a range where I said, okay, well what if we only use 60 per cent of what the house uses? But that freaked me out, you know; that was too much electricity. That didn't strike me as being particularly efficient, and so we've ruled that one out for that reason alone. It's one thing to spend a lot of money on installation if you lower your operating costs, but if you're going to continue to have high operating costs, that seems stupid.

So here I was still against a wall, and I wasn't happy. I wasn't particularly happy with any of the options that I had found. And so I started looking at solar. And when I refer to that, there's a couple of things I want to say about solar. Solar is actually a little bit like the term fossil fuels. There's so many different types of solar technology out there that it's not fair to just say solar.

And so I'm only going to be referring to passive solar heating — like the presenter before me did — and solar thermal heating. I'm not going to touch any of the others. I don't know enough about them. Those are the only two that I'm touching.

The next picture that's in here on page 12 is a house that was built in the 1970s. It's a passive solar heat heated house. It's one of our houses that we own in the other yard site. So we had experience with solar. It was passive solar. We knew passive solar worked. We knew passive solar reduced our costs significantly.

We didn't have any experience with active solar. So that was why I was a little bit leery when I started looking at active solar.

The other picture that's there is that stove. And just again, I put the chair beside it when I took the picture. That is the backup heat in that house. It's a 3,000-square-foot house. That is the backup heat. You know, like it's . . . And that was built in the '70s. That's pretty old technology. There's a lot of things . . . The windows have been reduced because the windows were too big to begin with. Like there's a lot of things that have been learned since then.

In terms of solar though, what we did know about that house is you need a heat sink for doing passive solar. And so when you look at those windows, half of those have got cement walls behind them, so you don't actually see them inside the house. And so that stores heat.

We knew, or well we found out last year that our honey house shop actually already has an incredible heat sink in it in our concrete floor, and the reason we found that out is because one day during the winter the heat got turned off, a pump got unplugged, and the heat got turned off and it took us five days to notice that the temperature was dropping in that building. You know? So that's the kind of thing what the last presenter was talking about where minus 35 weather and you don't notice. Like it took us five days. Granted it wasn't minus 35, but it was in the wintertime and it took us a long time to notice that we were losing heat there. And like and all it was, was the pump had been unplugged.

So we went looking into solar. Someone told us, well you're heating in the summer and the wintertime. That makes logical sense. Well we weren't quite convinced that the technology existed. I toured two residences that are solar heated. The one guy had actually made his own solar panels. He showed me how to do it. It's something that we could even do in a shop class in high school. Like it was incredible how easy it would be.

The other place had a higher technology panel. We showed up at that place. It was foggy. It was so foggy you couldn't see the windmill behind the house. The panels were frost covered. It was in February, and we went inside the building to talk to him and we're down by his equipment and you could hear the gauges, the pressure gauges, kicking in and out because the temperature of his water was still increasing despite the fact that it was foggy out there and they were frost covered. Like I was just blown away. By the time we went out, it was a mix of sun and cloud and he took one of his tubes out there that hadn't been outside. Within a minute you couldn't touch the end of it — that's how hot it was. And so it became . . . We're kind of like, okay wait a minute, this makes sense. Okay.

But trying to find someone who could design a system for us — I'm not an engineer; I didn't know how many panels we needed — became a real issue. There's a shortage out there in terms of what we found as people that do that. They've got enough work in the city and we're kind of out there, so that was one of the problems. It also led us to look at our electricity even more and to get more efficiencies so that we put in clothes dryers for the business . . . or sorry, not clothes dryers. We put in clotheslines for the business as well.

Yes, so it kind of led us on a few things, and then the real epiphany was when we realized that all of our buildings were passively solar heated. The difference is, is while that one house had that little stove for backup heat, my house required constant coal and some propane, and the other businesses required constant coal for backup heat. All of our buildings are passive solar heated. Most of them require constant backup instead of just a little bit.

So what we've decided to do is to first of all do conservation; secondly, install a solar thermal heating system; thirdly, put up wind turbines so that the electricity becomes our backup; and fourthly, we need to replace that house trailer which we already knew we had to do it, but we'll replace it with a passive solar residence.

And we're taking a risk no matter which decision we make. If you look at that graph on the back there, or this one here, if you look, the ranges that I looked at natural gas versus solar, they're fairly close to one another. The darker parts are operational costs which assume that there's no price increases. The lighter costs are installation costs.

And we're taking a risk either way, whichever way we go. But what we've decided, and the risk that we've decided to take, is we're betting on the fact that fossil fuels will not continue to remain cheap. We're betting on the fact that we think renewable technology in the next little while will continue to come down but as other people hit walls and fossil fuel prices go up, renewable technologies will also increase in price. And so we want to be ahead of that curve and install the renewable technology ahead of those price increases.

