STANDING COMMITTEE ON

CROWN AND CENTRAL AGENCIES

EIGHTH REPORT

INQUIRY INTO SASKATCHEWAN'S ENERGY NEEDS

INTERIM REPORT

DECEMBER 1, 2009

Legislative Assembly of Saskatchewan
Committees Branch

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December 1, 2009

To the Honourable Members
of the Legislative Assembly:

Your Standing Committee on Crown and Central Agencies is pleased to present its Eighth Report, *Inquiry into Saskatchewan's Energy Needs - Interim Report.*

Pursuant to Rule 147, your Committee conducted an inquiry into Saskatchewan's energy needs. From October 6 to October 19, 2009, your Committee held public hearings in Regina, Saskatoon and La Ronge and received written submissions. In total, your Committee received 32 different presentations plus an additional 24 written submissions.

This interim report outlines the information gathered during the fall hearings. Your Committee will be conducting an additional nine days of public hearings in January 2010. A final report outlining the information gathered during the fall and winter public hearings will be tabled with the Legislative Assembly before the end of the Third session of the 26th Legislature.

Respectfully submitted on behalf of the committee,

Tim McMillan
Chair
MLA Lloydminster

Table of Contents

COMPOSITION OF COMMITTEE

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Mr. Doyle Vermette
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EXECUTIVE SUMMARY

On April 29, 2009, the Standing Committee on Crown and Central Agencies received an Order of Reference from the Legislature. Members of your Committee met *in camera* on September 9, 2009. Your Committee scheduled nine public hearing dates in October in Regina, Saskatoon and La Ronge. Witnesses and written submissions were asked to respond to the following question:

> *"How should the Government best meet the growing energy needs of the province, in a manner that is safe, reliable, and environmentally-sustainable, while meeting any current and expected Federal Environmental Standards and Regulations, and maintaining a focus on affordability for Saskatchewan residents today and into the future?"*

Witness testimony began on October 6, 2009. There were a total of 32 different presentations – 17 in Regina, 12 in Saskatoon and three in La Ronge. There were six individuals, ten social justice and environmental groups, nine representatives from industry, four presentations from representative organizations, one political party and two First Nation organizations.

Your Committee also received written submissions until October 19, 2009. There were 24 written submissions – 14 individual submissions, one social justice and environmental group, three letters from industry, one representative organization, one political organization, three communities and one research organization.

There were several themes that emerged from the presentations and written submissions. A prominent issue that became apparent was the cost and who was to bear the cost of upgrading, expanding and modernizing the electrical generation system. Many desired conservation and efficiency as the first line of defence against growing energy needs and rates. Many presenters and written submissions also wanted a decentralized mix of renewable energy sources to meet the expected growth and many wished for the ability to sell excess energy back to the grid for a profit. Businesses and representative organizations wanted to see an investment in baseload energy to ensure there is a reliable and stable energy supply for industry.

Your Committee will be conducting an additional nine public hearings in January 2010. The meetings will be held in Lloydminster, Prince Albert, Saskatoon, Yorkton, Estevan and Regina. A final report outlining the information gathered during the fall and winter public hearings as well as the written submissions will be tabled with the Legislative Assembly before the end of the Third session of the 26th Legislature.

A. PROCESS

On April 29, 2009, your Standing Committee on Crown and Central Agencies received an Order of Reference from the Legislature. Your Committee was given the following Order:

> *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 at a date determined by the committee.*

Your Steering Committee, consisting of the Chair, Mr. Tim McMillan and the Deputy Chair, Mr. Buckley Belanger met to discuss details of the public hearings. This was followed by your Committee meeting *in camera* on September 9, 2009 to further discuss the public hearing process. Your Committee scheduled nine public hearing dates in October in Regina, Saskatoon and La Ronge. It was agreed that all witnesses and written submissions respond to the following question:

> *How should the Government best meet the growing energy needs of the province, in a manner that is safe, reliable, and environmentally-sustainable, while meeting any current and expected Federal Environmental Standards and Regulations, and maintaining a focus on affordability for Saskatchewan residents today and into the future?*

Media advisories were sent out to major newspapers, radio and television stations throughout the province and 135 stakeholder letters were sent to individuals, social justice and environmental organizations, cities, industry, representative organizations, political groups and First Nations and Métis organizations. For a complete list, please see Appendix A.

Newspaper advertising commenced during the week of September 22, 2009. Newspaper advertisements were placed in the weekly and daily newspapers in Saskatchewan. All interested parties who wished to make an oral presentation were invited to make a request by October 2, 2009. Written submissions were accepted until October 19, 2009.

On September 29, your Committee met to discuss additional hearing dates and an interim report. Your Committee agreed to conduct nine public hearings in January in Lloydminster, Prince Albert, Saskatoon, Yorkton, Estevan and Regina. Also, your Committee decided that an interim report would be tabled outlining the information received from SaskPower, stakeholders and the public.

B. EMERGING THEMES

There were several themes that emerged from the presentations and written submissions. A prominent issue that became apparent was the cost and who was to bear the cost of upgrading, expanding and modernizing the electrical generation system. Many expressed a desire for conservation and efficiency as the first line of defence against growing energy needs and rates. Many presenters and written submissions also wanted a decentralized mix of renewable energy sources to meet the expected growth and many wanted the ability to sell excess energy back to the grid for a profit. Businesses and representative organizations wanted to see an investment in baseload energy to ensure there is a reliable and stable energy supply for industry.

The following section will be organized in the same manner that the presentations were held: SaskPower comments will be first, which will then be followed by witness quotations and finally, SaskPower's responses to Member's questions that emerged throughout the hearings.

1. Cost

SaskPower

On the first day of testimony, SaskPower identified the need for substantial upgrades and infrastructure to meet Saskatchewan's growing energy needs. Given the extensive capital investment required to build, refurbish and replace generation, transmission and distribution facilities, SaskPower projected a $15 billion cost to do this. President Pat Youzwa stated publicly:

> *Regardless of which supply option we choose, we know that 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 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 of $15 billion" (Saskatchewan 2009a, 250).*

Given this estimate, renewing the fleet, moving away from a coal-based electricity generation system and towards more renewable energy sources will increase costs. As Vice President of Planning, Environment and Regulatory Affairs, Mr. Gary Wilkinson simply stated, "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" (Saskatchewan 2009a, 247).

Witness Responses

Given the heavy investment required to upgrade the current electricity system, there was a general understanding and acceptance regardless of which energy sources invested in that there will be increased rates. Mr. Tim Weis, Director of Renewable Energy and Energy Efficiency Policy at the Pembina Institute, aptly summarized increasing rates:

> *Power prices are going up regardless. And I think that was made clear by SaskPower, that even without renewable power, we're looking at price increases across the board across Canada because a lot of our aging infrastructure is going to need to be rebuilt in one shape or another. So power prices are going up, and I think that's an important starting point (Saskatchewan 2009c, 310).*

Some witnesses and those making written submissions were more willing to pay increased costs if they knew it was due to an investment in renewable energy sources such as Ms. Marion E. Tolley of Moose Jaw who wrote, "As an 86 year old mother of seven, grandmother of ten and great grandmother of one, I

have always been concerned about the environment…I realize that all projects costs millions $ but doesn't it [renewable energy sources] benefit all in a healthier, safer, environment?" (CCA 151/26)

Mr. Daron Priest of Save Our Saskatchewan (S.O.S) stated, "Myself, I'm willing to spend more if I know its renewables. And I really do feel that maybe right now that they're going to cost more. But in time, you know, maybe those costs come down and be more comparable to everything else" (Saskatchewan 2009d, 331).

Some witnesses supported rate increases that were widely distributed between customers however some did believe that the heaviest users, industry, should pay for a larger share. Ms. Cathy Holtslander said, "It seems to me that the cost should be spread out over the whole system, and the savings should be spread out over the whole system too" (Saskatchewan 2009f, 392). Dr. Dan Beveridge Sr. of KAIROS Regina chapter pondered whether the costs should be borne by the heaviest users. He stated, "It does raise the question of whether the cost of the whole upgrade should be spread evenly over the total base of SaskPower utility users, or whether those particular industries might have to maybe bear a larger share" (Saskatchewan 2009i, 487).

In contrast, this sentiment was not shared by the members of the Saskatchewan Mining Association, who held that increasing their member's share might dissuade investment. Mr. Fortney, Chair Saskatchewan Mining Association Potash Section and General Manager of PotashCorp Rocanville Mine said, "if you've got a new project that's invested in all new infrastructure in terms of a plant up north, and then they see a significant penalty in terms of having to pay all of the infrastructure for a new power grid, that would make the project less viable" (Saskatchewan 2009h, 440). Furthermore, Ms. Pam Schwann, President of the Saskatchewan Mining Association made comments in regards to increased costs to the mining industry. She stated, "A large part of the transmission infrastructure in the North was paid by the mining industry…We don't know that it's really a fair distribution that the mining companies pay for everything…We'd also note that the mining companies do pay significant revenues to the government already, directly and indirectly" (Saskatchewan 2009h, 440).

Mr. Steve McLellan, President of the Saskatchewan Chamber of Commerce summarized the cost debate, he said:

> *Regardless of how we choose to finance and implement our energy infrastructure growth, the tax burden on individuals and businesses should be minimized whenever possible…We're going to pay more in the future for power. It's as simple as that. But we need to make sure that we think about it and that we minimize it as much as possible for the consumer as well as for the businesspeople (Saskatchewan 2009i, 491).*

SaskPower Response

Costs are going to rise regardless of the options chosen but SaskPower officials recognize their role in minimizing the cost to consumers. President Pat Youzwa said, "We know that whatever generation and transmission options are chosen to meet the province's future electrical needs, there will be cost impacts on everyone in Saskatchewan. It is our job to minimize those as best we can" (Saskatchewan 2009i, 528).

2. Demand-Side Management, Conservation & Efficiency

SaskPower

Demand-side management, conservation and efficiency were identified as key components to SaskPower's short, medium and long-term energy mix. Not only are these important at reducing demand but these are viewed as mechanisms to ease rate increases. Mr. Gary Wilkinson, Vice President of Planning, Environment and Regulatory Affairs, stated:

> *As you take the amount of load to be served down through conservation and efficiency, 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 (Saskatchewan 2009a, 238).*

Witness Response

Demand-side management, conservation and efficiency were areas in which there was support by witnesses and in the written submissions. There was support for continued use of conservation to help the environment and to lower electricity costs. Some wanted to see SaskPower's conservation targets expanded and some wanted further incentives.

