STANDING COMMITTEE ON CROWN AND CENTRAL AGENCIES

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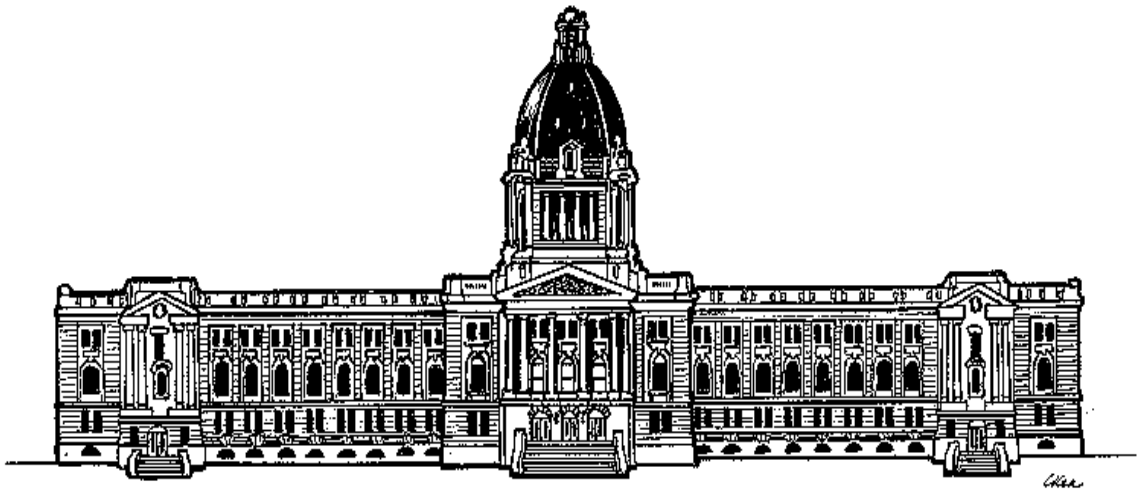

Legislative Assembly of Saskatchewan

Twenty-sixth Legislature

STANDING COMMITTEE ON CROWN AND CENTRAL AGENCIES

Mr. Tim McMillan, Chair
Lloydminster

Mr. Buckley Belanger, Deputy Chair
Athabasca

Mr. Denis Allchurch
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Carrot River Valley

Mr. Dan D'Autremont
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Mr. Randy Weekes
Biggar

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: — Good morning everyone. This morning is the first day of our hearings. I'd like to welcome everyone here today. I'm the Chair of the Crown and Central Agencies Committee. My name is Tim McMillan. I'd also like to introduce the other members of the committee. On the government side: Mr. Weekes, Mr. D'Autremont, Mr. Allchurch, Mr. Bradshaw. The Vice-Chair of the committee is Mr. Belanger, and Mr. Wotherspoon is also on the opposition side. We're also joined by several members that aren't on the committee but are certainly welcome to attend and ask questions.

The inquiry mandate and process . . . I'll just run through why we're here. Today is the first day of the committee's inquiry into how to best meet Saskatchewan's growing demand for energy. In April of this year, the committee was issued the following order of reference from the Legislative Assembly:

> That the Standing Committee on Crown and Central Agencies, in accordance with rule 147(3) of the *Rules and Procedures of the Legislative Assembly of Saskatchewan*, shall conduct an inquiry to determine how the province can best meet the growing demand for electricity in a manner that is safe, reliable, environmentally sustainable, and affordable for Saskatchewan residents; and that the said committee shall conduct public hearings to receive representations from interested individuals and groups; and further, that the said committee may, notwithstanding rule 147(4), report its recommendations to the Assembly on a date determined by the committee.

Over the last few months the committee planned the inquiry process, deciding on the time and location of meetings as well as scope and focus of the inquiry. The committee agreed that stakeholders and the public should focus upon the following question. The question that the committee wants representations focused on 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 future federal environmental standards and regulations and maintaining a focus on affordability for Saskatchewan residents today and into the future?

The committee has scheduled a total of 18 meetings across the province. In October the committee will convene in Regina, in room 8 of the Legislative Building on October 6, 7, 8, 16, and 19; in Saskatoon Travelodge on October 9, 13, and 14; in La Ronge on October 15 at the La Ronge Hotel & Suites.

In January 2010, the committee will be meeting in Lloydminster on January 18, in Prince Albert on January 19, in Saskatoon on January 20 and 21, in Yorkton on January 22, in Estevan on January 25, and in Regina from January 27 to 29. The exact meeting rooms for January meetings will be advertised when these are determined.

Within the next two weeks, the committee will be hearing from SaskPower, stakeholders including industry, and the general public. After these meetings it is the committee's intent to table an interim report with the Legislative Assembly which will then be made available to the public. The report, along with the testimony and written submissions provided to the committee in the upcoming weeks, will be available for the public to consider and study prior to the next set of public meetings scheduled for January 2010.

Public information and availability. All the committee's public documents and other information pertaining to the inquiry are posted daily to the committee's website. The committee's website can be accessed by going to the Legislative Assembly of Saskatchewan website at www.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 from the meetings outside Regina. Check the website for information regarding locations, cable companies, and channels. The meetings will also be available live on the website with past proceedings archived on the website as well.

I would like to advise the media and general public of decorum to be followed while in the committee meeting. The public and media are invited to attend the public proceedings based on seating availability. Photography, videotaping, or recording are not permitted while the committee is meeting. The media may access the audio proceedings for the audio box provided. Any media interviews shall be held outside the committee room, and footage of the committee may be taken before and after the committee meetings.

Before we hear from our first witness, I would like to advise witnesses of the process of presentations. I will be asking all witnesses to introduce themselves and anyone that may be presenting with them. Please state your name; if applicable, your position within the organization represented. If you have a written submission, please advise that you would like to table the 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.

I will ask you to proceed with your presentation. Once your presentation is completed, the committee members may have questions for you. I will direct the 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 the committee. Our agenda is to allow for a prescribed time period for each presentation which will include both the presentation and the question-and-answer afterwards.

I would like to remind witnesses that any written submission, presentation to the committee will become a public document and will be posted to the committee's website. I'd like to now ask Pat Youzwa to introduce her members and be off with her presentation.

Mr. Belanger: — Just before Pat, as Vice-Chair . . .

The Chair: — If I could recognize Mr. Belanger.

Mr. Belanger: — Thank you, Mr. Chair. Thank you for your opening statement. We would like to take the privilege of being on the committee, and as the Vice-Chair to make a few opening statements, as you just did.

The Chair: — I would invite you to welcome our guests, but I think we're going to head straight into the committee proceedings.

Mr. Belanger: — I would suggest, Mr. Chair, that it would only be appropriate for the public viewing and for the purposes of explaining the committee work from our perspective as a member of the all-party committee that we be given the opportunity to make an opening statement, because it's quite obvious that the public wanted to hear as much about this information as possible. And an introduction of what we're here for and our perspective on the committee meetings, I think, is very, very important and valuable to the public.

An Hon. Member: — On a point of order, Mr. Chairman.

The Chair: — I recognize Mr. D'Autremont.

Mr. D'Autremont: — Thank you, Mr. Chairman. Mr. Chairman, you've called the witnesses. The witnesses are here. Procedures in the House before committee is that we move directly into the witnesses' presentations, that there are no opening statements by members. And I believe that we should continue to follow the practice as we do in the House — that the members have their opportunity to ask questions after the witnesses do their presentations — and I believe that's how we should be proceeding in this case. The members opposite have had two meetings already to express their interests and desires in these particular matters and we are here now to hear witnesses, not commentary from members.

The Chair: — I recognize Mr. Wotherspoon.

Mr. Wotherspoon: — Mr. Chair, it's only appropriate that the Vice-Chair of the committee offer some opening remarks to a process that is an inquiry that's a result of a motion from all members of the legislature. And this is a big process that we're embarking on.

We're very pleased to have SaskPower here today. Welcome those officials, but simply ask for a moment of committee's time to properly introduce and to provide brief comments as we undertake what now is going to be an 18-day process, something that's very important to Saskatchewan people, Saskatchewan families, and something that we've had quite the concerns as we've developed this process.

It's only fair that the Vice-Chair of our committee can make comments. This is an all-party committee built in the spirit of co-operation, focused on a goal of examining our energy future, and it's only rightful and fair that the Vice-Chair can speak briefly.

Presenter: SaskPower

The Chair: — I think that the committee is going to move to presentations from our witnesses. The opening statement was not of a partisan nature. I don't think you need to have a retort. I think we do have serious work to be done and I recognize SaskPower. If Pat Youzwa would introduce her counterparts and lead off with her presentation.

Ms. Youzwa: — Good morning, Mr. Chair, members of the Crown and Central Agencies Committee. I am Pat Youzwa, the president and CEO [chief executive officer] of SaskPower and I'm very pleased to be here today. I'm joined by several members of my executive and senior management team at SaskPower and we're here to share SaskPower's comprehensive and long-term strategy to meet growing electrical demands of the province with your committee.

I have the pleasure of tabling two documents with you this morning. I have the paper entitled *Powering a Sustainable Energy Future*: *The Electricity and Conservation Strategy for Meeting Saskatchewan's Needs*. I also have a document which is called *Powering a Sustainable Energy Future*, which is the presentation that we will use during the day today to present our strategy to you.

[10:15]

Let me now introduce the other SaskPower representatives that are here with me today. To my left is Mr. Mike Marsh, our vice-president in transmission and distribution; to my right, Judy May, our vice-president of customer services. Seated at the back of the room we also have Mr. Sandeep Kalra, our vice-president and chief financial officer; Mr. Gary Wilkinson, our vice-president of planning, environment, and regulatory affairs; Mr. Garner Mitchell, our vice-president of power production; Mr. Mike Monea, our vice-president of integrated carbon capture and sequestration projects; Mr. Kevin Doherty, our vice-president of corporate relations; Shawn Silzer, our manager of marketing and communications; and Guy Bruce, our general manager of system planning. A number of these executives will also play a role in presenting to your committee today, and certainly they will be available for questions after we've concluded our presentation.

We are here today to respond to your committee's question:

> How should the government [of Saskatchewan] best meet the growing . . . needs of the province, in a manner that is safe, reliable, and environmentally sustainable, while meeting any current and expected federal . . . regulations [and standards], and maintaining a focus on affordability for Saskatchewan residents today and into the future?

Over the next four hours, we will walk you through what changes we are facing in our operating environment that requires us to undertake a renewal of the province's electrical infrastructure and what our strategy is to respond to this challenge.

It is my belief that in 10 years from now, thanks to the thoughtful planning, investment, and partnerships that are at the heart of our strategy, SaskPower will be in an even better position to fulfill its mandate to serve. Saskatchewan will have a modern, efficient, reliable, and environmentally sustainable power system, one that will better deliver on the growing demand for electricity that comes with a robust economy.

This is a very exciting time for SaskPower and the people of Saskatchewan. As a Crown corporation, we understand that SaskPower is a very important component of the province's economic engine. It is something that SaskPower's more than 2,500 employees are very proud to be a part of.

We also realize it's a role that is accompanied by a tremendous responsibility to provide safe, reliable, and sustainable sources of electricity to our 460,000 customers each and every day.

Obviously the job of implementing a long-term infrastructure renewal strategy isn't a job that's going to be completed overnight. Generation and transmission projects can take anywhere from two to ten years to complete. It's a job that all of us at SaskPower are very eagerly looking forward to taking on as we help build a brighter future for our province.

It is important to note that we're not alone in facing this type of challenge. All across North America, electrical utilities are grappling with the very same issues we are here in Saskatchewan — how to meet growing demand for electricity in a way that is green, reliable, and affordable.

This document we're sharing with the committee represents a snapshot in the time of our planning process. And it is built to be fluid. Nothing less could be expected for a document that looks well into the future. And that's why through these nine days of hearings I am also looking forward to hearing the thoughts and recommendations of other witnesses presenting before this committee. And early next year SaskPower will also benefit from the input of the people of Saskatchewan when the committee conducts its public meetings across Saskatchewan.

Now before we get started, I want to provide a bit of a road map for our presentation. I will begin this morning by giving you an overview of our current generating, transmission, and distribution system, as well as the fundamental challenge we face in meeting customer demand for power.

Judy May will then talk about how SaskPower goes about determining the future demand for power so that we can build just the right amount of generation capacity, and how that has become an increasingly complex task.

Judy's presentation will be followed by Mike Marsh who will talk about the challenges we face and the solutions we're putting into place to ensure our generation, transmission, and distribution infrastructure is up to the task of meeting that growing demand for power.

And then Gary Wilkinson will speak at length on what is really the heart of our presentation today. Gary will talk about the environmental and operational challenges we'll confront while meeting a growing demand for power; our short-term, medium-, and long-term plans to meet the power supply needs of the province up to 2023 and beyond. He'll also talk about the various options we're considering to meet those needs and the pros and cons of each.

After Gary is finished, Judy May will return to speak about our energy efficiency and conservation initiatives — what is known as demand-side management in the industry — and how these programs form a critical part of our strategy.

And then finally I will conclude our presentation with a discussion on how all of this will impact our customers — the rates they pay — and also give you a summary of our conclusions.

We know this is a lot of information for the committee members to take in, as well as for those following the proceedings online or on television, but at the same time I do not believe we can do it any other way without shortchanging the committee of very valuable information. We want you to have a full and thorough understanding of the challenges we face and the options we are considering to address them. And with that, I'll begin our PowerPoint presentation.

SaskPower has been in business for the last 80 years, having a mandate to serve the people of Saskatchewan. Our mission through those many decades has really remained unchanged. Our mission is to plan an electrical system to provide safe, reliable, and sustainable power for our customers.

We currently have a system which is made up of $4.5 billion worth of assets. Some of those assets are power generation assets. Some are in transmission and distribution system. And beyond that, we also provide retail services to our customers and of course overall corporate support services to support the operations of the company.

Our company is currently made up of more than 2,500 full-time employees, and we have employees living and working in 71 communities throughout Saskatchewan.

This slide provides you a very quick snapshot of our electrical system today. I will talk at some length about the specific generating stations and infrastructure that we have, but this map shows you where our generating stations are currently located. As you can see, the coal-fired generation is in the southeastern part of the province where our lignite coal reserves are. We have gas generation distributed across the province towards the west side, and of course hydro generation along the river systems. It also shows you where we have major transmission lines connecting our generating facilities to our customers or what we call to our load that we serve in the province.

So I want to talk now about SaskPower's generation sources. As you can see by the pie chart, we have a diverse set of generation or electricity supply available in Saskatchewan. We have three coal-fired power stations, seven hydroelectric stations, four natural gas stations, and two wind facilities. We also purchase power from independent power projects. We purchase from the SunBridge wind power project, the Meridian cogeneration station, and Cory cogeneration station. Those are both gas-fired generators. And we have four heat recovery projects that are owned and operated by NRGreen. Our total system today — this is the combination of those generating stations that we own and operate plus the energy and capacity that we buy from others, the independent power producers — our total system today is 3641 megawatts.

The coal-fired electricity is the foundation of our system. This reflects historically how the electrical system was developed in Saskatchewan. We currently sit at . . . Just over 45 per cent of our installed capacity comes from coal. This has diminished in recent years, but it still is the backbone of the electrical system

today.

We work every day to maximize the availability of our existing coal, hydro, and wind generation because they have the lowest costs for us, and we do that to ensure that our customers have the benefit of the lowest cost generation available to them on a daily basis.

Talk a little bit more about our coal generation. The Boundary dam power station is located west of Estevan. It is the largest lignite coal-burning power station in Canada. We have six units there that have a combined generating capacity of 824 megawatts. And if you look at our overall system, that's almost a quarter of our overall system at the Boundary dam power station — just about 24 per cent. We have six units there, and they vary in age.

The first unit was commissioned in 1959, so you can see it is 50 years old. It is still in operations and providing electricity. We have made significant capital injections into that plant, and we will require decisions about how much more we reinvest into Boundary dam power station. We currently have, in that range of six units — and you'll hear more about this a little bit later — they are scheduled for retirement anywhere from 2014 to 2025.

Shand power station is our newest coal-fired power generating station. It is also located east of Estevan. When it was commissioned in 1992, it certainly was recognized for its advanced environmental design. It currently has one unit that provides 276 megawatts of capacity, and we will need to make a decision on whether we life-extend and rebuild that unit with a retirement date of 2038.

Our third coal-fired generating station is east of Coronach. It's called Poplar River power station. There are two units there and has a combined generating capacity of 582 megawatts. We also have, at the Poplar River power station, our emissions control research facility. This is a facility that SaskPower has built and operates and has been looking to find innovative ways to deal with some of the emissions that are associated with coal-fired generation. And the emissions control research facility, in particular, was started to look at mercury emissions from our flue stack and has been very successful in finding a cost-effective way for us to meet regulations that we'll need to comply with in the not-too-distant future on mercury emissions.

We have recently injected significant capital into that power plant, and those two units now have been life-extended and are expected to be able to be in operation from anywhere from 2026 to 2028.

Turning to natural gas, we have a number of natural gas stations. We have the Queen Elizabeth power station. It is located in Saskatoon on the banks of the Saskatchewan River. There are eight units there for a combined capacity of 322 megawatts. The first unit there was commissioned in 1958, and we will have significant capital decisions to make to either life-extend or retire units, and those decisions will take us anywhere from 2012 to 2029.

The Landis power station is located near Landis. It's one unit of a generating capacity with 79 megawatts, commissioned in 1975, and we did refurbish that in 1999. Again we'll make decisions about capital injection or retirement in 2014.

The Success power station is located near Swift Current. There's three units there with a combined capacity of 30 megawatts. Here as stated in the slide, it was commissioned in 1967-68. We have slated a retirement date for this unit in December of this year. It will continue to be able to operate, but for planning purposes we'll no longer count it within our overall capacity that's available to meet our requirements.

The Meadow Lake power station is located near Meadow Lake — one unit, 44 megawatts, commissioned in 1984, a newer unit. And we'll make capital decisions or retirement decisions for this unit in 2015.

[10:30]

Moving on now to hydro. We have the Coteau Creek hydroelectric station. It is located on the South Saskatchewan River near Outlook. It draws water from the Gardiner dam on Lake Diefenbaker. There are three units at the Coteau Creek station with a combined capacity of 186 megawatts. It was commissioned in 1968. And again we will look at a capital injection or retirement for the units ranging from 2035 to 2039.

The Nipawin hydroelectric station is on the Saskatchewan River near Nipawin, three units. It is our newest hydroelectric station — three units for 255 megawatts commissioned in the mid-1980s. And again the capital decisions to take these units from 2021 to 2023.

E.B. Campbell is another hydroelectric station that's located on the Saskatchewan River. It's downstream from the Nipawin plant. There are eight units at the E.B. Campbell station with a combined generating capacity of 288 megawatts. The first of these units was commissioned in 1963. And again the significant capital injection or retirement dates for these units range anywhere from 2035 to 2043.

And our oldest hydroelectric station is located on the Churchill River system near the Saskatchewan-Manitoba border. This station was built by the Churchill River Power Company, and it was built for the purpose of providing a power supply to the mining operations of Flin Flon. There are seven units at Island Falls with a combined capacity of 102 megawatts. And again the capital injection or retirement dates for the Island Falls station range from 2024 to 2043.

We have three smaller hydro stations located in the Far North on the Athabasca River system. There are three of them: Wellington, Waterloo, and the Charlotte River stations. Wellington is located near Uranium City, and there are two units there for 5 megawatts of capacity. It was commissioned in 1939. And we're looking at a capital injection or retirement date for this unit of 2041.

Downstream from Wellington is Waterloo. Capacity there is 8 megawatts, commissioned in 1962. And Charlotte River is downstream from Waterloo — two units with a combined generating capacity of 10 megawatts, commissioned in 1980.

We're assessing all of these units, and we'll make decisions

whether we should reinvest in them and life-extend them or retire them.

Our next source of generation I want to talk about is wind generation. Our centennial wind power facility is located east of Swift Current. It is one of Canada's largest wind facilities. The facility is made up of 83 wind turbines, and the total combined generating capacity, installed capacity of these 83 wind turbines is 150 megawatts. This wind farm was commissioned in March 2006. We expect it to be in service until 2026, at which point we'll make decisions about whether or not to life-extend them or not.

Before we did the centennial wind power facility, we built a smaller wind farm called Cypress. It's located southwest of Gull Lake. It is a much smaller project. There were 16 wind turbines with a combined capacity of 11 megawatts, and we commissioned that in 2002.

That concludes an overview of the power generating plants that SaskPower owns and operates. I'll touch now on those plants where we have power purchase agreements with the owners and operators, and we take power and they provide us with capacity as well from those projects.

So the power purchase agreement. The first two on this slide are gas-fired cogeneration projects. We have the Cory cogeneration station which is located at the Cory mine site of the Potash Corporation of Saskatchewan — this is of course close to Saskatoon — there's 228 megawatts of natural gas-fired cogeneration. It is 50 per cent owned by SaskPower and 50 per cent owned by ATCO Power. So we developed that as a joint venture. It was commissioned in 2003, and we have a contract with the owner-operators of that plant that expires in 2028.

The first cogeneration station and the first power purchase agreement we entered into was with a project that we called the Meridian cogeneration station. It's located at the Husky heavy oil upgrader near Lloydminster. There's 221 megawatts of natural gas-fired cogeneration. It was commissioned in 1999, and our agreement that we have in place will expire in 2024.

Recently we signed power purchase agreements for four projects which are owned and operated by NRGreen. These are heat recovery projects that are collocated with the Alliance compressor stations along the Alliance pipeline. There are four units there; the total combined capacity is 20 megawatts. And we have power purchase agreements in place that will expire from 2016 to 2018.

We also have a power purchase agreement with the SunBridge wind power project. There are 17 turbines, again this is located in the Gull Lake area. They have a combined generating capacity of 11 megawatts. This project was commissioned in 2002, and we have an agreement in place that will expire in 2022.

And finally our newest wind power project and which is known as the Red Lily Wind Power project. It will be constructed near Moosomin. It's a 25, planned to be a 25 megawatt facility. We have a power purchase agreement in place with the developer, and it's scheduled to be in operation by 2011.

I want to move now to talk about our transmission and distribution infrastructure. The map showed you of sort of where our major transmission infrastructure is within the province, but it's important for us to note that our electrical grid serves not only the province, but we are interconnected to electrical utilities with our neighbours. So we have interties with Manitoba, Alberta, and North America, and we do this through seven tie lines that we have currently in place.

We also have the second largest service area of any utility served in Canada. We are second only to Ontario, and so we have a customer base spread over a very large service area. We currently serve about three customers per kilometre of line; the Canadian average for utilities is 12 customers per kilometre line. And so that of course brings us certain challenges in not only constructing, owning, and operating, but finding cost-effective ways of serving customers over such a very large service area.

Our transmission infrastructure, we have a net asset base today of just short of $400 million. There is 13 500 kilometres of high-voltage transmission lines. And these lines operate at three different voltages: there's 72 000 volts; 138 000 volts; and 230 000 volts. These transmission lines are connected to 52 high-voltage switching stations, and these are monitored on a 24/7 basis by our grid control centre throughout the province.

Our transmission infrastructure, the grid control centre plays a very key role in the day-to-day operations of our transmissions system. They essentially direct the operations of the power system and ensure that it operates in a safe and reliable manner. The grid control system, also we have an open access transmission tariff in place. So we do allow people to wheel across the province and use our transmission system, and we have a tariff in place that specifies the terms and conditions for wheeling and the tariffs that we would charge. The grid control system is responsible for the administration of open access services.

We also have to operate the system to comply with what we call NERC standards and requirements, and these are really North American electricity reliability council standards. And they've been developed by the industry over years, and they ensure that electrical system in North America continues to operate in a safe and reliable way. The grid control centre is the organization that's at the heart of ensuring that we run the system and maintain NERC compliance.

The transmission system, an important aspect of it is our communication protection and SCADA, which is the supervisory control and data acquisition systems. We remotely operate and control our facilities from the grid control centre, and we use our communication protection and SCADA systems to do that. So we can do remote operations — for example, our hydro units — so there's generating stations, switching stations, transmission lines, and substation facilities. So we use a sophisticated and complex communication system to do that.

We also have protection systems which are designed and implemented to maintain reliability and to minimize our service disruptions. All of this happens in real time, so we capture real time information and of course provide it to support system operations and to make sure that we can find ways to continue

to improve our operations over time.

The distribution system is the part of our delivery system that takes power to many customers in Saskatchewan and does so at lower voltages. A number of our very large customers are connected to our system at high voltages to our transmission system, but the vast majority of our customers are connected at lower voltages through the distribution infrastructure.

So we have a net asset base of $1.2 billion invested in the distribution system. There are almost 145 000 kilometres of distribution lines in the province, and they operate at two different voltages: 25 000 volts and 14 400 volts. We also have distribution infrastructure that is both installed overhead but also underground as well.

There are 182 distribution substations distributed across Saskatchewan, and we have more than 150,000 pole-top and pad-mounted transformers in the system.

So I've completed a very quick overview of the system that we have today — its key components, both from a generating, transmission, and distribution point of view. I now want to sort of introduce our supply challenge.

We are facing in Saskatchewan an unprecedented demand for power from our customers. And this is very much reflective of the very strong and robust economy that we have in the province. The growing demand for electricity is also coupled with the need that we have as a utility to retire and refurbish some of our aging infrastructure. So while we're planning for growth and we're planning to invest, to retire and refurbish aging infrastructure, we also are doing planning and operating in an environment that has certain unknowns or uncertainties associated with it.

One of the very important uncertainties that we have is in regard to environmental regulations and their impact on the choices we may be able to make in the future — so in particular, environmental regulations with regard to emissions that come from coal- and natural gas-fired power stations. As those become more clear and better defined, they will have an impact on the supply choices that we will make in the future. And our expectation is that coal-fired generation may not continue to be an option for us in the way that it has been in the past. There are significant amounts of CO_2 emissions that are associated with coal-fired generation. And as policy-makers and governments move to regulate CO_2 emissions, our expectation is that our ability to use coal will be affected as a consequence.

In total we see that our expectation is that we will have to rebuild, replace, or acquire 4100 megawatts of electricity by 2030. There are challenges with evaluating the options available to us. There are timing challenges in ensuring that we can make decisions so that we have supply in place to meet our customers' needs and expectations. And we also have operational challenges that we need to meet when we add new generation so that we can continue to provide assurances that electricity will be provided in a safe and reliable way to our customers.

And with that as an introduction to the supply challenge, I now want to turn it over to our next presenter, which is Judy May. Judy May, as I mentioned, is our vice-president of customer services. Judy May is going to talk about our growing demand for power in Saskatchewan, what is driving demand for power, how we forecast what that demand will be over time, and finally what our outlook is for the next 10 years.