So that's what we're betting on, and when it comes down to it, I think there's a better bet as well making a business decision to reduce our costs rather than betting on prices remaining constant, or even prices staying, you know, at a fairly low level. I just think there's less risk that way.

Where we live, it makes sense for wind; it makes sense for sun. And 25 years is I think a practical way of, you know, in terms of a long-term business decision, I think that's a logical decision to make.

And I'm going to tackle efficiency. One more thing. We have looked in the last few years and I honestly, up until this past year I would have told you that as a business we had become as efficient as we could because we had done, you know, like we'd looked at fuel efficiencies; we'd looked at labour efficiencies — all of these kinds of things. And when we did those efficiencies and we changed things, what ended up happening is we took the money that we saved and we reinvested it in the business. And it didn't hurt the economy at all doing conservation. To me, conservation and efficiency are the same. And so when I look at energy — and I'm looking at my energy efficiency as well now — I expect the same thing to happen.

And so that in itself will give us a competitive advantage. It will keep our competitive advantage because right now North America's competitive advantage has been cheap fossil fuels, and the rest of the world is way ahead of us. And when we stop having cheap fossil fuels, we're going to be in deep trouble. And so as a business, we don't intend to keep our heads in the sand and end up there. We're going to get ahead of the curve, we hope. So I'll leave it at that.

The Chair: — Great. Well thank you very much for your presentation. If I could just lead off with a couple of questions. And I've run into this myself. We live half an hour outside of Lloydminster and about the same distance as you are from Saskatoon. How did you find an expert that you were comfortable with? Or was it somewhat trial and error? How did you ever size up what you actually needed for panels?

Ms. Pedersen: — What we ended up doing . . . And right now because of the shortage in providers, you have to be determined. If I wasn't so unhappy with the others, I probably would have given up. We contacted every solar provider in Saskatchewan. We started contacting ones in Alberta. Most of them weren't prepared to come that far.

To tell you the honest truth, the way that we ended up connecting with the person that we did, the engineer that we did, is we got concerned when they were talking about putting a nuclear power plant up where we were, and we started looking into that and the finances of that. And in being involved in that fight, we found an engineer that was in the business. And we talked to several different people, and in the end that's how we got connected. Like it turns out it was kind of fluke.

The Chair: — You talked about the cement wall that is your heat store. My parents just built a house using the Styrofoam blocks and cement, and we've had the same experience. It's

unbelievable how much heat cement can store, and the same experience, you know. The heat doesn't come on for a day or two, and you realize that it's just coming out of the walls and out of the floor.

Ms. Pedersen: — Well and that's the thing that . . . Like again you look at that graph, and you look at how much we spent on conservation. It's piddly in comparison. And that's where, you know, like we took the attics up to R-50. We're increasing the walls to R-32. We're finishing the basement. It's phenomenal how much energy you'll save just in that insulation alone.

The Chair: — We heard from you on a small scale on your house. Conservation has been a common theme with many of the presenters that, you know, the cost of every kilowatt saved is cheaper than any they bring on. And no, that's been a very common theme. So thank you very much. Mr. D'Autremont.

Mr. D'Autremont: — Thank you. Very interesting presentation. I was glad to note that you had on your graph here at the end the conservation measures. You know, to me that's one that everyone should be involved with. I mean, just simple insulation and proper windows in your house makes a huge difference. And so I think that's probably the place that everybody should be looking at initially because that's actually the lowest cost investment you can make for the best return.

In your paper here when you talk about solar, you talk about using windmills, wind generation, as a backup system. And you also talk about the costs you're already spending on electricity at $3,000 per year for that yard, and that you'd have a possibility of $75,000 over 25 years then to pay for the windmills. But you didn't include any of the wind costs and generation numbers in your graph.

Ms. Pedersen: — I haven't had time to completely price out windmills and stuff like that. Several people that I've talked to over the course of me doing this have basically said to me that putting up windmills is about 10 cents a kilowatt hour, and so it's kind of iffy right now as to whether or not it's on parity with the grid. And so I'm going off of that basis that we will do it. But, you know, like this has been trying to do harvest and do this at the same time. I haven't had time to price out windmills. I haven't had time to price out, you know, like what kind of towers we need to do any of those sorts of things. And so that's why I haven't put it in there.

Mr. D'Autremont: — I noticed that there and I just wondered if there was a particular reason. We've had a number of people, including today, that have . . . No, we didn't have any wind people today. We had wind over the last three or four days. A number of people have come forward. And SaskPower's numbers are about 8 to 13 cents, depending on what you're doing, and although some of the numbers have seemed that the larger the wind generator that you would think the prices are lower, and yet we're seeing in some of the applications that they're putting in more small units rather than one larger unit. And the prices . . . or they seem to get a more consistent supply perhaps is what it is. But the costs are running 8 to 13 cents, depending on what you're getting.

