**Small Modular Reactor (SMR) Call-In Event Transcript**
**October 5, 2023**

**Kevin Powers:**

Good evening, Saskatchewan, and welcome to SaskPower's first call-in event. My name's Kevin Powers, and I'll be your host tonight as we explore the potential for nuclear power in Saskatchewan. Before we get started, let me explain how a call-in event works. Right now, residents across the province are answering their phones or using their electronic devices to connect to this discussion. It's an opportunity to talk with thousands of people across the province from the comfort of their homes about an important topic. For those of you just joining us, welcome. Tonight, I have with me three guests who will help answer some of my questions, but more importantly, they're here to answer your questions. With me in the studio tonight is Doug Opseth, the director of generation asset management at SaskPower. In this role, Doug leads the team with the challenging task of ensuring the growing demand for power in Saskatchewan can be met. Doug also manages SaskPower's aging generation facilities and is helping lead the company through today's energy transition. Hello, Doug, and welcome.

**Doug Opseth:**

Thanks, Kevin. It's great to be here tonight.

**Kevin Powers:**

Also with me is Darcy Holderness, the project manager for SaskPower's small modular reactor development project. In his role, Darcy manages the potential development of nuclear power from small modular reactors, or SMRs, as a zero-emission option for Saskatchewan beyond 2030. Hi, Darcy.

**Darcy Holderness:**

Hi, Kevin. Thanks for listening to us here.

**Kevin Powers:**

Finally, we have Sarah Klein Bentley, a supply planning engineer who has previously led the site selection process for large and small power generation facilities at SaskPower. She's responsible for finding the best site to potentially host an SMR. Welcome, Sarah.

**Sarah Klein Bentley:**

Thanks, Kevin. Looking forward to chatting with you and taking questions tonight.

**Kevin Powers:**

Now, I have a lot of questions for the three of you, but I want to invite our audience to ask questions as well. If you have a question at any point in the call, just press star three on your phone at any time to let us know you'd like to speak live on the call. An operator will take down your question and put you in line to ask your question live. You'll still be able to hear the conversation while you're waiting to ask your question, and when I call your name, you'll be able to ask your question live on the air. If you'd prefer not to ask your question live on the air, you'll have a chance to leave SaskPower a message at the end of this event. We're also going to be posing quick real time poll questions throughout the discussion, so let's try one of these poll questions now.

The first poll question is, what do you think is the biggest source of electric power in Saskatchewan? Press one on your phone for hydro, press two on your phone for wind and solar, press three on your phone for natural gas, press four on your phone for coal. Once again, the question is, what is the biggest source of power in Saskatchewan? Press one for hydro, two for wind and solar, three for natural gas, or four for coal. Now while we wait for the results, Darcy, I'm going to ask you to offer us a land acknowledgement while we begin.

**Darcy Holderness:**

You bet. Thanks, Kevin. At SaskPower, our work, our operations stretch right across Saskatchewan, and that means we effect and work on the ancestral lands of many nations. So that's all six treaties in Saskatchewan, as well as the homeland of the Metis and the Lakota and Dakota nations as well. We respect and honor the indigenous knowledge and the ancestral lands of indigenous peoples, and we're committed to moving forward in the spirit of reconciliation and collaboration. I myself, I've grown up in Saskatchewan and lived here my whole life. I come from the Treaty 6 territory where I grew up around the Saskatoon area, and all three of us now from SaskPower here, or all four of us are coming to you from Treaty 4. We're all located in Regina. Thanks, Kevin.

**Kevin Powers:**

Thanks, Darcy. And thanks to everyone for participating in our poll. The results are in, and according to our audience, 50% say the biggest source of power in Saskatchewan is coal. 29% say it's natural gas, 21% say hydro and 0% say wind and solar. Now to share the answer from SaskPower, I'm going to ask Doug to join us.

**Doug Opseth:**

Thanks, Kevin. Well, SaskPower, we've always been lucky to have a diverse mix of supply options, right now is no difference. Right now, the biggest source of power is gas at 40%, the conventional coal at

24%, followed by hydro and hydro imports at 21%, wind makes up about 11%. Solar comes in at 2%, another 2% comes from other sources.

**Kevin Powers:**

Doug, part of your job is to oversee SaskPower's long-term supply plan for how to power the province in the future. Why does SaskPower plan so far in advance?

**Doug Opseth:**

Well, at SaskPower we not only look at how we deliver power today, but well into the future. As we know, things will change. Each power supply option has its pros and cons, like how much they cost, how many greenhouse gas emissions they produce, and how reliable they are. So, by having a diverse mix, we can deliver reliable, sustainable, and cost-effective power for Saskatchewan people and businesses. Now changes in our regulatory environment, the growing demand for power, and evolving customer expectations mean that we need to change where our power comes from.