[10:45]

Ms. May: — Thank you. Well we began to see an increased demand for electrical services in a number of our customer groups in the latter part of 2007. It really was our experience in 2008 that truly solidified our view that what we'd been experiencing in the past for load growth wasn't likely going to be the pattern that would be repeated in the future.

In 2008, it was a record-setting year for SaskPower in serving its customers on a number of fronts. We spent a record amount of money connecting new customers — $103 million that year — whereas when we looked back in the past over the past about five years, we were averaging roughly about $50 million a year in spending on new service connections.

We also saw in 2008 that we recorded a record number of new applications for service — 16,162 new applications for service in 2008 — whereas about the five-year average over those past years would have been more along the lines of 9,000 new service applications, so just roughly half of what the volume was that we experienced in 2008.

And we also saw a record peak load, peak seasonal demand that occurred and was registered as 3194 megawatts registered on December 15, 2008; whereas the previous seasonal peak demand had been 3016 megawatts that was registered for the winter 2007-2008 period on January 30, 2008. So certainly those were very much indicators of what we believe is going to be our future as it unfolds. And when we look, not only to the past but also into that future, in terms of the demand for electricity throughout the province, we see really a further confirmation of a new era for SaskPower.

Over the last 10 years, we have had a system peak demand growth by on average of 1.3 per cent per year, but as we look forward based on our forecast, we see in the next decade that our demand is expected to increase by approximately 3 per cent per year. And another way that we can describe that is to talk about the average growth that we are predicting, which is in the neighbourhood of 110 megawatts per year — 110 megawatts being enough electricity to supply power to approximately 110,000 customers in a year.

So forecasting our load growth, what customers are going to require for electrical service, given the significant shifts that we have begun to see in our customers' need for new and expanded electrical services and given the recent volatility in the economy in general, has become a bit more challenging as we move forward. But the load forecast is a very key input into our supply plan, so we devote a considerable amount of time and effort in putting our load forecast together each year.

In terms of how we do load forecasting, we begin the process early in January of each and every year by gathering data from a variety of information sources. The first important input that we gather is information that is provided by our industrial

customers who actually are served by what we call key account or industrial account managers. So we have a group of people in SaskPower who manage and work with our industrial customers to make sure that their electrical service needs for new and expanded service are met.

And we begin our information gathering by holding individual meetings with these customers to review their plans for electrical service, not only for the upcoming year, but certainly to obtain updates on what their plans are for future years. And we look to get as much information as we can — as the industrial customers are able to give us — for as far out on the horizon as possible.

We also obtained a number of economic variables from the provincial economic model that are key inputs to our load forecasting. We get information about the gross domestic product. We obtain projections on population growth. We obtain projections on the number of households and farm customers. And we utilize a variety of commercial data that is provided to us through this economic model, predominantly the gross domestic product by commercial sectors — so, for example, by retail trade versus use by office buildings, etc.

Because weather is also a very critical factor and has a significant influence on our electrical usage, particularly for residential, farm, commercial, and our reseller customers — our reseller customers being the two city distribution utilities in the province of Saskatchewan — we obtain information from Environment Canada on the average daily weather conditions for the last 30 years. And from that historical information we build a prediction of the average daily weather conditions that we will experience going forward, again because it's such an important influencer of our electrical usage.

We also obtain residential and commercial end-use data from our own surveys that we do from time to time. And these are surveys that give us information on the kinds of electrical appliances and equipment that are used by our various customer groups, and indications of how energy-efficient these appliances and equipment types are, and when and how the customer uses these appliances in their activities, be they residential or be they commercial.

And of course we also utilize our own historic load growth data because our history on energy sales and on load growth is certainly used as the starting point as we create our forecasts for the upcoming year. The information is entered into our computer models. Our models are used to analyze and create our forecasts.

And I wanted to mention the fact that our load forecast methodology is reviewed every five years. We issue a request for proposal for outside industry experts to come and review our methodology to ensure that it continues to comply with industry standards and is appropriate methodology for a utility such as SaskPower. Our last review was done in 2005, and so we will be undertaking a review in 2010. And so traditionally we would normally complete our load forecast for the current year and the next 10 years in March of the year. And once done that in times past, we've pretty much had the one forecast a year and completed that work and sent it to our planning group.

However what we started to see in load growth and in customer expectations in 2008 moved us to undertake a change to our load forecasting. As of 2008, we actually undertake quarterly load forecasts. So we have done that in 2008, and we are doing so again in 2009.

And the next slide really tells you one of the reasons why we have undertaken to begin quarterly load forecasts, and what we are seeing in our load forecasts which is different from what we've been experiencing in the past. And we also, by looking at this graph in the next few minutes, will also get a sense for the volatility that our customers are experiencing in trying to plan for the changing economic circumstances, and therefore some of the issues that we face in terms of forecasting for electrical load.

Now the first thing I'd like to point out is the graph is titled energy forecast. And you're going to hear us describe electrical load in a couple of different ways. And so here is one way that we describe electrical load, and it's by talking about the energy forecast. And one way to think of energy forecast, it's really how much electricity cumulatively will all of our customers use over a given period of time. And in this graph the given period of time is each and every year over a 10-year span approximately, and the measure of energy consumption or electrical consumption is in gigawatt hours.

Now what you may note as you look at this graph is that it starts out in 1998 upwards to 2006 at a fairly moderate pace for growth. We saw our energy requirements growing at a moderate pace of about 1.3 per cent per year, but beginning in 2007 and then certainly in 2008 we began to see an upswing in that energy growth and that requirement for energy going forward.

And what we also began to see, as we move into 2008 and now in 2009, is that our forecasts — what all those variables that I talked about in the load forecast just a few minutes ago, including what our customers are doing and what our customers are telling us they're planning — has also changed significantly over time or is changing from one year to the next. And the important thing to note though is that nonetheless whatever we see for pattern into the future is substantially more and substantially faster growth than what we've experienced in the past. The blue line on this graph depicts that our forecast that we used last year for business planning purposes — and again using those variables that I just spoke about — last year's forecast for this year for 2009 shows that we were predicting about 21 400 gigawatt hours of energy to be used.

Now this year, it's a slightly different view in that we're now seeing the forecast indicating that by the time we're done 2009, we'll see about 20 300 gigawatt hours of energy used. Again if you go to last year's forecast — the blue line, for what we were predicting to happen in 2010 — 2010, we saw just slightly over 22 000 gigawatt hours of electricity consumed or energy consumed. Whereas this year, as we are looking at our variables again and we've revised and reviewed our inputs, we see 2010 looking more like 20 700 gigawatt-hours.

And finally, just to go to a little wider gap in the graph, as we look out to 2013, we see last year that we were forecasting about 26 000 gigawatt hours of energy, whereas this year, for

2013, our forecast is indicating about 24 300 gigawatt hours.

So the important thing in all of this is really that while our forecasts have changed from last year to this year, we are still predicting a significant growth rate in terms of energy growth, at about 3.5 per cent per year for the next 10 years. When you look back at the last 10 years however, and you go back to 1998 and bring it all the way forward to 2008, what we saw was a growth rate in energy of 1.5 per cent.

So again, it's a significant change from the past to what we are seeing presently and in the future. It is not as aggressive a rate of growth as what we were seeing last year, based on all the variables that we introduced and that we gathered for a load forecast, but in 2009 nonetheless, what we see going forward is a significant increase in the rate of energy as we move forward.

Another way to look at load forecasting — and a way that you will certainly hear a great deal about as well in the coming parts of our presentation — is that we can also express a load growth in terms of predicting our peak electrical demand using the measure of megawatts. And really this is a measure of how much electricity must be delivered by our system at an instant in time in order to serve all the customers.

The instant in time that we're looking at here is what we call the seasonal or winter peak. So it's the seasonal peak demand or seasonal peak load. And so this is really the point in time, the instant in time — typically in the winter, and in fact always in the winter — where all of a sudden we have a maximum amount of electricity being used by all of our customers in one instance in time.

As you again look going back into the past, relatively moderate growth in our seasonal peak forecast — a little bit of a sawtoothed effect in early years, largely due to some variations in the weather that had an impact on our seasonal peak demand — but again going forward in 2007 and '08, we see that the peak demand grows. We experienced a peak demand, as I said, for the winter of 2008-2009 of 3194 megawatts as of December 15, 2008.

[11:00]

As we look forward into last year's forecast, again for 2010, we were predicting a seasonal peak of 3560 megawatts. We now are predicting for 2010 a system peak that will be more along the line of 3352 megawatts.

And again if you look out to 2013, you see last year we were predicting 3954 megawatts for a system peak. And now again as we look with this year's forecast, 3770 megawatts appears to be more likely to be experienced in 2013, based on what we know today.

And again as you see, when 2016 the lines cross over, and the system peak grows faster in our current forecast than it did in last year's forecast.

So again, not unlike the graph that you just saw, again the pattern is moderate growth in the previous 10 years, much more aggressive growth going forward. However, what we're currently seeing is a less aggressive growth in the seasonal system peak than what we were predicting last year. But nonetheless it's a rate of growth for the system peak of about 3 per cent a year versus the peak that we were predicting, the rate of system peak that we were predicting for last year for the 10 years going forward at 2.4 per cent. And system peak information is very critical to our planners because they must make sure that we can meet the electrical load that shows up in that instant in time, and it's an instant in time that we experience in the winter months.

The one other thing that I wanted to say that was certainly part of the preceding graph is that in these graphs that you're looking at, you're seeing the most likely forecast. We also produce a high and a low forecast so that we can provide that to our planners, so that not only can they plan for what we see to be the most likely scenario, but they can also have some backup plans in case our load begins to look more like either the low forecast or the high forecast because once again we need to be able to have plans in place that will give us some opportunity to answer that kind of a load growth, whether it's most likely high or low.

So who is driving the load growth? And of course the question is, who's driving our energy growth and our growth in system peak? And so I'd like to just step back for a minute or two and talk about who our customers are, and we group our customers by the primary reason for which they use electricity.

So we certainly have a very large group of customers under the residential category. Cities, towns, villages, acreages, urban and rural resorts qualify in that category. We have our farm category of customers, which I think is pretty self-explanatory although they can certainly vary in size.

We have commercial customers, and they span a wide range of business endeavours and a very wide range of sizes of electrical use throughout the province. We have oil field customers, who again it's fairly self-explanatory what they are involved in — pumping and processing in the oil field sector.

Our industrial customers — and every once in a while you may hear one of us say power customers — our industrial customers are our very large customers. They are the customers that are served by the transmission grid. They're served at high voltages, and they are involved in industrial endeavours such as mining, manufacturing, and the like.

And finally we have resellers. And the resellers are the two city distribution utilities, the city of Swift Current and the city of Saskatoon, who have their own distribution franchise. However they buy electricity from us to distribute to their customer base.

And so again the other thing you may note from this particular slide is the number of accounts attributed to each customer group. And just suffice it to say that a particular customer can have more than one account. They can have more one electrical service that's a residential or more than one commercial service.

So all in all when you look at this particular slide, certainly in terms of the measure of the number of accounts, the residential customer base definitely is the largest customer base, but while they are an important customer base, they are all very important to SaskPower.

The customer base or the customer group that contributes perhaps singly the most significantly to our energy and load forecasting is the industrial customers. And here's just one view. And I'm going to move to another view very shortly. But here's just one view of our customers, the reason why we are here. And all I really want to depict in this particular bar chart is the fact that our industrial customer base, as denoted by the black bar, is a significant percentage of our energy growth currently. And as we move forward into the next 10 years and beyond, they become 50 per cent or better of our energy growth in future years.

Another way of expressing how our industrial customers impact us, rather than looking at a bar chart, is again to look at their impact on our energy and our seasonal peak demand. And just again to reiterate, the industrial customers, while they have 78 accounts, they're actually 35 customers or entities that account for a substantial amount of energy currently used in the province and certainly forecasted to grow even more in the future.

Now important in sort of sizing up their impact is to first look at what we're forecasting, again from our forecasts for average annual system energy growth, 2009 to 2019. Our energy growth for those 10 years, as I've mentioned earlier, is 3.5 per cent per year. Our industrial group of customers is forecasted to have an average annual growth — and again here you see power class in the slide; again that's the industrial customers — is their growth in this particular group is forecasted to be 6.7 per cent per year of energy growth. Now that doesn't mean that the rest of the customer groups aren't growing. It just means that the industrial customer group is growing far faster than any other class of customer.

The commercial group during this time frame we're predicting will grow by about 1 per cent per year. The residential grouping of customers we are forecasting to grow by 1.6 per cent per year. And our oil field grouping of customers is predicted to grow by 2.5 per cent per year — still important rates of growth and rates of growth we need to take into consideration, but as you can see, by far the industrial sector is growing the fastest, the most aggressively. And if you look at our seasonal peak that I just talked about a few minutes ago, currently our industrial grouping of customers contributes about 30 per cent of our seasonal peak demand, and we are forecasting that to grow to about 40 per cent or so of our seasonal peak demand as we move forward.

So I think it certainly . . . Suffice to say that when our industrial customers experience changes to our plans for whatever reasons, such as the economic downturn that we've experienced more recently or growth uptake as we have experienced in the past, it certainly introduces not only some significant change and volatility in their plans; it also introduces a significant amount of change and volatility in our plans.

But the story going forward is aggressive load growth, and our industrial customers in particular, while they contribute to our load growth in a significant way, they are still being forecasted to grow along with the rest of our customer base. So again going forward, that pattern is load growth for the next 10 years and beyond.

So with that, that's really a summary of how we do load forecasting and a definition of forecasting in a couple of different views, how we have changed — how our pattern of load has changed over the years — and the significant contribution of all of our customer classes to that, but particularly our industrial customers.

Ms. Youzwa: — The next topic we want to cover is in regard to aging infrastructure. As I said when I opened this part of our presentation, we have a number of challenges that it's important for the committee to understand that affect our supply planning. So Judy has talked about what's happening with the demand for electricity or the demand for load. I'm now going to turn the presentation over to Mike Marsh who is our vice-president of transmission distribution, and he's going to talk about the challenge we face with regard to our aging infrastructure.

Mr. Marsh: — Thank you, Pat. Just briefly, aging infrastructure is not a new phenomenon. Just a brief definition. In the utility sector we are seeing infrastructure age as we approach the end of life of the first phase of build-out in Canada. This is not unlike what municipal governments, provincial governments, or federal governments are seeing with respect to roads, sewer, and water infrastructure. As the economy was developed mostly in the postwar years, they were designed with a certain design life in mind. Utilities were built the same way and because most of the infrastructure in the utility world was built '40s, '50s, and '60s, when we had the growth in the economy in Saskatchewan, we're now entering a period where we have to start replacing some of those assets and that is, you know, causing our investment in what we call infrastructure capital to start to rise.

This is happening at the same time that we're also seeing this unprecedented growth in load, so we've got two challenges hitting us really at the same time. But we're probably blessed because we do have a growing economy in the province. Other utilities across the country will experience these load growths from time to time. We just happen to be experiencing the two of them together, so that's the point to make here.

Our infrastructure is aging and running close to full capacity. Again it was designed to handle certain loads when it was put in the ground in the '40s, '50s, and '60s. And as that load growth goes up, we have to replace lines, we have to increase conductor size, we have to add additional facilities in order to accommodate that load growth.

What is also happening is, as that equipment ages, we are not getting the full design life out of it because of the increase in load growth. So our design lives are being reached earlier than they otherwise might have been.

We continue to replace and refurbish our aging facilities as we go forward, and we will continue to do that for the foreseeable future. This is not an issue that will be solved in one or two years. Aging infrastructure has to be built into our plans going forward to replace assets on a regular basis. Things like transformers, breakers, switches, those things will require continual replacement, whether or not we had an increase in load or not.

Where we can, we will extend the life of existing infrastructure,

so many areas have been life-extended or rebuilt. A lot of our transmission lines, some of our substation equipment, we rebuild and we life-extend whatever equipment we can for as long as we can in those facilities. And again the problem is common to electric utilities throughout North America. We are not unique. We plan for the future and we manage our aging infrastructure assets as well as our new growth issue as we go forward.

The next slide is on aging generation infrastructure and this is really a summary of the slides President Youzwa had shown you a few minutes ago. Just to summarize that, we do have a number of stations that were built earlier in the last century, I guess, earlier than 1960. Four generation stations built prior to 1960. Four were built in the growth period in the '60s. One was built in the '71 to '80 period. Four generation stations were built in the '80s. Nipawin would've been one of those stations as well. And one generation station was built in 1992, the Shand power station. Construction actually started in 1988 on that one and it took four years to complete.

Again the point is we have assets that are aging. The generation assets where we generate the electricity from have to be replaced from time to time in big blocks and that's what Gary Wilkinson will be speaking to this panel in the next few minutes.

[11:15]

On the transmission infrastructure, again many of our lines are more than 40 years old. The current capacity requirements exceed original design in many existing lines as the load growth continues to come up. Original portions of the system were also built only for provincial or security needs and not for export at the time. And all utilities across the country designed their systems in the same way. They designed it for the jurisdiction they served with interties to maintain reliability, but in the early years most utilities did not build for large export. It's only been in the last 20, 30 years when you've seen Ontario, Quebec, and Manitoba build out large transmission for export.

The president also indicated that the NERC regulatory reliability council or corporation is a regulatory body that we have to abide by as we add new assets or we replace assets that are currently in the ground. We have to make sure that we do this in a way that conforms to the standards of the day and we, as with all other utilities across North America, are compliant with NERC standards.

For infrastructure capital we are estimating $500 million over the next 10 years, so about $50 million a year to replace those assets that are nearing the end of their life and will have to be replaced in any event.

On the distribution side, the lower voltage side, again we are seeing the capacity of lines being challenged as the economy grows. We are looking at increasing substation transformer capacity to many locations, so that the substations that exist in many of the communities in the province that serve the lower voltage lines that go to the towns and the villages and the farms, those transformers have to be upgraded. Many of them were put in in the '50s and '60s, and many of them were put in with sizes that didn't anticipate the load growth over the last few years.

We have over 1.2 million power poles in the province of Saskatchewan. That's a phenomenal inventory that we have to maintain, and we do that through programs on an annual basis. And the programs that we currently have under way to address our aging infrastructure on the distribution side include a rural overhead and underground rebuild program that was started earlier this year. Currently we're building up that program. Next year it'll be about $15 million a year to move lines and replace aging lines that are in the fields and in the farmyards.

We have a substation rebuild and transformer upgrade program over the next few years. Currently we have over 20 transformers on order or in various stages of being put into the system right now. It's an unprecedented amount of replacement in our substation facilities in the province, and it just speaks to the load growth everywhere.

Wood pole replacement program: of the 1.2 million poles, we budget approximately $10 million a year. We will be looking at increasing that over the next few years. That translates currently at about 10,000 poles a year, so over a 10-year period 100,000 poles. And if we increase the cap spending in this area, as we look at replacing more and more poles, that could increase to about 200,000 poles a year through more aggressive programming. On the distribution side that translates to about $400 million in capital spending over the next decade on infrastructure capital.

Just to touch briefly on Judy May's message on load growth. As she indicated, our large industrial customers account for a significant portion of our energy and our peak load demand. As they move forward with new projects and expansion of existing facilities, that load shows up on our transmission grid.

Where they're located in the province will have a significant impact on how much transmission infrastructure needs to be built. It may be located close to a line or a switching station which has the capacity to serve. If it is located in an area that does not have that capacity, then we have to build that line back to the next available source of supply, which means that we could be investing in new line, in new switching station, transformation equipment as well.

We're also connecting new generation to the grid, and currently the two stations that are under construction — the Ermine gas turbine station, the Queen Elizabeth power station — have switching stations nearby, but they have to be tied into the grid in the appropriate way, and that does cost money as well. The NRGreen facilities — the four 5-megawatt units that are located around the province — were built into the transmission voltages. And that's just an example of what we have to do to connect new generation.

Now we have, based on the information that the customers have brought to us, we have approximately $1 billion in capital spending identified over the next 10 years for industrial connected load and transmission grid capacity improvements in order to serve that industrial load.

On the distribution side where we have the majority of customers both for residential, commercial, oil field — for example, in the Southeast and in the west side of the province — I've indicated earlier we have upgrades to substation

capacity and other equipment, new feeder lines, new distribution lines, increased protection and control equipment so that we can improve reliability. On the distribution side alone, we have another $1 billion identified in capital spending over the next 10 years, if the economy remains strong and we continue to see the levels of growth that we've seen in the last two to three years.

And finally, this is just an indication of our distribution load growth. Judy had indicated the number of service requests being about 16,000 in 2008. You can see that, in the graphs from 2004 through 2008, every year we've seen a significant increase in the number of what we call customer connects which translates into capital that we have to put into the ground in order to serve residential developments, oil field customers, commercial customers around the province.

In 2004 our new connects were running about half of what they were for in 2008, and as a result you can see the annual capital that we spent went from about 45 to over $100 million in 2008. The outlook for 2009 is about the same as 2008, maybe slightly less. And the outlook for 2010 and beyond still continues to look very, very strong. Thank you.

Ms. Youzwa: — We've now presented information for you on the demand for electricity and the challenge that we face there. Mike has just concluded giving you an overview of the challenge with aging infrastructure. We have two other challenges which we would like to present on, and I'm going to ask Gary Wilkinson, our vice-president of planning, environment, and regulatory affairs, to join us at the table here. And Gary's going to speak to the environmental challenges and to the operational challenges that we face.

Mr. Wilkinson: — So President Youzwa mentioned that you have a fairly large province, a service area, and a very small customer count which is challenging enough to keep the service affordable. You have one of the harshest climates going, from minus 40 degrees to plus 40 degrees, which makes some interesting challenges for the equipment that has to run here. Keeping it reliable, operable, and affordable is a bit of a trick. And up to this point in time SaskPower has done pretty good.

Pat mentioned that we'll talk about maybe just a few specific challenges that are in front of us right now. Maybe we'll go to environmental challenges, improving environmental performance. We've talked a little bit about climate change. This is essentially greenhouse gases, and primarily in the context of electricity generation we're talking about CO_2, carbon dioxide. Climate change has the single largest potential to shape the energy future of SaskPower and its customers.

The next bullet talks about federal and provincial regulations. They're not settled yet; they're still swinging a little bit, particularly at the federal level, so we're monitoring that. There's the potential for significant cost impacts for SaskPower and its customers, depending on how those regulations shake out.

Nearly 60 per cent of SaskPower's generating capacity uses coal and natural gas. Coal and natural gas are both CO_2 emitters. Natural gas emits about half the CO_2 that perhaps coal generation does per unit of electricity.

The regulations regarding coal generation are changing. The swinginess in the regulations, particularly as regards coal generation, has been everything from there will be perhaps no new licences for coal plants to any new coal plants have to be capable of carbon capture and storage. And also there has been some discussion about some degree of grandfathering for existing coal plants. So it's still swinging a little bit. Given that approximately 40 per cent of our capacity is coal, that's important to us to monitor those regulations.

The anticipated need, in addition to the CO_2, the greenhouse gas regulations, there's going to be an anticipated need to reduce sulphur dioxide — another emission — nitrous oxides, mercury, and particulates. In our business plan, we currently carry about $1.8 billion for those purposes, to correct those emissions on some of the existing plants. I think Pat mentioned that the Canada-wide standard for mercury emissions from coal plants I think it kicks in in 2010.

At Poplar River, one of the coal stations, they did a little bit of research on the best way to remove what is literally a few kilograms of mercury from tons and tons and tons of emissions, a true needle in a haystack. That research conducted by SaskPower and a few other partners found a way to get the mercury out of the emissions at about 10 per cent of the cost that we thought it was going to hit the SaskPower and its customers. So that little research effort by SaskPower's engineers and some of its partners found a way to be more environmentally friendly in a very cost-effective way.

That same group is now turning its attention to sulphur dioxide and NOx [nitrogen oxides] to see if we can again find cost-effective ways to deal with the emissions from coal plants. So as the regulations change, we hope to have technological solutions in place to change with it.

Anecdotally, we mentioned that a lot of our electricity comes from coal, and it's a very cost-effective source for us. The last time we as a province decided to build a coal station was in the late '80s, and it came online in the very early '90s. And so it's been 20 years since we've really entertained the notion of a coal plant. It has been a very strong performer for us, and it's been very cost-effective. But in 20 years we've not added another coal unit to our fleet. The environmental challenge in front of us is significant.

You hear a lot about the challenges associated with supply. I'm going to take you through something that's a little bit integral to the electric utility business. You may not hear so much about this from suppliers of generation or other folks, but the people who have to operate power systems. I'd like to spend a little bit of time on that if I can.

One of the things that we have to do, and I'm going to say we have to balance the system. And so what that really means is for every megawatt of load that is on the system — because the customers are consuming it with lights and industry and whatever — we have to match that very, very closely with the amount of power we're generating at that moment. And so we have to balance; we call it balancing the system.

The one thing I'd like you to think about or remember as we go forward through the presentation, every time the amount we

generate does not match the amount of load being consumed in our province, that amount of power shows up on our tie lines and on our neighbouring systems. Okay, just remember that as we go through the next little while: every time we don't balance, that amount of power, the imbalance shows up on our tie lines and the neighbouring systems that we're hooked up to. That's an important feature, and it'll surface a couple of more times.

In order to do that balancing act or that matching of generation and load, we often have a variety of sources. And I'll just go through them here.

One is kind of referred to as baseload power, and this is power that often runs pretty steady. You don't start it and you don't stop it; it runs pretty flat out. You don't cycle this kind of generation. Coal generation falls into this category. Nuclear generation falls into this category. Maybe anecdotally to give you a sense, if you have a coal unit and you shut it off and you let it go cold for a period of time, it can be 24 hours before that unit can be back up at full load. You have to closely match temperatures in the plant, etc., etc. It's not very flexible for matching generational, but it's very effective for low-cost power, but you don't cycle it very much, and that's what we refer to as baseload generation.

[11:30]

There's another category of generation called intermediate, and we tend to use these to hit the peak periods of the load cycle, and we have some pictures later on that. It's a little more flexible than the coal units, but you're not starting and stopping it daily either. But it has a little more flexibility to change load level, and we refer to those as intermediate. The next one on the slide talks about intermittent and it comes and goes with the wind, or it comes and goes with the sun, and what it really suggests is that the electric utility itself has no control over its electrical output other than maybe to shut it off is all we've got perhaps for things like wind generation. It would fall into that intermittent category.