[15:30]

Ms. Pedersen: — Yes. Like the 10 cents was what I had been sort of told. We originally had kind of thought, oh we'll just put up one big one. What's been recommended to us is that it would be smarter to put up more little ones because then if one goes down, you still have the others generating.

The other benefit for us, and why we saw as sort of doing wind and solar both, is quite often when the sun isn't shining, the wind is blowing or vice versa. So that's why we looked at that, and I mean I talk about that in here. But where we actually live, on a ridge of hills, you can actually see the lights of North Battleford and Lloydminster both from where we are. We're significantly higher than the land around us, and so therefore we shouldn't need as many towers or as tall a towers to capture wind either.

Mr. D'Autremont: — Not knowing your location at all, are your farmyards — you've got two of them — are they on the same piece of property, or are they spread out between two different pieces of property?

Ms. Pedersen: — They're on two different quarter sections.

Mr. D'Autremont: — Okay. Because I know that a number of years ago SaskPower put in some regulations that if you did have wind generation set up where you were feeding back into a meter — net metering — that you can't transport that power across the road. So if there's a boundary there, a separation, there may be some problems there for you as well.

Ms. Pedersen: — And again I mean we haven't spent a lot of time looking into things like that. Where we sort of envisioned putting up the wind turbines at this point, the ones for backup would be fairly close to that yard site, in fact closer to the meter than my house is. And again like the area where I live, I actually think there's huge potential for wind. But I haven't looked into those kinds of things, and trying to put in cables and stuff like that regarding roads is, you know, like it's something I haven't looked at. There's a lot of hills there that I think there's potential for a windmill on, but I haven't done that kind of research yet.

Mr. D'Autremont: — The other issue that, and this comes with feeding back into the system again, that you have to have proper switches and things in place to protect both yourself and SaskPower when they're working on the lines, etc. Thank you.

The Chair: — Thank you very much for taking the time to present to us today. I think there's something for all of us here and a case study. We can table this?

Ms. Pedersen: — Yes.

The Chair: — You know, I think that's something anyone that's looking for options can go to the website and find it, so thank you very much. The committee will recess until 4 o'clock.

[The committee recessed for a period of time.]

The Chair: — Before we hear from our next witness, I'd like to advise the witness of the process for presentations. I'll be asking all witnesses to introduce themselves and please state

your name and, if applicable, a position within the organization you represent.

If you have a written submission, please advise us if you would like to table it. Once this occurs, it will be available to the public. Electronic copies of tabled submissions will be available on the committee's website.

The committee has asked all presentations to be an answer to the following question: 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. Once your presentation is complete, the committee members may have questions for you. I will direct the 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 for public viewing. And with that, please go ahead with your presentation.

Presenter: North Saskatchewan River Environmental Society

Mr. Pedersen: — Okay. My name is Gil Pedersen. I'm from a farm in the Cut Knife area. I grew up there and have lived all my life there, basically farming with a few short stints off, trying a few other things.

In the '70s and '80s, I designed and built a passive solar house which my wife and I still live in. That was where my family grew up and all of us still have all of our digits left. So even in the wintertime, we haven't froze off one finger.

I don't know whether you've got a copy of my document . . . yes, okay. And I'm prepared for it being tabled. I'm representing the North Saskatchewan River Environmental Society. I hold the position of resource person in that group, so that's where I'm coming from. And the North Saskatchewan River Environmental Society was a group of people that came together at the time when Bruce Power was talking about building a power plant up there. And we were opposed to it and we came together and we are basically committed to renewable-type energy, conservation and that, and that is where we're coming from.

The recommendations we make: all customers of SaskPower be supplied with a recording meter; energy rates should vary between daily peaks and daily valleys and between seasonal peaks and seasonal valleys; energy consultants be hired to help consumers reduce consumption; an expanded retrofit program be developed; expand the net metering program; provide technical assistance for customers considering retrofitting or net metering; an expanded education program on energy conservation; and research into renewable energy use.

The key premise of this submission is that it should not automatically be assumed that electrical energy, or indeed energy of any source, the consumption of it will continue to rise. Instead every effort should be made to reduce the amount of energy we're consuming now, and we're confident with a concerted effort, energy consumption can be reduced significantly.

We think this will be resisted both by the existing management of SaskPower and SaskEnergy and by the leadership of IBEW, the International Brotherhood of Electrical Workers.

[16:00]

The reason we assume there will be resistance from the current management is the natural reluctance of any company to downsize without significant outside pressure, and this assumption is reinforced by SaskPower's opinion that electricity rates will have to increase by 8 per cent per year to pay for expanding generating capacity. The leadership of IBEW has shown that it has no interest in trying to service a smaller, more scattered membership if they can continue with the status quo. Despite this opposition, the government and the residents of Saskatchewan should not be deterred.