Many of the social justice and environmental groups indicated that conservation and efficiency should be first and foremost in reducing demand during the transitional period and into the future. In his presentation, Dr. Jim Harding stated:

> *While you're using the fossil fuels, your first thing is an efficient, lower impact policy. That's how you lower your greenhouses. Until you shift your technologies to renewables, you're responsible to lower your impact and increase your efficiencies, which is why we say efficiency and conservation first always (*Saskatchewan 2009b, 282*).*

Also, social justice and environmental groups such as Save Our Saskatchewan (S.O.S.) offered suggestions to increase conservation and efficiency measures. President of Save Our Saskatchewan, Mr. Aaron Hougham, said, "The government needs to play a much stronger role in encouraging and supporting conservation. This could be done through legislation and incentives" (Saskatchewan 2009d, 326).

Industry has stated that they have taken a lead role in demand-side management, conservation and efficiency. The Saskatchewan Mining Association declared that their members are heavily involved in conservation and efficiency measures to help reduce costs. Mr. Steve Fortney, Chair Saskatchewan Mining Association Potash Section and General Manager of Potash Corporation Rocanville Mine stated, "The SMA supports initiatives for energy efficiency and conservation. Member companies actively adopt these practices as energy costs are a significant part of our business, and improved efficiency means reduced costs" (Saskatchewan 2009h, 439).

Some witnesses fully support conservation and efficiency measure but indicated that SaskPower's reduction targets were not aggressive enough. Mark Bigland-Pritchard from Low Energy Design stated, "They [SaskPower] are talking about reducing capacity or effective capacity by 100 megawatts in 10 years. That's a conservation saving of 0.3 per cent per year. The general view in the demand-side management community throughout North America is that 1 per cent per year is easily achievable" (Saskatchewan 2009e, 369).

SaskPower Response

On the first day of presentations, October 6, 2009, Ms. Judy May identified programs in place or to be introduced to aid in conservation and efficiency measures. SaskPower Eneraction, is their "portfolio of energy efficiency, conservation and load management programs, aimed at really, programs for all customer bases" (Saskatchewan 2009a, 249). Some programs include: the Energy Star furnace and air conditioner program; a high efficiency lighting program; a low interest rate loan program for geothermal and self-generation renewables; rebates available for energy efficient new homes, energy performance

contracting service for commercial, municipal and industrial customers, commercial lighting program, start-to-finish energy efficiency retrofit service for ice rinks, a newly introduced geothermal heating program for commercial customers and an energy efficiency service for industrial facilities.

In regards to SaskPower's electricity reduction targets, Ms. Judy May stated:

> *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…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 (*Saskatchewan 2009a, 248*).*

3. Renewable Energy Sources

SaskPower spoke at length about all renewable energy options, including biomass, geothermal, hydroelectricity, solar and wind. Currently, wind energy and hydroelectricity are the only renewable energy source on the generation system. SaskPower, although enthusiastic about the future of renewable energy sources, cautioned how much renewable energy goes into the electricity system because of the unique characteristics of each generation type. As Mr. Gary Wilkinson stated, "you want to be careful how much of that up-and-down stuff you put in your province at any time" (Saskatchewan 2009a, 239).

Many witnesses and written submissions discussed the importance of renewable energy sources in the energy mix. Many presenters discussed a diversified and decentralized electricity system that includes biomass, geothermal, hydroelectricity, solar and wind. Witnesses also expressed an interest in producing their own energy and have the opportunity to sell it back to the grid for a profit like Ontario's feed-in tariff.

a) Biomass

SaskPower

Saskatchewan is well-positioned to expand biomass as an electricity option. "Biomass energy utilizes the energy content in all forms of organic matter, including agricultural crops such as wheat and other grasses, harvest residue, trees, forestry residue and wood waste, methane extracted from the decomposition of human and animal wastes, and municipal garbage" (The Canadian Renewable Energy Guide 1999, 34).

Biomass is looked upon positively by SaskPower. The officials from SaskPower "believe that it's eligible for favorable 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" (Saskatchewan 2009a, 243). Currently, SaskPower is having one of their coal plants evaluated as a potential site to take wood in as a fuel source and are interested in potential Independent Power Provider agreements with First Nations groups.

Witness Response

Biomass was often discussed as part of the energy mix and the North was identified as a potential location for biomass development. Dr. Malcolm Wilson said, "biomass certainly has a huge potential in the province…The fuel sources can be everything from agricultural surplus materials, forestry wastes, and indeed municipal solid waste which has the benefit then of decreasing the amount of material going to landfills and the downside of landfills such as methane production and the like" (Saskatchewan 2009i, 476).

Meadow Lake Tribal Council Resource Development Inc. discussed their two projects that they have heavily researched and would require a power purchase agreement with SaskPower before they can move ahead. Mr. Ben Voss said, "We're a logical partner and developer of sustainable biomass energy. And it makes sense because we have a saw mill, we own the only operating forestry license, and we operate it to the highest degree of environmental certification and sustainability available internationally" (Saskatchewan 2009g, 415).

SaskPower Response
Biomass was not discussed at any length in SaskPower's final presentation but SaskPower did restate that biomass may get "a bit of a free ride. It emits CO_2 but that's better than letting the waste wood rot" (Saskatchewan 2009i, 500).

b) Geothermal

SaskPower
Geothermal uses heat and steam from the earth's core to produce electricity. Heated or geothermal waters circulate throughout the Earth's upper crust to depths of 10 km or more. Such hot waters underlie much of southern Saskatchewan (Natural Resources Canada 2008). Electricity generation "is accomplished using conventional steam power plant technology" (Evans 2007, 111). SaskPower did not discuss extensively about geothermal potential in Saskatchewan. They mentioned geothermal in regards to a low interest rate loan program for residential customers who may be interested in generating their own heat or environmentally friendly electricity. Also available is a Commercial Geothermal Rebate Program for business and farm customers. Those that qualify for this program will receive a 15 per cent rebate up to $100,000 (SaskPower 2009c).

Witness Response
Brian Brunskill, a geologist studying deep geothermal potential in Saskatchewan stated, "we're looking at a fairly small area of southeast Saskatchewan where the rocks are deep enough – therefore hot enough – where geothermal energy could actually support the generation of electricity using one of the mechanical systems" (Saskatchewan 2009b, 291).

SaskPower Response
SaskPower did not provide a detailed discussion of geothermal electricity production. They did reiterate the loan program available for residential customers.

c) Hydroelectricity

SaskPower
Currently, hydroelectricity is one of the largest renewable energy resources in the world (Evans 2007). Hydroelectricity is a long established, renewable energy resource that utilizes water in rivers, stream and waterfalls to power turbines and generate electricity.

Currently, SaskPower maintains seven hydroelectric stations. They are, the Athabasca Hydroelectric System which includes the Wellington, Waterloo and Charlot River stations, the Island Falls Station, E.B. Campbell Station, Nipawin Station and the Coteau Creek Station. The stations range in age from 23 to 80 years of age. The total capacity of hydroelectricity in Saskatchewan is 854MW (SaskPower 2009b).

Like the Wind Power Integration Unit, SaskPower has established a Hydroelectric Development Unit to begin looking intensively at hydroelectric options in Saskatchewan because of its

flexibility and storage capacity. As Mr. Gary Wilkinson stated, "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…" (Saskatchewan 2009a, 244). SaskPower is looking to First Nations for hydroelectric partnerships in the medium range plan.

Witness Response

Hydro was often cited as a green energy solution and is beginning to be seen in a more positive light if it is a small scale, run-of-the-river instillation or modifications to existing structures. Furthermore, witnesses supported community partnerships with First Nations. Peter Ballantyne Cree Nation discussed potential hydro projects. Councillor Nataweyes said

> *PBCN should be given priority status in becoming hydro development partners with SaskPower and Saskatchewan in the northeastern region…We could provide the stimulus to move the projects forward and help meet the rural electrical demand in northeastern Saskatchewan and elsewhere. We are ready to enter a new era of co-operation and partnership with SaskPower and Saskatchewan to work towards a positive energy future (*Saskatchewan 2009g, 427*).*

SaskPower Response

SaskPower was questioned about a potential hydro partnership with the Peter Ballantyne First Nation. SaskPower was very positive about the information. Mr. Garner Mitchell, Vice President of Power Production said, "I think it's very encouraging that the Peter Ballantyne Cree Nation are interested because we have been encouraging them for years and years and saying look it, let's work together. And so I think it's just great news that they're expressing current interest because that really can go someplace" (Saskatchewan 2009g, 516).

d) Solar

SaskPower

There are three forms of solar energy. The majority of witnesses discussed one type in particular; photovoltaic energy. Photovoltaic energy produces a direct current of energy. Solar was not talked about extensively by SaskPower mainly because of the high cost. Mr. Gary Wilkinson said, "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" (Saskatchewan 2009a, 246). Nonetheless, SaskPower is studying the industry and there may be potential in the medium and long-term plans.

Witness Response

Your Committee heard from many witnesses discussing Saskatchewan's great solar potential but the current price of photovoltaic energy makes it too costly. Many emphasized that the industry is rapidly changing and the technologies and costs that are today will be vastly different in the near future. Wade Zawalski said, "the technology is developing so quickly that we can't look past at what costs were, you know, a few years ago. We have to basically go forward…" (Saskatchewan 2009h, 415).

Your Committee received a written submission from SHEC Energy Corporation which has invented and developed another form of solar energy; Concentrated Solar Power technology. The process of designing the pilot plant is nearly complete and they expect their technology can produce energy ranging in price from 4-9 cents per kilowatt hour (CCA 146/26).

SaskPower Response
SaskPower indicated that they are watching solar prices and are hoping that as demand increases, prices will come down. Mr. Gary Wilkinson said, "I do believe technology will be our friend. And the same with solar, maybe it's 43 cents now. But as the whole world picks that up, hopefully that comes down" (Saskatchewan 2009i, 511).

e) Wind

SaskPower
Currently, Saskatchewan produces 4.4% of its energy supply through wind power. SaskPower maintains the Centennial and Cypress wind facilities near Swift Current and Gull Lake. They also have purchase agreements with the SunBridge Wind Power Project and Red Lily Wind LP. The construction of the Red Lily wind facility is expected to begin in the fall of 2009 and operational in 2011. Also, the Government of Saskatchewan and SaskPower introduced two new programs on October 28, 2009 that will enable the corporation to more than double wind power production in the province. The Green Options Plan and the Green Options Partners Program will add another 200 megawatts of wind power to SaskPower's generation capacity.

SaskPower could potentially increase their wind generation capacity. SaskPower has a Wind Power Integration Development Unit (WPIDU) that analyzed the potential expansion of wind energy. "The WPIDU group has said there's a possibility…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" (Saskatchewan 2009a, 240). This would increase their current capacity from over four per cent to roughly eight per cent. SaskPower is looking at Independent Power Producer agreements for wind in the short and medium time frames and will continue to evaluate it into the long-term supply plan

SaskPower discussed concerns regarding Saskatchewan's climate and cost. The current wind turbines shut off when the temperature drops below -30^{o} C and when there are very high winds. These are safety features that protect the turbines from damage. Wind generation is more costly than coal generation which will likely result in increased rates for customers.