Then there's another category of generation, and we refer to it as peaking power. And this is very helpful to electric utilities who have to match the generation and the load. This kind of generation can be started very quickly. It can be loaded up very quickly, and you can shut it off in a heartbeat when you need to. And that tends to help match the generation and the load because the customers are forever turning things on and off without telling us, as it turns out.

The supply combination provides SaskPower with the flexibility to match. We find in our system . . . Judy talked about the peak load, but every day SaskPower is cycling generation on and off line. Between 500 and 900 megawatts of load has to go on and off line every day because the load is going up and down throughout the day. We tend to peak over the noon hour and the supper hour, and then overnight the load tends to go soft. And so you have to get your generation on. You have to match your generation with your load. Having too much must-run stuff on your system can be a problem. So this is a key concept.

And to keep the service affordable, you find that you're drawn in a couple of directions: you kind of like the large-scale, baseload, must-run stuff, where every kilowatt hour that comes out of there is reasonably priced. It's not very flexible to operate, but you do a certain amount of that. And then you want a certain amount of flexible generation on your system as well. You really want a portfolio approach to this because the load is not steady.

Let's go on to the next one. This one says, SaskPower must constantly and precisely balance the supply of power and the demands of its customers. I think we've talked a little bit about that. On one of the previous slides — I think President Youzwa had it up, and I don't know whether Mike Marsh had it up or not — it showed the grid control centre. And from there, every four seconds SaskPower is sending a signal to its generators to go up a little or go down a little, go up a little or go down a little, to try and match the generation and the load. There're some computers involved, some significant communications involved, and you're actually asking a lot of your generation to change its load level up and down on a regular basis. For some kinds of generation, that's quite acceptable; for other kinds of generation, it can be a problem.

Next bullet. The interconnection with neighbouring jurisdictions can have a significant impact on the reliability of the interconnected system. Reliability standards — and we'll talk more about that in a moment — require SaskPower to not only balance the generation and the load, but you have to keep enough reserve in your hip pocket so that when you have a generation unit trip, so when a generation unit trips off our system, think of that as an imbalance. My generation no longer equals my load. That imbalance comes from my neighbours, and it comes across their systems. And so the generation — the unit size, how often it trips — has a big impact on my neighbours.

And so one thing that I hope you're beginning to see here is there's a real connection between the supply you choose, how you run it, and the reliability of the interconnected grid. Okay? Hopefully that's coming through for you.

Let's go on to the next one. This is a very busy chart, and I'll spend a little bit of time on it. Mike Marsh spoke about NERC, North American Electrical Reliability Council, and this is kind of a holdover from the 1960s. There was some significant outages in the '60s, and the reliability standards of the day were kind of ad hoc, and people were kind of pretty much marching to their own tune in their own jurisdiction.

On the east coast of the United States, they had an outage. It lasted for quite a while. Restoring the system was a problem. The worst in the fabric of society came out with no lights, no security, etc., etc. As a result NERC was formed. And they felt that there was a consistent set of reliability standards for the North American grids, the electrical grids, that was going to be important. In the early days, this was a voluntary thing to comply with. In the United States, it's now mandatory. In the United States, NERC rules are enforced; they have a penalty structure if you're found to be offside with these reliability and operating standards. In the United States, the penalty right now can run a million bucks a day if you're found to be consistently offside. So it's big enough to get your attention.

So under these NERC rules, there's people who have responsibilities. And there's a long list of these things, but perhaps the one I'll draw your attention to, it's that load and generation balancing function.

If you look at that chart up on the wall, you can see those circles, and there's a certain colour that deals with balancing authority. Across Canada and the United States, approximately 120 of us have that job to balance the generation and the load and to do that in a standard and a reliable kind of way under NERC rules. And so you can see right in the middle it says SPC. We are what's known as a control area, and SaskPower has the job of being the balancing authority. And like I say, there's another 120 in Canada and the United States that have that same job. If we all do that job effectively, the North American grid stays nicely stable and you don't have any untoward impacts on your neighbours and the interconnected system can be quite reliable.

While I've got this one up, I will just take you through something that may surface in some of the committee's discussions. It may not, but when Mike was talking about how the electric systems grew up . . . And I don't have a pointer but what I'll kind of suggest is, there's a line on the left-hand side of Saskatchewan and heads straight down pretty much into Texas. You can see that black line. On the left-hand side of that all those utilities and balancing authorities are tied together in a synchronous way. On the right-hand side of that line, SaskPower is hooked up all the way to New York and down to Florida. We're also hooked up down to Texas, and we are running in synchronism with that group.

We kind of grew up apart and the one on the left-hand side, it's called the western, and they all run in the synchronism. And we're part of the eastern interconnection, as strange as that may seem, and we're running in synchronism with Florida and New York and we kind of manage our reliability with those people that we are synchronous with.

Probably the only piece that I want to talk to you about a little bit is when you'd want to try and make power go between the interconnections from the western and the eastern. You actually have to take some special steps, put in some special equipment, and you have to kind of convert your power into a DC [direct current] form and then reconvert it into an AC [alternating current] form on their side. There's a lot of equipment required to do that.

There's connection points between the eastern and the western interconnection. Saskatchewan has one of them. It's called the McNeil converter station and that's where that conversion from AC to DC to AC. That is just pretty close to the border between Saskatchewan and Alberta. And as you walk down that line — the one I mentioned from left-hand side of SaskPower down into Texas — you'll find another one of these converter stations at Miles City, another one at Stegall, Nebraska, and all the way down, and it has this specialized kind of equipment called HVDC [high voltage direct current] converter stations in order to make power go between the interconnections of the East and the West because they're not running in synchronism.

You'll also run into this concept a little bit when people start to talk to you a little bit about concepts such as the western electric power grid. And over the years we've had a number of looks at this to try and find ways to move power east-west in Canada and elsewhere and they often bring in the concept of high voltage DC lines, particularly when they cross that line because the two systems that they're connecting are not in synchronism. That equipment can be very expensive. It's certainly doable. It's mature. There's a lot of instances of it, but it's just one feature that may surface in some of your discussions that I thought you'd be aware of.

While we're on this chart, I'll just touch one more piece. And this interconnected system I mention, as long as everybody behaves, the whole system stays really reliable and in balance.

A couple of years ago in Ohio a few transmission lines at the same time encountered a difficulty and the generation that was flowing over those lines rerouted through one of the neighbouring systems. It rerouted through Ontario, and it tripped a lot of the infrastructure in Ontario. It decked the whole province, in fact. And so these NERC standards, when you get it right, you don't really notice it. When you get it wrong and you get multiple outages or you don't confine the balance within your system, and you put it on to other systems, they can have real difficulties.

You may recall at that time, folks in Ontario had, I believe it was between . . . Your outage lasted between one and three days. And so part of the reason you interconnect to the outside world is to give you extra reliability, but you also get to feel the pain of your neighbours

And this interconnection Saskatchewan has with the outside world is very important. It has been . . . Late '60s, early '70s, we started hooking up to the outside world. In the '60s, for those of you who are old enough to remember — and Garner and I might be the only ones — the province was dropping its entire load a number of times per year. It was not very satisfying at all. And that was back in the time when electricity was kind of new and we don't rely on it quite as much as we do today. In the interconnected world that we've had since the early '70s, outages to the whole province, I think our last one — 1981. And so that interconnected operation, you win big, but you really have to behave because you're now hooked up to the other people's systems that you can influence.

This next chart talks about operational challenges. Judy talks about the load and energy and all that kind of stuff, and I've been trying to talk to you a little bit about how it kind of bounces up and down and moves around. So I think this is 2008, and as you look at that, on the right-hand side, there's a dot. Above that top black line there's a dot, and that should be pretty close to Judy's 3194 megawatts. And that's the peak load we experienced in 2008. And it's not an instant; it lasted for an hour or two. And the load was a little bit lower than that for other hours, but that's the big one.

And so when you plan supply, it's pretty clear — you've got to have enough so that when they're taking that amount of load off your system, you've got to have enough generation so that that can be served, otherwise it shows up on your neighbour's system, okay? So you have to have enough generation.

But that top line, you can see that the peak load in any month or

on any day, you can see in the winter it's kind of high. And that's what Judy was referring to as winter peaking. In the summer, it seems to come up quite a bit there too. And we're finding that the air conditioning load in our society is beginning to contribute to electric load. We're still winter peaking, we call it. But the summer peak is beginning to distinguish itself a little bit. And south of us, in the United States where it's a little warmer, they're summer peaking. They actually have their big loads in the summer and less in the winter.

The line that's underneath, the second dark line, that's where the load goes to at night, depending on weather and a few other bits and pieces. And I have to get my generation down to that load every day. And so that's when we were talking about the 500 to 900 megawatts that has to be cycled on and off. I have to be able to meet the peak but I got to get that stuff off by the time the nighttime comes along. And that's a challenge that all the balancing authorities on that previous map have to deal with.

I'll just spend a little bit of time. The bottom part of that chart, it's kind of a dark brown. That's kind of the coal generation. And the coal generation can be moved around a little bit. You can shuffle it, but turning it on and off is not in the cards. We use other generation — you can see the hydro is moving up and down throughout the day — in order to be able to hit the low loads, as some of the gas generation as well.

[11:45]

The blue stuff there is our hydro. There are times in the mountain runoff when hydro, which is normally a very flexible kind of generation, when the runoff comes out of the mountains and begins to fill the river systems and fill our reservoirs, those hydro units can turn into a must-run. in other words, I have no discretion; I have to run them flat out. Either that or I spill the water. And I'm from the electric utility business, and I hate to spill a drop of hydro. It has no emissions, and it's very decently priced once you've built the thing. That's just sort of an anecdote on how interesting it is to try and meet that variability.

Let's go on to the next one. Still under the topic of operational challenges inside Saskatchewan, I mentioned that the customers are turning things on and off quite a bit, and so the load bounces up and down. We have to follow that around; that's that load matching business.

There's a few of us in North America have inside our footprint or our area — and Saskatchewan has one of these — is something called an arc furnace. The arc furnace is, if you haven't been to Evraz or IPSCO, try to get a tour there. The way they melt the steel is to put a couple of electrodes into a pot of scrap. They put those electrodes in and it causes the power in our system to jump immediately. And you remember I was telling you we have a special job at SaskPower to balance the load and the generation? Well that thing moves around quite a bit.

And so there's very special challenges inside SaskPower because we have one or two loads that really change quickly on our system, and the matching issue in Saskatchewan is tricky. There's one in Iowa as well, and we commiserate with them about how tough it is to try balance when you've got an arc furnace in your footprint.

The other thing that causes a little bit of interesting challenges for us on the operational front . . . And this chart I think is wind generation from 2007. Yes. And so the wind generation on our system, when it's on, you can see that it's variable over a year. That's a snapshot of a year — the wind going up and down. And as the wind changes, one of the things that happens . . . Remember I said that I had to match my generation to my load; I mentioned the load moves around. Well some of my generation moves around quite a bit as well. And it can make that balancing act of matching your generation and your load as you take higher and higher degrees of wind on to your system, it makes that challenge of balancing somewhat more interesting.

So you can see the IPSCO load or the Evraz load — still got to get used to that — moving around, and you can see some of your generation moving around. That all has to be corrected, that balancing act. What you add for supply has to be capable of balancing these kinds of effects.

Wind has a few other added features. At minus 30, we tend to shut it down. At minus 30, the blades and some other equipment get a little brittle. Also at minus 30 your load can sometimes be coming up because the furnaces are all kicking in. Again the balancing thing can be kind of interesting. Also at very high winds — again to protect the equipment — the wind is shut down. So it's intermittent, but from time to time you will not have it.

I have a lot of material here, and at the committee's pleasure . . . I know you mentioned you might want to have a break. Any time is fine as far as that goes. I'm at a logical place now if that's a good time to break.

The Chair: — That's terrific. I was going to mention in 10 minutes if you didn't, to pick a logical time. But I think if this is one, I think we'll certainly take it. Okay, we will reconvene at 1. Thank you all. The committee is now recessed.

[The committee recessed for a period of time.]

[13:00]

The Chair: — Thank you. I'd like to bring the meeting back to order. The business before the committee, we will be picking up where we left off before lunch, with the presentation from SaskPower, so please take it away.

Mr. Wilkinson: — Okay. At this point we should be on supply planning process. So at any given time SaskPower's engaged in a comprehensive and defined process of supply planning. It uses well-established power supply methodology and it's a common methodology amongst our industry. As Judy mentioned, we work with the customers to forecast their requirements. As Mike mentioned before, you can assess the existing system capabilities and then evaluate alternative supplies and the options therein.

The information is used to create a bunch of scenarios to help in looking at an appropriate future supply, appropriate demand-side management, and transmission resources. It takes a lot of data to run these models — load forecasts, generation

retirements, yearly maintenance — and I'll just dwell on that a little bit.

In a previous chart I kind of showed you the load was high in the winter and then came down a little bit and then in the summer it came back up again and then went back up again in the late fall. You have to do a lot of maintenance in those shoulder seasons, in spring and fall, when the load is giving you a little bit of relief. And that is a highly choreographed process to maintain all the units in our system in those shoulder periods when the load is not so high. The tools recognize that as well.

In addition, current and potential environmental regulations are modelled. Fuel, capital, operating costs, transmission constraints — there's a lot of data goes into this assessment of supply options.

The tool we use is actually called PROMOD. It's a production modelling tool. It looks at high loads, low loads, hourly loads in fact. It looks at the range of water that might be available to us and it also plans to have a little bit of a safety margin in case some of the existing generation is faulted or trips.

It's a probabilistic tool. I had an interesting discussion with some interested parties in the audience today about the probabilistic tools and how that worked. They were nodding in all the right places. But it essentially assesses the adequacy of your supply mix to consistently meet the load, both high and low. It recognizes the limits of the technologies that you've employed. The start times. I talked a little about the cold — once it's cold, how long it takes to start that; things called minimum down times; and also ramp rates — how fast you can change the load with some technologies. Again, coming back to that balancing thing that we talked about a little earlier. And it also recognizes the probability that some of your existing units may trip off line while you're trying to serve that load.

Making decisions in the supply planning process, you have to consider the all-in costs and the impacts of various options. And this is everything from fuel to manpower, etc. Another thing, in the short term, the key is to make timely decisions to meet the load that is in the forecast. Judy mentioned that the load forecast had risen dramatically recently, and so one of the tricks is to make sure that the generation or the supply that you're planning can be put in in time.

Anecdotally, across the range of technologies, some technologies such as things like simple cycle gas turbines can be put in in approximately two years. Other types of gas generation where a steam turbine is involved take a little longer, sometimes three years, maybe even four. If you're thinking of large hydro, a large hydro installation — and Pat showed you some of those that we already have on the system — you might want to be thinking maybe seven to ten years lead time to get one of those built and online and approved.

In the old days — I mentioned it's been 20 years since we decided to add a coal unit — but in the old days, adding a straight coal unit was four to six years. You had to anticipate and be ready and make the decision four to six years before you needed that power online. And in the case of nuclear, you'll get a bunch of estimates on that, but 10 years plus is not unreasonable for some of the very large installations that we've seen.

Over the longer term, the key is to apply resources and undertake research to better understand the supply options. Sometimes we do this at a very high level and we just get published costs where the technologies mature, but in other places we've been sort of setting up specific groups to take a more detailed look at the technologies. Clean coal is one where it showed enough promise in the early going that we actually set up a distinct unit under Vice-President Monea to take a very detailed look at the technology and the commercial aspects of that.

We in SaskPower have set up something called the hydroelectric development unit to again put a little more emphasis on some of those technologies where a more detailed look is required, not just a high level, unit price kind of overview. Judy's got demand-side management teams set up to develop and roll out those conservation programs, and there's one that I think will surface a little later called the wind power integration development unit, but I'll speak to that in a little bit.

These more detailed groups, where they look at the topic in a bit more detail . . . I come back to that mercury capture story where that team was, after a couple years, was able to drop the costs of mercury capture by a factor of 10. So these groups are set up with a bit of a challenge as to find a way to develop the technology and to develop it economically for Saskatchewan, where some of the affordability challenges are clear. And we've talked about that.

Inside SaskPower we have the capability to tackle a lot of these issues. Judy and the president mentioned it's kind of an unprecedented time. We have a lot of issues on the plate at this time, and so the resources are being maybe a little bit thin.

The last one says, you do not want to lock into an option earlier than required, and it says, we'd like to allow some time for the regulations and technology to develop. Right now you definitely want to see how the Canadian greenhouse gas regulations settle out so that you can attempt an orderly modernization and adjustment to supply.

Considering options for the future, some supply options are best suited to meet baseload. We've talked a little bit about that. And others can be used to meet peaks in demand, and this comes back to that balancing thing that we've probably discussed at length. The right mix gives us the security of electricity supply across a wide variety of conditions.

SaskPower has historically relied upon coal because the abundance of coal in the southern Saskatchewan and the low cost. The sub-bullet says, coal-fired generation may not be allowed to continue as it has in the past. The regulatory treatment is still swinging a little bit. We mentioned there's everything from no new coal, to maybe it'll be grandfathered, or maybe the only coal that goes ahead will be carbon capture and sequestration kind of coal. That's still swinging a little bit.

The last bullet — attempting to employ environmentally friendly generation sources while minimizing costs for customers. You kind of want an orderly transition to reduce, I guess, what you'd call sticker shock. You take the 1959 Chevy

out of service and put in the brand new Camaro. It's going to feel different from a cost point of view. But pressing discussions are coming up.

The picture on this one is a dragline. I'm unsure as to whether this is one of the big boys or not. But you look at that. There's a box on the left-hand side and the operator sits in there. And then there's a big boom heading off to the right, and then straight down from there is a bucket. That picture doesn't do it justice. It goes down through about 100 feet of dirt and overburden to get to the coal. So you could put the SaskPower building in that hole. You put that box where the operator sits in one end zone at Mosaic Stadium; that bucket will be in the other end zone.

It's a very large-scale operation to mine coal in Saskatchewan and we have a very effective coal industry. Somewhere at the bottom of that hole, 100 feet down, is a 12-foot seam of coal, and that's what we haul over to the plant. We've learned how to burn it cleanly. They've learned how to mine it cheaply. Coal has helped keep the bills in Saskatchewan low.

Pat mentioned we might talk about short-term, mid-term, and long-term supplies, so we'll start with the short-term. Judy mentioned we're going to see a little bump in the load forecast as the industrial customers bring more and more production online in the system, so we have to match that with some generation. Saskatchewan's short-term electrical supply is secure, and we'll go through the details of that in a bit.

And we have a timely and comprehensive strategy in place to meet the province's electrical needs to 2014 is locked up pretty well, we think. The necessary actions are already under way to ensure that the appropriate infrastructure is there to meet the projected demand that . . . Judy described the projected demand for you already.

This map — quite busy — you can kind of see from there as you walk around the map that we've kind of got a lot on the go in Saskatchewan here, and you heard quite a bit about some of this already. But just in summary, as you start at the top left-hand corner of the arrows pointing into the Saskatchewan map, Mike was telling you about wood pole replacements.

A little farther down on the map it says new generation at Queen Elizabeth, new generation at North Battleford, new generation at Ermine switching station. Those are simple cycle gas turbines that we're adding to meet that jump in the load forecast that Judy has described for you. There'll be more details on sort of the pricing and the operational characteristics of those a little later.

You get farther down on that, again on the left-hand side, you see something called the Poplar River to Pasqua transmission line. This was put in to help us meet NERC standards and requirements for system performance, and it also has the beauty of reducing the losses on our system.

So you generate the power and use the transmission lines and the distribution lines to get it to the load. Approximately 10 per cent of everything we generate goes into losses on those transmission lines. And so we're kind of working over time to bolster the transmissions, to make it stronger. But as we do that, the losses on that system come down, which means I don't have to have generation to meet it, which means I don't have to have CO_2, etc. And it's kind of a self-fulfilling prophecy. Judy's working with the customers to find ways to reduce their demand. Inside our company we're doing it as well on the transmission, on the distribution assets we own.

At the bottom of that, in the coal belt that Pat was describing, you can see that Garner's . . . He's spending a little money and a little activity to keep those plants in shape. They're old. They're old Chevrolets, but they're running really, really well.

And as you come up the right side, there's something called proposed location for generation siting. It's called peaking RFP [request for proposal] at Tantallon. I think that independent power producer project was announced in September. Tantallon is pretty close to potash load in that area, and we'll talk more about that a little further. As you go up the other side, you can see some of Judy's industrial customers being connected, and Mike talked about that a little bit as well.

So in the short term, short-term needs are being addressed strategically and decisively, and we described the short term as 2009 to around 2014. We're using customer-focused energy efficiency, conservation, load management programs to reduce energy consumption 75 megawatts and about 120 megawatts of peak demand reduction. Judy will say more on that later.

But as you take the amount of load to be served down through conservation and efficiency, there's less load to serve, there's less generation that has to be added, there's less cost, there's fewer emissions. This is good for the customer, who has a lower bill. It's good for the environment because there's less CO_2 up there. And it's good for SaskPower because we're not adding expensive generation.

The next point, it says, installing natural gas turbines. These are the ones that were on the previous map. There's a combination of SaskPower doing some. On the left-hand side of the map there was Yellowhead and Saskatoon and Ermine, and on the right side of the map was IPPs [independent power producer] at Tantallon. So these simple cycle gas turbines, they are a very flexible kind of generation. They start quickly. They load up quickly. We can shut them off when we don't need them. They're a very flexible style. They can be added in very short lead times.

The equipment is not quite off the shelf — I wouldn't be doing justice to Garner if I said that — but they can be done very quickly. They can be sited close to load, and if we site the generation close to load, the losses on the system come down. And they help with that balancing thing because they're a very flexible kind of style of generation and so I can shut them off when I don't need them.

And they have one more feature that I think I'll mention. A local natural-gas-fired . . . So you put the natural gas in a turbine, it spins the turbine, and on that same shaft is a generator and out comes the power, all right? We put a clutch in between the turbine and the generator and so you can run the gas and fire it up and get it hooked up to the system. Then you open the clutch and shut off the gas, and now you have something that's really called a synchronous motor, I guess, but what it really allows us to do is to control the voltage in that

area even though the gas isn't running. So even when these machines aren't running, we can control the voltage — hold it up or keep it steady.

This is good for industrial customers in the area — and obviously residentials as well — but it tends to allow you to control the voltage and the losses on your system even when we're not running the gas. It's another flexible feature of that technology.

[13:15]

Next bullet down, we're pursuing new generation technologies including the development of one of the world's first and largest integrated carbon capture and sequestration demonstration projects. I mentioned Mike Monea. He's taking a very detailed look at the technical and commercial aspects of essentially rebuilding an existing coal unit and turning it into a clean coal unit, which is carbon capture and sequestration.

Saskatchewan is probably well poised for this kind of project. We happen to have an aging unit in the neighbourhood. It's right beside a place where enhanced oil recovery has been going on for a while, and we know it works. And arguably they've been putting the CO_2 underground in the Weyburn area, and it is one of the places that has been measured and monitored ad nauseam for a number of years now. If there was a place where you were going to try and get regulations set up that CO_2 was going to be stored down there, this is the place to try it because we've got the data to back it up. So Saskatchewan is well poised on that.

We undertake short-term import contracts with neighbouring utilities. Often if the load comes up and surprises us a little bit, we'll put a deal on for the winter months because those are our peak ones from a neighbour who might be overinstalled or have a little surplus for us. And we'll have access to firm power over the tie lines if we require it. Right now the information I have from Garner, the vice-president of power production, is the projects that we're building are sort of on time, on budget, going well. But having those tie lines is a little bit of an insurance policy as well, just in case you get a bit of a surprise. We're not seeing any at this time.

The other thing that we're kind of focusing on is improving short-term load forecasting, and this is next-day and next-hour forecasting. So we have a group at that grid control centre that you saw the picture; they're our operators. They have to forecast what the load is going to be in the next hour and they have to forecast what the wind generation is going to be in the next hour, and then they have to commit enough units to get through that hour safely. They have to do that for the next day, hour by hour as well. So we spend a little bit of time working with wind forecasting tools and that's a work-in-progress. It's helpful and it's good, but we have to have a little more experience with those tools and we might actually put up a few weather towers in the odd spot to make those tools work better.

The other thing we're doing, I mentioned Evraz is kind of a bouncy load in our system and we've had some discussions with that customer and they now send us their schedule. They let us know when they're about to put those electrodes into that pot of scrap steel, because you know which way the load is going to go the moment they do that. And they'll also send us a schedule when they're going to pull it out, and you also know which way your load is going to go when they do that too. Again trying to bring that modern digital technology and forecasting into the short run to try and optimize so we're not starting units unnecessary or getting caught short.

Short-term supply — carrying on — upgrading the voltages, constructing new lines to reduce losses on the transmission system. I mentioned the Poplar River-Pasqua transmission line is maybe an example of that. Mike Marsh, who talked earlier, is taking the voltage up on some of his lines to reduce losses and improve our ability to serve load. And Judy's customers are being asked to reduce demand, and we're doing the same thing on our system.

Building on the work of the SaskPower wind power integration and development unit, what we call the WPIDU. It was only after we gave it that name that we understood the acronym was whoopee do, which was unfortunate, but it's concise at least. We asked that group to essentially assess the wind and its variability, to look at that variability on the generating side and connect that with the variability that we have on the load side — and I'll mention Evraz again, but there's more — and see how far we could go in adding wind and yet keep the impacts manageable on the rest of the fleet. And again that comes back to that balancing bit.

We also asked the WPIDU group to do a diversity study and take a look at Saskatchewan, and they had an independent contractor do this. And they essentially took everybody's wind measurements, not just ours, but independent wind developers, anyone who had measurements in Saskatchewan what the wind was like. And then their job was to try to find out, if we spread the wind far enough apart so it wouldn't all come and go together with the breeze in the local area, is that a winning solution?

And we have that report now and we're just going through it. And I would be one of the first ones to tell you that Saskatchewan has a wonderful, wonderful wind regime. We're getting a lot of energy out of the wind farms and Pat mentioned some and they're in the southwest area of our province. Not all of Saskatchewan is similarly blessed. And so we're going through the report now. But right now it looks like your best bet is to put the wind generation where it's windy, and spreading it out is not that big of a gain when you just look at the Saskatchewan context. But we're going through and getting the details on that report. But that's kind of what we're finding.

I mentioned that the wind is variable. It goes up and down. And I'm hinting — maybe I'm not hinting; I'm probably saying quite explicitly — you want to be careful how much of that up-and-down stuff you put in your province at any time. But WPIDU did great work. They've kind of given us some indications as to how much farther we can go and keep the effects manageable on the rest of the fleet.