The points we plan to cover are those recording meters, variable rates, energy consultants, retrofit program, the expanded net metering program, technical assistance, education, and research into renewable energy use.

Recording meters. We recommend that every customer, SaskPower customer, be equipped with a new power meter which records and maintains a minute-by-minute, hour-by-hour, day-by-day, week-by-week record of the power usage. We don't know whether such a meter is available, but we do know that it is possible to build one with the current technology. A meter like this would enable a consumer to know when their heavy consumption is and to plan to reduce it or shift power use to non-peak times.

Variable rates. It is our understanding that there are daily peaks in electrical consumption — one in the morning, a smaller one at midday, and the largest one in the evening. Along with daily peaks there are also seasonal peaks — one near mid-winter and another near midsummer. We recommend the price of a kilowatt hour of electricity charged to SaskPower consumers be varied between the daily peak and the daily valley as well as between the seasonal peak and seasonal valley. For example, a customer would pay 4 cents per kilowatt hour more for consumption in a daily peak during a seasonal peak as opposed to consumption in a daily valley during a seasonal valley.

In addition, rates should be varied according to where customers fit, according to the average consumption. Therefore if we assume that the average residential electrical consumption is 10 000 kilowatt hours per annum, a customer that can reduce their consumption to 8000 kilowatt hours would benefit from a 1 cent per kilowatt hour reduction in their rate. For every 2000 kilowatt hours of reduction below the average residential consumption, the rate would be reduced an additional 1 cent per kilowatt hour. On the other hand, customers should be penalized 1 cent per kilowatt hour for every 2000 kilowatt hours their consumption is above average.

Commercial, business, and agricultural customers would have to be judged against their own history of consumption. Energy audits would have to be conducted. Reduction in penalties and rates would have to be allocated according to how well the customer responded to the audit by reducing their energy use.

By SaskPower's own testimony, 35 customers consume 45 per cent of Saskatchewan's electrical production and are expected to continue or increase their share into the future. This demonstrates a need for differential pricing. The more one uses, the more one should pay. Much of SaskPower's projected increase in electrical use comes from these 35 customers' own estimates.

Our information does not indicate if these customers are expecting a corresponding increase in production or just an increase in electrical use at the expense of other forms of energy. The rates from SaskPower and SaskEnergy should both be variable like we have described, otherwise customers can just transfer their energy consumption from one to the other.

We wonder what is the advantage of maintaining two separate Crown corporations in charge of energy. Would it not be far easier to monitor total energy consumption if SaskPower and SaskEnergy were amalgamated under one management?

Energy consultants. We advocate the government or the Crown corporation employ a number of energy consultants whose job would be to assist consumers in determining where their main energy consumption is and how to reduce it. They would advise consumers on how to reduce total energy consumption, including power, space heating, and hot water heating. A carrot-and-stick approach could be applied to get consumers to make use of these energy consultants if they're reluctant to utilize their expertise. An automatic surcharge could be added to the bill of any consumer who has made no effort to have an energy audit done. The government should implement a major retrofit program for homes and places of business. This should include upgrading insulation, windows, and doors; changing lighting, heating systems, etc. Energy consultants could play a major role with this by advising consumers on what is practical and cost-effective.

We are aware of the current program, EnerGuide for Houses, but it has some major shortcomings. In the current EnerGuide for Houses program, geothermal, or to be more accurate, a ground source heat pump system, qualifies for a large subsidy, but solar space heating does not qualify for a grant at all. Also a large number of possible participants are deterred by having to pay upfront costs of the audit and then pay for retrofit costs while hoping for a rebate.

The retrofit program should make low-interest, forgivable loans available to low-income people. As long as they effectively reduce energy consumption, these loans should be forgiven. An effective retrofit program would be easy to use, accessible to everyone, and would reward actual energy-efficient technologies rather than the latest energy fad.

Expanded net metering program. The net metering program is not the best kept secret in Saskatchewan, but SaskPower has not done an outstanding job of informing customers about its existence. All too often, when talking to farmers, they know nothing about net metering. Promoting this program, along with technical assistance, could go a long way in removing the biggest single consumer of electrical power in Saskatchewan — line loss.

As well the net metering program should not penalize producers for producing more than they consume. Currently a producer turns the extra power over to SaskPower gratis, so there's no incentive to generate more power. There is actually a disincentive to generate more power.

Technical assistance. We recommend the Crown corporations supply technical expertise to assist customers designing and installing electrical generating facilities which will qualify for a net metering program. There are private firms engaged in this service, but they're concentrated in some areas and non-existent in others. Trying to find a reputable contractor close to where one lives can easily discourage any but the most determined.