Witness Responses
Wind energy was consistently brought up as a renewable energy source that witnesses and those that made a written submission want to see pursued in this province. Witnesses responded to SaskPower concerns about temperature, reliability and costs and challenged wind penetration targets set by utilities.

Mr. Tim Weis, Director of Renewable Energy and Efficiency at the Pembina Institute, addressed the cold weather concerns. He advised your Committee that:

> *The wind chill isn't really relevant I guess in terms of what, in terms of how cold the temperature the turbines can handle. It's more the absolute temperature…Typically when turbines operate down to minus 30 – absolute temperature, not without wind chill – but you can get cold weather packages that have been operated down to minus 40 (*Saskatchewan 2009b, 310*).*

He also noted that wind turbines are being operated in much harsher climates such as Yukon, Alaska and Antarctica.

David Huggill, the Western Canada Policy Manager of the Canadian Wind Energy Association, discussed the reservations about wind reliability. He stated, "as you increase the amount of wind installed as well as the geographic diversity, you see a leveling of the variability – both the diurnal and yearly fluctuations tend to smooth" (Saskatchewan 2009e, 373).

Mr. Weis spoke to the increased cost associated with wind generation. His assertion is that the cost of wind is known and will not go up unlike fossil fuels such as coal and natural gas. He said, "You might be paying a premium, but the price of wind never increases. And so you're hedging some of your price. You're sheltering" (Saskatchewan 2009c, 312).

Many witnesses felt strongly that wind power should be contributing more to our energy mix. Many stated that 20 per cent should be the target and other jurisdictions in the world are on their way to meeting this. Canadian Wind Energy Association (CanWEA) challenged utilities and system operators' historic underestimation of wind penetration on the system. They are advocating for a target of 20 per cent of Canada's on aggregate generation mix coming from wind power.

SaskPower Response

Witnesses discussed some of the concerns that SaskPower brought forth in regards to wind such as cold weather wind turbine packages and wind targets. Mr. Gary Wilkinson responded to questions about cold weather wind turbine packages and stated that it does not make economical sense, "Apparently when it goes desperately, desperately cold the amount of energy that you would get during those time frames is…It can be modest…You can pay more, but you don't get a whole bunch of energy out of it, which is kind of key for recovering the extra expense" (Saskatchewan 2009i, 510).

As stated, some witnesses want to see Saskatchewan set a wind penetration target of 20 per cent. Mr. Gary Wilkinson said, "they [Wind Power Integration Generation Unit] felt that you could go up to around 8 per cent before you started driving the need for the extra cost" (Saskatchewan 2009i, 510). Furthermore, SaskPower is observing other jurisdictions that have higher wind penetration levels to understand how it impacts the overall power generation system.

f) Net Metering, Feed-In Tariffs & Ontario's Green Energy Act

SaskPower

Net Metering is SaskPower's program that allows "customers to generate their own energy and feed excess electricity that they're not able to use back to SaskPower's system. They get a credit for the excess energy…And this credit is banked at the value of SaskPower's residential rate" (Saskatchewan 2009a, 250). Currently there are "62 customers connected and another 47 who are waiting either for their generation to be installed or for a meter to be set" (Saskatchewan 2009i, 520).

Witness Responses

Witnesses consistently brought up net metering, feed-in tariffs and Ontario's *Green Energy Act*. They believed that net metering, although a first step in the right direction should be expanded to a feed-in tariff where producers could potentially make a profit by selling excess power back to the grid. It was unclear if witnesses understood that SaskPower does have a Small Power Producer program that compensates those customers interested in producing above their needs since no witness mentioned it in their testimony. Below are several comments witnesses made.

Ms. Cathy Holtslander provided an analogy about net metering. She said, "I'd say graduate from net metering to feed-in tariff. You know, we've got grade 8; let's go for grade 12" (Saskatchewan 2009f, 391).

Mr. Gil Pedersen of the North Saskatchewan River Environmental Society said, "SaskPower has not done an outstanding job of informing customers about its [net metering] existence" (Saskatchewan 2009h, 370).

Dr. Jim Harding stated, "Finally we have net metering. And I'll tell you, we're 10 years behind other jurisdictions. But one of the recommendations and you're going to hear it all through your hearings, is we'd better get the feed-in tariff here quick" (Saskatchewan 2009b, 282).

Tim Weis described Ontario's *Green Energy Act* as "arguably Canada's most aggressive renewable energy law, arguably the most progressive renewable energy law ever passed in North America. It guarantees contracts for anyone who wants to build renewable power systems and put them onto the grid. It does so based on what's going to be profitable" (Saskatchewan 2009c, 291).

The Saskatchewan Environmental Society also discussed the Ontario *Green Energy Act* and would like to see Saskatchewan move in this direction. Peter Prebble described the principles of the feed-in tariff but also noted that "we've got better sunlight and wind resources here than they do in Ontario. Therefore our feed-in tariff doesn't need to be as high as the one that Ontario has set" (Saskatchewan 2009e, 364).

Saskatchewan Chamber of Commerce also supported entrepreneurial enterprising in power generation. Mr. Steve McLellan said, "Another way for Saskatchewan people and businesses to help SaskPower carry out our province's energy burden is to allow individuals and businesses who generate electricity through renewable energy sources such as wind turbines and so on to sell their excess power back into the province's grid or to their neighbors" (Saskatchewan 2009i, 491).

David Anderson of Solar Outpost, highlighted a current flaw in the net metering program and made a recommendation:

> *One suggestion for policy improvement,…Right now if you have more than one meter, you need more than one system. You can't feed power to another meter and get credit for both, even if the bill is coming out of the same person's pocket. You have to put up two separate systems and that's just a policy that's in place currently because they don't have access to the retail market. You can't sell it for retail and credit other people's meters. They want to stop that. If that's something we improved, I think it would improve the small wind market as well (Saskatchewan 2009f, 404)*

SaskPower Response

Questions regarding personal power production for profit and the net metering policy were addressed by SaskPower. Ms. Judy May explained the Net Metering program which encourages residential, farm and commercial customers to set up environmentally preferred technologies for electricity generation. Customers are credited at the retail price of their generation however, if they produce more electricity than they use, the credit is banked. The credit does not get rolled over into a new year and the consumers are not financially compensated for their excess. Net metering customers may qualify for rebates for their installation.

Another program, the Small Power Producers, was not discussed on the first day of hearings but was touched on October 19. The Small Power Producers program allows customers to be compensated for excess generation at the marginal cost of generation which is 8.42 cents per kilowatt hour. The compensation value is assessed each year (SaskPower 2009a).

President Pat Youzwa said, "We see a role for it [standing offer program] in the future. It also provides encouragement for people to look for new technologies on a smaller scale, which may be of interest to them, but for us it's just difficult for us to spend the time and attention on those smaller scale projects"(Saskatchewan 2009i, 519).

4. Baseload Energy Supplies

SaskPower

Baseload power refers to the reliable and stable power that forms the basis of the whole generating system. In regards to baseload power, Mr. Gary Wilkinson stated, "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" (Saskatchewan 2009a, 234)

a) Coal

Burning coal produces the majority of Saskatchewan's electricity. The Poplar River, Boundary Dam and Shand Power Stations produce over sixteen hundred megawatts. Coal is a non-renewable resource that contributes to air pollution, acid rain and other environmental degradation (Nersesian 2007).

Given the toxic and environmentally harmful aspects of burning coal, it is likely there will be financial and regulatory penalties set for coal-fired plants but currently, coal and carbon regulations have yet to be set. Mr. Gary Wilkinson said, "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 licenses 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" (Saskatchewan 2009a, 233). Because of the uncertain future of coal and carbon regulations, SaskPower is investing in carbon capture and sequestration research as a means to continue using coal but in a cleaner and more efficient manner.

Saskatchewan is a world leader in carbon capture and storage. "Carbon dioxide, (CO_2) capture and storage (CCS) is a process consisting of the separation of CO_2 from industrial and energy related sources, transport to a storage location and long-term isolation from the atmosphere" (Intergovernmental Panel on Climate Change 2005, 3). In Saskatchewan, the carbon dioxide is captured, liquefied and sent via pipeline to aid in oil extraction (SaskPower 2009b). This is a major private-public-academic project in Saskatchewan.

Witness Response

In the witness presentations, there was a desire for increased baseload energy generation. Saskatchewan Mining Association strongly supports increased baseload generation. Mr. Fortney said:

> *Our objective here today is to underscore the need for significant new infrastructure investment in baseline power generation, transmission, and distribution capacity. Companies making multi-billion dollar investments in the province, as our companies*

> *are doing, need to have the confidence that the required baseload power generation, transmission, and distribution infrastructure is in place to support their investment and operations (*Saskatchewan 2009h, 437*).*

The R.M. of Hart Butte, Town of Bengough and the Town of Willow Bunch all support the continued use of coal however, the current method of baseload power generation is harmful to the environment and needs to be adjusted to provide cleaner and greener energy. This point was highlighted by S.A.R.M. (Saskatchewan Association of Rural Municipalities). S.A.R.M supports the use of coal-generated electricity because of the vast supply but also noted that it could be done in a more environmentally friendly fashion. Mr. David Marit said, "SaskPower's coal-fired and natural gas electrical plants…can be maintained, adapted, and retrofitted to be made more eco-friendly and efficient" (Saskatchewan 2009h, 453).

Carbon capture and sequestration is a technology that could provide a cleaner and greener solution. The carbon capture and sequestration project generated discussion by some witnesses. Mainly, the project is supported. Dr. Malcolm Wilson, a world leading researcher of carbon capture and sequestration and 2007 Nobel Peace Prize recipient, said, "I think we have no option but to move forward with carbon dioxide capture and storage. It's certainly not the cheapest process out there, but I'll also argue it's a long way from being the most expensive out there" (Saskatchewan 2009i, 478).

Mr. Hougham, President of Save Our Saskatchewan explained his hope for carbon capture and sequestration project. He stated:

> *He [Mr. Lyle Stewart] actually explained some of the clean coal project that was coming forward. The abundance of coal that we have, it's very much an interesting approach. And I hope that the clean burning coal aspect does provide a clean energy source. I think that because we have such an abundant supply, we have to look at that as an option. And I hope that it's successful. It sounds like Saskatchewan is a leader in this undertaking. And I encourage the government and the committee to look into that. I think that that's a tremendous opportunity that does have potential (*Saskatchewan 2009d, 332*).*

There was some concern expressed regarding the cost of carbon capture and sequestration. Dr. Dan Beveridge, "it would appear that it [carbon capture and sequestration] indeed could have great potential worldwide in the long run – we have concerns about Saskatchewan footing the major part of the bill to develop this very expensive technology" (Saskatchewan 2009i, 484).