What we're finding in North America that NERC group — the North American Electrical Reliability Council — has now formed a group that's called the Integration of Variable Generation Task Force because they're beginning to find out that as you add more and more of what we call intermittent

generation is that it starts to have a potential for real reliability impacts on not only your system but the system of your neighbours, and so they've convened a group that's called the IVGTF [Integration of Variable Generation Task Force]. I guess that's their acronym. Not as good as WPIDU.

But they're now beginning to sense that to protect the reliability of the North American electric grid they are going to have to do some studies to see what would be required to either of the transmission or the way we're currently operating that in order to incorporate more.

In the Canadian context there's also a group formed. We've been asked as SaskPower to sit on the steering committee. It's a wind integration group and we're working primarily in the Canadian context, not the North American context, to see what would be required in Canada by way of transmission and operating bits to incorporate more renewable technology in a very big way such as wind. In some respects, and I don't mean to blow our own horn, but with that WPIDU group having been active on this for about two years, we actually are maybe a little ahead of where the rest of our industry is in looking at this issue.

At the bottom here it says improving wind forecasts. We've talked about that a little bit. We have about, by capacity, about 4.7 per cent wind penetration. Actually in a Canadian context at least, we might actually be fighting a little above our weight. For the size of system, we're actually carrying quite a bit of wind compared to other jurisdictions. I think it says here the Canadian national average is around 2.3 per cent or something like that.

The WPIDU group has said there's a possibility and a technical with manageable kind of effects on the rest of the system is we might be able to double the amount of wind that we've got on the system before you start to feel it in uneconomical or unreliable kinds of ways. What that really means, I think what they're telling us is, it's approximately 200 megawatts more we could add.

Pat showed a picture of the centennial wind farm, which is around 150 megawatts that's on the system already. Be thinking approximately that order of magnitude is what we can add before we start to run into tougher effects. And that would take on that . . . If we did add that, we would go up to about 8 per cent of our capacity or thereabouts, would be from wind.

Independent power producer development of renewable, including wind and biomass, is another thing we're focusing on in the short run.

This is an interesting chart. It kind of shows . . . And this is as current as of maybe this summer, so it's not very old, but this information tends to move quite a bit. It's based on published information. It tends to show what per cent of capacity each of the provinces has in its footprint, as of this summer, I guess. You can kind of see Saskatchewan is up there. Like I say, we're fighting maybe a little bit above our weight compared to the rest of the footprints.

On the right-hand side there's a hero out there — Prince Edward Island — who's got a great big bar of wind in there. They have a relatively small footprint. I think that's about 73 megawatts of wind, but as a per cent of who they are it's a big percentage. And we actually kind of called out there and say, how are you managing that, because that's a high percentage. It turns out that Prince Edward Island is not managing it. They have a couple of lines that run into New Brunswick and New Brunswick is managing it for them. They have a bigger system. They're about our size in terms of load.

So we talked to New Brunswick and apparently that amount of wind on Prince Edward Island has got New Brunswick's attention with how they operate their system because they're essentially allowing New Brunswick to correct that variability and New Brunswick is now, they've indicated that they will send us a list of the issues that they have run into. I don't have that yet but at the end that bar suggests that Prince Edward Island is fighting above its weight with its wind, but it's not absorbing the punches on that balancing thing that we talked about earlier. New Brunswick is absorbing that on their behalf.

So short-term supply, there's some things that will be added and there's some things that will be retired or refurbished and there's kind of some dates. And maybe we'll just go down quickly the left-hand side of this. It says adding supply, and you see Ermine, QE [Queen Elizabeth] power station and North Battleford area. Those are our gas-fired generation. They're on time and on budget.

The next one below that is a Tantallon RFP. This is again an independent power producer. It's close to the Esterhazy area. And again it looked like it's going to be in on time as well. Red Lily is a project that's 25 megawatts of wind. That's actually in the Moosomin area.

Below that is baseload RFP. We asked for proposals for independent power producers for a baseload product. We obviously have quite a lot of peaking products, that simple cycle gas turbine stuff coming on. So we actually asked for a baseload product. We're in evaluating those bids now. I'm told that by November the results of the evaluation will be in and we should be able to tell you more about that.

Boundary dam unit 3 — clean coal. Mike Monea has the task of getting the technical, commercial things figured out on that, and by 2010 we should have an idea whether that's a great idea, a fabulous idea, or something we should think about more by 2010.

Landis capacity replacement, that's an existing unit. In general one of the things that we find is that if you have an existing unit and it has served you well, often to refurbish or replace the unit at that site is quite an economical thing to do as opposed to starting with a Greenfield site. It's kind of better environmentally, and the transmission is already there. So at the end, that tends to be an economical approach.

Boundary dam 4, it says capacity replacement. In this manifestation, we put a little money in there to try to extend its life by a single digit number of years.

On the right-hand side, there's going to be some dates where we're either going to retire or refurbish. In other words, some money would be required to make the asset go longer or you'll

retire it.

Success is mentioned there. Pat had a mention of that. It's a gas-fired generation built in the '60s. It is literally an aircraft engine with a generator on it, and the only reason we're kind of retiring it is that, number one, it's really, really old. We can't get parts for that engine any more. They just don't exist. So when it breaks the next time, it's gone. We have removed it from our planning inventory just because of that fact.

Farther down you see the Boundary dam unit 3 will require some capital money by 2013. If Mike Monea turns it into a clean coal unit, that's maybe one of its futures, but there's been no decision taken on that yet.

And then down the chart you see Boundary dam unit 1, Landis. We already talked about Boundary dam unit 4. Those are the dates when you probably have to give some attention to those particular units.

The Red Lily project, it's the wind one. It kind of came out of, I'm going to say, nowhere. We did a couple of environmentally preferred power solicitations some years ago and we got Gaia project and we got some of those heat recovery projects in our green. Pat had some of those on her slides.

The Gaia one came out of that process but they had trouble getting their financing lined up and I think some of the wind credits at the federal level kind of vaporized on them and so they actually . . . We wrote the agreement with them but they weren't quite ready to proceed and then they finally got their ducks in a row. So now they're coming on by 2011. In a perfect world they would have been on already.

The other ones that came out of that environmentally preferred power solicitations was the heat recovery thing. And I'll just talk a little bit about that. Pat mentioned that there's a pipeline and on that pipeline are some compressors. And they're natural-gas-fired compressors and they are literally aircraft engines. And what you know about aircraft engines is the exhaust that comes off those is really, really hot. So this technology tends to use that heat that's coming off there and essentially make power from that waste heat. You can't consider it renewable, but at the end it's not chewing up a new fuel source and it's not creating any new emissions.

[13:30]

And Saskatchewan is a little bit blessed because in these pipelines that kind of run across us, we're towards the head end of the pipeline. So as the need for whatever's being taken off the pipeline — natural gas — at the far end goes up and down, they tend to cycle the compressors at the far end. They don't cycle the ones at the head end where we exist, so they get a nice steady run of heat there.

That's something that Saskatchewan . . . We're taking a deeper look at that because of that facet. The heat here is a nice, steady heat. It's a dry cold. It's a good, steady heat at the head end of the pipeline, and we think that might be an advantage for us.

Medium-term supply, once again we mentioned the demand response initiatives. And Judy will talk more about that, trying to make the load go away, because efficiency and conservation is the low cost CO_2 scrubber. It is the cheapest way to make things go away, make the environment better in terms of CO_2.

In the medium term, we're also talking about First Nations partnerships and hydro development. Maybe I'll just talk a little bit about that.

In 2007 we had a number of independent power developers had been working with Aboriginal groups to try develop a project. In 2007 they thought they'd be able to bring us a project for our consideration at that time. As it turns out, none of them came forward with a project. They were struggling to develop the relationship, the project, the economics, etc. One of the things that we've had more recently done with those groups is to see if SaskPower can be of some assistance in helping to develop those projects in terms of either personnel expertise or business arrangements.

We're chasing IPP development of renewables in the medium term. And I forgot to mention this is, we kind of think it is 2015 to 2022. We're pursuing new generation technology. We talked a little bit about clean coal there.

Undertaking intertie capacity increases with neighbouring utilities. This is a pet favourite of mine. The interconnections to the outside world solve a multitude of sins. You get surprised by a load, no problem; you have multiple outages, no problem; you want market advantage to sell, no problem; you want to buy, no problem.

Getting interconnected to the outside world is a great idea. A little tough to do because you're now talking about your neighbours' systems, not just your own, and they all have to be negotiated. We're finding more and more interest in a number of our neighbours in this facet as well.

So we're evaluating a number of supply options, and there's a long list here. We'll talk about some of these technologies one by one a little later. But biomass, carbon capture and sequestration are clean coal. Cogeneration. Compliant coal just means a coal unit that meets the rules of the day. Heat recovery, we've talked a little bit about that. Hydro, we talked about that and maybe trying to . . . by setting up a hydro development unit as we've done with clean coal, is to try to get a little more emphasis on that and help the parties. The parties involved seem positive on seeing us in there, so we're going to try and help that out. Natural gas.

Polygeneration is probably one that is maybe a little unusual in this mix, and this was in the news a ways back. There was a proponent would like to take . . . essentially it was petroleum coke waste products from Alberta and gasify that and make power and some steam and a few things in the Belle Plaine area. We'll talk a little more about that later as well, particularly some of the attributes of that, and solar and wind.

We're also looking at something at the bottom there, electricity storage — it's not something that stores real easy currently — and smart grid technologies. Maybe we'll talk about the electricity storage. As the wind goes up and down, one of the obvious things you'd like to do is say, can I store that someplace when I don't need it and bring it out when I do?

About a year ago the biggest storage installations that we were seeing — and these were batteries essentially — were about 1 megawatt.

In the last year, we're watching people try these now more at, I'm going to call it, utility scale. They're about 30 megawatt installations, pretty close to the front end of this. So we're monitoring that, keeping an eye on that, because we think that would be very useful in helping us take the next or subsequent steps with wind, if you want to think of it that way.

For anyone who was at the front end of nicad rechargeable batteries, you probably want to understand you want this technology to bake awhile before you start using it for systems. And anyone who's tried to use a battery at 30 below in Saskatchewan, you probably also want to see this technology perform in our environment before you start embracing too much of this technology. So it's still baking, but they're aimed in the right direction. The ability to store is going to be key to bringing on more intermittent generation.

The other one that we're kind of looking at, and we call this smart grid technologies. Smart grid is modern digital technology. We will use it to optimize our operations. We'll have smart meters out there which will allow us to forecast better. It will help us to involve the load in that balancing act between supply and load. We can bring them in. We can have controllable parts of their load.

I had at least one suggestion from the back of the room over the noon hour that if we could control people's air conditioners, we might be able to have a little help with that summer thing, and that was much appreciated. But that's really its intent, is to involve load. It's also to help adopt more variable generation.

In the United States, they have thrown a lot of money at this, called the smart grid concept. There's a lot of incentive money out there. They are just now at the point where they are developing the standards for this equipment and the protocols and we're kind of wanting to see how that turns out. You really probably don't want to get into this too deeply until you actually have a standard that you know will endure over time. And you don't want anything that's too proprietary in this because you're going to be doing this for a great number of years forward and you don't want to be tied to just one manufacturer. So that's just kind of developing now in the United States.

Okay. Let's go on to the next one. So this is the chart medium-term supply. And this period will see an overall supply requirement about 1,000 megawatts, and it describes there how much is sort of load growth and how much is kind of opportunities where refurbishment may be required. I won't spend a whole bunch of time on this. You see Meadow Lake on the left-hand side — Meadow Lake capacity replacement — that just falls under that category. It's generally cheaper to replace at the existing site. The transmission is there. The site's there. The building's there. Renewables such as wind and biomass, we think there's a role for that, and we talked about WPIDU or the wind power integration development unit work speaking to that.

On the right-hand side at the lower, you see Boundary dam unit 2, Boundary dam unit 5, and QE unit 3. There's been no decisions taken on these yet, but aging infrastructure, these are the dates when it's going to require some money and some attention.

Next slide up is long-term supply. And this is 2023 and beyond. You get to thinking about some very large-scale options here because time has marched on. So again the first bullet — continued expansion of energy efficiency and demand response. That is the low-cost carbon scrubber, in my view. And by then Judy will have an additional 200 megawatts of saved energy and related demand reductions. Pursuing new generation technologies — and I'll say a little bit more about that in a second, I suppose.

Evaluating numerous supply options, and again there's the lists. And it's similar to the last list. I think in here you see something nuclear is now . . . That's far enough out that nuclear, those kind of technologies, there's enough lead time that you can be thinking about those.

And maybe I'll just dwell on the nuclear one a little bit. We've never built one, of course, so at the end we took a number of folks — our planners, designers, operators — and we essentially sent them down to New Brunswick and said, you're about the same size as we are; let's have a chat. What does it take to have one of these in your system? How does it feel? What do you have to do? Very illustrative.

And also of interest, both New Brunswick and Ontario have been looking at maybe adding further nuclear power. We don't have those cost assessments yet. I think they're still under lock and key, but we're hopeful that eventually they'll tell us how that process went in terms of the ability to get pricing around the nuclear option. That's kind of a variable. You can read a lot of public documents and see a lot of information on nuclear pricing. It's really quite variable. We'll talk more about that when we do the technology-by-technology discussion.

I put in here, in this slide, something called small nukes. There is at least a number of manufacturers who now understand the problems with really large unit sizes and the transmission issues around that. I mentioned to you before that when you have a unit on your system and it trips, that shows up as an imbalance. In other words, your generation no longer equals your load because that generation tripped up. If it's a great big generator, that shows up on your tie line and your neighbour's systems.

And some of the large nuclear units are coming in sizes of literally 1000 megawatts to 1600 megawatts in a single unit. If that thing trips, that amount of power is going to show up on your neighbour's system. That requires some consideration, not only on your transmission but in all the system around you. So there's some manufacturers saying, you know, that big unit thing could be a bit of an issue. And they're actually looking at the concept called the smaller nuke. And we've had some discussions with these folks. It's early days, I think.

They are talking about smaller sizes; sizes that would be compatible with grids such as ours. It's not licensed yet. In other words, these are ideas that are just baking. But they've baked, looks like a pretty good recipe in terms of market need because they'll be able to put these in a great number of places

compared to the great big ones which have to go in major centres beside great big loads. If they're successful, there may be a much larger market for that technology. I think they're telling me the earliest they could get one licensed, if any, by about 2015.

We mentioned polygeneration. We'll get back to that. Long-term supply. Let's go on to the next one. We haven't filled a whole bunch in the adding supply. There are no decisions taken on that, but on the right-hand side, you can kind of see the dates at which some of the plants and the facilities that Ms. Youzwa mentioned in her opening remarks, you can see when they come due for either refurbishment or retirement. And it gives you a sense of the aging bits that will need attention.

So planning assumptions, in order to do this planning work that we talked about, you have to have some assumptions, and we'll go through some of these. The generation options under consideration for medium- and long-term frames will be presented to you alphabetically and it's . . . They call it the estimated busbar power costs. In other words, if you were going to buy the power right outside the fence of the plant, that's what it would cost you. So there's no transmission in there. There's no losses in there. It's pretty generic kinds of information. It's aimed at approximately 2010, so it's a little bit forward-looking, but not wildly so. So if you were going to build one of these in the year 2018, obviously you'd have to inflate that.

The next bullet says these costs are described as overnight costs. In other words, if you could build it all between tonight and tomorrow morning, that's what it would cost you. When you actually build projects, if they take a very long time, you have to add things like interest during construction and a few other accounting mechanisms which make it fairer, I suppose. But these are overnight costs; they have not factored in what you call interest during construction. And they are, for the esoteric group, these are first-year escalating style of costs.

For comparison purposes, when you look at the ones on the subsequent slide, right now the generation at present — which is kind of a mix of some really old stuff and some stuff that we've added in just the last few years — it's around 5.8 cents per kilowatt hour. And on the following slides, we'll talk about how that might compare to the newer kinds of equipment if we were to make the change out.

So the first one is biomass. And you can see that it's 6 to 11 cents — quite a range there because there's really quite a range of technologies. The dollars per kilowatt is really the capital cost to install the equipment overnight. There's some advantages. Biomass — there's a wide range of this stuff, everything from making power from straw or from waste wood, I'm going to say animal waste. There's a wide range of things that would fall under the category of biomass. At one time, the Weyerhaeuser plant was making power on their site from waste wood. And that would be considered biomass.

We have in the past engaged some parties to demonstrate on a very small scale some of these technologies. My predecessor indicated, he says, we're going to try and see if we can make power from pig poo. And we also tried some experiments with folks to try to develop wood gasification, where you take the wood and turn it into a synthetic natural gas, if you want to think of it that way.

There were technical challenges. There was intellectual property challenges in this. So the demonstrations said this is kind of tricky, it's kind of expensive. And to give you an example, when you try and make power from biomass — maybe the pig poo one is an obvious one — there's things in that, the gas, after the biodigester has made the natural gas, there's things in there that can rot out turbine blades fairly quickly. There are some tricks to this technology. So the technology is still developing.

We are seeing some interest from independent power producers primarily in the Prince Albert area and the Meadow Lake area, pretty close to where there's large supplies of waste wood. They are examining the feasibility of waste wood for purposes of biomass generation.

[13:45]

Biomass is seen as renewable, fair enough. And we believe that it's eligible for favourable regulatory treatment — in other words, even though I might burn it to make power, it was better than the alternative. And so it may get a free ride or, well, something of a free ride under CO_2 regulations.

Under biomass as well, I mentioned there's a broad technical spectrum. In our industry we're starting to watch a number of people — and we're also involved in this — is trying to see if there's a way for waste wood to be used in existing coal-fired boilers in whole or in part. And in Ontario they're doing some wonderful work trying to see if they can supplement the coal in there with something that is treated very favourably under environmental regulations, which is wood pellets. And through I think it's Canadian Electricity Association, we actually have one of our plants that is being assessed for its technical capability to take wood in. We won't have the result of that probably till the end of this year, early next year. But the idea is to say, can you improve on the coal theme somewhat with wood pellets.

Carbon capture sequestration. I mentioned that this is a project that's being assessed by Mike Monea, vice president in SaskPower. Potentially low cost electricity, low air emissions, if you put the CO_2 underground. This is the one we're really talking about is taking existing Boundary dam 3 unit, cleaning up the exhaust gas, capturing the CO_2, taking that through a pipeline over to an enhanced oil recovery situation, putting it underground and leaving it there.

We have a good coal source, and we talked about that. There's enhanced oil recovery that's actually been working, and you'll get oil out of the ground that you otherwise would not be privy to, I suppose.

Disadvantages, you need a demonstration project. This is kind of new stuff, new commercial arrangements because you have to sell the CO_2 to kind of make this work economically, we think. There's some technical issues. The regulations are uncertain that we put that as a disadvantage, but Saskatchewan has a highly monitored site. If there was a place to get regulations set up, this is it because of that highly monitored

site. It'll make a best practices handbook from that monitoring and sequestration exercise, and the regs could be based upon that. I think it'll be, I think we said 2010 before we'll be in a position to draw conclusions from this work.

Coal compliant with present emissions guidelines. And I hinted that that might be a bit of a moving target, but coal is a mature technology. There's a lot of coal. Arguably 100 to 200 years of coal supply in Saskatchewan is available to us at depths that are economically retrievable.

Disadvantages of the emissions — we talked about CO_2, declining public acceptability for, I'm going to call it, straight coal. I think we're seeing that. There's a regulatory risk, cost of licensing and permits, and it's obviously non-renewable. It's been 20 years since we built one of these or even decided to build one of these, so there's been a bit of a hiatus.

The rules on new coal are not settled. It's interesting. Some provinces are trying to take their coal out, and other provinces are adding coal as we speak. It's interesting. We definitely want to see the regulatory assurances around this before we take too many actions on this. And it has the advantage, I think, if you've got a site that's already been used for generation — the transmission is already there — continuing to use that site makes some sense. So they might have that as an advantage as well.

The next option we talked about is hydro, and it comes in kind of I guess you call it a couple of flavours. One is sort of a place where you build a dam and build a reservoir. Another one is on a river where it's not too disruptive. You let the water flow the way it would and capture its energy on the way by. You don't put in much of a dam there. It's low greenhouse gas. There's no sulphur, no nitrogen, no No_x [nitrogen oxides] things. It has a low operating cost once you get it built. It's capital intensive to build the dam and a few other things, but once you get it going . . . Right now our hydro has a water rental fee that we pay to the government to help Sask Watershed Authority run their operations. But it's around 0.3 cents per kilowatt hour once you get it built. It's inexpensive to operate.

On the right-hand side, it has a high construction cost. Aquatic habitat and biodiversity, I'll talk a little bit more about that. A northern location increases transmission requirements sometimes. There's a natural and climate change induced — is the next hundred years of water availability in the river systems going to be the same as the last hundred years? You have to think about that a little bit when you're thinking about hydro. Rivers tend to be close to traditional lands, and so there's a complexity in sort of the Aboriginal component of this.

Hydro is really, really flexible. I can start it; I can stop it. It can be loaded up quickly. It can be very helpful with that balancing issue that we talked about perhaps this morning. But I'll give you a couple more pieces of information on hydro.

In the way we are required to run the hydro in SaskPower, Sask Watershed Authority will give us target elevations and releases that we have to accomplish. In other words, you can't just run it exactly the way the power system requires it. You kind of have to run it the way the river system needs to be run because there's other water users there.

Department of Fisheries and Oceans is also trying to protect fish habitat, and so they also have input saying we'd like you to run the hydro in this way so that fish spawning and other activities are, can be sort of optimized.

In the spring runoff when that water comes out of the mountains — and I don't like to waste a drop of that stuff — you end up running your hydro so that you don't overfill the reservoir. And so it changes, nature, throughout the year on you. And when you go through freeze-up and ice starts to form on the river system, all kinds of water just disappeared on you. It'll come back next spring. It'll just reappear for you, but you have to recognize that when you actually run hydro on a river system that freezes up. And we've got that of course.

The other piece, that when you're freezing up and when the ice is coming on and the ice is coming off, you have to run in a very special way. And you have to run really, really, steady. You're not going to change very much because if you change very much, you'll flex the ice. You'll break the ice. It'll jam on you, and you start creating flooding for people who are close to the river.

We've been very successful in managing all of these things and having hydro be a great, a great contributor to how we operate the power system. But I'd thought I'd share just a few facets that we encounter every year in how we run the hydro that you will not see on the facts and figure advantage and disadvantage. There are some hooks to this game, and there's more and more each year with how you're required to run the hydro, but I thought I'd bring those to your attention.

The item that I'll also mention, you tend to like hydro for moving it up and down to correct those tie lines, to balance your generation with your load. The information that we have from some of the Saskatchewan units is, as you change the load on your unit, you change the efficiency. And some of our generation has a real sweet spot — 90 per cent efficiency. You're using the water in a really good way. Start moving it around too much, you find yourself in zones where the efficiency can drop to 50 per cent — using the same amount of water, but getting half the power out. So at the end you have to be very careful how you use hydro for that balancing act too, because in a CO_2 constrained world, you do not want to be wasting water or not using the water in the absolute most CO_2 friendly way you can. So it's adaptable and it can move around for you, but there's a price to be paid for that as well, even in hydro technology.

Imports, long-term. I mentioned we're interconnected to the outside world, so we can talk to some of our neighbours from time to time. Can we put a deal on the ties to buy power, say for the winter months or when we need to? Or export if we've got some surplus to sell?

One of the obvious things we should talk about here is that Manitoba Hydro is a big hydro utility. They kind of overbuilt; they sell a lot to the United States. Matter of fact, most of that, what I call the firm hydro — the stuff that is pretty much guaranteed — is spoken for by the United States. We tend to see more power come available from those folks within a calendar year. They don't like to make sales beyond firm until that water's actually in their reservoir. They're kind of risk

averse when it comes to that, and I can't say I blame them.

In 2007 we asked them, would you like to supply power to us? Because at that point we were in a supply decision mode. And they gave us a bid, but they thought they might not have any firm power for us until approximately 2020 or 2023. And so it's pretty much all spoken for in terms of the firm power that they have.

Natural-gas-fire generation. When we were talking about the map, we talked about simple cycle gas turbines. This is really what this option talks about. When we get to these . . . I'm just looking for cents per kilowatt hour, I don't see it. Anyway on the advantages, it's proven technology. It's not quite off-the-shelf, but you could think of it almost that way. It has lower greenhouse gas emissions than, think about, coal. It has no sulphur, no SO_x, low capital costs.

On the disadvantage side — obviously natural gas, the fuel can be pricey from time to time. We're enjoying a nice soft spot now, but the long-run projections is it'll come back to more normal pricing points. It can be difficult to capture CO_2 from a gas turbine. It's definitely considered non-renewable. And in all the gas options, this one might be low-efficiency because I don't use the waste heat for anything. It has a real flexible arrangement — I can start it and stop it, etc. — but you kind of pay for that with the efficiency aspect.

I can site these easily. I can put it close to the load. It helps me reduce the losses on my system. It can start and stop quickly. I can load it up and down quickly. That really helps my balancing authority. I put the clutch in, and we talked about the voltage control. This is actually good for a system where you got a large geographical area with widespread customers. Controlling voltage is sometimes an issue for us; this will be helpful. And they can be remote controlled by computer — I can start it by pushing a computer button. I don't require a man at the site, and that's very flexible for quick response times.

We'll have a number of gas options here. The next one is natural gas-fired generation. We call it combined cycle. In this one it's like a simple cycle gas turbine. But remember that waste heat that I wasn't doing anything with in the previous option? In this option, I use that to raise steam, and I hook a steam turbine up and try and use the waste heat to generate some more electricity. And so I've added some more equipment. Because I've added a steam turbine, I've probably added some manpower requirements here. I've made it less flexible because steam turbines have to be heat matched and loaded up more slowly than just the gas turbine equipment would imply. But it's proven technology. It says lower greenhouse gases than obviously coal, and even simple cycle if you ran it continuously. Moderate capital cost, higher efficiency than simple cycle, again because I'm using the waste heat.

There can be risks associated with natural gas. This is on the disadvantage side. Again CO_2 is difficult to capture. Non-renewable. It's less flexible in operation compared to simple cycle. It doesn't change load as quickly. It can be started and stopped, but you don't like to do that hourly or daily. You like to keep them running a bit more steady than that.

Next one is called natural-gas-fired generation and it's got dash, cogeneration. A lot of these sound quite similar. This is sort of the next step up in efficiency. And now I use that waste heat from the simple cycle gas turbines. I use it to raise steam for industrial process such as potash or upgrading and that kind of thing. These things are really quite efficient. The steam guy is relying heavily on this for his industrial process.