Education. A major education and promotional program is needed on energy conservation including the expanded retrofit program. We are aware there is currently an advertising campaign going on, but its emphasis seems to be more geared to be appearing to do something rather than actually doing it. This is the sort of education that could be done in schools as advertisements on primetime TV and radio and to teach Saskatchewan residents how to conserve energy.

One of the things that a lot of consumers are not aware of is the fact that just the colour of the interior a room is painted influences the amount of light that is needed by a huge amount. It takes just about twice as much light to light a dark-coloured room as it does to light a light-coloured room. And most consumers are not aware of that huge discrepancy. And just that alone promoted out there would make a big difference.

Research into renewable energy use. Wind and solar are somewhat intermittent, and the high-production months do not coincide with the high-consumption months. While this presents a bit of a technical problem, it is not insurmountable. There are several methods of storing power from the high-production periods for use when production does not equal consumption. The methods we're aware of are batteries, compressed air, hydrogen separation, and pump water storage.

Batteries are at present the most common method of storage but are quite expensive. Using electric vehicles as battery storage when they're not in use warrants study however. There are many natural gas caverns in the province now in use which will become available for compressed air storage as our supply of natural gas runs out. Hydrogen separation uses too much electricity to be practical most times, but in periods of surplus production, it may have some merit. Pump water storage is one which is not much is known about it in this province, but may have a lot of potential. There are thousands of seasonal natural water reservoirs and coolies which could have small earthen dams with small generating units. Then, water could be pumped into them in March, April, and May to be released when necessary from October onward through the winter. Just one example of where these could be used is around the shore of Lake Diefenbaker.

Research is needed to determine the most effective and least

environmentally damaging method of storage. Natural gas would make an obvious choice for flexible backup to renewable power generation in Saskatchewan. It can be turned on and off quickly, and it is a resource that Saskatchewan has. Biomass and methane digesting must also be explored to see if they can provide flexible power backup, as well as economic development in the North. Crop residues that cannot readily be worked into the soil and which are already burned, such as flax or canary seed straw, must also be examined to see if they would provide alternate forms of heating or power generation.

We believe there are multiple opportunities for economic development around energy in Saskatchewan if the government would invest in research and innovation. So in conclusion, we recommend that any energy consumption policy in Saskatchewan be geared to lead the smallest environmental footprint — not only for the current generation, but also for all future generations.

Therefore we specifically recommend all customers of SaskPower be supplied with a recording meter; energy rates should vary between daily peaks and daily valleys, and between seasonal peaks and seasonal valleys; energy consultants be hired to help consumers reduce consumption; an expanded retrofit program be developed; expand the net metering program; provide technical assistance for customers considering retrofitting or net metering; an expanded education program on energy conservation; and research into renewable energy use. Thank you.

[16:15]

The Chair: — Thank you very much for your presentation. You know, I feel like you've really fleshed out a lot of what we've heard from a lot of people and brought it into some point form here.

Talking about your net metering and recording meter, just a couple thoughts I had on that as you were going through that. I attended a conference earlier this year that they were talking about if people knew when electricity was at a high price or when we're short . . . And one utility in the States had what they called the orb, and it would change colour and it would turn red during, like, peak times and green in other times. And they said that just doing something like that, where people had a tangible object which would dictate . . . it would change people's patterns. And just simple things like that. If you had a meter that was charging you more, you know, I think it would definitely start changing your patterns. But even without changing the pricing structure, just letting people know, they found that had a meaningful effect on it.

At the same conference they talked about meters that were smart meters and, you know, technology, maybe it's five years away. I don't know, but where your power meter is linked to your water heater and to your appliances in your house, that when the price gets over a certain amount, your fridge doesn't kick in until it comes back down or maybe your water heater doesn't kick in from 6 till 9 at night because that's when it's peaking. You know, I think you've raised some very valid points on those, so thank you very much. Mr. D'Autremont has some questions.

Mr. D'Autremont: — Thank you. Interesting presentation. Looking over your recommendations that you have provided us with, most of those would be additional costs to the system. I don't think the net metering one is an extra cost. I think that's one where there is some benefits there to be had by the individuals who may be providing electricity. I see that as no cost to the system and a potential return to the investor that would put up a wind tower or whatever the case may be. A couple of the other ones are very low-cost ones.

But one of the concerns that has been raised throughout these hearings is additional costs for whatever method we utilize for ensuring that we have the necessary electrical power in the province. How would you have those costs allocated to the system? Would the system pay for those costs, or would they be allocated to the individuals who are utilizing — let's say — a recording meter or those type of equipment? Do you have any idea what kind of costs these would be for all your recommendations?

Mr. Pedersen: — No, we did no ballpark costing. And we recognize that there is definitely additional costs, and I don't know what a recording meter would cost. I suspect it would be crowding $1,000 a meter. So yes it is a . . . But is it a cost or is it an investment? That is the thing we're looking at.