SaskPower Response

The carbon capture and storage project has an estimated value of $1 billion dollars. Mr. Mike Monea, Vice President of Integrated Carbon Capture and Storage Projects clarified the current expenditures to this point and the future status of the project, "On the Boundary Dam project as of the end of August we've spent $18, 886,940 and we hope by the end of December of next year we'll be at $97million…At that point, in December 2010, we have a go or no-go decision…" (Saskatchewan 2009i, 506).

b) Cogeneration and Polygeneration

Although co-and polygeneration energy production utilizes non-renewable resources, such as natural gas, it does reduce the amount of harmful emissions into the atmosphere and increases energy efficiency. In cogeneration facilities, the exhaust gases from each gas turbine are captured and redirected into a waste heat recovery boiler to produce steam. This steam is used to power a

turbine, which generates additional electricity. In a cogeneration facility, greenhouse gas emissions are only about one-third of a similarly sized coal-fired power station.

Polygeneration uses cogeneration plus gasification to produce electricity. Like cogeneration, polygeneration uses waste heat to generate electricity in a steam turbine but also uses fuel that is burned in a gas turbine to produce electricity. These methods increase electricity efficiency at industrial businesses and a potential transitional energy source that will reduce greenhouse gas emissions.

Since 2003, the Cory Cogeneration Station has been running. It is a 50/50 cost sharing program with Atco Gas at the PCS Cory Division site. The Cory Cogeneration Station uses two natural gas-fired combustion turbines and generators. The exhaust gases from each gas turbine are discharged into a waste heat recovery boiler to produce steam. This steam is used to power a steam turbine, which generates additional electricity as well as provides all of PCS Potash Cory Division's steam requirements (SaskPower 2003).

NRGreen, an entity related to Alliance Pipeline, has four operational units in Saskatchewan including, Kerrobert, Loreburn, Estlin and Alameda. NRGreen is constructing waste heat units at Alliance's compressor stations that use technology to generate electricity from the heat emitted by the natural gas turbines (NRGreen 2009)

TransCanada Corporation had been looking at Belle Plaine as a site for a polygeneration facility however has delayed its plans to build (*The Star*, 2009).

Witness Responses

Efficiency has been identified as a key element to reducing demand. Cogeneration and polygeneration are examples of increasing energy efficiencies in industrial plants in Saskatchewan. Mr. Fortney from the Saskatchewan Mining Association supports cogeneration, "definitely we'd be interested in supporting additional cogeneration projects. It makes good sense if they can provide a reliable power source up at the northern part" (Saskatchewan 2009h, 440).

Peter Prebble from the Saskatchewan Environmental Society said, "We think there's a good opportunity for expanding cogeneration of electricity in Saskatchewan. Probably one of the best opportunities is at our potash mines where we can do industrial steam processing and electrical generation at the same time" (Saskatchewan 2009e, 359)

President Alan Cruikshank from NuCoal came before your Committee to discuss their polygeneration plans for Saskatchewan. Their plant would gasify coal and make several product streams including electricity. Mr. Alan Cruikshank, stated, "from time to time we will have access to 3 to 400 megawatts of power that could be available to the grid from this polygeneration plant" (Saskatchewan 2009b, 271).

SaskPower Response

SaskPower was questioned about past cogeneration and polygeneration proposals and their decision making process. SaskPower uses a competitive process because it brings forth the "sharpest pencils". (Saskatchewan 2009h). Currently there is a competitive process for baseload generation, which could include cogen and polygeneration facilities, and it was used to illustrate their process. The process started with a request for capabilities, followed by a request for proposal. These proposals will then be evaluated. The power purchase agreement was "essentially crafted in advance of having selected the winner" (Saskatchewan 2009h, 504). This is different

from previous competitive processes but it is expected it will decrease the time overall for an agreement to be met.

c) Nuclear

The debate around nuclear power continued in the public hearings and in the written submissions. Industry and representative organizations identified a need for a stable and reliable baseload energy source for continued economic expansion. Many individuals and social justice and environmental groups took the opportunity to express their continued opposition to nuclear development.

SaskPower

Nuclear power uses a fission process to heat water and produce steam which then spins turbines and produces electricity. The advantages and disadvantages were laid out by Mr. Gary Wilkinson, "the advantages of nuclear…it has low air emissions. There's an abundant fuel source in Saskatchewan, a low operating cost, new manifestations of nuclear...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" (Saskatchewan 2009a, 245).

Witness Responses

Ron Oberth Director of Marketing and Business development of Atomic Energy of Canada Ltd. used his presentation as an opportunity to discuss nuclear regulations, safety, storage and costs. He noted that a nuclear renaissance is occurring because of the world's need for a clean baseload generation system and hoped for an educated decision, "we hope the decision in Saskatchewan is based upon sound analysis of options and their long-term impacts on the environment and the economy and should not be driven by some of the non-factual discussions that perhaps have taken place during some of the public hearings" (Saskatchewan 2009f, 275).

Dr. Malcolm Wilson envisioned nuclear as part of the long-term energy mix. "I'm a firm believer that we have such a big problem dealing with climate change that we need to use…we need every weapon in the arsenal to be able to reduce those emissions. So I see nuclear energy as being one of the options available to us" (Saskatchewan 2009i, 471).

Areva and Cameco made a joint written submission and made the following comment:

> *At present, nuclear power must be part of a broader energy mix. It is primarily geared towards supplying steady baseload power, and not well suited to meeting short-term fluctuations in demand. However, with ongoing advances in the field of small reactor technology, it may soon become a more flexible option for meeting a greater portion of the province's energy needs (CCA 206/26).*

In contrast, many individuals and social justice and environmental groups illustrated the reasons why Saskatchewan should not pursue nuclear as an energy option. Members of Save Our Saskatchewan summarized many of their member's sentiments regarding nuclear, "Locally the reasons for opposing nuclear power are varied. The reasons include economic, health, environment, quality of life, and community or rural values" (Saskatchewan 2009d, 326).

Mr. David Geary of Clean Green Saskatchewan illustrated why his organization opposes nuclear on several levels including the economic, safety and health risks.

> *Contrary to what these proponents say – nuclear industry proponents – nuclear power is not clean or green, is not competitive in price, and is not really reliable as a*

> *baseload. Regarding the fiction of nuclear power being clean power, first of all, nuclear power has emissions and lots of emissions. CO_2 is not one of those emissions really. But several radioisotopes are routinely emitted (*Saskatchewan 2009f, 397*).*

Mr. Tim Weis of the Pembina Institute looked at the nuclear issue from another lens, one that highlights the urgency for green technology to combat climate change "I think if we're looking seriously at climate change action and taking action in the very near future, we need technology that we can put into the ground right away in the next few years" (Saskatchewan 2009c, 312).

SaskPower Response

SaskPower has not ruled out nuclear power generation. They continue to monitor the technological developments, President Pat Youzwa said, "SaskPower has I think been monitoring nuclear power as a supply option, has been following, you know, developments in nuclear reactor technology, assessing its suitability as a supply option for Saskatchewan on an ongoing basis" (Saskatchewan 2009i, 499).

5. Transmission, Distribution & Interties

SaskPower

In their presentation, SaskPower outlined their extensive transmission and distribution infrastructure. They operate the second largest service area, they have 13,500 kilometers of high voltage transmission lines, 52 high voltage switching stations, 144,400 kilometers of distribution voltage lines, 183 distribution stations and more than 150,00 pole top and pad mounted transformers (CCA 145/26). SaskPower is also interconnected to adjoining electrical utilities in Manitoba, Alberta and North Dakota through seven tie-lines (CCA 145/26).

Mr. Gary Wilkinson outlined the benefits and challenges of interconnections between neighbouring utilities:

> *The interconnections to the outside world would 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. Get 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 neighbours in this facet as well" (Saskatchewan 2009a, 241).*

Witness Responses

Many witnesses also saw the benefits of expanding interties with other jurisdictions, in particular Manitoba Hydro. Many argued that hydro is the storage mechanism for wind; when the wind is blowing, the utility stores the water in the dam and when the wind is not blowing, the water is released and electricity is generated. Mr. David Huggill of The Canadian Wind Energy Association said, "I'm certainly interested in, certainly encourage the conversations with Manitoba because of the strong hydro. I also encourage conversations through Alberta as well as BC [British Columbia] because BC has also a very strong hydro resource and capacity – I mean, that's the storage for wind" (Saskatchewan 2009e, 376).

SaskPower Response

As stated previously, SaskPower already has interties with other jurisdictions. In regards to accessing more hydroelectric power from Manitoba, SaskPower informed your Committee that they have already had discussions with Manitoba Hydro and Mr. Gary Wilkinson said, "they [Manitoba Hydro] 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…they thought they may not have any firm power for us until approximately 2020 or 2023" (Saskatchewan 2009a, 245).

Mr. Gary Wilkinson also illustrated the cost of expanding intertie connections between jurisdictions. Again, he emphasized that the cost depends on the size and capability that one would transfer between regions:

> *To move, I'm going to say, about 1000 to 1500 megawatts across the region – I'm talking Manitoba, Saskatchewan, Alberta – the price tag for that…It's a single line. It reaches from Manitoba to someplace in the Regina area – at least this is the concept – and then reaches into the Calgary area. The price tag for that is, an HVDC [high voltage direct current] line, is around $2.6 billion…Between ourselves and Manitoba, if we added just a single 230 kilovolt line, not the HVDC, just 50 to 100 million is sort of, per line is not entirely unreasonable for that size. And that wouldn't get you anywhere close to 1,500 megawatts. That'd get you maybe 50 to 100 megawatts of transfer capability (Saskatchewan2009i, 518)*

6. Decentralize & Downsize

Downsizing and decentralizing power generation were not highlighted by SaskPower but was consistently discussed by witnesses. Many witnesses felt that this would lead to good jobs, rural economic development and the revitalization of small town Saskatchewan. Members of Save Our Saskatchewan clearly stated, "The development of renewable energy allows numerous people from all over the province to share in the benefits of producing power rather than a chosen few. People in our community look forward to the time when we can do our part and provide safe and clean energy for others in the province" (Saskatchewan 2009e, 373).

Mr. David Geary of Clean Green Saskatchewan said, "A shift toward renewable distributed electrical generation could greatly benefit many communities throughout the province, north to south, by providing high-quality, long-term jobs" (Saskatchewan 2009f, 396).

Mr. Mark Bigland-Pritchard of Low Energy Design Ltd. identified that "The jobs are more local. So local communities which are struggling have a chance of, you know, maintaining their existence, staying together, keeps families together with less people commuting North for work, more opportunity for local community enterprise" (Saskatchewan 2009e, 367).