So what you find is that the plant often runs to kind of suit the steam host to some degree, and so you get a nice feel off these from time to time. But there's a component of this generation that is must-run. You can't shut it off, otherwise the steam host guy is out of luck. So you have more offtakers here, and in our case, we have a couple of these. Pat had a slide under the independent power producer, one at Cory and one at Meridian. We take those services through a power purchase agreement. But the steam guy also has a steam purchase agreement. And so that thing is run to meet kind of both users' needs. It can be tricky to get your electrical output, your maintenance, etc., to match the electrical situation because you have more offtakers of products from these.

I don't think there's a whole bunch more that I want to say about that. The siting on these, you can't just put them anywhere. You're normally putting them pretty close to whoever that industrial process is. You don't have carte blanche as to where you put these. They have to go pretty close to where that steam guy is going to live.

Next one under future supply options is nuclear. And you've got the 8 to 10 cents. That gives you some sense what that means in terms of the 5 cents that we're spending now for supply. The advantages of nuclear — and I'll spend a little more time on this one — it has low air emissions. There's an abundant fuel source in Saskatchewan, a low operating cost, new manifestations of nuclear. They're now telling me 60 to 65 years is the design life on these; prior to that it wasn't quite that long. It's proven technology in some jurisdictions.

[14:00]

On the disadvantage side, you see uncertainties surrounding costs, including those incurred through decommissioning at the end of its life and long-term spent fuel storage.

Potential transmissions upgrades . . . And I'll just come back a little bit to that. Whenever the generation in Saskatchewan doesn't match the load, it shows up on your neighbouring systems. So in some of the very large situations where you're hooking 1000-megawatt or 1600-megawatt units up — and it doesn't happen often — but when they trip, I have an imbalance on my system. That imbalance could be 1000 or 1600 megawatts. That will show up on my neighbour's system.

It's that same concept again. But when the unit trips, if it has a problem — and nuclear units do trip; we understand that quite clearly from the New Brunswick and the others we've talked to — that power shows up in your neighbouring systems. In those kind of sizes, that's the nature of the problem. Your neighbours aren't going to be very happy to see their lines trip out because that amount of power showed up on their system inadvertently. And that's what that bullet kind of hints at.

Significant cooling water needs. The large unit sizes are water

hogs for cooling. They take a lot of water. The image you should have in your head, I think, for the really large unit sizes is the one where cooling towers are involved. The flows on the North Saskatchewan River will go low from time to time on you. They will go so low they couldn't cool a nuclear unit. So what you do is you put in cooling towers, and you take a little efficiency hit to do that, but you essentially do the cooling in the cooling tower, not in the river. We think that's a Saskatchewan reality.

Long-term management required for spent fuel storage. I don't think that's necessarily in place yet although I know there's people working on that. Social acceptability's obviously been in the news lately. Large unit sizes can be an issue for small grids — we talked about that, I think — whether they're being maintained, and I need 1600 megawatts of backup power while I'm maintaining it, or if they trip off line. And I talked about that earlier. Length of time to construct might be 10 years.

Demanding and complex regulatory environment. This is true in both Canada and the United States is that that can be cruel and unusual to get one of these through the regulatory process, and that begins with siting, construction, operating, decommissioning — you need a licence for everything. And every change you make to that plant is a highly documented event. It's a very demanding regulatory environment. And it's obviously seen as non-renewable.

I think this was covered well in the UDP [Uranium Development Partnership] discussion, so I won't say a whole bunch more about it, but a couple things.

Modern designs for nuclear, and we call these generation III plus, have enhanced safety features. It's very impressive at the engineering level. They are called passive safety. In other words, they don't require power to fail safe. All they require is gravity. And that's pretty impressive. We think that there's something useful in that.

Again the unit sizes are big; not so good for small systems. So if you're thinking about the large units, you begin to think you're going to put these beside great big loads or you're going to begin to have to think more regionally, not just your own little power system. You've got to think more about your neighbours and how very large unit sizes might fit into a region as opposed to perhaps a province.

We took some people to New Brunswick. I talked about that. The small ones, it'll be 2015 before we find out whether they can get these licensed. Right now they look like they'd be system-friendly for systems that are our size, but that's a work-in-progress to be announced.

Polygeneration. We've had one manifestation of this in our past called . . . the advantages of multi-product system. The one we talked about . . . We actually started at SaskPower, we kind of encouraged this in the early going some years ago, trying to see if they would use the lignite from southern Saskatchewan and turn that into a synthetic gas.

That group did their work, and they found out it would probably be better to use petroleum coke from Alberta and turn that into a synthetic gas to make power. But essentially, it's like a gas turbine. It runs on a synthetic gas that's made from petroleum coke — in this case — and they'd make some electricity by running that through, the synthetic gas through a gas turbine. They used the waste heat to raise steam, but when they change the petroleum coke into this synthetic gas they actually disassemble its chemistry and so they'd have some hydrogen for sale and some CO_2 for sale, and as you start to gasify things like coal and petroleum coke there's a lot of different products that can come off of that.

We find in North Dakota they have a coal gasification plant down there and they find that they make as much money from selling the various fertilizers and chemicals in that disassembly process as they do from the synthetic gas, and so there's something interesting in there.

But one of the things you have to think about, there's so many offtakers in terms of the steam, the CO_2, the chemistry is you probably want to be thinking about this kind of technology as pretty much a must-run technology. It can't follow the whims of the power system because there's a lot of wants in the offtakers associated with polygeneration, and maybe that's enough to say about that one.

Getting close to the end, folks, so bear with me. Solar, this is kind of intermittent power. If the sun shines it can make power, I guess. The 43 cents to 180 cents per kilowatt hour when you compare that to the 5 cents that we currently enjoy you get some sense that this still feels a little pricey. SaskPower has done a couple of things. We've run a small demonstration project in our net metering program. Solar people can come to the front. Right now the costs particularly . . . We try to take the sunlight and turn it into electricity — and we call that photovoltaics — but when you take the sunlight and turn it into electricity, the costs are pretty high.

And Ontario hydro, I think, is trying to incent people to bring some of that technology forward, and they're up to 43 cents a kilowatt hour trying to incent people to bring it forward, and that's very high to try incent that technology. And so the technology on solar where you try and turn it into electricity through photovoltaics — that's the solar cells. There's a lot of people looking at that because the fuel is decently free if the sun's shining. And we're watching the technology.

In the '90s, there was a lot of work on that. In the 1990s they had a solar cell and they thought it was pretty good, and they brought it out and said, here it is. And if you added up all the energy that that thing would deliver over its 25-year life, it would just about match the energy it took to make it.

Yes, so they're trying; they're working hard to get that technology to be more efficient and more cost-effective. And there's a lot of effort on that front. Anecdotally, the less expensive ones come from common elements in the earth. The really elegant ones, the ones that are up to 40 per cent efficient, are using rare earth metals, and so at the end they cost 100 times more. But that'll settle out in a good place.

What we're finding is that converting and using sunlight and using the heat from that for water heating and those kind of things is actually pretty efficient. But that's more of a conversation for perhaps SaskEnergy and others than it is with

SaskPower at this point in time.

I guess what we're finding is we're starting to see people set up mirror farms where you reflect . . . This is not trying to convert the sun into electricity. They're focusing the heat, and trying to ray it from that high temperature source, trying to make power. It's sort of like using waste heat and making power if you can think of it that way.

Early going. Some of those experiments are being run in places, deserts, where there's a lot of sunlight. It's intense. The land is not such a problem in those locations. And also they don't have snow covering the mirrors for part of the year. To make it suitable here, that one bears watching.

By now, if you've hung in this long, you're beginning to see a lot technology. SaskPower has to kind of keep its eye on this. We do that in detail with some of the units that I mentioned. But at the more global level the Canadian Electricity Association, for like-minded people and utilities such as ourselves, we collectively try and keep an eye on this and share information because we actually want to see this technology come in cleaner, cheaper, again for the reliability and the affordability we've talked about. So we're not doing all of this ourselves. We do quite a bit ourselves, but in the Canadian Electricity Association we gang up with others to try to do this perhaps economically and watch what is a very wide array of technology.

I think I'll take you though one more just for fun. This is the wind one. It is my last one. We've talked a lot about wind. Probably the part we didn't talk about was the risk to birds and bats, and maybe a little bit on public acceptability. You begin to read in the news on the options here that some people are sensitive to this, the aesthetics of very large wind farms. I was through Pincher Creek not too long ago, and they've got a lot of wind there. The locals are becoming maybe less enamoured of the view that they once had of the mountains.

We talked about, we have a good wind regime here. We've done wind diversity studies. We have the WPIDU group. What we're finding is people who put in small wind installations . . . I mean really small, not 50 metres, 60 metres in the air like the wind farms that Pat had showed you, but where they're putting it down closer to the ground, smaller kinds of installations. Pat showed you a wind installation that can generate 38 to 41 per cent capacity factor. That's a lot of energy coming from a wind farm. The smaller ones on average are proving to be about 9. They don't capture as much wind; they don't generate as effectively. So the bigger ones seem like . . . If you are going to harness the wind, the bigger ones seem to be a better bet, cost-effective for the energy you get.

WPIDU has told us we can go the next steps. We talked about that, perhaps doubling what we've got. And I'll also mention that Canada and US [United States] forums are just now assembling to see what they could do to try enable more renewables such as wind at the international and national levels.

So in conclusion — and I apologize for the length of this — I hope you heard a couple of things. You have a big geographical area and a small customer count. You have cost challenges to begin with. From the pricing — and I didn't take you through all that as we went through each of these options — but as you retire the 3-, 4-, and the 5-cent stuff and you bring in the 10-cent and the 15-cent stuff, you are going to see costs rise.

Managing this transition from the old to the new, if we do that well, I think we can soften the impact on our customers. And having the right combination of supply — and we spent a lot of time talking about that today — having the right combination of supply is key to the operability and it's key to the reliability and I think that's going to end up being key to the affordability of supply. And that's it for me. Thanks.

Ms. Youzwa: — Thank you, Gary. Mr. Chair, we have about half an hour presentation yet. We do want to talk about energy efficiency and conservation, and our summary wrap-up and conclusions. So if you like, we can continue on.

The Chair: — I think we should continue on and maybe take a break at the end, unless any of the committee members feel it's necessary now to take a break. Let's continue on. Thank you.

Ms. Youzwa: — Thank you. So we heard an extensive presentation from Gary Wilkinson and Gary has summarized for you, I think very well, some of the key messages to take away from his presentation. So he did talk about the supply planning process. He did talk to you about how we see the short term, the medium term, and the longer term unfold. We do have specific projects and commitments in place to meet our short-term requirements to 2014. We are looking at a full range of options that are available for the medium term and long term. He also gave you a extensive description of the full range of options and their numerous advantages and disadvantages with each.

We now want to have Judy May come back and present to you and talk about energy efficiency and conservation. As we're looking to add generation to our system to meet growing demand, energy and conservation becomes an increasingly important strategy for us to pursue. As Gary said, it's the cheapest CO_2 scrubber that we have available to us. And Judy will explain a little bit more what that means. But I think it's very important for us to be able to describe to you what we see as the potential for energy efficiency and conservation and what some of our strategies and programs are to meet our goals in this area. Judy.

Ms. May: — Thank you, Pat. I want to begin first by just summarizing or perhaps revisiting for you a few points that others have made earlier that, in fact, we are doing everything we can as well to walk the talk on energy efficiency. And energy efficiency in SaskPower comes in a number of ways as we look at rebuilding and refurbishing our current infrastructure. And what we've experienced recently is in our rebuilding of existing coal-fired facilities, we've been seeing improvements in efficiency by about 2 or 3 per cent — which does mean on average about an extra 10 megawatts coming out of those older units that we can then generate in addition and then transmit and distribute to our customer base.

The new gas generation units as well are also more efficient than earlier designs. And so that means that again we are able to produce and deliver more energy to customers from these newer units than we have been able to do in time from the same sized

unit that is older. So again new technology gives some inherent efficiencies there.

[14:15]

We're currently undertaking a sizable effort in hydro optimization and efficiency improvements at our E.B. Campbell and Island Falls hydroelectric stations and again, not unlike coal-fired facilities, when we're doing improvements we see efficiency improvements overall which means again more megawatts that we can generate and then send down the line so to speak, through our transmission and distribution system to our customers. And as we upgrade our line voltages and construct new power lines, particularly in the transmission side, what we see is lower line losses and again more efficient transmission of electricity. And I think Gary earlier talked about certainly circumstances where we can experience a 10 per cent line loss in transmission line losses and so what we can do to improve our performance there is certainly key.

And one other point that I'd like to mention that isn't on this slide is that we've been undertaking work within our own buildings and, for example, we have had nine buildings here in the Regina area alone where we've applied our own energy performance contracting program — which I'll explain in a few minutes — to those buildings so that we can improve the efficiency of our own buildings and reduce our need for electricity for our own facilities.

Now having said that, I want to turn for a few minutes to talk about the demand-side management programs and the need for reducing our generation which Gary has, I think, really very well outlined and summarized for you.

Our demand-side management programs focus on energy efficiency, conservation, and altering patterns of electrical use so that we can reduce the overall demand for power. And again if we can do that, it means we have less need for adding new supply. We have less of an issue with greenhouse gas emissions, and we certainly are able to also, in addition to that, provide benefit to the customer by helping them manage their own electrical usage and therefore the impact to their bottom line of electrical costs.

We set some goals, and I want to just speak first to our short-term goals. We have set a goal for load management programming that will deliver 120 megawatts of peak demand reduction in the short term. And we have set a goal in the short term of energy consumption reduction of 75 megawatts by 2014.

So the peak demand reduction of 120 is going to come largely, in fact all, from the industrial grouping of customers — and I'll talk about that in just a minute in more detail.

And we also see in the short term a reduction of 75 megawatts for energy savings in all classes of customer by 2014. And by 2017, we see that our energy efficiency programming will actually be able to introduce and deliver 100 megawatts of savings. And we are targeting a percentage breakdown of that 100 megawatt savings as depicted to you: 10 to 15 per cent from industrial customers, 50 to 60 from commercial, 30 to 35 from residential, and then 10 per cent from customer self-generation and renewables.

It's important to note here that in setting our targets we undertook an initial potential study, a study of the potential savings in energy and capacity that we think that we can effect in this jurisdiction. And we actually had Manitoba Hydro as our consultant in helping us do this initial potential study. So with their expertise, because they've certainly been in the business for almost two decades, they helped us to set these initial targets for both capacity and energy savings.

But we're not stopping there. We've actually set a long-term target of a total of 300 megawatts of energy savings. And again, this is in the long term, the time frame described by Gary earlier. And again it's important to note that in setting this long-term goal we have also again utilized the assistance of Manitoba Hydro acting as our consultant. We've also attained additional outside industry expertise to advise us on our long-term targets and are working going forward to making sure that we meet that target in our long-term time frame.

The other area to note is that we are certainly going to be introducing later this year, by the end of the year, a demand response program targeted to our industrial customers. And this is where we are targeting that 120 megawatts of capacity savings — again, a target that we've set in consultation with industry experts including Manitoba Hydro and others. And once we have this program up and running, we'll be looking at that program and the take-up rate and looking at potential other subsets of programming that we can introduce under this banner of demand response programming.

Some might think that perhaps these numbers are rather modest, but I want to touch on why I think that they're quite reasonable. First off, when we look at 300 megawatts of energy savings, that's about 10 per cent of our load growth as we project into the future that we think that we will be able to offset through our demand-side management programming.

And that may not be as aggressive as some targets you might have heard about in other jurisdictions that they're setting for the long term such as 20 per cent of load growth, but it is what other jurisdictions who've been in the demand-side management programming area for almost two decades are currently experiencing in terms of their demand-side management program savings. So it is very reflective of what other jurisdictions that have been at the demand-side management programming for almost 20 years are actually able to achieve today. So we certainly think it's a reasonable target to set.

Also, 300 megawatts in the long term; 300 megawatts is, I think, fairly significant. If you recall Gary talking about gas-fired generation that will be installed by the end of 2009-2010 at Ermine, Queen Elizabeth, and the Yellowhead project in North Battleford, that suite of three gas-fired units is about 340 megawatts. So 300 megawatts of energy saving from demand-side management is about the same size or roughly the same size as those three units, and again I think not too insignificant.

The other thing that I want to say just before we move off this slide is that we want to be prudent in the estimates that we give

to our planners for demand-side management programming and so we certainly probably err perhaps a bit on the side of caution. But as we produce these programs, put them into delivery mode, and measure their success with our various customer groups, if we see the take-up rates increasing faster or far greater than what we originally anticipated, we're certainly going to move aggressively to capture additional energy and capacity savings through these programs.

So what are these programs? Just to give you a sense for the kinds of things that we have been doing and that we're planning to do before the end of 2009, we are introducing and have been introducing a suite of demand-side management programs under what I'll call the banner of SaskPower Eneraction. And really that's a portfolio of energy efficiency, conservation, and load management programs, aimed at really, programs for all customer bases.

When it comes to our residential customers or our homeowners, we have been delivering a number of programs that really are aimed at encouraging our residential customers to increase their use of energy efficiency products. So we've had programs in place for a while such as the Energy Star furnace motor program and air conditioner program. And we have just introduced a high efficiency lighting program aimed at residential customers. And in 2008 we had about 200,000 customers participate in our residential focused demand-side management programming for an estimated 8 megawatts of energy saved.

Just one other note in terms of residential programming. Residential geothermal and self-generation renewable power program really does encourage that subset of our residential — and, by the way, farms as well — who are interested in setting up small-scale, environmentally responsible generation. And we have a program in place. They can access a low interest rate program, a loan program, and there are rebates available through the energy efficiency rebate for new homes program.

When it comes to commercial, municipal, and industrial customers, I'm pleased to say we have a number of programs under way and a number of programs about to be launched. I think our longest standing program when it comes to the commercial institutional sector is our energy performance contracting service, a partnership with Honeywell where we help customers to reduce their energy-related operating costs. It's aimed at the health care industry, the educational sector, and certainly commercial office buildings. And we have to date 22 contracts that we have signed. We have saved over 25 gigawatt hours a year which is enough electricity to power about 3,000 or so homes in a year. It has provided an annual saving to those customers participating of $3.3 million and it has involved 50 contractors throughout the province in helping with this retrofit program.

We have also launched a commercial lighting program, just again within the last few weeks, in partnership with electrical distributors throughout the province, and here we're offering premium, high performance, energy efficiency fluorescent lighting and light fixtures at the cost of standard equipment. And again one of the barriers to many types of customers in entering into energy efficiency programming is often the retrofits are expensive upfront expenditures for customers. So here's one way that we're assisting with distributors throughout the province to help our commercial sector improve their lighting efficiency. Our estimate is about 28 per cent of electrical load in commercial facilities is due to lighting and so that's a significant impact.

We're projecting at least initially for 18 gigawatt hours a year of savings in this program, which is about something in the neighbourhood of about 2,200 households powered per year with these savings.

This fall we will be announcing as well a retrofit program to assist our municipalities in reducing the operating costs of their ice rinks. This program is going to provide customers with a start-to-finish energy efficiency retrofit service, everything from auditing and monitoring their current energy efficiency levels to giving them recommendations on retrofits to help them to actually implement the retrofits — in other words, project manage their retrofit activities and help them actually monitor the success of those retrofits after they're installed. So we're quite excited about that program that's due to be launched in very short order.

We also have a program that we introduced about I think June of this year, and it is to promote geothermal heating to commercial customers who do not have access to natural gas. And again this is a very significant program where there is a 15 per cent rebate available to customers, and I think too a 15 per cent rebate of installed costs to customers. And again, this is just a fairly new program so, you know, the take-up, we haven't really seen a lot of numbers coming in yet, but we think that this will certainly be of interest to a certain subset of our commercial customers.

And an additional focus on our industrial customers will also be on an energy efficiency service for industrial facilities whereby we work with our industrial customers to look at energy improvement opportunities for them with emphasis on new, more efficient technologies and process optimization going forward. So that will certainly be in addition to the program that we will be offering before the end of this year, which is our demand response program. And this program is currently under development, but we're quite confident that we will be able to target for implementation at the end of this year where we will be working with industrial customers to have their participation in reducing the demand for electricity under certain particular conditions when requested by SaskPower. And again in the short term, this is where we're going to see that 120 megawatts of capacity savings occurring.

And as I said before, once the program is up and running, we will measure its success and look for additional opportunities in this area. We think there probably are some, but we want to get this program up and running first before we make any other forecasts.

[14:30]

And finally I want to just make a quick mention of one program that doesn't necessarily fall into residential or commercial, but certainly has been of interest to some of our residential, some of our small commercial, and some of our farm customers, and that's net metering. And this is a program whereby customers

can generate their own electricity and feed excess electricity that they're not able to use back to SaskPower's system. They get a credit for the excess energy that they produce and feed back to us. And this credit is banked at the value of SaskPower's residential rate, and so they can apply it in future months when perhaps they are not able to generate as much electricity as they actually need to use in total.

We are asking only for environmentally friendly technologies in this program, so it's environmentally friendly technologies that are eligible for the net metering program. And again there are some incentives available to customers as well to take advantage of, and I believe it's about 25 per cent of the costs to a maximum cap of $25,000, and then SaskPower also contributes an additional 10 per cent of the cost to a maximum of, I believe, $10,000. This program's certainly been a huge success for us. We have 62 customers who are active, as we speak, in this program, and we have 47 customers who are currently either waiting for a meter to be set or for their generation source or device to be installed so that we can finalize the installation and get them into billing under this net metering program.

So I hope that I have, in a very short order, given you a sense for the fact that we are walking the talk. We are doing what we can to be energy efficient in our own operations; that we have undertaken some study with other industry experts — including utilities that have been in this business for a lot longer than we have in demand-side management — to come up with short-term and long-term targets for energy and capacity savings that we think are not insignificant but prudent estimates. And that as we go forward we're going to continue to measure the success of these programs and wherever possible to ensure that we aggressively pursue even more energy and capacity savings as we hope and we expect the take-up rates will be high.

And we will certainly be, going forward, producing other programs to further enhance the demand-side management programming for our residential, farm, commercial, and industrial sector because as Gary said, it's a very important supply option for us, and it is a way of us helping our customers manage their electrical costs. So with that, I'd like to turn the table back to Pat.

Ms. Youzwa: — Thank you, Judy. It's been a long presentation. I want to thank all the committee members for their interest and attention as we've walked you through first of all the description overall of the system we have today, have talked to you about some of the challenges that we face as we look to planning the future electrical system for this province.

We've talked about what's happening to the demand for electricity, what's happening with the state of our infrastructure, how it's aging. We had a good description as well of the environmental challenges that we're facing in the future which are different than those that we faced in the past. And Gary Wilkinson took you through the ABC's of operating the electrical system and some of the challenges we have from an operating point of view.

We also gave you a presentation of what we see in our supply plan for both the short term, medium term, and the longer term and then took you through an extensive description of all the supply options that we currently have under evaluation with their advantages and disadvantages.

So it now falls to me to wrap it up and to give you our perspective on what this means for Saskatchewan.

So the impacts of a growing economy. What we are doing is investing in Saskatchewan. We believe that SaskPower's supply plan at the end of the day will deliver a modern, efficient, reliable, cleaner or environmentally sustainable power system for the people of Saskatchewan. This is a critical piece of infrastructure that will enable growth and prosperity in this province in the future. We also believe that we have to have a stable supply to help continue to build the momentum that we've seen in our provincial economy starting in recent years but certainly projected to carry on for the next several years.

Regardless of which supply option we choose, we know that the costs associated with new or rebuilt generation, transmission, and distribution facilities will put cost pressures on SaskPower, and we can expect to see our expenses increase. We are replacing equipment that's been in place and operating for many decades with new but also more efficient, more modern, and cleaner assets and systems and then building a more reliable and safe system for the future than we have today.

We have projected for scoping purposes that the cost to fill the needs that we're forecasting at this point in time and to meet the regulatory requirements that we anticipate, that the cost overall is in the order to $15 billion.

This is an estimate. It's based on our current forecasts and our understandings of what some of the requirements are that we'll have to meet. Certainly we have made some commitments in the early years of our supply plan to ensure that we've got supply in place and transmission infrastructure in place to meet our customer needs. And that's from today into that 2014 time period.

For what we're going to choose to do beyond 2014, those options are still open, and those commitments still haven't been made. And we're certainly going to look to the report of this committee and the presentations and opinions that'll be expressed through this process to help inform those decisions that will be made for that post-2014 period.

Of the $15 billion within our own capital program, we have identified $8 billion worth of projects. These were part of our capital program for this year in '09 and will continue to be carried forward into the future.

We understand with increased cost pressures, it's going to put pressures on rates for our customers. And we are going to work very hard to minimize the impact of rate adjustments, and we'll do this by conservation and productivity programs. We're going to institute productivity programs and efficiency improvement programs within SaskPower itself to do everything that's possible to manage our own internal costs, but we're also going to — what Judy's just described — introduce and make available conservation and energy efficiency programs for our customers to help them manage energy costs into the future.

We believe that Saskatchewan's short-term energy supply is secure and that we are preparing for the medium and long terms. As I've already stated, we have the actions and the projects in place under way already to ensure that infrastructure is in place to meet projected demand for the next five years.

Our residents will benefit from a modern, efficient, reliable, and environmentally sustainable power system, and we believe that our rates will be competitive. Our rates today, if you compared the rates that we charge for all of our customer groups — whether it's residentials, commercial customers, or large industrial customers — if you compare those rates today with what rates are charged by other thermal utilities, our rates are competitive. We believe that's an appropriate benchmark for us and a comparison for us to take. Our rates are competitive with thermal utilities across Canada. We believe that in the future we can continue to be competitive compared to other thermal utilities.

We certainly welcome input from the public and from industry experts into our medium- and long-term generation options. We are committed as a company to an open, transparent, supply planning process. And as we've done for the last 80 years, SaskPower will continue to work with the people of Saskatchewan to meet the province's energy needs now and into the future. Thank you very much.

The Chair: — Well thank you very much. That is a lot of information you have given us here in the last couple hours. And I think everyone appreciates it.

We will take a short 10-minute break and reconvene. I would just like to remind everybody that would be following this, your document that you tabled today is already on the website, so anyone can access that right now.

So we will take a 10-minute recess.

[The committee recessed for a period of time.]

The Chair: — Okay. I'd like to call the committee back to order. Again thank you for the presentation, and we'll now move on to the questioning phase if committee members would like to ask a question. Mr. Weekes.

Mr. Weekes: — Thank you very much, Mr. Chair. First I want to thank the SaskPower officials for your presentation. There's a lot to digest, but it's very worthwhile. There certainly would be a lot of questions. And I'd just like to lead off by saying I think this whole process that we're in — both the UDP process and the legislative committee process — is very valuable, not only for members of the legislature, but obviously for the general public to get a handle on our energy needs and the issues around costs and the environmental issues. So I think it's going to be a very worthwhile process.