To keep going down the road that we are going is not a viable option, so we've got to look at alternatives. And regardless of whether we go to conservation or whether we go to additional power generation and lines, there's costs. Certainly building power stations is not a cheap project. Building transmission lines is not a cheap project. And certainly our current system of power generation or configuration of power generation where most of the power is generated, you know, on the fringes of the province and transported long distances to the major consumption is not a particularly efficient way of doing things. So if we can move our generation into where the power is used, just what we save there would pay for quite a few of these other things.

Mr. D'Autremont: — We do have an increasing demand though. But in looking at costs I know that in looking at all governments, if they're spending money that's a cost, and I'll give you an example. Years ago when the Department of Agriculture had the bull program for the PFRA [Prairie Farm Rehabilitation Administration] pastures, buying bulls was a cost to Agriculture. When they turned around and sold those bulls, that was revenue for the Department of Finance. There was no offset to Agriculture. It was strictly a cost, you know. And so governments do funny things with their financing and how they account for things. So it's not always as direct as you would think it should be.

Your suggestion though about a variable rate depending on your usage, you know, and I think of IPSCO or Evraz out just north of Regina here — which is one of the major consumers, perhaps even the largest consumer in Saskatchewan — if their rates were to rise as they utilized power, at some point in time we would price ourselves out of the industry. We would become non-competitive and they'd simply move. And there are certainly lots of areas that would gladly take that kind of a company. So if we had that kind of a system in place, is there a danger to our economy of pricing industry out of this province?

Mr. Pedersen: — We may, I would assume, quite possibly price some industries out of the province, but at the same token, we quite probably would entice other industries into the province.

Certainly a program of variable rates would entice a huge amount of retrofitting business into the province which is very labour intensive. If anybody's ever retrofitted a house, you know that it's not something you go in there today and walk out tomorrow, and do it. It's a lot of hours of work and a fair amount of cost as the previous presenter outlined.

And as you're probably aware, I am part of that same company that she was representing, so I know intimately those details. What we have spent in retrofitting our buildings this year, you know, would certainly — if this was widespread — this would certainly bring in a lot of extra build. And the presenter previous to her was talking about the possibility of, you know, solar, whether it was possible to produce solar panels and such in the province. If there's a big enough demand, I think it still would be possible.

Mr. D'Autremont: — I know that over the last 20, 30 years in Saskatchewan, there have been variable rates — not as you'd indicated them for peak load and spring and summer, etc., but rather by industry; that industry paid at one point in time 120 per cent of the cost, and residences paid something like 80 per cent of the costs for their consumption. And over time that changed to actually fairly close now. But in part that was done because of demands by federal regulators, as well that you had to be fair to all the customers, that you couldn't be seen to be gouging one based on the kind of industry they were versus whether they were a residence or something. So there are regulations at various government levels that do cause some difficulties with that.

One of the other recommendations you had, that you brought forward, was the implementation of a number of small dams, that turbines could be placed in to extract some electricity. I'm just wondering. You know, I'm thinking of the Rafferty-Alameda projects where, in the concept of dams, were not huge dams, but I think they're probably larger than what you're envisioning. But there was still a significant environmental impact there, and the population, the people of Saskatchewan, there was some concerns about the flooding of those valleys and I suspect there may be concerns about the flooding of any valley.

And I'm just wondering what your thoughts are on that. Do you think the people of Saskatchewan would be prepared to accept dams of this size or any other, or is there still concerns about the environmental impact of any dam?

Mr. Pedersen: — There's definitely concerns about the environmental impact of any dam. You know, any time you change the status quo, there's an environmental impact. And certainly I am envisioning much, much smaller dams than what those are.

I'm looking at, you know, particularly one that I'll describe is one that's on our own land. There's several small sloughs and the total coverage is, if they were dammed, would be probably only 2 hectare. The dam would be no more than about 100 meters long, maybe 4 to 5 meters in height. And I haven't shot any levels to know exactly whether my eye is telling me the right thing or whether I have my water on a slant. But if my eye is accurate or anywhere close to accurate, I would estimate a potential of maybe 20 000 cubic meters of water being available to drain down through a turbine in the wintertime.

Mr. D'Autremont: — That doesn't sound like a lot of water, what you describe, really. How much electricity . . . Is there a turbine small enough to generate that over a period of time? Or would, if you open the dam up, would it be gone in two weeks?

Mr. Pedersen: — No, there's many small turbines available from, you know, a pipe this small — and it doesn't generate a lot — to I would think in a particular case like that, you would be looking at an outflow of anywhere from 3 to 600 millimetre size which is the size of an awful lot of the culverts that are under a road. And if you watch that water going through there in the spring, you know, there's a lot of force there with not much head. If you have a 10-metre drop, and I don't know what the optimum . . . I have to admit I do not know a lot about this type of what is the optimum of these things, you know, the volume versus head and that sort of thing.