**Kevin Powers:**

Why is that, Doug?

**Doug Opseth:**

Well, every province, including Saskatchewan, has a target to reduce greenhouse gas emissions by at least 50 per cent from 2005 levels by 2030, and Saskatchewan is well on its way to meeting this target. And now in Saskatchewan, we're working towards a long-term goal of net-zero greenhouse gas emissions by 2050 or sooner. To get to a net-zero, we are planning for the retirement of conventional coal by 2030 as required by federal government. So, to replace this retiring coal, we're building more natural gas facilities, wind and solar projects, battery energy storage and transmission lines to our neighbors to ensure a successful transmission by 2030. Now a lot of work is required to plan for beyond 2030. We know that demand for power will increase as our population grows and as people adopt technologies like electric vehicles. To meet that demand, all low and non-emitting sources of power are on the table. This includes wind, solar, geothermal, hydro, carbon capture storage, and nuclear power.

**Kevin Powers:**

That's a lot to consider. Now, are you taking any input from the residents of Saskatchewan on the future of power in the province and what they want?

**Doug Opseth:**

Yes, we are definitely taking input from the province. We know this transmission brings opportunities and trade-offs that are important to our customers and all Saskatchewan residents, so we are seeking

their input. Next summer, we'll release our integrated long-term supply plan. It will be based on everything we've heard and learned in this process, along with our analysis and conclusions, we'll also share the role the public input played in developing this final plan.

**Kevin Powers:**

It sounds like quite the process, Doug. Maybe now is a good time though to share that for those who are interested in learning more, and engage with us about our future supply plan, the next virtual event will be held on October 12th. There we'll be discussing the customer renewable programs, and you can visit saskpower.com/powertalks. Looks like we have a few questions from our callers, Doug, so why don't we go to those. First, we have Rudy from Abbotsford. Ruby, you're live.

**Ruby:**

Hi, how are you guys today?

**Doug Opseth:**

I'm doing great, thanks.

**Kevin Powers:**

Great, thanks.

**Ruby:**

Good. My question is, how much waste product are we going to produce with this, and how much farmland is it going to take up? And what do you plan on doing with the waste product and the safety protocol in dealing with this because of... Well, we all know about what happened in Chernobyl, right?

**Kevin Powers:**

Good question. Doug.

**Doug Opseth:**

Yeah, well this is an excellent question, and this might be a great question that we'll get to, and we get to Darcy speaking about this. But certainly, as we're thinking about this product, as we're thinking about nuclear power, certainly waste is one of those things we're considering. The nice thing about nuclear power is that produces very little waste that needs to be managed, but we have a plan in place to effectively manage that as we go forward. Then maybe Darcy can follow up on that when he gets to his questions.

**Kevin Powers:**

All right, Doug, we have another question from Manuel in Prince Albert. Manuel, you're on the air.

**Manuel:**

Hi, good evening. My question is about the solar power development, which is has zero emission and less polluting the environment. I'm just wondering, is there any plan for SaskPower to provide more opportunity for individual homeowners to develop solar power?

**Doug Opseth:**

Yeah, that's a great question. Certainly we have plans that significantly more renewable generation, Saskatchewan. Right now, our plans have us adding about 3,000 megawatts of wind and solar generation between now and 2035. And certainly, we do have programs in place right now to allow homeowners to put solar panels on the roofs, and that's our net metering program. And additional information can be found on our website at saskpower.com. But certainly, solar and wind power will play a big role in our energy transition going forward.

**Kevin Powers:**

All right, Doug, another question here from Bill. Bill asks, why is the priority the most expensive source of energy?

**Doug Opseth:**

Well, thanks for the question. I think the most expensive form of energy, the work we're doing right now is to determine the cost of all these options. Every different type of generation source has a certain type of cost. And certainly, what we're doing now is evaluating the cost of all these options. Now with nuclear power, I'll say it's too early for us to really know what that cost is, and the work we're doing right now is really to inform that cost. The cost will really become important as we get closer to 2029 to make that decision whether to proceed, and at that time the cost will be assessed against other possible supply options available at that time.

**Kevin Powers:**

All right, thanks for all these questions. If you're just joining us, my name is Kevin Powers and I'm hosting tonight's call-in event to discuss the potential for nuclear power in Saskatchewan. We've just heard from Doug Opseth, the director of generation asset management on electricity supply planning. I'd now like to turn to the topic of nuclear power, which a lot of people have questions about. We know that SaskPower is considering nuclear power, which has been around for more than 50 years in Canada. Why now in Saskatchewan? Darcy as the project manager for SaskPower's small modular reactor development project, I'm going to throw this question to you.