Just one area I'd like to look at right now. Your presentation spoke much about aging infrastructure. And just looking at your slide, it refers to four generation stations built prior to 1960, four generation stations built 1961 to 1970, one generation station built '71 to 1980, four generation stations built 1981 to 1990, and one generation station that was built in 1992 which is the Shand power station. After that there's, well there's basically no new generation stations that look after demand load.

And it seems to me that any business or any government would be looking at investments over the future so that there wasn't a huge infrastructure deficit that would be built up suddenly that had to be dealt with. And I was just wondering if you have some numbers concerning how much has SaskPower invested in capital infrastructure over the last decade on an annual basis?

Ms. Youzwa: — I do have that information. If you could just give us a moment to tally it up, we can give you a total. But maybe while one of my colleagues does that, I should point out on slide 33, where you have the aging generation infrastructure that we've listed for you there and that we'd talked about, we did add generation to our system after 1992. You'll recall from earlier in my presentation I talked about for example the cogeneration projects, the first one being at Lloydminster, the Meridian project, which I believe came on in 1999. We also had the Cory cogeneration project that came in after that. We invested in our Queen Elizabeth power station and we repowered QE, so there was gas-fired generation added during this period of time to meet anticipated load growth and requirements of the system.

The capital program of SaskPower from 1998 to 2008 was $3.3 billion.

Mr. Weekes: — Could you break that down on an annual basis?

Ms. Youzwa: — Sure. So in 1998 it was 137 million. 1999 was 185 million. 2000 is 210 million. 2001 was 364 million. Am I going too fast?

Mr. Weekes: — No, it's okay.

Ms. Youzwa: — 2002 is 305 million. 2003 is 267 million. 2004 was 301 million. 2005 was 474 million. 2006 was 285 million. And 2007 was 280 million. And 2008 was 422 million.

Mr. Weekes: — Was this all capital spending on generation?

Ms. Youzwa: — No. It's a combination of spending on power production, power generation, also transmission distribution infrastructure and other capital spending, which is relatively small amounts to support the operations of the company.

Mr. Weekes: — Would you be able to break out what expenditures were just on generation?

Ms. Youzwa: — Sure. Do you want those numbers now?

Mr. Weekes: — Sure.

Ms. Youzwa: — Okay. 1998 is 28 million. 1999 is 62 million. 2000 is 90 million. 2001 is 230 million. 2002 is 168 million. 2003 is 119 million. 2004 is 157 million. 2005 is 296 million. 2006 is 113 million. 2007 is 108 million. And 2008 is 208 million.

Mr. Weekes: — Thank you. I just noticed — correct me if I'm wrong — but most of the initiatives after the Shand power plant

was done by the private sector and was a . . . they had a power purchase agreement with SaskPower.

Ms. Youzwa: — There is a combination. Certainly there was, as I mentioned, the Meridian cogeneration project which is a private sector, independent power project. The capital for that project is not in these numbers. The share of the Cory cogeneration project which was invested by ATCO Power is not in these numbers; the SaskPower share is.

[15:00]

Mr. Weekes: — Thank you. Could you also supply some historical rate increases over the last 15 years?

Ms. Youzwa: — Yes. I've got that. How far back would you like to go?

Mr. Weekes: — Well 15 years if you could.

Ms. Youzwa: — I've got 10 years from 1999.

Mr. Weekes: — Okay.

Ms. Youzwa: — Okay. 1999 was — these are average system increases — was zero per cent. 2000 was 1.5 per cent. 2001 is 2 per cent. 2002 is 4.5 per cent. 2003 was zero. 2004 is 5.7 per cent. 2005 was zero. 2006 was 4.9 per cent. 2007 was 4.3 per cent. 2008 was zero. And 2009 was 8.5 per cent.

Mr. Weekes: — Thank you. Would you also supply the historical, what other historical dividends have been returned by SaskPower over the last 10 years, if you have that.

Ms. Youzwa: — I do have that. I have those for 10 years.

Mr. Weekes: — Sure. That'd be fine.

Ms. Youzwa: — Okay. Again, starting in 1999, the dividend paid was $63 million. In 2000 it was 69 million. In 2001 it was 16 million. In 2002 it was 82 million. In 2003 it was 169 million. In 2004 it was 59 million. In 2005 it was 85 million. In 2006 it was 61 million. In 2007 it was 97 million. In 2008 it's 46 million. In 2009 we're not expecting to pay dividends.

Mr. Weekes: — In your wrap-up of your statements, impacts of a growing economy, you referred to "SaskPower has firm plans for $8 billion" in capital expenditures, and the "specific decisions pending on the remaining 7 billion." Could you explain what the firm plans are for the proposed $8 billion in capital expenditures?

Ms. Youzwa: — Sure. I can talk about some of the more major expenditures. You have in there the transmission and distribution investments that Mike Marsh talked about, which I think come to a total of 2.8 billion.

You have included in that number the capital cost remaining to finish the generation projects that we have currently under construction. So there'll be some residual capital for the Ermine project and the QE projects that are going to come into service in December of this year.

We will still be in construction for the Yellowhead project, which will come in . . . The in-service date for that is December 2010. So there's capital in that $8 billion to complete that project.

We have put in the $8 billion place markers for the clean coal project, which is the conversion of our Boundary dam unit no. 3 into a carbon capture and storage project. And the capital spending for that will start in 2011 and continue to 2011, '12, and '13.

We have also put in those numbers some budgetary numbers of investments we'll have to make on pollution control equipment if we're required to clean up our air emissions to meet new national standards for what they call critical air contaminants — so sulphur dioxide, nitrous oxides, mercury, and particulates. And those would all be associated with fitting equipment onto some of our existing coal units.

Mr. Weekes: — Thank you. You also stated in your presentation there remains pending $7 billion of spending further down the road. Now could you elaborate a bit more on what that investment will go to?

Ms. Youzwa: — The remaining $7 billion is an estimate at this point of what we think the potential costs could be to meet that supply requirement that we've identified in our presentation. So you recall at the very beginning we said that over the supply planning period, we have a need to make decisions around 4100 megawatts of capacity. So some of these decisions have been made, as I've talked about — the generating plants we're building. We have put a placeholder in for clean coal, but we haven't made a decision there yet, and won't, until the end of next year, know whether that's something that will be proceeded with.

The $7 billion, that's an estimate of what we think overall generation costs could be to meet that supply requirement. We've made some estimates based on what could be, you know, a supply sequence, but certainly there's no commitments been made. We're still evaluating options and that number certainly it's really for scoping purposes. At this point in time, we haven't made specific decisions on what our preferred long-term supply mix will look like. We're still evaluating those options for the medium term and long term, but that $7 billion is kind of a placeholder for that.

Mr. Weekes: — Thank you. Well this is a huge investment that you're proposing. What will this mean for rates for the customers in Saskatchewan?

Ms. Youzwa: — Well I think that what we have described for you today is that we have a need to modernize our existing electrical system, and we're not alone in this. Electrical utilities across North America are all facing this type of challenge. Electrical utilities, I know, in Canada all see this as one of the most important issues they have ahead of them is, you know, being able to invest and renew the infrastructure that is aging and meeting the end of its design life.

Over and above that, we have requirements that we have to meet because we have a very robust economy. We are seeing strong growth across our customers groups, particularly in those

drivers of the Saskatchewan economy, you know — manufacturing, processing, resource sectors. We're going to have to expand the electrical system in the future. So the $15 billion is both for a modernization and more efficient system and also a cleaner system at the end of the day, but it will also build a larger system for the province of Saskatchewan.

If we're putting new equipment in place and equipment that is cleaner, if I can put it that way, than what we've built in the past, then certainly our expectation is that what we put in place in the future will be more expensive than that which we replace from the past. So what we put in place for new generation will be more expensive than the 50-year-old units that we're going to be retiring. And this is going to put pressure on costs and will put pressure on rates for our customers as well.

I don't have a specific number for you. I think that in any year from time to time, you know, there's a number of different factors that affect what kind of rate increase we need or maybe we don't need one at all that year. And so I don't have, you know, a number or a series of numbers to give you of what we're projecting. We know that there will be increases necessary from year to year. Those will vary. We certainly hope and plan to make, sort of, decisions around the right mix of options for our customers to try to keep those costs as low as possible.

Mr. Weekes: — Thank you. Well just looking at the historical rate changes, when you go back to, well, 1991, zero per cent, and then '92, 4 per cent — I'll go through them — but remained very low until 2009. And at the same time there was much less investment in our generation infrastructure while the rates were very low. And it seems to me that there was just a huge gap in planning around our aging infrastructure.

There was no secret what needed to be done in the future and power generation, either for growth or to just replace existing facilities. And as I point out, during that time, the government of the day, the NDP [New Democratic Party] government kept rates very low and also never invested in infrastructure on the capital expenditures for electrical generation. So now we're faced with, you're saying, $15 billion worth of investment. My question: has SaskPower been putting money into a capital reserve fund to help pay for these future expenses?

Ms. Youzwa: — No, we have not. We determine what our capital requirements are on an annual basis and then secure, you know, the funding that we require to execute those programs.

Mr. Weekes: — Did SaskPower ever ask to keep more money back instead of returning a large dividend in order to fund future capital infrastructure needs?

Ms. Youzwa: — Well SaskPower, I mean the infrastructure needs, particularly the need to rebuild and reinvest in the existing infrastructure, those are requirements that we have seen for some period of time because we do, you know, monitor and . . . the condition of our equipment, we know what its design life . . . We monitor what its performance is. We do planned maintenance and asset replacement, and so we were aware there was a need for us to invest in infrastructure. And so certainly those kind of capital requirements had been kind of understood. What has happened more recently that hadn't necessarily been the case a few years ago is we saw that tremendous jump in the economy and economic growth that happened starting in 2007 — and moving forecasted forward as Judy has described today — and which has really accelerated the need for us to do the capital reinvestment.

And so certainly growing capital requirements to maintain system reliability and security — yes, we were aware of that. And I think we certainly made the board of SaskPower and others aware that we would have capital requirements like that, so I think that was well understood. And we did start making some reinvestments in the last five to ten years.

Mr. Weekes: — Well that leads to, you know, the industry standard as far as putting money aside for future large investments. Do you know what other utilities, publicly owned utilities, have done in other jurisdictions have done as far as putting money aside for capital expenditures?

Ms. Youzwa: — I'm going to ask Sandeep Kalra, our chief financial officer, to join us at the table and talk about this.

Mr. Kalra: — Most of the public utilities are not putting money aside upfront. They are managing their debt/capital ratio so that remains, you know, at an adequate level for them to fund their growth and also for them to reinvest in the existing infrastructure.

Mr. Weekes: — During the last, well the 16 years of NDP government, did the minister responsible for SaskPower suggest that it would be a good idea to set some money aside for capital expenditures?

Ms. Youzwa: — Oh, I'm sorry. Would you mind repeating the question?

Mr. Weekes: — Well we're just asking about the former NDP government. In their 16 years of government, did any of their ministers responsible for SaskPower ever suggest to put money aside within SaskPower for capital expenditures?

Ms. Youzwa: — Not that I'm aware of.

Mr. Weekes: — Because as I mentioned before, when you look at the historical, rates were kept quite low and also the investment infrastructure was, well, not non-existent but certainly not adequate given the $15 billion that now has to be sent to bring the system up to speed. I find it interesting that the . . .

The Chair: — Could I interrupt there? There's getting to be some conversations across the table. The person presenting to us has asked for one question to be repeated, so I'd rather the conversation go between questioner and the answerers. Thank you.

Mr. Weekes: — Thank you. Well I'm just trying to key in on why there was a huge infrastructure gap and when you look at the historical rate charged during that same period . . . [inaudible interjection] . . . Well $15 billion is considered a huge gap in my mind. And the question I have is, how have large expenditures been handled in the past? Through rates,

transfer of some CIC [Crown Investments Corporation of Saskatchewan], or could you elaborate on that?

[15:15]

Ms. Youzwa: — We have funded our capital program in the past from a combination of investing retained earnings and borrowings, taking on debt.

Mr. Weekes: — I guess the question, going back to the lack of investment and low rates at the time, is whose discretion was it to ensure zero per cent or very low increases during that period?

Ms. Youzwa: — In my experience we have come forward with rate increase applications from time to time when we've needed rate adjustments to be able meet our financial targets. And so those are requests that SaskPower makes through its board, recommended to the executive and to the board, and then on to CIC, which then goes into a public review process. And so the applications that we have made, we have made when we felt it was necessary to meet those financial targets, and then it's gone through that rate review process and approval process.

Mr. Weekes: — Well that was the process. Decisions were made. But I guess the question I ask again is, why were small rate increases not made to avoid a much larger shock rate which we are experiencing now? And I assume it will be in the future because of the $15 billion worth of investment that will need to take place over the years, and there was no money put aside for infrastructure expenditures in the future.

Ms. Youzwa: — Well I would agree with you. We have taken and hold the view that if we're required to make rate adjustments and increase rates for our customers, we certainly see a lot of advantages in being able to move forward with regular rate increases. If we can do that, then we can keep the rate increases relatively moderate, and we're going to work towards doing that. And so, you know, if you can get rate increases on an annual basis, our ability to keep those rate adjustments at more modest levels year over year is much easier than if we have a rate application and then, you know, have a gap period of time and then come in with a rate application over a period with a gap of year or two in between.

So from a rate adjustment point of view, certainly there's good arguments to be made to look at regular rate increases. And we believe if we could do that, we could keep those rate increases certainly within . . . our goal is certainly to keep them within single digits and try to keep them as moderate as possible.

Mr. Weekes: — Thank you, Mr. Chair. That's all for now.

The Chair: — I have Mr. Belanger.

Mr. Belanger: — Thank you very much, Mr. Chair. I just want to point out first of all, a lot of good information, a lot of valuable information. And obviously given the context of all the information, of course you immediately have a number of people that have a number of questions just for clarification and certainly for a public consumption.

So I just want to suggest as a Co-Chair that one of the things that we would like to do — or sorry, as a Vice-Chair — is to have you come back. Because obviously we'll be hearing from some professional people in the areas of cogeneration, wind, solar. And we obviously want to have a comparison based on what SaskPower tells us and certainly what the private sector and the experts might tell us because there is a distinct difference between experts and the private sector. And I will point out that's one of the things I'd certainly like to do is to have you come back, and after a number of questions, because I know my colleagues and I can go on for a number of hours. And since you've made other plans after the wrap-up time today, we can't ignore the clock and continue going on.

One of the things I would point out is that we're not going to belittle the process by engaging in a political debate. But obviously one of the things that's really, really important is SaskPower be very upfront and open in terms of what their demands are. And this information that you presented to the committee today is very, very valuable. It's very valuable.

And certainly I think part of the process that we have been advocating as the members of the opposition on this particular committee is the sharing of information. And what we wanted to do is go with what the SaskPower needs are in terms of the people of Saskatchewan ought to know and need to know what SaskPower's demands are in the future. And once we have all that information from your very capable staff and from a very good corporation that over the years has built up, you know, its reputation, and we want to make sure that people have the access to information as we have here today.

I noted one of the comments from one of your officials — and I can't remember the gentleman's name offhand — but he indicated that it's not a new trauma in terms of having an operation such as SaskPower faced with some of these challenges. It's a good challenge to have when we have a growing economy, and it's certainly something that people in Saskatchewan ought to be proud of.

And in terms of your comparison with other entities similar to SaskPower across the country, that yes, SaskPower will always have to continue building and have to have their infrastructure upgraded from time to time and so on and so forth. So it's good to see that SaskPower is being managed well. It's good to see that SaskPower is sharing the information. And there'll be other information that we'll be given over the period of the next nine days that we would like to question you on some of the things that you've presented.

So I've got a few questions in terms of the breakdown, very quickly. But the document that you provided us today, I understand, is on the website for this particular committee. And I think the address — and correct me if I'm wrong — is www.legassembly.sk.ca/committees. That information that you presented today could be on that site or will be on that site so the public can actually, so the public can actually look at this and review it under their own time frame. So I want to make sure that people know that access to information is certainly there as to what SaskPower has.

Based on some of the infrastructure needs that you've identified, and you've determined today that you're par for the course from other companies like SaskPower in terms of demands for your infrastructure. I notice on my power bill, as a

household, that there's a small 2 per cent levy for infrastructure costs. What is that cost all about? And what kind of money does SaskPower generate from that each year?

Ms. May: — I believe you're referring to the municipal surcharge which is really a surcharge that we collect on behalf of various municipal governments. And my memory is a little bit imprecise here, so we will certainly make sure that we give to the committee a proper and definitive definition. But it is a charge that we collect on behalf of municipal governments — cities, towns — that have passed a resolution asking SaskPower to collect a surcharge from those customers in that particular community based on a percentage of the electrical billing for that community.

Mr. Belanger: — Just to correct, I am aware of the surcharge that some of the towns and villages are allowed to charge on their power bill. But this is a separate . . . I am pretty sure it's a $2 . . . I thought it was an infrastructure-related charge, but it has a different phrase on it.

Ms. May: — As perhaps my other colleagues are thinking, the only surcharge that I can think of that does not exist any more is a reconstruction charge that had been applicable quite some time ago; it was either the late '80s or early 1990s. Beyond that our rates are really based on three components: the basic charge, the energy charge, and the demand charge. So that is the structure of our rate.

But if you can provide us with the specific example, so I'm certain of what we're looking at, we'll certainly be happy to answer your question in better fashion than I'm doing right now.

Mr. Belanger: — Okay. Well I'll certainly present the bill, and I'll show the surcharge that I'm making reference to.

Ms. May: — That would be great. Thank you.

Mr. Belanger: — And in terms of the infrastructure costs that you're looking at now, in terms of, you know, the charges and the demands that you have, the cheapest cost for power, I believe, is hydro. Is that correct?

Ms. May: — Hydro utilities, yes, are in our industry are the utilities with the lowest electrical costs, yes.

Mr. Belanger: — Right. And I guess the next question that I would have from the northern perspective is, has SaskPower done a lot of research and work, and are they moving forward with an agenda or plan to look at damming the Churchill River as part of their ongoing need for more power generation? Is that within your radar within a 10-, 15-year time frame? Like how does SaskPower look at the hydro option when it comes to the Churchill River system?

Ms. May: — I'll turn that to Gary.

Mr. Wilkinson: — I can speak to that. So hydro, we have a number of projects that are of interest to it. In my discussions earlier, I mentioned that we have at least a couple of interested parties who are interested in developing hydro projects for Saskatchewan. One is in the centre of the province, pretty close to — I call it the forks — the confluence of the North and South Saskatchewan River. And the other project is in the farther north, closer to Fond-du-Lac. Those two are on — to use your phrase — are on the radar screen currently.

When I was discussing the 2007 situation, we thought both those developers and the Aboriginal groups in partnership would bring us options, and they did not. So we're kind of working with those groups to see if we can facilitate bringing some hydro projects to the fore. So SaskPower may actually help with either technical, operational, or even possibly commercial discussions.

More broadly on the hydro front and coming back maybe a little closer to the question that you've asked, is I hinted that SaskPower was setting up something called a hydro development unit. And that hydro development unit, its job is to facilitate those two projects that are of interest right now. It may have another job in trying to actually make the existing hydro run more efficiently, etc.

Thirdly it has an aging list of hydro potential for our province. It was done in the '80s, I guess, and it's an exhaustive list of the sites in Saskatchewan that have some hydro potential. It's really quite a good list. However some of the sites are mutually exclusive — if you built site A it would preclude building site B — so it has that going for it.

Coming to your question, on that list of hydro potential sites is one of the things that's maybe not active currently but was looked at, I think, in the late, I'm going to say, the late 1970s was a dam on the Churchill River. I think the name of the site that we used at that time was Wintego, but that's . . . and that was, I think there was a public review in the late '70s to see whether it should be a hydro situation or a coal situation back at that time. And I think that's probably about the time that the Poplar River plant was to proceed.

So yes, it's a potential hydro site on the list of sites that we hope this HDU [hydroelectric development unit] will dust off and renew. But it's not on, I call it, on the active list.

The two that are on the active list I would describe as that Forks project — anecdotally it's around 250 megawatts; the potential size of it is being discussed — and then there's another one in the North closer to Fond-du-Lac. It's smaller and it doesn't involve a dam so much. It's a run-of-river style. We talked about that a little bit before under the options. And the size for that one is around 42 megawatts, at least that was the last discussion we had with that group.

I'd be remiss if I didn't mention that there are at least a couple other parties very recently who've come to see us. I think one is on the Grease River in the North again. Again very, very preliminary, but there's some interest then in perhaps making that an active site as well. So the three active ones I would describe as Grease River, the Fond-du-Lac area, and the Forks.

And then the broader list of hydro potential will be dusted off and looked at in, I think, a modern context, which includes things such as effects and interest, such as Department of Fisheries and Oceans and others. Does that help?

[15:30]

Mr. Belanger: — Yes, it certainly helps. I think one of the proponents they'd probably make reference to was the Black Lake or Black Lake Indian Band, and I think their plan was a non-invasive type of hydro generation project where, you know, it wasn't dammed per se. It was this place in the water and the current would turn turbines. I'm not familiar with all the details. But that kind of concept, I think that's probably where you're getting a bit of the information in terms of the far northern bands had that interest.

And then there's the competing vision and plan of some years ago that the Churchill River would be also an option being looked at by SaskPower, and so there's a bunch of questions from the northern perspective on where that sat compared to the Black Lake Band proposal.

When you guys do evaluation in SaskPower, I would assume that you're taking into consideration, when you do a project, your proposed development of generating more power. Whether it's refurbishing an existing station or building other facilities, that you take the entire cost right to decommissioning and to doing the environmental monitoring and reducing your footprint on the environment and so on and so forth. Am I correct in assuming that?

Mr. Wilkinson: — Maybe I'll answer that this way. Yes, we try to make the costs as all-inclusive as possible, including the decommissioning at the end of life.

In terms of the environmental costs, we try to make sure that the performance of whatever option we're evaluating meets the environmental requirements that are in place and foreseeably in place. And so right now when we plan a unit it has to meet the emissions criteria that are in place so the unit can actually be onside, I guess is the right word, with emissions regulations of the day.

And even where we think there are regulations that are not yet in place or maybe the rules are not set, to use our president's word we often put in a placeholder, a very rough estimate of what we think those rules might imply for that option. And that's taken into account as well, even though it might be not firm in terms of the actual regulations that we do have to meet subsequently. So we try to put in a placeholder for the future regulations.

So to answer your question maybe a bit more fully, when we do our planning process we will make an assumption around the cost of dollars per tonne for greenhouse gas regulation and bring that into the planning process. We will make an assumption about the SOx, the NOx, the particulates in the mercury, and even though those regulations are not necessarily in place, if they apply to the option that we're assessing we will put in a placeholder, or an estimate to give it a — I guess you'd call it — a fair shake or a reasonable shake.

Mr. Belanger: — I want to point out that this is a fairly significant, challenging time for SaskPower and we certainly appreciate, you know, the dilemma and the opportunity that the corporation has now, and the people of Saskatchewan obviously want to know more. And some of them may not, but I think the vast majority of the people will be forced to understand how our Power Corporation works because they're obviously a big part of the customer base and they are in a sense the owners of the Power Corporation and they ought to know what challenges face the company itself.

When the Power Corporation was formed under Tommy Douglas, I think one of the things that people wanted to do was to understand electrification of rural Saskatchewan, building our own power company, and strengthening it. It was really important those days, but today now there's a huge challenge in front of it and the Saskatchewan people want to retain ownership, but they also want to participate in trying to find options to strengthen it and the environmental regulations with the greenhouse gas emissions and the challenges that . . . just a phenomenal challenge that the power company itself faces.

So given the fact that you see the mood of the people, you see the challenges, there are different roadblocks ahead, either that we have now as opposed to having then and so people are now trying to participate in a way — to say, have you looked at this option? There's a lot of good advice out there. And any good person worth their salt would listen to it. You certainly don't have to use it all but listening to it is pretty important.

In your R & D [research and development] in the development of your power supply, how much time and effort does the corporation — not the politicians, but the corporation itself — spend on research and development options when it comes to coal versus hydro versus wind versus solar, geothermal, etc.? Do you have a breakdown of how you concentrate on these different sources of potential power supply?

Mr. Wilkinson: — So in my remarks I'd mentioned that when you're trying to keep your eye on this much technology you tend to do it in a couple of ways. At sort of a very high level and in conjunction with folks like the Canadian Electricity Association, I would suggest that we tend to keep an eye on a very broad spectrum of technologies, but in kind of a light way

And to answer your question a bit more directly, in places where we have to go the next layer — and you used the phrase R & D, research and development — one of the things we are doing, for example . . . And you mentioned clean coal. We initially started at a very high level to see if it held promise. And as we had a more detailed look at it, it looked like it was worth pursuing. And I won't have these numbers for all of the technologies, but I think they're illustrative of the depths that we are prepared to go to look at some technologies as SaskPower. I think we set a budget of $20 million to look at the first manifestation of clean coal. And that was something they called an oxy-fuel process; it proved to be very expensive.

So we regrouped and wanted to look at the rebuild of an existing unit, not a greenfield site. And this is the one we were talking about earlier that Mike Monea is currently taking a look at. We were fortunate enough to get some federal support for that. I believe the amount of federal support to develop a project was in the order of $240 million. And I would suggest that in our efforts for R & D we will spend some portions of $100 million trying to wrestle this down to the ground. That's but one technology. And maybe I'll just talk on a few others, if you'll just give me a little bit of space.

One of the things we are interested in, and if you heard me, we're interested in wind generation. I would say SaskPower has taken kind of a stepwise approach to that. President Youzwa talked about some of the earlier ones that were maybe 11 megawatts in size. The idea was to see if that technology would work here in what I'd describe as a decently harsh climate. Those early efforts with the smaller wind projects — there's still high towers and they're still commercial size— those were successful. We found that the technology could be handled. It could survive our conditions and it was telling us that the technology would work here and it would work well.

And so again we probably took the next step in terms of the investment and the technology to develop a larger wind farm. I believe the centennial wind farm, the investment required to make that a reality was around $240 million. And so now from that we've found, I'd describe, a very successful wind regime; a very successful output. I mentioned that 40 per cent capacity factor. That is particularly attractive in the wind world; that's maybe a bit esoteric.

And so now we took another group inside the corporation to do a little further research and that's that wind power integration and development unit that I spoke of earlier, the WPIDU, if that's not too . . . And we took some people away from their regular duties and asked them to assess. So we invested their time and effort and studies, etc. So we invested in that to see how much farther we could take the wind, I would suggest, coming down under the R & D umbrella, which is the kernel of your question.