The Regina Qu'Appelle Federal Green Party in their submission felt, "the more widespread, the more reliable the production of power. High quality, long term jobs in many communities will result. Incomes of farmers, ranchers and First Nations can be stabilized whether owning or leasing sites. This will reduce the decline in our rural areas" (CCA 149/26).

SaskPower Response

Mr. Gary Wilkinson explained the economics and stability of a centralized system as opposed to a dispersed system. He said, "One of the things you'll find, often you'll find when you go to the smaller scales of generation, it becomes more expensive…We grew up over the last 50 years actually trying to get economies of scale to try to drive the cost down" (Saskatchewan 2009i, 521). Furthermore, he stated that a dispersed system could potentially compromise the stability "it's a decently complex business, and if you allow anyone to put just any kind of generator up, it's not long before the neighbour who lives beside that person is having voltage trouble, and they often come to SaskPower, but it may not be an issue of our making" (Saskatchewan 2009i, 521).

7. Saskatchewan Educational Institutions

Finally, many witnesses believed that the post-secondary institutions in Saskatchewan should play a crucial role in researching and training students for future green energy careers. Mr. Steve Lawrence from Renewable Power the Intelligent Choice said, "if we're going to prepare for the future, and we're going to hire Saskatchewan people without bringing people in from outside – we really need to start getting programs in our post-secondary institutions so that we can be up and running with the best of them" (Saskatchewan 2009d, 338).

Mr. Peter Prebble from the Saskatchewan Environmental Society offered specific solutions, "All our electricians, for example, should be trained at SIAST [Saskatchewan Institute of Applied Science and Technology] to install solar photovoltaic systems so that they're ready for that when the price of solar PV [photovoltaic] drops. (Saskatchewan 2009e, 359).

Other witnesses wanted to see the development of center of excellence at the University of Saskatchewan. Mr. Ron Oberth of AECL saw great potential for Saskatchewan being home to a nuclear center of excellence while others, such as Sandra Finley and Cathy Holtslander, thought it would be more appropriate to have a renewable energy center of excellence.

C. SUMMARY OF PRESENTATIONS

Witness testimony began on October 6, 2009. There were a total of 32 different presentations – 17 in Regina, 12 in Saskatoon and three in La Ronge. There were six individuals, ten social justice and environmental groups, nine representatives from industry, four presentations from representative organizations, one political party and two First Nations. Table 1 – Witness Summary by Category

October 6, 2009

SaskPower

Your Committee commenced public hearings on Saskatchewan's energy needs and dedicated the entire day to hearing from SaskPower officials. The officials from SaskPower tabled two documents, a Power Point Presentation (CCA 145/26) and a written submission, titled *Powering a Sustainable Future: The Electricity and Conservation Strategy for Meeting Saskatchewan's Needs* (CCA 144/26).

SaskPower senior executives provided an overview and described the challenges that lay ahead. The executives that provided testimony included: Ms. Pat Youwza, President and Chief Executive Officer, Mr. Sandeep Kalra, Vice-President and Chief Financial Officer, Kevin Doherty, Vice President of Marketing and Communications, Mr. Mike Marsh, Vice-President in Transmission and Distribution, Ms. Judy May, Vice-President of Customer Services, Mr. Garner Mitchell, Vice President of Power Production, Mr. Mike Monea, Vice President of Integrated Carbon Capture and Sequestration Projects and Mr. Gary Wilkinson, Vice-President of Planning, Environment and Regulatory Affairs.

a) Key Highlights

- SaskPower's total available generating capacity is 3,641MW
- Coal-fired electricity serves as the foundation of the SaskPower system
- SaskPower serves the second largest area in Canada and the customer base is spread out over a large land base
- At a crossroad between "unprecedented demand for power from customers due to the momentum of the provincial economy" (CCA 145/26) and an aging infrastructure
- SaskPower will have to rebuild, replace, or acquire 4,100 MW of electricity by 2030(CCA 145/26)

b) Energy Demand

SaskPower explained forecasting energy demand and the growing demand for energy. In the latter part of 2007, SaskPower began to experience demand changes and in 2008, it was confirmed that SaskPower demands were in fact experiencing great increases. As outlined in their power point presentation, SaskPower's demand has grown by an average of 1.3% each year. During the next decade, demand is expected to increase by 3% per year" (SaskPower 2009b).

c) Forecasting

Forecasting provides SaskPower the basis for demand expectations. Forecasting begins in January each year and takes a number of factors into consideration:

- Information provided by industrial customers (78 accounts; 35 of the 78 accounts consume 45% of the energy used in the province)
- Economic variables (GDP, population, households and commercial data)
- Weather data from Environment Canada
- Customer surveys about residential and commercial end-use
- Historical load data

Industrial customers are the primary driver of the growing energy demand. Average annual system energy growth for the province is 3.5% whereas the forecasted average annual industrial energy growth is 6.7%. There will be aggressive load growth by the industrial accounts for the next 10 years and beyond (CCA 145/26).

d) Aging Infrastructure

The second challenge facing SaskPower is aging infrastructure. SaskPower highlighted that the facilities, distribution and transmission infrastructure is nearing their life expectancy and the high demand is exceeding the original design capabilities. SaskPower is also experiencing environmental and operational challenges. The environmental challenges are related to reducing greenhouse gas emissions and coal regulations. Considering the baseload energy source is coal, Saskatchewan has to pay particularly close attention to any new coal regulations as they will have great impact on our energy source.

e) Operational Challenges

SaskPower must 'balance the system' meaning that they "must constantly and precisely balance the supply of power and the demands of customers" (SaskPower 2009b). The Grid Control Center informs stations every four seconds to either increase or decrease load. A key component to 'balancing the system' is interconnection with neighboring jurisdictions. This assures reliability and stability of the province's electrical supply. Saskatchewan is part of the Eastern Interconnection – this includes Manitoba, Ontario, North and South Dakota and many other states in the Eastern United States. Alberta, British Columbia, half of Montana and many other Western United States belong to the Western Interconnection. This poses synchronism problems between the East and West Interconnection and if conversion is to occur between the East and the West (i.e. between Alberta and Saskatchewan) a lot of costly equipment is required for a conversion station. Currently Saskatchewan has one conversion station on the Alberta/Saskatchewan border.

In order to 'balance the system' SaskPower engages in an intensive supply planning process and evaluates all its options. The right energy mix gives the province a secure electricity supply. In the five year short-term time frame, SaskPower states, "the necessary actions are already underway to ensure the appropriate infrastructure is in place to meet projected demand" (SaskPower 2009b). This includes: demand side management, installing natural gas turbines and wind turbines, carbon capture and sequestration, short-term contracts with neighboring utilities and better short-term load forecasting.

Further into the future, 2015-2022, SaskPower is continuing to look at demand side management, evaluating and pursuing new supply options, investigating electricity storage and smart grid technologies, partnerships with First Nations, independent power producers (IPP) and intertie capacity with neighboring utilities (SaskPower 2009b).

In the long-term future, 2023 and beyond, SaskPower will continue demand response initiatives and energy efficiency. It will be pursuing new generation technologies and continued evaluation of other energy supplies. Mr. Gary Wilkinson touched on small-scale nuclear power as an energy source. New small scale nuclear power plants may begin to see licensing in about 2015. If Saskatchewan is to move in the nuclear direction, a small scale reactor may be a more appropriate size of reactor given the population size and electricity use.

f) Future Options

SaskPower concluded their presentation with a discussion of future energy supply options which include: biomass, carbon capture and sequestration, coal compliant, demand-side management,

hydro (reservoir and run-of-river), imports, natural gas-fired generation (simple cycle, combined cycle and cogeneration) nuclear, polygeneration, solar and wind.

Ms. Pat Youzwa, President and CEO of SaskPower, concluded by stating, "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" (Saskatchewan 2009a).

October 7, 2009 – Regina

NuCoal Energy Corporation– Alan Cruickshank, CEO and President
Alan Cruickshank of NuCoal Energy Corporation presented their *South 50 Project* - a polygeneration project that will use gasification of low rank stranded coal into transportation fuels, chemicals, fertilizer and electrical power. The plant itself produces 1400 MW and would use the majority of the electricity but could potentially have between 300-400MW of electricity made available to the grid from the polygeneration plant.

KAIROS, Fort Qu'Appelle Chapter – Dr. Jim Harding
Dr. Harding provided a broad perspective of the impact of greenhouse gases and the need for renewable energy sources. The proposed three-point plan was outlined in KAIROS' document, *Too Earth-Shaking to be Partisan* which stated that energy policy should be "integrated" with other policies such as food security, water protection and so on; a movement towards sustainable energy which includes a reduction in demand through efficiency and conservation, increasing wind targets to 20%, upgrading interconnection with Manitoba hydro, expand public transportation and move towards a smart grid and finally embracing ecologically sustainable development such as organic agriculture and run-of-river hydro and biomass.

Council of Canadians, Moose Jaw Chapter – Don Mitchell
Don Mitchell, as the representative of the Council of Canadians, Moose Jaw Chapter, relayed a four step strategy that focuses on renewable energy sources to meet Saskatchewan's growing energy needs which included establishing a renewable electricity task force, developing a comprehensive energy efficiency and conservation strategy, conduct an assessment of renewable energy for Saskatchewan and earmark funds for Renewable Energy. Mr. Mitchell highlighted several renewable sources including wind, hydro, biomass, geothermal and micro-power (small scale wind, solar and cogeneration) large scale cogeneration and recovered industrial energy.

Helix Geologic Consulting Ltd. – Brian Brunskill
Mr. Brunskill brought forth his recent research, *Saskatchewan's Deep Geothermal Energy Potential* to your Committee. Below the surface of Southern Saskatchewan to the Precambrian Shield is the Deadwood Aquifer which has heated water that ranges in temperatures from 60-105^{o}C exists. This can be pumped to the surface for heating and electricity production. This technology is best suited for the South Eastern portions of the province.

October 8, 2009 – Regina

CCG Trade & Development – Dave Kutcher
CCG Trade & Development is an agent for the China National Machinery Import and Export Corporation (CMEC). CMEC is interested in exploring biomass electricity options with First Nations, northern communities and/or forestry companies. CMEC has a variety of "turn-key" facilities ranging in sizes from 2x3MW to 2x15MW.

Pembina Institute - Tim Weis, Director Renewable Energy and Efficiency
Mr. Tim Weis of the Pembina Institute, stated that Saskatchewan has two sister provinces, Alberta and Nova Scotia, because of the provinces' reliance on coal as their primary source of electricity production. He strongly supported a renewable energy mix with wind providing 20% of the electricity load.