**Darcy Holderness:**

Yeah, thanks Kevin. First off, it's not quite now. At SaskPower, we've been looking and carefully studying the opportunity for nuclear power for a long time. In 2021, conditions were right for us to initiate a planning phase for a project that would consider a potential small modular reactor power plant. We won't make a final investment decision for this type of technology of this plant until around 2029, when we know a lot more about it. What we do know now is that nuclear power has always provided emissions-free base load power to other jurisdictions around the world, and in Canada. Now, base load power means it's power that's available all the time when we need it. That's a little bit unlike some of the other options, like wind or solar, which are only available when weather conditions are right.

Our current power sources, like coal and natural gas, rely on burning fossil fuels, and when we burn those fossil fuels, we harness all of that heat to produce steam. And then we spin a turbine that we connect to a generator, and we create the electricity, but a byproduct of that process is emissions, and they go up a smokestack. Those emissions include some greenhouse gases, CO2 is the main one, which is a contributor to climate change. Nuclear power plants also generate a lot of heat, and we use that heat in the same way to produce steam, and we spin a turbine with that steam, which is a familiar process to us as SaskPower. But instead of burning gas or burning coal, these types of plants, they generate heat through a process called nuclear fission. And that's where you're splitting atoms in the nuclear fuel to create that heat. This process doesn't produce greenhouse gas emissions, there is no smokestack on a nuclear power plant, and so it's considered an emissions-free operation.

**Kevin Powers:**

Okay, so that's a good explanation of nuclear, Darcy. Can you tell me a bit about what an SMR is?

**Darcy Holderness:**

Yeah. Until recently, nuclear energy was really only available in the power sector by building really big nuclear reactors. Most of these were custom-made, and they're made for larger electricity markets than Saskatchewan. Ontario, for example, they get 60% of their power from nuclear plants today, and that's only from three nuclear plants alone. So, these large reactors, they produce around 1,000 megawatts per unit, and that's a challenge for us in Saskatchewan. Our grid today is only 5,000 megawatts big. But the technology is changing, and it's advanced since Ontario built those plants in the 70s and 80s.

Small modular reactors, or SMRs, are nuclear reactors that are significantly smaller. They generate a lot less power than the conventional sized counterparts, and they're physically smaller in size. Grid scale, SMRs are about 300 megawatts, the technologies we've been looking at, and that's very comparable to the power plant SaskPower has on our system today. Like the natural gas plant we just finished building in Swift Current in the late 2010s, and we're building one in Moose Jaw right now. Those are a total output of 350 megawatts each. Or like our coal plants, our Poplar River coal plant near Coronach, it contains two, 300-megawatt coal-fired units.

And so traditional reactors, traditional nuclear reactors are all large, they're custom-built, and that often led to a lot of challenges assembling them on time and on budget. SMRs have a lot of elements that can be built in a controlled factory setting and then assembled on site, which helps manage some of that construction schedule and cost risk, and it leads to a lot faster construction times too. SMRs can be built in a fraction of the time of larger traditional nuclear plants, and that lowers our costs and reduces the possibility of overruns during the construction. So, if we decide to build SMRs in 2029, it'll be about a four-year period to construct and then put it into service. One more point I want to make on SMRs being a good fit for Saskatchewan has to do with the fuel, the uranium. Saskatchewan is home to the world's best uranium resources, and so using that locally mined fuel makes SMRs a good made in Saskatchewan solution as well.

**Kevin Powers:**

Thanks, Darcy. Now, SaskPower has already chosen an SMR design from GE Hitachi, right? Could you tell me a bit about the technology you selected?

**Darcy Holderness:**

Yeah. We selected this GE Hitachi design, it's called the BWRX 300, as our preferred design for first deployment in Saskatchewan. That name sounds technical, but the BWR simply means boiling water reactor, which is the type of nuclear power plant it would be. And the X is a Roman numeral for 10, and that represents, it's the 10th version of this boiling water reactor design that GE Hitachi has. And then the 300 at the end is just to say it's a 300 megawatt. There are many of these boiling water reactors actively operating in North America and around the world today, and this SMR builds off of those known operating principles and brings it down into a size that makes sense for our grid. This SMR is known as a generation three plus design, and that means it's a bit of an evolution of existing technology too. This design would apply the same concepts of the larger reactors just on a smaller facility, and that means it's going to be a bit less complex, and there's also some inherent or passive safety systems built into the design.