We also paid for, essentially, I'm going to call it the distributed generation study, where we brought together all the wind producers from across the province. And in an anonymous way we shared the data and had that independent contractor assess, you know, if you spread the wind around, are there better ways that you could make use of the wind regime in Saskatchewan. We invested in that as well. I don't have the dollar figure for that, but it's not as large as perhaps some of the earlier ones.

For the hydro development — and I won't go on ad nauseam because you've heard quite a bit of this already — the hydro development unit will be single digit numbers of people. I suspect that our interest in seeing hydro developed inside Saskatchewan, we won't know for a while yet what kind of stake or investment we're going to have to play in that. We've kind of offered our services.

And I'll come back to the one that perhaps you'd mentioned a little bit specifically was the Black Lake in that Fond-du-Lac River kind of area. That is one of the active ones, and we've offered some support.

Anecdotally, a corporation was formed up there to handle the affairs of the band. And when it came time to supply members on the board of directors, SaskPower was more than happy to recommend a couple of names. On that particular board, we have an ex-vice-president from SaskPower and we also have an ex-manager of environmental programs, both of which we think can help facilitate the development of what I call is an active project at that site.

Admittedly these people volunteer. We didn't push them to do that. And maybe that's not our investment, but it is indicative of the kind of support we're willing to provide to try to get an option developed. Does that help?

Mr. Belanger: — Yes. I just wanted to point out though, it's quite important that SaskPower understand from our perspective, as members of this committee, we want to build SaskPower and make it very, very strong. And you can make it very strong by making it customer friendly, inviting partners in a very good arrangement for the people of Saskatchewan to be of benefit to that arrangement to that partnership or business deal. And all the while, quite frankly, being aware of some of the challenges attached to SaskPower. So I just want to make sure I reiterate that comment that my colleagues and I had made from time to time. So I think the important point being that the people of Saskatchewan will be coming to SaskPower.

And I think one of the criticisms that I've heard of SaskPower is that SaskPower is, quite frankly, hooked on coal, and it's really dependent on coal. And we obviously can't turn off the lights and turn off the heat. And given the political environment in not just Canada but the world in terms of greenhouse gases, that we have to somehow wrap our heads around, how do we address that particular challenge facing the Power Corporation?

And so, you know, we certainly, when I say it's a really serious matter, it's a very, very daunting task that the corporation has. I want you to know that we understand those particular challenges and that we want to be part of the solution. And that's why our process in the committees is going to continue being very . . . we're going to participate thoroughly and continually.

So in terms of the actual . . . And that's one of the reasons why people come to us and say, has SaskPower looked at this option? Has SaskPower looked at that option? And that's the crux of my question. In terms of the ability and skill of the people within SaskPower, I would suggest that as opposed to the flawed process of the UDP process, that we ought to as a power company, as a power corporation owned by the people of Saskatchewan that helps drive the economy of Saskatchewan, that we ought to provide resources perhaps from the government to do a fair and thorough undertaking to study all these options by giving them the proper resources and the proper experts. Because one of the things we want to do here as committee members is you want to do a side-by-side comparison — a thoughtful, well-crafted, side-by-side comparison — consisting of expert testimonial, and of course people that are advocating for their wind power because you'll have some companies that will want to push their product and that's fair.

So that's one of the questions why I think as a corporation that we think that if the government doesn't want to do it — and we've seen the evidence that they don't want to do it — that I would suggest that the Power Corporation itself undertake that measure. Because, after all, you are running a business, and having those R & D dollars set aside and the resources and the time set aside to really truthfully and truly look at those options is something that the corporation ought to do, and something that we have been pushing the current government to try and do as well.

So I guess I'd go back to my earlier point is you never really gave me a percentage of hydro versus geothermal. Is there a percentage that you can give me today in terms of what R & D dollars you're committing to each of those sectors?

[15:45]

Ms. Youzwa: — We could go back and see if we can pull together some numbers that might give you a better feel for the split, but let me just say this, is that we have a department in SaskPower which is the department that Gary Wilkinson is responsible for and that's our planning, environment, and regulatory affairs group, and they are responsible for planning the system. And so we have experts in SaskPower who are going to forecast the requirements for a grid, a network, who are going to take Judy's load forecast and are going to look at the various supply options that are available to fill those requirements and compare the different options and be able to come forward with analysis that allows us to see how they rank against each other.

This is a capability that SaskPower has had for decades. We have been looking at sort of, you know, longer term supply requirements for many years. So we have that core capability within SaskPower.

I think that the comment was made that we sort of are too fixed on coal, but I think it's fair to say we haven't built a coal plant since 1992. We've really diversified our sources of generation since that point in time. Within the peer group, we're building capacity to allow us to further analyze a wider range of options so that we can do that analysis and be able to provide information to make good decisions. And so the hydro unit that Gary's talked to is in his group, and the wind development unit will be in his group. All of those will come out of the planning area.

Some of the work that we do there, of course we'll use our own internal expertise. We do have, you know, system planning experts within SaskPower who are technically knowledgeable and also knowledgeable about the system itself. But we also go out and we secure, you know, expert assistance as needed so that we can understand those other kinds of options. And we do that on a regular basis. We'll go to, you know, consultants and experts wherever we can find them to supplement our own expertise. We'll also talk to developers who may come to us with projects and ideas and technologies that we're not expert in, and have them help us understand how they may fit into our system.

So we do have resources within SaskPower. To meet the challenge ahead of us, we know we're going to have to supplement those resources. Some of that will be internal. Some of it will go to external experts and bring it in. Some of it will look to developers who can bring us new ideas and new projects that we haven't had. And any of those options, at the end of the day we're going to have to have an understanding of how those options, what they mean for the system. Because any one, whether it's a project that SaskPower builds or whether it's a project that an independent power producer builds, they will sell the output from those projects to SaskPower and then we in turn will resell it to the customers because we are responsible for the retail distribution, the retail side of electricity in Saskatchewan, and so we need to understand how all of those options fit, whether they're things that we have built and operated or whether things that we would contract with others to buy. So that group within SaskPower will have the capability to evaluate it and be able to provide information analysis to inform decisions.

Mr. Belanger: — My final question is in terms of the . . . If I can get a list of some of the experts that you speak to who . . . I'm assuming their expertise are unbiased and professional in the sense of saying, okay this would work in this system; it wouldn't work in that system. Because some people would say, well SaskPower is really not forthcoming because the guy that's giving us advice on the wind is really working for them, so he's not going to go against the corporation. He's going to kind of, you know, be part of the corporate mentality so to speak. It's a fair critique. It's not a criticism, but that's kind of what the general feeling of the odd person might be.

So getting a list from you of some of the independent experts that you've spoken with or the corporation has dealt with or the consultants that you've had discussion with, that would be very much appreciated because it gives us kind of an idea as to what people are you speaking with.

And the final question I would have in what we're trying to do here with SaskPower is that you're obviously looking at the demand because you've got to meet your demand. But I was quite pleasantly surprised to see that you're also looking at the customers and how they can help you do a couple things: lower their drain on the power — I'm not saying it in a negative sense — but also how they can add to the grid. And also recommending heating systems for different kind of community centres. Because obviously if you heat the community centre with something else besides power, it saves the drain on your load, right?

So that's what I think the Saskatchewan people would like in this process, is how can we contribute to meeting the demands of SaskPower by two things: reducing our own drain on the Power Corporation in terms of our air conditioners and so on and so forth. And secondly is, can we somehow contribute to the grid or provide another source of power? And that's where the UDP failed miserably because people weren't given that opportunity and they weren't given the resources nor were they given the financial means to really thoroughly look at all these options.

So what you have is you have SaskPower needing the power and UDP process being put on the people, and the people felt excluded, yet there's a lot of good ideas. And my father used to tell me, half of being intelligent is knowing what you're dumb at. So ask a lot of advice, there, Buck, he'd say. So I ask a lot of advice. And what people of Saskatchewan would like is information and to participate. And so far, based on what we've seen from the UDP process and this particular government, they've been ignored on both fronts.

So I think as a corporation owned by the people of Saskatchewan, it's one of the messages we wanted to drive home today, I wanted to drive home today.

Ms. Youzwa: — Let me make a couple of comments. Let me

give you an example on the expert side. So for example, on the clean coal project we're working on, BD [Boundary dam] 3, we are working closely with Stantec, which is a world-class consulting and engineering company. Last week they announced that they are going to create their Canadian clean coal centre of excellence in Regina. And they've created an office in Regina and will be hiring between 30 to 35 people to work on clean coal technology.

So that's an area where we have gone and sought sort of the expertise of others and are working in partnership with them. So that's one example. And that's what I was referring to before.

In terms of information, we hope that the paper that we've provided the committee — the PowerPoint presentation and the extensive presentation and information we walked you through today — will meet some of the information requirements and interests of the public in looking at what our energy supply challenges are and what some of our options are, and in particular what SaskPower sees as its supply plan and strategy. And this process of the committee as inquiry and hearings was certainly an opportunity for the public to become informed and respond to the information that we've shared with you today.

The Chair: — I have Mr. D'Autremont next.

Mr. D'Autremont: — Thank you very much, Mr. Chairman. I'd like to welcome SaskPower — Ms. Youzwa here, and your colleagues — to these committee hearings. I think this is a very valuable exercise for this committee and for the people of Saskatchewan.

But after listening to Mr. Belanger's comments, I am flabbergasted by some of his accusations. I find them very reprehensible that he would imply that SaskPower would threaten or coerce any of the presenters to this committee to come forward in a manner that would be beneficial to SaskPower and not be able to respond to this committee in the manner they felt appropriate.

And I think that accusation by Mr. Belanger should be withdrawn, and that he apologize to the committee and to SaskPower for implying that kind of an accusation. That may be the way he operated, that may be the way his colleagues operated, or how they would like to operate, but that's certainly not the way that I have seen SaskPower operate.

I haven't always agreed with SaskPower — and I'm sure some of you are aware of that — but I always found them to be very professional in their operation and prepared to listen to the discussion and the discourse and respond in an appropriate manner, either for or against whatever it was that I was arguing, but nevertheless in a professional manner. And I think to make that kind of an implied accusation is totally beyond the pale. And Mr. Belanger should apologize for that.

I also am quite interested in his comment about the UDP, that there was no opportunity for the public to have their input. There was more than 20 hearings held across this province that allowed for individuals, groups, whomever might have been interested in the process to come forward and present their information.

He also called for SaskPower or the government to pay witnesses to come forward to this committee. Again I think that's completely wrong.

Over the last 10 years you listed a number of projects that had come forward, new generation projects most of which were done with the private sector but some of which were done completely by SaskPower — the two wind projects out in the Swift Current area. In all of those projects or some that happened before that under the NDP, were there ever any public hearings?

Ms. Youzwa: — In the last 10 years, I'm not aware of any public hearings.

Mr. D'Autremont: — That's my understanding as well. I just find it amazing that all of a sudden when we are having public hearings — both the UDP and this process — all of a sudden we're not having enough public hearings on generation, on the electrical needs of this province. And yet the members opposite are demanding more and in their 16 years of government they had zero public hearings, zero public hearings.

The only public hearings that I recollect taking place dealt with Rafferty and Shand projects through the '80s and into the early stages of 1991-1992 at the wrap-up of Rafferty-Alameda project. But there was no discussions, no public hearings on new generation while the NDP were in government and yet today we hear them demanding more and more hearings, more hearings, and yet they provided no hearings, and you just confirmed what was my belief that there were no hearings, especially in the last 10 years.

So I think what we see here is a significant mischief by the members opposite on this issue to try and promote a particular agenda where we're giving people the opportunity to have a say and to learn and understand. And, Mr. Chairman, I would appreciate having the floor. Thank you.

We've had an opportunity here now to have hearings, to start these hearings. I think it's an excellent opportunity for the members opposite, for the members on the government side, and for the general public to get a much greater understanding of the needs of electricity in Saskatchewan — that it's not simply a case of putting up a generation system and turning on the switch and you have electricity running your lights. There is a lot more involved in it than that, and yet all of us had the impression that you simply need to put new generation online and it meets all of our demands. Well it certainly doesn't. Mr. Wilkinson talked very much about balancing, and that is a very, very large component in what you need. Yes, you need to be able to generate it, but you need to be able to utilize it and move it around as needed.

So that's why I find some of the operations though of SaskPower to be somewhat mystifying. I won't say surprising because it doesn't surprise me, but mystifying that when we have a need for capital expenditures, we know that our system is old, that we need to either refurbish, rebuild, or acquire new generation capacity, that we haven't been carrying out, at least in the public venue . . . SaskPower I know has had plans in place to meet the generation needs that Saskatchewan would need if they had approval to go ahead.

[16:00]

I look at a news announcement that was made back in 2006 where the premier of the day, Mr. Calvert, is signing on board for a $1.5 billion clean coal plan in Swift Current. And it says in there, to quote Ms. Youzwa, that Saskatchewan:

> . . . is expecting a shortfall of 300 megawatts by the year 2012 and a potential "gap" of 600 megawatts by 2016. If approved, this proposed clean-coal plant, which would generate 300 megawatts of electricity, [would come into] . . . service by 2011.

Well in 2007 that program was killed. So all of a sudden we have a need for 300 megawatts by 2012, and no plans on the books on how to put that in place. And that was under the previous administration.

I'm sure SaskPower had some plans in their hip pocket, some understanding of what they wanted to do, but it certainly wasn't being moved ahead by the former administration,
nor was the capital funding being put in place.

As you said, you plan on a year-to-year basis for your capital needs. And yet you know that by 2016, you're going to have a shortfall of 600 megawatts of electricity. You would think that there would be some planning put in place, some capital reserves put in place, some capital structure plans put in place to deal with that kind of an infrastructure cost.

I look at the rate increases that were put in place — rate increases that could pay for today's operations on the year that they were put in place, rate increases that could provide some capital for reconstruction. And I do remember the reconstruction charge that was in place — I believe it was $14 because I had to pay it on two of my installations, even though one of them was always the minimum charge — and yet that reconstruction was very limited. In fact, the Provincial Auditor was the one who insisted it be removed because it wasn't being used for reconstruction.

So when you look at the rate increases that went in place, 1999 had a zero rate increase. What else happened in 1999? Oh, we had an election that year. 2003 we had a rate increase that year of zero per cent. What else happened in 2003? Oh, we had an election that year. 2007, yes we had a rate increase — 4.3 per cent. It happened after the election in 2007, and that's why there was no rate increase in 2008.

So what I would like to ask you, Ms. Youzwa, were you getting any direction from Executive Council, from cabinet on doing capital projects? Were you getting any direction on rate increases? Were you getting any direction on dividends?

Ms. Youzwa: — So you're looking for response to capital rates and dividends? Let me start with dividends. The dividend policy that, and the dividends that we pay, that policy is set by the Crown Investments Corporation. And those policies were put in place and approved and then they're applied to SaskPower. So those policies were set and whatever the policy of the day was, we then paid dividends in accordance with that policy. So those were not policies that SaskPower set; those were set by the holding company.

The rates, as I say, we've come forward with requests for rates adjustments. Again we need to go through review and approval processes to do that. And we've come forward with those applications when we've had to. For those years where there may be zero increases, there may have been other constraints as to our ability to go forward with the review process and a request at that time. But when the rate review process was in place and accessible to us, we've gone forward with the applications and requests that we thought were necessary.

What you see for the increases here is what was approved. And those approved rate increases were the recommendation of whatever review process was in place. Most recently that's been the Saskatchewan rate review panel.

On capital projects, we do, as I say, plan an annual capital budget and seek approval for that. We have been forecasting, historically we've run out capital forecasts for five years. Starting last year we've now started to run it out over 10 years. And you can see why we've taken a longer term time frame because you can see that many of the issues and challenges that we have ahead of us, we really do need to have a longer term view of what capital requirements are, and the implications of choices that we'll make on capital spending and the capital structure of SaskPower.

With regard to specific projects, capital projects, when we've gone through the capital projects which are sort of investments, if you will, in infrastructure and upgrades and extensions, those have been by and large identified by SaskPower and then taken to its board and built into its business plan and into its capital programs which have been reviewed by CIC. And our capital projects budgets every year are approved by the holding company. And that's principally, well in large measure, because any borrowings that we require, we of course do that through the province of Saskatchewan. So our overall capital program every year is recommended by SaskPower and then reviewed and approved by CIC.

On some specific capital projects, when it comes to for example the addition of new generation where the expenditure and the commitment's very large, those are cases where we may go to our board, but also then seek approval of the holding company and cabinet as well.

Mr. D'Autremont: — Thank you very much. You said that CIC sets the dividend rate. Did those dividend rates vary from year to year?

Ms. Youzwa: — They did and I don't . . . There's different thresholds. We would pay different amounts depending on where we stood relative to our target debt/equity ratio. I can certainly provide to the committee what we understood the dividend policy to be over the last 10 years, if that would be helpful.

Mr. D'Autremont: — That would be helpful. As well you said there were certain constraints that were put in place in dealing with rate increases. It's my understanding that while any of the Crowns, including SaskPower, applies to the utility rate review panel for a rate increase, cabinet has the final determination on what that will be and whether that will go ahead. What were the constraints that you spoke of? And did the rate review panel

come back with a recommendation for or against any amounts that you may have applied for, submitted for review? And did cabinet change them?

Ms. Youzwa: — On the request versus the approved rates, we made applications to the rate review panel — and I can only speak to the last 10 years because that's as long as I've been with the company — I believe of the requests that we made, only once did we get what we had asked for. There were minor adjustments made. I believe in all the cases the recommendation of the rate review panel was accepted by cabinet and approved.

Mr. D'Autremont: — Okay. And what were the constraints?

Ms. Youzwa: — In some years, particularly if it was an election year, there was not access to that review process. Those things were, you know, we weren't able to access that process, which takes several months to both make application and go through public meetings and then go through decision making. And so, you know, that kind of review process just wasn't accessible in those years.

Mr. D'Autremont: — Thank you. When I look at your energy forecasts graphs and your peak load forecasts, I see in 2009 that there will the loss of the Success station if it breaks down. So you've taken it out of your calculations, so that's a loss of 30 megawatts.

In 2011-2012 — and I didn't write down just which ones would be coming off-line — but you're looking at a loss of 322 megawatts unless you refurbish. In 2014 you're looking at the loss of another 229 megawatts — again loss if you don't refurbish or replace. So between the growth that you're projecting of 3 per cent, the loss of this generation capacity, you're looking at a greater than 21 per cent shortfall in generation capacity by 2014. Even without the growth in place of 3 per cent, your annual growth was 1.3 per cent over the five years, so there you're looking at six and a half and another six. You're looking at about 13 per cent shortfall in place. Why would SaskPower not have been planning for that loss over the last number of years if it takes seven to ten years to bring baseload online? You can't bring baseload online today in this time frame.

Ms. Youzwa: — It would be helpful if you could give me the page number of the chart you're looking at.

Mr. D'Autremont: — 26 and 27.

Ms. Youzwa: — 26 and 27. Okay. Probably best to look at the peak load forecast because that's really what drives our capacity requirements. That's the amount of capacity we require to be able to meet the peak at any point in time in that year. In terms of our plans and what we had been looking at in terms of meeting the gap, we were looking . . . We did understand that we were going to have to add capacity to the system. We added a 150 megawatt wind farm in 2005-2006. Wind is an energy product; it's not a capacity product. And we did know, as we were forecasting load growth, that we were going to be capacity short and were going to have to add capacity to the system. We were evaluating a range of options. We certainly did put a lot of effort into the clean coal option, and there was a lot of public awareness of that.

At the end of the day, we found that we could not go forward with that. But we had a 300 megawatt, at that point, a 300 megawatt need that needed to be filled. And so we had been running, in parallel to the clean coal option, an evaluation of what other options were available to us. And certainly the gas-fired generation options is what we ended up turning to. So what you've got in the three projects that are being built today is that simple cycle gas turbine option, which Gary spoke about extensively, were put in place to fill that gap.

What happened after that is we saw load growth really take off on us and jump significantly. And what we've done is accelerate other plans to fill that gap. So in parallel with the construction of those three gas-fired generating projects, we issued RFPs for another 100 megawatts of peaking power and another 2 to 400 megawatts of baseload capacity. And the RFP for the peaking generation has been completed, and we've awarded the contract. And we will finish our evaluation, and we'll be looking to put in place then commitments for the 2 to 400. So we had been running parallel options to clean coal. We've moved forward with the gas. We've had to accelerate other options just to meet that increase in load.

Mr. D'Autremont: — Okay. Page 44, your operational challenges. It shows low load and peak load. If Gary wants to, he can answer this. When I look at this, both coal and gas — and gas just because of the way you've drawn the graphic; it could've been hydro in the gas position — but with those two entities, you're still not meeting what could be considered the baseload need in Saskatchewan. Has that baseload need, how has that been changing over the last 10 years? The low load requirement.

Mr. Wilkinson: — I can speak to that. As you add load as of the residential variety, you find that the daytime peak tends to climb but the overnight stuff doesn't. As you add industrial load, you find that both the daytime peak and the evening peak — particularly if they're still producing potash, uranium overnight; if they're running three shifts — they tend to consume the electricity all the way through the evening as well. So it's kind of a mix.

[16:15]

The load growth over the last 10 years has been both industrial and sort of residential-commercial. And so the commercial operations that have their lights on and do retail business during the day, you tend to see the load in that time frame. Restaurants that come on and that kind of thing, again you see it in the day, but later in the evening you see that load come off. Industrial customers, you tend to see that load more flat across the way.

So to answer your question more directly and succinctly, I suppose is over the last 10 years, particularly with industrial growth, we tend to find that the low load is starting to creep up.

Mr. D'Autremont: — So there was room in the system then, or a demand, that could be met by baseload. The baseload need was increasing.

Mr. Wilkinson: — Yes. So coming back to the operational things that we observe on the power system, we use the phrase, if you're having to back into coal at night — in other words,

forcing the coal down — and that's not a really good fit for that technology, but sometimes you have to do it.

Just after you've added one, you will find yourself in that mode for quite a while. When we added things like . . . and I'll just discuss perhaps the Meridian Station. When the Meridian Station, which came in '98 — probably came on by '99-2000, that neck of the woods — that was pretty much a baseload gas plant. It's one of those ones we talked about on the technology front, where's there's a guy who's taken the steam away as well, and that plant has to be run in concert with the steam host and the electricity thing. That was pretty much a baseload operation.

And so even when we added that baseload into the mix with the coal that we already had, we found we had to be very, very careful at night because from time to time we were still backing into coal, causing the coal to come down a little lower than its most efficient point.

So when you hear me talk about that, when we put the wind in, if the wind starts to blow at night and the Meridian facilities has a must-run component and the coal is on, and I happen to be in a period where the spring runoff is causing me to must-run my hydro too, you find that that baseload — that must-run component, that stuff that has to be online— we can still touch it.

Mr. D'Autremont: — Well I note in that graph on 2008 with coal and gas, it looks like twice it met the low load requirement.

Mr. Wilkinson: — Yes, the idea is not to bump in regular. That's really the goal, is not to mess into the baseload technologies very much if you can help it. That's correct.

Mr. D'Autremont: — You gave us also a list of costs for the various types of construction. And you quote two different costs on it — costs of kilowatt hours at a certain rate and cost of kilowatts. Okay. They're different?

Mr. Wilkinson: — Yes.

Mr. D'Autremont: — Why?

Mr. Wilkinson: — Okay. So right now I have some generation on the system, and it costs us some money. Obviously I might still be paying a little bit of money to the bank. I obviously have to staff it. I have to put fuel into it. I have to do a bunch of things. In the SaskPower system . . . and I think that's the 5.78 cents that was listed. And that kind of takes all your costs into account and says, in a year, what did that thing cost you? Okay? So that's the existing situation.

When we look at the options that we discussed, and we gave you those two costs, one is the cents per kilowatt hour. And it says by the way if you had a bank payment and a fuel payment and a manpower payment and all that kind of stuff, how would you describe that all-in kind of cost? And that's the cents-per-kilowatt hour. And I'll describe that as a 2010 cost, I'll describe it as a first-year escalating kind of cost, which means it can be expected to go up with fuel escalation and manpower escalation and those kinds of things. And that's how you'd describe the cost.

The other one, which is in thousands of dollars per kilowatt, that tends to say to build the machinery, depending on its size, you'd multiply the number of kilowatts times that number to figure out what it would take to actually build the facility. It is just to build it; it's the overnight build cost. It's not the cost to run it and it's not the cost of fuel, etc.

Mr. D'Autremont: — So this is just the capital cost of the construction?

Mr. Wilkinson: — Yes. The $1,000 per kilowatt is really what it would take to build one in 2010, and if it was 100 kilowatts you'd multiply that number by 100. If it was 1 million kilowatts you'd multiply it by 1 million.

Mr. D'Autremont: — Right.

Mr. Wilkinson: — Okay.

Mr. D'Autremont: — When you look at the cost of wind on this, if you were looking at a 24-hour supply of electricity — because I want my lights to work 24 hours a day; when I hit the switch I want the lights to come on — when you look at the price of wind, how do you calculate then what the cost is going to be for my lights to always work when I want them? Because you obviously . . . If we look at the graph, I mean, it's from one end of the board to the other end of the board here on wind generation. So you're going to have to have something backing wind up. So you're going to have capital costs on that. You're going to have standby costs. How do you calculate what the real cost of wind is?

Mr. Wilkinson: — Okay. Here we go. And it is a little bit tricky, so I'll back up a little bit and just remind you that when we were talking about serving the load in Saskatchewan, is the load itself tends to bounce around a little bit. And we talked about Evraz, and we talked about pipelines turning stuff on, and lights in all the restaurants, and all that stuff.

So the load tends to bounce around a little bit anyway. And so SaskPower is required, because of all that balancing thing that we discussed perhaps this morning, SaskPower is required to have a certain amount of generation — which is often machinery and fuel and a few other things — ready to correct those tie lines because the imbalance shows up on our tie lines and the systems of our neighbours that we're hooked up to.

So because I'm serving the load, I have a certain amount of variable generation that I have to have ready to balance my generation and my load. I have to have that anyway. So as I add wind, I find out that if I add a little bit of wind it doesn't require me to add any more of that load-following stuff because it's not as troublesome as the load is by itself. As that amount of wind comes up, the cost of that regulating capacity that I have to have for balancing, as I bring up more and more wind, you begin to see that you're going to have to carry more machinery that is ready to pick up the swings.

When we talked about the wind power integration and development unit, one of the things that they did is they did a statistical analysis of saying you have to be ready to balance your generation load by this amount just because you're in the load serving business.