Green Party of Saskatchewan – Larissa Shasko
The Green Party of Saskatchewan strongly opposes a nuclear power reactor in Saskatchewan and argued that Saskatchewan's electricity needs can be met with simple, clean and affordable power. The Green Party of Saskatchewan outlined a plan which included, a Smart Grid, SaskPower purchase renewable electricity from other producers, ending subsidies to non-renewable resources and transferring those subsidies to renewable sources, legislation that ensures the use of passive solar and the installment of green switches in all new homes and developments.

October 9, 2009 - Saskatoon

Save Our Saskatchewan (S.O.S) – Aaron Hougham, President and Daron Priest, Vice President
The members of S.O.S are a group of concerned citizens from Lloydminster and were formed in response to the nuclear question. Their community strongly opposes the development of nuclear power in Saskatchewan and support renewable energy options. They explained that conservation should be made a priority through legislation and incentives such as selling power back to the grid. They also thought that people in Saskatchewan are willing to increase their electricity rates if they knew it was for renewable energy sources.

Dr. James Penna
Dr. Penna highlighted the moral and political implications of the hearings. He stated that the earth has intrinsic value and that there is no I/It dichotomy; the human race is tied to the earth.

Renewable Power the Intelligent Choice – Steve Lawrence
Mr. Lawrence echoed Dan Perrins' report *Future of Uranium Public Consultation Process* recommendation that expert research be conducted and provided to the public to digest. He proposed that an integrated energy system, such as solar, wind and hydro, and a smart grid.

Sandra Finley
Ms. Finley strongly argued that Saskatchewan's growing energy needs are due to the Tar Sand projects. She supports research and experimentation with renewable energy sources to determine the right mix for Saskatchewan.

Council of Canadians Prince Albert Chapter - Rick Sawa
Mr. Sawa came before your Committee to encourage the members to get experts to conduct a study on the needs, options and costs of alternative energy options.

October 13, 2009 – Saskatoon

Saskatchewan Environmental Society (SES) – Peter Prebble
Mr. Prebble reaffirmed the Saskatchewan Environmental Society's opposition to nuclear power. The organization recommended conservation methods followed by renewable energy sources to meet Saskatchewan's growing energy needs.

Low Energy Design – Mark Bigland-Pritchard
Mr. Bigland-Pritchard's presentation comprised of an overview of traditional renewable energy sources such as wind, solar and hydro. He discussed two additional forms of biomass – torrefaction and biochar. He recommended that these two areas needed further research.

Canadian Wind Energy Association (CanWEA) – David Huggill
Mr. Huggill presented the benefits of wind power. His organization, which represents 400 members, is advocating that 20% of Canada's energy be produced by wind by 2025.

October 14, 2009 – Saskatoon

Atomic Energy of Canada Ltd. (AECL) – Ron Oberth
Mr. Oberth introduced AECL and the CANDU reactor technology. He stated that there is a "nuclear renaissance" because of the world's growing need to provide a clean baseload energy source. He addressed environmental concerns and storage questions.

Cathy Holtslander
Ms. Holtslander began her presentation by outlining the broad context in which these hearing are being held and highlighted several jurisdictions moving towards renewable energy sources. The members solicited Ms. Holtslander for her opinion on a number of topics – energy mix, debt associated with renewing the energy system, rate increases and potential interest in decentralized energy.

Clean Green Saskatchewan – David Geary
Mr. Geary discussed the risks associated with nuclear power. Clean Green Saskatchewan supports decentralized power generation in conjunction with SaskPower.

Solar Outpost – David Anderson
Solar Outpost supplies residential and commercial sized photovoltaic, solar heating, wind and geothermal installations. Mr. Anderson emphasized Saskatchewan's exceptional sun and wind resources and featured his company's systems.

October 15, 2009 – La Ronge

Meadow Lake Tribal Council Resource Development Ltd. – Ben Voss, CEO and Erin Duff, Junior Analyst
MLTC Resource Development Ltd. has signed a Memorandum of Understanding with Pristine Power Inc. and has identified two biomass projects, the Meadow Lake Combined Cycle-Biomass and Northern Mine Site Biomass Co-Gen, as priority projects. The Meadow Lake Combined Cycle-Biomass would produce a total of 84MW and the Northern Mine Site Biomass Co-Gen could be up to 5x9MW Biomass Rankine Cycle heat recovery for mine heat applications.

Dave Elliot
Mr. Elliot discussed coal gasification and the potential for underground coal gasification (UCG) for the La Ronge area. Production of methane from coal beds in traditional petroleum engineering practices may be an option for La Ronge and many parts of the north because they reside above the Mannville coal bed.

Peter Ballantyne Cree Nation – Harvey Nataweyes, Stanley Merasty and Dale P. Reid
The members of the Peter Ballantyne Cree Nation discussed two hydro projects that they are interested in exploring with SaskPower. They believe they can produce roughly 200MW on Island Falls and Whitesand Dams without environmental impacts because these Dams are part of a water control system.

October 16, 2009 – Regina

Saskatchewan Mining Association – Pam Schwann, Executive Director and Steve Fortney, Chair of the Potash Section and General Manager of PotashCorp Rocanville Mine
Members of the Saskatchewan Mining Association came before your Committee to show support for "significant new infrastructure investment in baseload power generation, transmission and distribution capacity" (CCA 192/26). They estimated that 20 of their members are those industrial customers that SaskPower provides the most energy to and in order for Saskatchewan's resource industry to continue growing they need power.

Wade Zawalski
Mr. Zawalski discussed solar technologies and made it clear that the technology is changing very rapidly which in turn, is lowering prices.

Saskatchewan Association of Rural Municipalities –David Marit, President
SARM supports continued use of coal as the baseload power supply but also supports wind, solar and nuclear which could meet the expected increase in demand. Their members would like to see the coal-fired plants maintained and adapted to meet the current and expected federal regulations.

Kelln Solar – Ken Kelln, President and General Manager
Mr. Kelln highlighted the dramatic changes in the solar industry and the subsequent decreasing solar prices. He recommended removing PST on renewable energy sources, building demonstration homes that highlight energy efficiency, feed-in tariffs and low interest rate loans for renewable energy sources.

Pedersen Apiaries Ltd. – Karen Pedersen, President
Ms. Pedersen provided her business' experience as a case study about energy and heating. Through extensive research and site analysis she began to understand the interconnected relationship between heating and energy.

North Saskatchewan River Environmental Society – Gil Pedersen
This organization was established in response to the potential of nuclear power in Saskatchewan. They do not support the development of a nuclear power plant and are critical of the assumption that energy demands need to increase. They support conservation to help reduce consumption.

October 19, 2009 – Regina

Dr. Malcolm Wilson
Dr. Wilson, a leading carbon capture and sequestration researcher and 2007 Nobel Peace Prize recipient, discussed broadly energy options and concerns. He recognizes Saskatchewan's large energy sources and supports continued use of coal, the development of carbon capture and sequestration research, renewable energy sources, such as biomass and geothermal, and believes nuclear has a role to play in the long range energy mix.

KAIROS, Regina Chapter - Dr. Dan Beveridge
Dr. Dan Beveridge, as a representative of KAIROS-Regina, emphasized opposition to nuclear and continued support for energy conservation, efficiency and renewables. KAIROS made six recommendations which included, calling on expert witnesses, look to other jurisdictions that are leading the way in sustainable societies, conduct education programs through Universities and NGOs, invest in an integrated system of conservation, efficiency and renewables, cogeneration and a smart grid, create a Centre of Excellence, increase the Standing Committee on Crown and Central Agencies' budget to address other sources of energy

Saskatchewan Chamber of Commerce – Steve McLellan, CEO
The Saskatchewan Chamber of Commerce encourages exploring all energy options which will lead to stability and sustainability. In their written submission, they discussed all options including fossil fuels, renewable energy sources and nuclear energy sources. They argued that if there is a strong business case for any type of power generation option by SaskPower or private business, then it should be fully explored.

SaskPower
On the final day of the first round of public hearings, SaskPower responded to questions from your Committee on the following topics:

- transmission and distribution,
- demand side management and energy efficiency
- renewables – wind, hydro,
- process for Independent Power Producer bids, purchase agreements and pricing
- corporate planning in regards to infrastructure upgrades,
- Dispersed generation system and current programs

In SaskPower's concluding remarks, they urged your Committee to act prudently. They stated that the matter is complex, that the stakes are high and that there is "no silver bullet" solution. Finally, President Youzwa stated, "there's an undeniable urge to make long-term decisions today to be seen to be ahead of the pack. But I would suggest to the members here that this approach is not only irresponsible but could also result in unnecessarily higher electrical costs for all of us" (Saskatchewan 2009i).

Witness presentations and tabled documents can be found on the Committees website. www.legassembly.sk.ca/committees

D. SUMMARY OF WRITTEN SUBMISSIONS

In addition to the witness presentations, your Committee also invited those who were interested but were not able to appear before your Committee to make a written submission. Twenty-four written submissions were received by your Committee. Fourteen of the 24 submissions were written by individuals.

The vast majority of individuals supported conservation and renewable energy sources, such as wind, solar and biomass. Elaine Hughes writes, "Other countries (and provinces) have realized the potential in wind, solar, geo-thermal and small hydro generation of electricity, and are aggressively pursuing their development. The employment opportunities are endless, and nearby workshops or factories are plentiful" (CCA 147/26). In John Pedersen's submission he summarized his points as follows:

1. *When one is looking at energy expansion the first avenue is to consider conservation of energy , in whatever form is being used.*
2. *If new electricity generation is needed, then the first consideration should be for renewables, such as small scale hydro, biomass, wind, and solar.*
3. *Phase out existing coal fired power plants, and only build new plants if emission control can be assured.*
4. *No nuclear power plants because of prohibitive costs, long lead time, and uncertain safety considerations, plus the unsolved problem of waste disposal (CCA 189/26).*

Lastly, Kathryn Scott, stated that "the solution need to be on every level, education consumers, providing infrastructure (transit, rail service, bike paths) that facilitate conservation, incentives to communities and businesses to utilize renewable energy sources" (CCA 196/26).

One individual supported the development of nuclear. Mr. Don Olson states, "Nuclear. It may be expensive but it doesn't produce greenhouse gases, it doesn't destroy the environment and it is reliable. And we can generate revenue (export power) to help offset our capital over time. This option should be considered very seriously for the province to pursue" (CCA 157/26). The other two written submission expressed concerns relating to the committee process and the potential threat of Crown Corporations being privatized.

The remaining ten written submissions were from one social justice and environmental organization, three submissions from industry, one representative organization, one political party, one research institution and three communities. The social justice and environmental organization and the political party supported conservation and renewable sources. The Regina-Qu'Appelle Federal Green Party Association stated, "We believe that Saskatchewan citizens energy needs and our ecology economy needs can be best served by energy conservation, energy efficiency, renewable energies, small scale hydro, micro generation, cogeneration, combined cycle gas turbines and possible hydro imports from Manitoba" (CCA 149/26).