My daughter was talking about not having a fancy engineering degree. Well I've got a grade 8 education, so I'm even farther back than she is. But there is potential for that, and again watching how long it takes to drain down a slough at that side of the culvert in the spring, that water could flow for quite a long time. It would take several weeks to drain that much water, and it would take a number of them, but there is just literally thousands and thousands of those locations scattered across the province.

Mr. D'Autremont: — Thank you.

The Chair: — Mr. Wotherspoon.

Mr. Wotherspoon: — Thank you, Gil. Thank you for your presentation and practical solutions or recommendations that you've put forward here today. I think, you know, looking at the cost of the recommendations, many of them are tied to conservation aspects or controlling the demand of the needed power generation or supply, so there is certainly, I think, huge value in evaluating many of these recommendations. Particularly when you start thinking that if we're going to be looking at 200 megawatts of power, if we need to put that into new generation, if that's going to cost, you know, $400 million up into the range of $1 billion, there certainly should be dollars to look at effective programs that are going to save over the long run. I think we hear time and time again that the biggest savings is in the power of course, that you're not going to meter the megawatts. We heard negawatts from one individual, negative gain.

Could you highlight specifically what you might see? We talk about I guess decentralizing some of the power, and what I would see with this, I'd imagine there'd be some benefits as far as jobs and whatnot that would be spread across the province. Would you see this as a positive thing for rural Saskatchewan or what's your thought there, Gil?

Mr. Pedersen: — Yes I would see it in the extremely positive

thing for rural Saskatchewan. As a farmer, the potential of producing power and having it as an income source, an additional income source would be a benefit for myself or our operation. But it would also be a benefit for the community because we might possibly employ an extra person somewhere through the season. We'd be buying more supplies from our local suppliers — just a general increase in the whole economic . . . And you multiply that by several thousand, scattered across the whole province. It's quite widely known that when a farmer gets a dollar, he or she spends at least a dollar if not a dollar and five, and they spend it locally. They don't spend it in Regina. They don't spend it in Toronto or somewhere else. It's spent in Cut Knife, in Carrot River, in you name it.

[16:30]

Mr. Wotherspoon: — Gil, have you done any accounting as to what kind of savings you might have as far as loss in power generation through distribution and transmission with a certain percentage being localized and decentralized?

Mr. Pedersen: — I've heard figures up to as high as 20 per cent of our power is lost through line loss at the peak times. Apparently as the power demand increases and it warms up the lines pulling more power though the lines, it warms up the lines, and a bigger amount of the power is lost. There's more resistance generated with a hotter line. And so if you could reduce that 20 per cent — and apparently this is a very hard figure to come up with exactly what it is — but if you could reduce it, even by a quarter, that's a pretty significant saving. Considering that we're now generating something like 36 000 megawatts, I think it is, of power and if we say even that only 10 per cent of that's lost, that's 360 megawatts. If we can save a quarter of that, that's about 90 megawatts of generation that we have saved.

Mr. Wotherspoon: — Thanks, Gil.

The Chair: — Mr. Hickie.

Mr. Hickie: — Thank you, Mr. Chair. Gil, just one question: on the retrofit portion of your presentation — and this is maybe actually your daughter talked about it — this issue regarding the audit that was done, who did the audit? That's the first question, so if you can tell me that.

Mr. Pedersen: — I can't remember if it was . . .

Ms. Pedersen: — Sun Ridge did the audit.

Mr. Hickie: — Thank you, I was wondering if it was our own SaskPower employees that did that because . . .

Mr. Pedersen: — No.

Mr. Hickie: — If that was the case, my next questions were about why was there a cost to you when you're already paying tax dollars for that. You said it was quite expensive?

Mr. Pedersen: — Not unreasonably expensive but it is . . . And I don't remember the exact dollar, but it seems to me it was $250 upfront plus mileage for them to come. And was there a second charge when they came back?

Ms. Pedersen: — They have to come back, and there's a second charge and mileage on that.

Mr. Pedersen: — And then you have to lay out the money for the, you know, whatever you . . . So it does deter a lot of people from going there.

Mr. Hickie: — Yes. I guess thanks as well. I was kind of curious about as to if it was a SaskPower employee that was doing it, if we had provided the service or not. That's something maybe to look at as well maybe. Thank you.

The Chair: — Mr. Bradshaw.

Mr. Bradshaw: — Thank you, Gil. And I think you farmers around Cut Knife must run a little cheaper than us farmers around Carrot River because for every dollar you give a farmer in Carrot River, they spend $1.50 and you guys only spend $1.05. So I think you're wrong there.