Statistically they started putting in more and more wind. And what they said is, we think you can go approximately — the same again — approximately double the same amount of wind that you've already got in. And that's that 200 megawatts that we talked about earlier. You can put that in, and you will probably not yet drive statistically significant or unmanageable amounts of extra machinery to regulate. Beyond that, if I go much beyond the extra 200 megawatts, they're saying you're either going to have to add extra machinery to correct that variation which is now the sum. The variation is now the sum of — and I don't mean to pick on Evraz — it's the sum of the load variation and wind variation.

So the plan as it stands says until we find a way to store that wind, this is about as far as you dare go before you start to incur extra cost. Now that's a statistical analysis, etc.; we think it's decently robust. But because we're correcting the load all the time, some of the time the wind goes up when our load goes up, and so I don't have to do anything. But occasionally the wind goes down when the load goes up, and I get an extra whack.

What they're saying is, statistically if we don't go much farther than just doubling what we've currently got, the effects will be manageable. And that really assumes that Judy May's load forecast is correct because we're assuming that the low load is also coming up with all this industrial load growth that she's described for you.

So at this point with the wind plan that we've got, so far we don't think it's causing a whole bunch of extra expense. We think we can go up one more step, and we think that that there'll be some impacts, but they'll be manageable. Beyond that I think we're now into that realm where we're going to need some extra machinery or some extra controls or extra balancing equipment.

Mr. D'Autremont: — Okay. When you say extra machinery, you mean additional peaking generation.

Mr. Wilkinson: — At this point I think that's a valuable assumption to make. Yes.

Mr. D'Autremont: — Okay. Thank you. A couple of other points I wanted to comment on. The interties — we currently have six and a half, let's say.

Mr. Wilkinson: — Fair.

Mr. D'Autremont: — Because the one up in the far north doesn't connect to SaskPower, it's strictly a Manitoba connection. Is that the case? It shows that on the map. I don't know that . . . Or do we have something up there generating as well?

Mr. Wilkinson: — Maybe we'll talk about that a little bit. We say seven. We say seven under connections. And so there's one into Alberta. And it's that one has . . .

Mr. D'Autremont: — Two into Alberta, isn't it?

Mr. Wilkinson: — Just the one line right now. It goes from . . .

Mr. D'Autremont: — Isn't there one down at around Leader, Burstall, and one up at near Lloydminster?

Mr. Wilkinson: — No. We don't tie into them up there. Those systems are not in synchronism, so you need one of those boxes — we call them the HVDC converter stations — between us and them. So the tie line that I talk about to Alberta goes from Swift Current to a place called McNeil that has that converter station and it hooks in there. That's one.

We have one down to the United States, comes out of Estevan area, Boundary dam area, into a utility down there called Basin Electric. We have three in the south of Saskatchewan between ourselves and Manitoba: Boundary dam into a place called Reston; Boundary dam, Brandon; Yorkton into Roblin area. And then there's one from our E.B. Campbell plant which is in the Carrot River area, and it goes into a place called The Pas. Those are the three in the south, so I'm up to five so far.

When we get up into the Flin Flon area, it's a single tower line, but it's got two circuits on it, so we count that as two ties. Anyway you're probably closer with your six and a half, but there's two lines go in there.

One of the hydro stations that President Youzwa had talked about is called Island Falls. It's in the Flin Flon area. It was built for the Flin Flon mining. We took that over in 1981. And we had two choices at that time: build a line — a new line — from Island Falls plant in the Flin Flon area down into the southern system so that that generation could find its way down to meet the load, or we had a very good relationship with Manitoba Hydro who had lines in that area. We set up an arrangement with them to save the capital money on what would otherwise be a new power line. We set up an arrangement with them. We pay them a few dollars every year, and we inject the power in the north of Manitoba, and it comes to us over the southern three interconnections — those ones at Estevan, Yorkton, and Carrot River. It comes in there. We call that a power and energy transfer agreement.

But essentially it allows us to inject power into the north of Manitoba and take the same in the South. It was kind of a win-win arrangement at the time; they had the lines already there. It works . . . well I guess we're more than 20 years now. It's been a very satisfactory arrangement.

As we grew the load in the North and uranium mines came on, we started building lines. And if you look at that one map, you see this large fishing rod of a line that goes all the way across the top of the province — talk about voltage control challenges. But I won't dwell on that.

We started adding load up there. And some of the Island Falls generation, not all of it, comes to us via the Manitoba system now. Some of it is used to actually serve the uranium mines and communities in northern Saskatchewan. So maybe that's how we get to the seven.

Mr. D'Autremont: — Okay. Thank you. Over the last approximately five years, seven years, the new generation that has been brought online, other than the two wind projects at Rush Lake, have been private enterprise arrangements as well — Cory, the Meridian, SunBridge. How have those partnerships worked for SaskPower?

Mr. Wilkinson: — So maybe I'll start, if that's okay. The Meridian is one of those, we call it — I'm going to use too much terminology here — but it's combined cycle cogen. It's one of the really efficient ones; you don't waste much heat on that. So you use some natural gas, you spin up some turbines, you get some electricity. You take the waste heat from that, and you raise some steam, and you make some more electricity. And there's another batch of steam that goes over to the . . .

Mr. D'Autremont: — Ethanol.

Mr. Wilkinson: — The upgrader and the ethanol. Exactly. And that is a very efficient gas installation. So how's it been? I would describe its performance as really steady. It's been a steady performer for us. We had the foresight in that power purchase agreement — because it's independently owned, we take the power through an agreement — to put in a clause that allowed us to find win-win scenarios from time to time.

[16:30]

So we'll have discussions with them. If their plant is coming down, we can actually make arrangements to vary the output of the electricity from time to time, and they would, anecdotally, find a market for the gas that they would otherwise burn, and we would find a cheap deal in one of the surrounding regions, and we were both having a very satisfactory, co-operative working relationship associated with that one. Been a very strong performer and very, very efficient.

Cory is the other one. It's a little different. It's still combined cycle cogen. The steam host requirements, the group that takes steam, it has a lesser need. So of the 230 megawatts or thereabouts of its size, approximately only 80 megawatts of that is what we call must-run, and that's because the steam host is there. And as long as we've got 80 megawatts coming off that for us, there's enough waste heat to raise the steam so that they're happy. Okay?

The rest of the band, and this is why we call it kind of intermediate, it has a must-run component, but it also has a dispatchable component.

In discussion with the Cory folks, because of that challenge that we have with the balancing, and we've talked enough about that perhaps, we have, through that agreement, found ways to alter the output of that, through the PPA [power purchase agreement] of that particular facility to help us with the balancing act.

And so that's also been very, very satisfying in terms of the co-operative spirit. It's been a very reliable facility for us. So right now I'd say we're happy with how those have turned out.

Mr. D'Autremont: — Thank you. I'm glad to hear that those partnerships are working well. My final question. You commented, Ms. Youzwa, that — I think it was you; perhaps it was Gary — commented that natural gas presents about a 50 per cent footprint of coal as far as CO_2 is concerned. What kind of an impact is that 50 per cent going to have on the cost of electrical generation using natural gas in the future?

Mr. Wilkinson: — Try it one more time. It must be getting late in the day. I'm sorry.

Mr. D'Autremont: — Like, your numbers are 2010 here for the cost of gas generation.

Mr. Wilkinson: — Yes, that's right.

Mr. D'Autremont: — If CO_2, there needs to be a cost associated with that, how much of an impact is that going to have on the viability of natural gas?

Mr. Wilkinson: — Okay. Let's try it this way. I'll shift gears a little bit, and I apologize in advance for this. So we've been talking about kilowatt hours. And Judy sells kilowatt hours, bless her heart. But where we operate the power system, we really talk about megawatt hours, and so for me this is an easier conversation.

If I make 1 megawatt hour from coal, approximately 1 tonne of CO_2 goes up, very approximately. We talked about varying efficiencies for natural gas, so there's really quite a range. But just for really rough scoping purposes, if I make 1 megawatt hour from gas, about half a tonne of CO_2 goes up.

So if you're thinking about the cost of CO_2 . . . and let's just pick a number per tonne. I'm going to say $25. If you think $25 a tonne is the new cost of CO_2 in Canada and North America — because there's going to be some harmonization there we think at the end of the day — that half tonne probably makes about a $12.50 difference in the overall cost.

Right now that's, I'd say, a modest swinging thing. When I run coal . . . and probably in a variable sense the fuel probably costs me 15, $16. So I make 15, $16 a megawatt hour when I make a megawatt hour from coal. And if it costs me $25 for a tonne of CO_2 associated with that, that brings you up to what, $39. If I have a natural gas megawatt hour — and let's just pick a gas price that's around 4 or $5, just because that's kind of interesting in a very efficient kind of thing — I'm probably talking about 40, $45 plus half tonne, fifty-two fifty. It doesn't change the pecking order very much. What it really says is coal plus a modest CO_2 charge can still compete quite nicely with gas even though it's only half the emitter. Does that get close to answering your question?

Mr. D'Autremont: — I just wondered what the comparisons were. Thank you, Mr. Chair.

The Chair: — I have Mr. Wotherspoon.

Mr. Wotherspoon: — Thank you very much, Mr. Chair. Thank you to SaskPower and Ms. Youzwa and officials here today. I think it's abundantly clear that we'll certainly need more time with SaskPower through this process and look forward to planning when that can occur because I know that I have certainly more questions than I have clock here today. And I'm sure my fellow colleagues on both sides of this table have similar type questions.

As it relates to the research and development questions that my colleague, Mr. Belanger, raised, and expenditures I guess for each energy option, would it be possible for SaskPower to commit to providing to this committee, prior to the conclusion of our hearings, a breakdown of those research and development costs with each of those, I guess, the allotments

with each of those energy sources?

Mr. Wilkinson: — I think they're very high level. I think we can tell you what we've been throwing towards each of the technologies. If I'm waffling at all here, it's you're using the phrase research and development, and so in areas where I'm going to say the technology is decently mature — and I'll just say natural gas turbines — you don't have to do a whole bunch of R & D to understand what it takes to get one of those in. And so you're going to find that kind of buy technology, you may not be spending very much because it's maybe not quite off the shelf, but it's a very mature technology. It's well known. You can order one up and get it fairly quickly.

In other places, and I'll start with the clean coal where you're actually maybe going a bit farther afield technology-wise, and you might actually be building or assessing a technology that may not exist yet in an industrial or a commercial size, you tend to invest a bit more. I think we can certainly get you those kinds of dollars that we've put towards looking at the clean coal option. We can certainly dig up the kinds of costs that we've invested looking at, I'm going to say, wind power. And the costs of, I don't think it's proprietary, but when we hired that independent contractor to do those wind diversity studies. Those kind of figures are pretty easy to get.

In cases like hydro, research and development is maybe not exactly the right term. People have been building hydro generation for 100 years, so how much R & D do you really need to do? But we had been kind of offering to help in sort of the development of options kind of thing, and so we're not exactly trying to invent new turbines and that kind of stuff. So there'll really be quite a mix across the technologies. But I think we can give you an idea of roughly where you're kind of having to spend more or less. But I don't think it'll be exhaustive.

And some of the manpower, for example, and I'll just say the wind power integration and development unit, that group went at her pretty hard for a couple years. We paid for the Genivar study. We got some consultant to help us with that. Those kinds of costs we can estimate, but we did not ask that group to keep track of their hours that they were spending on the wind power integration and development and then their real jobs, too. So it'll be kind of imprecise, but it'll be illustrative.

Mr. Wotherspoon: — Well I think we'd appreciate, just within the best estimates, if that could be tabled back. And I guess more so just the resources focused around development around each one of those sources. So I appreciate that commitment.

As I take a look at some of the growth and demand assumptions, the 3 per cent moving forward. And it's broken down nicely in sort of broad groups as to what factors are studied and forecasted for this, whether it's GDP [gross domestic product] or population and households and these different aspects. I guess we'll go specifically to a piece of that, such as GDP. And I'm just interested how you go about that forecasting, what forecasters you might rely on, and what those predictions are for 2009 running through your extension to 2018.

Ms. May: — When it comes to the GDP forecast information that I spoke of earlier today, we get that information from the provincial economic model. I don't have the specific numbers or data at hand in terms of that kind of GDP breakdown, but I believe we can certainly make that available to the committee. That is one of our source areas, and that's where we take that information from. So we'll get you some additional detail on that for you, but that is where that information is derived from.

Mr. Wotherspoon: — That's useful. Now is that the same . . . the provincial economic model is also where you'd receive the population statistics and the commercial numbers?

Ms. May: — That is correct. That's correct.

Mr. Wotherspoon: — And that comes out of the provincial government.

Ms. May: — That's correct.

Mr. Wotherspoon: — So that's something that we might want to actually reconcile at some point and to see if certainly, as a continued trend, if we're accurate on those. Because one thing we do know this year is that certainly the provincial government has been overly optimistic on many of its growth and revenue assumptions. And it may be worthwhile to take a look at some of those numbers because we have many members who speak of growth but are presiding over a contraction in their economy. So it would be worthwhile to take a look at that.

It's noted here that SaskPower has as well a high and low forecast. And then you'd go with sort of the most likely.

Ms. May: — Yes, that's true.

Mr. Wotherspoon: — Could we ask for the high and low forecast to be tabled back to this committee?

Ms. May: — Yes, we can. We will do that.

Mr. Wotherspoon: — Looking at the costs per kilowatt hour that were illustrated for the various power sources here today, I appreciated that illustration. My question would be, does that number exclude the cost of enhancements or improvements needed to the grid or distribution and transmission system particular to each of those sources?

Mr. Wilkinson: — Yes, it excludes it.

Mr. Wotherspoon: — It excludes those costs.

Mr. Wilkinson: — It excludes it, and it kind of depends where you put the unit as to what those costs might be, and its size of course.

Mr. Wotherspoon: — A question from a historical perspective: with your best and most current information as it relates to debt/equity ratios of SaskPower, maybe in the past five years to current state?

Ms. Youzwa: — We can provide that for you.

Mr. Wotherspoon: — Okay. At this time, or . . .

Ms. Youzwa: — I may have it. Let me just . . .

Mr. Wotherspoon: — Sure, if it's handy. If not, we can . . .

Ms. Youzwa: — I can give you the percentage of debt for the last 10 years.

Mr. Wotherspoon: — Yes, debt/equity. Yes.

Ms. Youzwa: — Well I'll give you the debt and then the difference would be . . . if that's okay. In 1999 the per cent debt was 54.8; in 2000, 54.1; in 2001, 56.6; 2002, 56.8; 2003, 56.5; 2004, 58.2; 2005, 60.9; 2006, 61.0; 2007, 59.7; and 2008, 60.7.

Mr. Wotherspoon: — Do you have any indications from 2009 where debt/equity's going this year?

Ms. Youzwa: — I will in a moment.

Mr. Wotherspoon: — And maybe projections that you might have for even to go forward on the next couple years if . . .

Ms. Youzwa: — I have it. 2008, I gave you 60.7. Our forecast for 2009 is 67.3.

Mr. Wotherspoon: — Now do you have any forecasting out beyond that at this point in time?

[16:45]

Ms. Youzwa: — We are in the process of preparing our business plan for 2010. That is still, if I can say, a work in progress. And it's still under review and will be finalized later this year. At that point, we'll have then our numbers settled for 2010, but right now they're all a bit of a moving target.

Mr. Wotherspoon: — Just going back to a point that was made . . . And we really do need more time with SaskPower because I have so many questions that come out of this. And there's really good information that was provided today, and I thank SaskPower for this.

But the information as it related to energy loss through transmission, or power loss through transmission, about 10 per cent of the power is lost, I understand, which might account to be about 360 megawatts, I guess, if my number could be verified possibly.

Mr. Wilkinson: — Okay. Maybe I'll speak to that. So when we're talking about the 10 per cent loss, we're really talking about energy. And so I understand how you got your numbers. You took our peak load and multiplied it by 10 per cent.

Mr. Wotherspoon: — Yes.

Mr. Wilkinson: — We don't have the peak load very often. There's that one dot at the top. Often the load is kind of lower than that. So the losses on the electric grid and the distribution system, okay, amount to 10 per cent. Roughly it splits evenly — about half on the transmission system and half on the distribution system.

When we talked about the distribution system, we talked about enough wire to go around the world four times. That's just the wire to serve the load in Saskatchewan — a big geographical area, small customer account — so what you find is that you're sometimes moving that power a very long ways. I'd say historically that level of losses on electrical power system would be typical. You'd run into that in a lot of places.

But as you get higher and higher marginal prices as you changed out your fleet and put more gas in it and a few other bits and pieces, you now find that you'd like to reduce that figure. And that's why we're adding some of those lines that we talked about earlier for reducing the losses on the power system. But historically, 10 per cent — 5 on the transmission, 5 on the distribution.

It's quicker to adjust the losses on the transmission system because I only add a line or two. But on that distribution system where I have 140 000 kilometres of conductor on top of poles inside Saskatchewan, as I say, that's enough wire to go around the world four times. You don't adjust that really quickly. That's a longer term proposition. Does that help?

Mr. Wotherspoon: — No, thank you. It seems that this would be a worthy area to continue the work that's being done but also to continue to move the line on this because if we're looking at sort of demand-side management or conservation, this might be a place that we could make some real headway.

I guess my question would be — and I'd certainly encourage that front — but my question would be, how do you, under the current plan and resources you're investing in making improvements on this front, how much do you plan to save as it relates to the amount of power and by what year, I guess, with the current strategy?

Mr. Wilkinson: — Maybe I'll try answer the question this way. So in the work that we've done in the last couple of years, it looks like about 81 gigawatt hours, which is 81 000 megawatt hours, which is 81 million kilowatt hours. And that's the energy loss reductions through the steps that we're taking in dealing primarily with the transmission system and a few other projects that are perhaps in that mid-voltage range.

So just to answer your question a bit more fully, so when it's time to hook up a new customer . . . And let's talk about an industrial class customer because those are the ones that are tending to drive the growth, and they don't exist so much on the distribution system. They tend to exist more on the transmission system. So we look at their load and we say, what kind of voltage is required to serve that and give them good voltage quality and reliability and all that stuff? We also look at the marginal cost of energy for losses on that power line, and we adjust the size of the wire or the conductor that goes out to serve it until it looks like it's going to be a very cost-effective, long-term arrangement with that customer.

And so we tend to adjust. Once we find out what the size of that customer's load is going to be, we adjust actually the design of the transmission system and the transmission line to serve them so that the losses are handled effectively. That's one place where we'll do this on a regular basis. In order to do that, you probably have to go through and do this on a site-by-site basis, and not all the customers have told us exactly this load in this year. So there's some details in there.

In the more general transmission system that is not necessarily an industrial customer specific — in other words it serves everybody; it's the high-voltage grid that we have — in those, and I mentioned the Poplar River-Pasqua transmission that serves the Coronach area into the Moose Jaw area, we wanted to add a line there to make our dynamic performance during disturbances NERC compliant, so that's compliant with standards. You're supposed to be able to withstand lightning strikes, line outages, unit outages, and other kinds of things that go bump in the night for power systems. You have to be able to withstand those with a certain robustness. We put that line in for that purpose, but it also reduced the losses on the system by a good chunk of that 81 million kilowatt hours. Every time we have the opportunity to add a line we try to see what we can do to adjust its size so that it actually has a loss reduction feature to it as well.

Mr. Wotherspoon: — It seems like a good area to continue to focus on as far as saving some of the power that we have. With the focus on wind and some of the general discussion today, it wasn't long ago, if I recall correctly, that it was expressed that 5 per cent was likely about tops in Saskatchewan that we could look for wind power within our grid. Now that's been moved along to maybe 8 per cent or modestly above that.

And I guess my question would be, you know, and wanting to just make sure we're getting as much independent information as well from around the globe, has this plan been verified by international experts, a source that might have specific expertise in wind power or in utilities or in grid systems that have stronger dependence on wind?

Mr. Wilkinson: — Maybe I'll answer the question this way. We had that wind power integration and development unit take on the task of seeing if we could add more wind.

One thing that you mentioned, at one point in time, shall we say, you could have about 4 or 5 per cent wind and that was about all you could do. So now we're talking about 8 per cent.

One of the things I'd like to comment on is that that 8 per cent that we might grow to, the low load and the load in Saskatchewan will have come up quite a bit in that period. The hump on Judy's load forecast suggests that we're going to have more load. The low loads will come up with it. And it'll cause less trouble for wind if it does that. And that enables a little more space for wind. That was part one.

So the circumstance after the load has grown is different from the circumstance before the load has grown, at least as system operators see this. So you're entitled to add a little more wind if you have a bigger system. So that's the first comment.

The next comment was, have we sort of independently verified very much of this stuff? So I talked about the wind power integration development unit and having done some work. I mentioned they might be a little ahead of the curve. In Canada we are seeing it's a CanWEA [Canadian Wind Energy Association] study group. They've asked us to sit on the steering committee to do exactly what you're talking about. Our person who sits on the steering committee . . . And this is the Canadian one that's trying to say, in a national context, what can we do to add more wind? They are going to go through pretty much the same exercise as the wind power integration development unit did. And so we will see fairly quickly what they come up with. I'm not sure of their time frame.

The other one, in terms of international or verification, validation, or process, the other one that surfaced is under NERC, North American Electric Reliability Corporation. And it is this integration of variable generation task force. And they're going to go through again . . . This is perhaps more of a North American-wide. The first one I mentioned is just Canadian. They're about to go through the same process because they are actually concerned that the reliability of the North American grid might be compromised unless they actually go through a joint . . .

Now these will have independent experts from, I'd say, other jurisdictions, obviously the Americans and a few of the other bits and pieces for that one. Right now their timetable, as I understand it, is probably 2010 for them to come up with the first work. Their initial work has indicated they believe there are reliability and operability concerns we should be thinking about, and so they've undertaken that. We don't have a seat at that table, the international one. The Canadian one, we've been asked to sit on the steering committee.

Mr. Wotherspoon: — Thank you for that. It's my understanding that a couple of American states have exceeded these numbers. And I guess I'm just looking for an understanding — maybe their grid's different or their power makeup is different.

But Iowa, I believe, is up over 13 per cent, Minnesota over 10 per cent, and that at least six different American utilities are up over 10 per cent of their makeup coming from wind. I guess, how is their circumstance different, or what are they doing that's different?

Mr. Wilkinson: — I'm not familiar with individual states, particularly in the US situation. What we were finding is, in the Canadian context — and I think one of our graphs probably showed that — is that we are probably, maybe, I use the phrase, fighting above our weight a little bit, in the Canadian context. So we actually have a higher percentage of wind than a number of others in Canada.

In the United States, I'm not too sure. It tends to vary with system makeup and system size. On a megawatt basis, there are some people who have more wind in their footprint than we do, but on a percentage basis it might be similar to us.

The only probably example that I'd like to share with you now is other than the first two wind facilities that we put in that were decently small, once you pass, and I'm going to say, 90 to about 110 megawatts in size, you're actually paying a premium by building too small. And so once you pass about 100 megawatts, you're getting a decent-sized wind farm. So SaskPower's approach to this was, try to understand the technology, see if it would work here. Those were those smaller ones I talked about. Then we built the bigger ones and we got a little experience with that.

I'm going to be one of the first ones to tell you that we need a little more time with our wind forecasting tools and that's a

work in progress. And SaskPower's approach to this is to try and build big enough to get the economies of scale but don't go so wild that you actually run into those operational problems before you have to. So we're building it effectively and it captures the wind real well. We have a good wind regime. But the way we're coming at it is maybe a little risk-averse, but we think it's prudent.

Mr. Wotherspoon: — Well we'd certainly encourage continued leadership from Saskatchewan on this front, and we've seen some stalling of wind power advancements for a period of time. And certainly I know this is something that the globe is — and different jurisdictions and utilities around the world — are wrestling with, and it's, I think, an excellent time to be sharing resources and looking at what particular jurisdictions are doing. Certainly we'd encourage that.

Just before time runs out here today, I'd be remiss not to touch on I think some of the information that was shared in a study that has recently gone out or a review around rates and assumed rate increases of 8 per cent a year. And it became a bit of a topical item here yesterday within the news. This of course grabs the attention of people because it's, you know, well over 100 per cent increase in a decade. And certainly SaskPower substantiated many of the concerns they have moving forward to meet power needs.

But I guess my question would be . . . would request, well (a) a response at this table. But secondly then, a tabling of reports and studies — internal and external — that have been commissioned that suggest that customers will need to expect 8 per cent rate increases annually over 10 years. And as well to, I guess, ask for your response here today at this tabled to the fact that we're looking at that. It seems presumptuous before we've got exactly what that mix of power sources are going to be to start assigning costs to it, but we're ready to be enlightened.

Ms. Youzwa: — I'm pleased to respond to that. The information that you're referring to was a scenario that we developed, that we asked an organization to take out and do some market research for us. It was a snapshot of what a future could look like. Our purpose was not to somehow preclude. And certainly I hope by the end of today you see that we haven't made any sort of firm commitments to fill up our supply requirements for the next 10 years. There's lots of work to be done evaluating options.

[17:00]

But we took a scenario; we asked them to go out and do market research for us. What we're trying to gauge here is our customers' understanding of the supply challenges that SaskPower faces, what the range of options are that we have in front of us, and their understanding of what might happen to electricity costs. This is information that we use to gauge the understanding of our customers so that we can then determine how we can best communicate what we think our challenges are so the public has an understanding and acceptability of what we're going to be doing going forward.

So in no way was it to pre-empt anything that we were doing here in the committee. And as you can see today from our presentations, we have, you know, many decisions to make to fill the supply requirements for the next 10 years.

But this was market research. It was to help inform, give us an understanding of our customers' understanding, and then help guide what we need to do going forward. Market research like this we do on a regular basis so that we can understand what our customers' information gaps may be and how we can best fill them. This was one of those normal kinds of processes that we were going forward with and in fact, I think, if you look at the Perrins report, that one of his recommendations was that SaskPower should on a regular basis use techniques like surveys and focus groups and so on to understand what the information gaps are and how we should move forward.

The Chair: — Well I see it's now just past 5 o'clock. I'd like to thank all those who presented, especially you, Ms. Youzwa. It's a lot of information for us to swallow and we'll be looking at it certainly over this process.

Just before we do adjourn, I would like to confirm that we'll be seeing you again on the 19th. I believe you're scheduled for 2 o'clock. The Co-Chair of the committee has suggested that potentially if our questions aren't all answered by 5 o'clock, we may ignore the clock that day if that works for you as well.

That being said, we will now adjourn until 10 o'clock tomorrow morning. Thank you.

[The committee adjourned at 17:02.]