Two submissions, received from industry, supported solar and biomass energy sources. SHEC Energy Corporation is working on solar projects while Prairie Green Renewable Energy Inc. are working with several agencies to design Saskatchewan's first wood and agricultural waste pellet fuel plant. (CCA 205/26). The third submission from industry was from Areva and Cameco. They reiterated their support for nuclear energy development. Nuclear was also mentioned as a potential energy source in the North Saskatoon Business Association's submission. Three communities, R.M. of Hart Butte, The Town of Bengough and the Town of Willow Bunch, sent letters to your Committee encouraging the continued use of coal. Finally, the Petroleum Technology Research Centre outlined its future research initiatives with hydrocarbons.

Written submissions can be found on the Committees website. www.legassembly.sk.ca/committees

E. NEXT STEPS

Your Committee will be conducting an additional nine public hearings in January 2010. They are scheduled as follows:

- January 18, 2010 Lloydminster – 9:00 a.m. – 2:00 p.m.
- January 19, 2010 Prince Albert – 10:00 a.m. – 12:00 p.m. and 1:00 p.m. – 5:00 p.m.
- January 20, 2010 Saskatoon – 10:00 a.m. – 12:00 p.m. and 1:00 p.m. – 5:00 p.m.
- January 21, 2010 Saskatoon– 9:00 a.m. – 2:00 p.m.
- January 22, 2010 Yorkton – 10:00 a.m. – 12:00 p.m. and 1:00 p.m. – 5:00 p.m.
- January 25, 2010 Estevan– 10:00 a.m. – 12:00 p.m. and 1:00 p.m. – 5:00 p.m.
- January 27, 2010 Regina– 10:00 a.m. – 12:00 p.m. and 1:00 p.m. – 5:00 p.m.
- January 28, 2010 Regina– 10:00 a.m. – 12:00 p.m. and 1:00 p.m. – 5:00 p.m.
- January 29, 2010 Regina– 10:00 a.m. – 12:00 p.m. and 1:00 p.m. – 5:00 p.m.

A final report outlining the information gathered during the fall and winter public hearings as well as the written submissions will be tabled with the Legislative Assembly before the end of the Third session of the 26th Legislature.

Appendix A – Invited Stakeholder List

Agrium
Archdiocese of Regina
Areva Resources Canada Inc.
Assembly of First Nations
Athabasca Basin -Transportation Planning Committee
BHP Billiton
Bruce Power
Cameco Corporation
Canada School of Energy and Environment
Canadian Centre for Policy Alternatives (CCPA)
Canadian Coalition for Nuclear Responsibility
Canadian Electricity Association
Canadian Energy Research Institute
Canadian Federation of Independent Businesses
Canadian Nuclear Safety Commission
Canadian Nuclear Society
Canadian Parks and Wilderness Society - Saskatchewan
Canadian Wind Energy Association
Cargill Ltd.
Centre for Studies in Agriculture, Law and the Environment
Coal Association of Canada
City of Estevan
City of Moose Jaw
City of Prince Albert
City of North Battleford
City of Regina
City of Saskatoon
City of Swift Current
City of Weyburn
City of Yorkton
Clean Green Saskatchewan
Communities of Tomorrow
Consumers' Cooperative Refinery
Cumulative Environmental Management Association
CUPE Saskatchewan
David Orchard Campaign for Canada
Denison Mines Corporation
Ducks Unlimited Canada
The David Suzuki Foundation
Enbridge Inc.
EnCana Corporation
Encanto Resource Development Inc
Energy Council of Canada
Environment Canada
Federation of Saskatchewan Indian Nations
First Nations University of Canada
Gabriel Dumont Institute
General Bio Energy
Golder Associates
Greater Saskatoon Chamber of Commerce
Green Communities Canada
Green Party of Saskatchewan
Greenpeace Canada
Husky Energy
Evraz Inc NA
Institute for Sustainable Energy, Environment and Economy
Intergovernmental Panel on Climate Change
International Atomic Energy Association
International Brotherhood of Electrical Workers
International Institute Sustainable Development
JNR Resources Inc
KAIROS: Canadian Ecumenical Justice Initiatives
Keewatin Career Development Corporation
Kitsaki Management Limited Partnership
Louis Dreyfus Highbridge Energy
Making the Links Radio
Manitoba Hydro
Mennonite Church of Saskatchewan
Métis Nation of Saskatchewan
Ministry of Environment - Climate Change Saskatchewan
Mosaic Potash
National Energy Board
National Farmers Union
Nature Saskatchewan
New North
North Saskatoon Business Association
Nuclear Energy Agency
NuCoal Energy Corporation
Office for Justice and Peace - Catholic Pastoral Centre
Office of Energy and Environment
Office of the Treaty Commissioner
One Sky: Canadian Institute of Sustainable Living
Partners FOR Saskatchewan River Basin
The Pembina Institute
Petroleum Technology Research Centre
Pollution Probe
Potash Corporation of Saskatchewan
Potash One
Prairie Adaptation Research Collaborative
Prairie BioGas
Prairie Policy Center
Progressive Conservative Party of Saskatchewan
Regina & District Chamber of Commerce
Regina Eco Living
Regional Center of Expertise - Renewable Power- The Intelligent Choice (RPIC)
Richardson International

Rocky Mountain Institute
Saskatchewan Apprenticeship and Trade Certification Commission
Saskatchewan Association of Health Organizations (SAHO)
Saskatchewan Association of Regional Colleges
Saskatchewan Association of Rural Municipalities (SARM)
Saskatchewan School Boards Association
Saskatchewan Catholic School Boards Association
Saskatchewan Chamber of Commerce
Saskatchewan Construction Association
Saskatchewan Council for International Cooperation
Sask Eco Network
SaskEnergy
Saskatchewan Environment & Industry Managers Association
Saskatchewan Environmental Society
Saskatchewan Federation of Labour
Saskatchewan Indian Institute of Technologies
Saskatchewan Institute of Applied Sciences & Technology (SIAST Administrative Offices
Saskatchewan Medical Association
Saskatchewan Mining Association
Saskatchewan Organic Directorate
Saskatchewan Outfitters Association
Saskatchewan Potash Producers Association
SaskPower
Saskatchewan Research Council
Saskatchewan Trade and Export Partnership
Saskatchewan Trappers Association
Saskatchewan Union of Nurses
Saskatchewan Urban Municipalities Association (SUMA)
Saskatchewan Watershed Authority
Saskatchewan Wildlife Federation
Solar Energy Society of Canada Inc.
Suncor Energy Inc.
Sustainable Concepts Ltd
Titan Uranium Exploration
TransCanada
United Steelworkers
Yara Belle Plaine Inc.

Appendix B – List of Tabled Documents

Document Number	Description of Document
CCA 144/26	**Saskatchewan Power Corporation:** Powering a Sustainable Energy Future, dated October 6, 2009
CCA 145/26	**Saskatchewan Power Corporation:** Powering a Sustainable Energy Future PowerPoint presentation, dated October 6, 2009.
CCA 146/26	**SHEC Energy Corporation:** Submission for Inquiry on Saskatchewan's energy needs, dated September 29, 2009
CCA 147/26	**Elaine Hughes: s**ubmission for Inquiry on Saskatchewan's energy needs, dated September 25, 2009
CCA 148/26	**Garrett Osborn:** Submission for Inquiry on Saskatchewan's energy needs "Semi-closed carbon cycle", dated October, 2009
CCA 149/26	**Regina-Qu'Appelle Federal Green Party Association**: Submission for Inquiry on Saskatchewan's energy needs, dated October 1, 2009
CCA 150/26	**Jacqueline Swiderski:** Submission for Inquiry on Saskatchewan's energy needs, dated October 1, 2009
CCA 151/26	**Marion E. Tolley:** Submission for Inquiry on Saskatchewan's energy needs, dated October 3, 2009
CCA 152/26	**NuCoal Energy Corp:** Submission for Inquiry on Saskatchewan's energy needs, dated October 7, 2009
CCA 153/26	**KAIROS Fort Qu'Appelle:** Submission for Inquiry on energy needs, "Too Earth-Shaking to be partisan" dated October 7, 2009
CCA 154/26	**Moose Jaw Chapter, Council of Canadian:** Submission for Inquiry on energy needs, dated October 7, 2009.
CCA 155/26	**Helix Geological Consulting:** Submission for Inquiry on energy needs, PowerPoint presentation, dated October 7, 2009.
CCA 156/26	**Helix Geological Consulting:** Response to questions raised during at the October 7, 2009 meeting of the committee re: cost per energy unit development cost for geothermal.
CCA 157/26	**Don Olson:** Submission for inquiry on Saskatchewan's energy needs, dated October 5, 2009.
CCA 158/26	**CCG Trade & Development Corporation:** Submission for Inquiry on Saskatchewan's energy needs - PowerPoint presentation "Biomass Power Generation", dated October 8, 2009.
CCA 159/26	**CCG Trade & Development Corporation:** Submission for Inquiry on Saskatchewan's energy needs - Table outlining renewable energy projects in Ontario, dated September 30, 2009.
CCA 160/26	**The Pembina Institute:** Submission for Inquiry on Saskatchewan's energy needs "Greening the Grid – Fact Sheet".
CCA 161/26	**The Pembina Institute:** Submission for Inquiry on Saskatchewan's energy needs - PowerPoint presentation, dated October 8, 2009.
CCA 162/26	**The Pembina Institute:** Submission for Inquiry on Saskatchewan's energy needs "Successful Strategies for Energy Efficiency", dated August 2006.
CCA 163/26	**Green Party of Saskatchewan:** Submission for Inquiry on Saskatchewan's energy needs "Unpacking the Question", dated October 8, 2009.
CCA 164/26	**Save Our Saskatchewan:** Submission for Inquiry on Saskatchewan's energy needs, dated October 9, 2009.