Just one thing and actually kind of a statement on . . . You were talking about your larger customers. Now I was with Arborfield Dehy for a number of years — actually I was on the board for 21 years — and Arborfield Dehy is basically a co-operative of farmers up there that own the dehy plant. And you know we always look for ways of saving money. And we actually went through with our electrical end because we were spending a couple hundred thousand dollars a month on electricity. We actually went through — and I think any business would do this — we went through and found efficiencies within our electrical system to cut it down.

So truthfully I think that a lot of the large users probably, they're going to go through and they're going to try and make it run as efficient as possible because it's in their best interests. It was one of our largest costs. And I think that the potash corporations of the world and whatnot . . . as they did say it was 25 per cent of the costs. So they're definitely looking for efficiencies. And I'd be a little concerned about going back. And they're probably being a lot more efficient than what we are in our homes.

Anyway but I did have one question in here, and it was that your rates were or you were going to vary your rates to the customers. And I take it this was your household customers? I take it that was what it was. And increasing and decreasing for the amount that you use when you used an average. I do see one problem in there, and that's because I'm a parent, and when we had kids, our power rates were a lot higher than what they are now, now that our kids have flown the nest. You know, we're not using near the power we are, and I would hate to see something like this being put in and then penalize families with the children. Just kind of a . . .

Mr. Pedersen: — Yes, definitely it does, and well just the more people that live in a house, the more power you use. That's a given and it's a very bare bones, you know, proposal but I did not get into the kind of nuances of, you know, and that probably would be something that would have to be factored in is the number of residents per residence, like number of people living per residence as to what your . . . A single person would have a lower tolerance than a family of five, you know, for their power consumption.

But the other thing that I do want to say is, having spent some time visiting relatives in Denmark and Belgium a few years ago and observing the difference in their attitude towards energy usage, you know, we're either going to have to start now and take some steps and fairly major steps — and I'm not saying this is a small step; this is a fairly major step towards changing our attitude towards consumption — we either do it now or we wait until we run out of energy and we do it big time. And that's going to be a real shocker. And, you know, the easiest time to train kids to conserve is when they're babies and start there, not when they're teenagers or when they're 40 years old.

Mr. Bradshaw: — Anyways those are just a couple of things. And I like your idea on the meter. And I didn't know about the metering end. I think Tim also likes that idea. I think that's a great idea on the meters. Anyways, thank you very much for coming and sharing your ideas.

The Chair: — Mr. Yates.

Mr. Yates: — Thank you very much, Mr. Chair. I just have two or three quick questions. When you're looking at issues of conservation, did your organization examine what the impact would be on potential changes to building codes and other things that would move forward more efficient structures into the future? Many things in the past are difficult to change, but if you start, say, today with a new building code and so on and so forth, it has long-term impact. It may reduce the potential growth in the demand. And secondly, did you examine at all issues like energy standards for appliances and those types of things that could be improved through a, you know, a requirement that they be improved?

Mr. Pedersen: — No. As far as energy standards for appliances, we haven't looked at that at all. And as far as building codes, we haven't really done any study on it.

We had some conversations on it as to, you know, the . . . Right now there's a building development, new development going in, in Battleford. And seeing as how we tend to meet in North Battleford and I see this new development, and every time I go by it, I shake my head. We've had quite a few conversations in the group about absolutely no effort being made to orient the directions of the houses, and we have no idea on . . . [inaudible] . . . they're inspecting the houses. But we know the building code is less than what we think it should be for energy conservation.

But definitely just the orientation of the houses, as Mr. Kelln was talking about, you know, having the roof oriented east and west so the overhang shades the windows. You have all your windows on the north side of a building, you know, and you see a house built like that, with all the windows on the north side because that's where they have theoretically the best view, and nothing on the south side. Those are the type of things that need to be looked at and put into building codes, yes. But we haven't done any actual study or anything on it.

Mr. Yates: — Thank you very much. Those are all my questions.

The Chair: — Mr. D'Autremont.

Mr. D'Autremont: — Just one last question. When you said you meet in North Battleford, it just triggered a thought. How many people are involved in your environmental society?

Mr. Pedersen: — Seeing as how we do not have a formal membership, but we have as many as 150 out at some of the meetings that we sponsor.

Mr. D'Autremont: — Thank you.

The Chair: — Well thank you very much for your presentation today. Every one surprises me how much new, and sometimes overlapping. But I found it very valuable. Thank you very much.

We will need an adjournment motion.

Mr. Bradshaw: — That's me.

The Chair: — Mr. Bradshaw moves. All in favour?

Some Hon. Members: — Agreed.

The Chair: — Carried. The committee will stand adjourned until Monday at 10 a.m.

[The committee adjourned at 16:42.]