CCA 165/26	**Renewable Power the Intelligent Choice:** Submission for Inquiry on Saskatchewan's energy needs, dated September 29, 2009.
CCA 166/26	**Council of Canadians, Prince Albert Chapter:** Submission for Inquiry on Saskatchewan's energy needs, dated October 9, 2009.
CCA 167/26	**Saskatchewan Environmental Society:** Submission for Inquiry on Saskatchewan's energy needs, "Addressing Saskatchewan's electricity needs in a sustainable manner".
CCA 168/26	**Low Energy Design Ltd.:** Submission for Inquiry on Saskatchewan's energy needs.
CCA 169/26	**Low Energy Design Ltd.:** Book titled *Six Degrees: Our Future on a Hotter Planet* by Mark Lynas.
CCA 170/26	**Canadian Wind Energy Association:** Submission for Inquiry on Saskatchewan's energy needs, dated October 13, 2009.
CCA 171/26	**Canadian Wind Energy Association:** Submission for Inquiry on Saskatchewan's energy needs, "WindVision 2025".
CCA 172/26	**Canadian Wind Energy Association:** Submission for Inquiry on Saskatchewan's energy needs, "WindVision 2025 – Backgrounders on Wind Energy".
CCA 173/26	**Atomic Energy of Canada Limited:** Submission for Inquiry on Saskatchewan's energy needs, dated October 14, 2009.
CCA 174/26	**Atomic Energy of Canada Limited:** Submission for Inquiry on Saskatchewan's energy needs, PowerPoint presentation "Nuclear Power in Saskatchewan", dated October 14, 2009.
CCA 175/26	**Cathy Holtslander:** Submission for Inquiry on Saskatchewan's energy needs, PowerPoint presentation "Saskatchewan's Energy Future", dated October 14, 2009.
CCA 176/26	**Clean Green Saskatchewan:** Submission for Inquiry on Saskatchewan's energy needs.
CCA 177/26	**Solar Outpost Inc.:** Submission for Inquiry on Saskatchewan's energy needs, "Benefits of distributed generation and small scale renewable energy applications in Saskatchewan", dated October 14, 2009.
CCA178/26	**Meadow Lake Tribal Council Development Inc.:** Submission for Inquiry on Saskatchewan's energy needs, dated October 15, 2009.
CCA 179/26	**Meadow Lake Tribal Council Development Inc.:** Submission for Inquiry on Saskatchewan's energy needs, PowerPoint presentation "Presentation to the Standing Committee on Crown and Central Agencies: Energy Options", dated October 15, 2009.
CCA 180/26	**Dave Elliott:** Submission for Inquiry on Saskatchewan's energy needs, dated October 15, 2009.
CCA 181/26	**Dave Elliott:** Submission for Inquiry on Saskatchewan's energy needs, "Design options for methane production from coal in the La Ronge region", dated April 8, 2005.
CCA 182/26	**Peter Ballantyne Cree Nation:** Submission for Inquiry on Saskatchewan's energy needs.
CCA 183/26	**Helix Geological Consultants Ltd:** Submission for Inquiry on Saskatchewan's energy needs, "Saskatchewan's deep geothermal energy potential".
CCA 184/26	**Low Energy Design Ltd.:** Submission for Inquiry on Saskatchewan's energy needs, dated October 13, 2009.

CCA 185/26	**Dr. James V. Penna:** Submission for Inquiry on Saskatchewan's energy needs, dated October 9, 2009.
CCA 186/26	**Renewal Power the Intelligent Choice:** Submission for Inquiry on Saskatchewan's energy needs, "follow up".
CCA 187/26	**Joyce Neufeld:** Submission for Inquiry on Saskatchewan's energy needs, dated October 14, 2009.
CCA 188/26	**Saskatchewan Environmental Society:** Submission for Inquiry on Saskatchewan's energy needs, "Archer, Cristina L. And Jacobson, Mark Z., 2007: Supply Baseload Power and Reducing Transmission Requirements by Interconnecting Wind Farms *Journal of Applied Meteorology and Climatology*, November, 1701-1717", dated October 14, 2009.
CCA 189/26	**John Pedersen:** Submission for Inquiry on Saskatchewan's energy needs.
CCA 190/26	**Rural Municipality of Hart Butte No. 11:** Submission for Inquiry on Saskatchewan's energy needs, dated October 13, 2009.
CCA 191/26	**Town of Willow Bunch:** Submission for Inquiry on Saskatchewan's energy needs, dated October 15, 2009.
CCA 192/26	**Saskatchewan Mining Association:** Submission for Inquiry on Saskatchewan's energy needs, "Investing in baseload power infrastructure as a foundation for economic growth and prosperity", dated October 17, 2009.
CCA 193/26	**Wade Zawalski:** Submission for Inquiry on Saskatchewan's energy needs, Power Point presentation, "Utility Scale Solar Power for Saskatchewan", dated October 16, 2009.
CCA 194/26	**Dwayne Keir:** Submission for Inquiry on Saskatchewan's energy needs, dated October 6, 2009.
CCA 195/26	**Petroleum Technology Research Centre:** Submission for Inquiry on Saskatchewan's energy needs, "A PTRC Technology Roadmap for Saskatchewan 2008 to 2050", dated October 13, 2009
CCA 196/26	**Kathryn Scott:** Submission for Inquiry on Saskatchewan's energy needs.
CCA 197/26	**Sherry Buller:** Submission for Inquiry on Saskatchewan's energy needs, "What is Saskatchewan's Energy Goal?"
CCA 198/26	**Town of Bengough:** Submission for Inquiry on Saskatchewan's energy needs, dated October 16, 2009.
CCA 199/26	**Brett Dolter:** Submission for Inquiry on Saskatchewan's energy needs, dated October 15, 2009.
CCA 200/26	**Saskatchewan Association of Rural Municipalities:** Submission for Inquiry on Saskatchewan's energy needs, dated October 16, 2009.
CCA 201/26	**Kelln Solar:** Submission for Inquiry on Saskatchewan's energy needs, PowerPoint presentation "Sustainable Energy Supply Options".
CCA 202/26	**Pedersen Apiaries Ltd.:** Submission for Inquiry on Saskatchewan's energy needs, "A small Saskatchewan energy case study", dated October 16, 2009.
CCA 203/26	**North Saskatchewan River Environmental Society:** Submission for Inquiry on Saskatchewan's energy needs, "Submission on energy production and use", dated October 16, 2009.
CCA 204/26	**Don Gunderson:** Submission for Inquiry on Saskatchewan's energy needs, dated October 19, 2009.
CCA 205/26	**Prairie Green Renewable Energy Inc.:** Submission for Inquiry on Saskatchewan's energy needs, dated October 15, 2009.
CCA 206/26	**Cameco & Areva:** Submission for Inquiry on Saskatchewan's energy needs, dated October 15, 2009.
CCA 207/26	**Phil Schaan-Dumont:** Submission for Inquiry on Saskatchewan's energy needs, dated October 7, 2009.

CCA 208/26	**North Saskatoon Business Association:** Submission for Inquiry on Saskatchewan's energy needs, dated October 16, 2009.
CCA 209/26	**Social Action Committee, Unitarian Congregation of Saskatoon:** Submission for Inquiry on Saskatchewan's energy needs, dated October 19, 2009.
CCA 210/26	**Gordon Michayluk:** Submission for Inquiry on Saskatchewan's energy needs, dated October 19, 2009.
CCA 211/26	**Malcolm Wilson:** Submission for Inquiry on Saskatchewan's energy needs, dated October 19, 2009.
CCA 212/26	**Malcolm Wilson:** Submission for Inquiry on Saskatchewan's energy needs 'Meeting future energy needs as a community benefit", dated October 19, 2009.
CCA 213/26	**Dr. Dan Beveridge:** Submission for Inquiry on Saskatchewan's energy needs, dated October 19, 2009.
CCA 214/26	**Atomic Energy of Canada Limited:** Submission for Inquiry on Saskatchewan's energy needs, "follow up", dated October 19, 2009.
CCA 215/26	**Saskatchewan Chamber of Commerce:** Submission for Inquiry on Saskatchewan's energy needs.
CCA 216/26	**Saskatchewan Chamber of Commerce:** Submission for Inquiry on Saskatchewan's energy needs, "Executive Summary: Lessons from the Spanish Renewable Bubble – Study about the effects on employment of public aid to renewable energy sources, Universidad Rey Juan Carlos, dated March 2009."
CCA 217/26	**Saskatchewan Power Corporation:** List of expertise that SaskPower has consulted in the development of supply options, dated October 19, 2009.
CCA 218/26	**Electrical Energy Options Review Panel:** Saskatchewan Electrical Energy Options position statement report, dated October 31, 1991.

Table 1 – Witness Summary by Category

Table 1 – Witnesses by Group		
Individuals	Dave Elliot	
	Sandra Finley	
	Cathy Holtslander	
	Dr. James Penna	
	Dr. Malcolm Wilson	
	Wade Zawalski	
Social Justice & Environmental Groups	Council of Canadians – Moose Jaw	Don Mitchell
	Council of Canadians – Prince Albert	Rick Sawa
	KAIROS – Fort Qu'Appelle	Dr. Jim Harding
	KAIROS – Regina	Dr. Dan Beveridge
	North Saskatchewan River Environmental Society	Gil Pedersen
	Pembina Institute	Tim Weis
	Renewable Power: the Intelligent Choice	Steve Lawrence
	Saskatchewan Environmental Society	Peter Prebble
	Save Our Saskatchewan	Aaron Hougham and Daron Priest
Industry	Atomic Energy of Canada Ltd.	Dr. Ron Oberth
	CCG Trade & Development	Dave Kutcher
	Helix Geological Consulting	Brian Brunskill
	Kelln Solar	Ken Kelln
	Low Energy Design Ltd.	Mark Bigland-Pritchard
	NuCoal Energy Corp.	Alan Cruikshank
	Pedersen Apiaries	Karen Pedersen
	SaskPower	Pat Youwza, Sandeep Kalra Kevin Doherty Mike Marsh Judy May Garner Mitchell Mike Monea Gary Wilkinson,
	Solar Outpost	David Anderson
Representative Organizations	Canadian Wind Energy Association	David Huggill
	Saskatchewan Association of Rural Municipalities	David Marit
	Saskatchewan Chamber of Commerce	Steve McLellan
	Saskatchewan Mining Association	Pam Schwan and Steve Fortney
Political	Green Party of Saskatchewan	Larissa Shasko
First Nations	Meadow Lake Tribal Council Resource Development Ltd.	Ben Voss
	Peter Ballantyne Cree Nation	Harvey Nataweyes, Stanley Merasty, Dale P. Reid

Table 2 – Written Submissions by Category

Table 2 – Written Submissions by Group	
Individuals	Elaine Hughes Garrett Osborn Jacqueline Swiderski Marion E. Tolley Don Olson Dwayne Keir John Pedersen Joyce Neufeld Kathryn Scott Sherry Buller Brett Dolter Don Gunderson Phil Schaan-Dumont Gordon Michayluk
Social Justice & Environmental Groups	Social Action Committee of the Unitarian Congregation of Saskatoon
Industry	SHEC Energy Corporation Prairie Green Renewable Energy Source Inc. Cameco and Areva
Representative Organizations	North Saskatoon Business Association
Political	Regina Qu'Appelle Federal Green Party Association
Communities	Willow Bunch R.M. of Hart Butte No. 11 Town of Bengough
Research Organization	Petroleum Technology Research Centre

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