**Kevin Powers:**

Okay. What do you mean by inherent or passive safety systems?

**Darcy Holderness:**

In the nuclear industry, it's what's called defense in depth, that keeps people in the environment safe. Nuclear technology in Canada has been operating for a long time with a very strong track record of protection of people in the environment. It's like wearing belts and suspenders, and then another belt and another set of suspenders too. Just as an example, keeping the reactor cool is an essential part of when you're operating the reactor when you're in service. And so, if you have water pumps that stop working, they have backup pumps. If your power runs out, you've got a backup generator. And that comes on, or you have the ability to connect the firetruck or pump water in, and so on. On top of that,

most SMR designs, including ours, offer these passive safety systems, and that means they do not need any human intervention or electricity or power to keep the operations in a stable state.

**Kevin Powers:**

Okay. Just a couple more questions here for you, Darcy. If you've already selected the SMR technology, but don't know whether you're going to proceed with nuclear power until 2029, what happens between now and that decision date?

**Darcy Holderness:**

Yeah, great question. Right now, we're in what we call the planning phase of the project. And simply put, we have to do a lot of work to be able to get our regulatory approvals in place and allow for an informed construction decision to be made. Our plan is, by 2029 we'll essentially have a shovel-ready project for our leadership to make that decision. And that means we need to put thousands of hours into the project to better understand the business case, better understand the costs, better understand the impacts of this type of technology and the power plant, and what it would have on a range of factors like the environment, wildlife, water, local economy, and much, much more. And that forms the basis of a lot of those regulatory process, and it takes a number of years to complete.

**Kevin Powers:**

All right. Thanks, Darcy. It looks like we have quite a few more questions from our callers. Why don't we go to those now. First, Jana from Prince Albert, who's been on the line here for a little while. Jana, you're on the air.

**Jana:**

Hi, I just tuned in a couple-

**Kevin Powers:**

Hi, Jana.

**Jana:**

Hi. I just tuned in a couple minutes ago and I hear you're talking about these SMR, is that what it is?

**Darcy Holderness:**

Yeah, that's right.

**Jana:**

Right. So, is that like a small-scale kind of thing?

**Darcy Holderness:**

Yeah. [inaudible 00:21:24] They're a small version.

**Jana:**

Yeah, that relates to my question. Because when it comes to nuclear, I've always heard people say that, oh, it takes just as much fossil fuel to build a nuclear reactor and then decommission it, than it's worth. It doesn't offset all that that it takes to have those two things happen. But I don't know if that's true or not. So maybe you can speak to that.

**Darcy Holderness:**

Yeah, sure. The good thing about nuclear power, it's a very dense form of energy. So, you get a lot of output from a very small footprint and a very small amount of fuel, and that speaks to the carbon footprint of the lifecycle as well. We consider it a zero emissions form of power generation when we're in operation, but there is an emissions price tag associated with all the concrete and the steel, the mining activity to produce the fuel. But the good thing that when you look at the amount of emissions on a per megawatt basis or per unit of energy, nuclear power is usually lower than most wind or solar in terms of total carbon footprint on a lifecycle basis. In terms CO2 emissions and greenhouse gases, it doesn't get much better than nuclear power.

**Kevin Powers:**

Thanks for that, Darcy. Next up we have Paul from Prince Albert. Paul, you're on the air.

**Paul:**

Yeah, good evening. Thank you so much for giving me the opportunity to participate in this. And my question, it's a two-part question. How will you involve our First Nations communities in the six treaty territories through this process and the development of the SMRs? And can you speak to any First Nations that are currently generating power that is being supplied to the grid?

**Darcy Holderness:**

Yeah, sure. I'll take the first part of that question, and then maybe I'll turn it over to Doug for the second part. The participation for indigenous communities, First Nations and Metis communities in the nuclear power industry is it's a huge opportunity. There are a lot of socioeconomic opportunities when you paired with deploying a nuclear power plant, you have to invest in training and education programs. It takes a lot of people to construct a reactor. There's a lot of supply chain opportunity. And that represents opportunity for meaningful reconciliation with indigenous people in Saskatchewan. It's a foundational element of the project, and we're working broadly in Saskatchewan across all treaty lines on that opportunity and building as much awareness and education about the potential that's there with this type of technology.

**Kevin Powers:**

Darcy, I believe we're going to hand the second part of that question to Doug. Doug, I believe the second part of the question was, any First Nations that are developing power in Saskatchewan?

**Doug Opseth:**

Yeah, there are a number of First Nations communities that are looking at developing power. One example would be the Meadow Lake Tribal Council building a solar facility. Sorry, building a biomass facility and operating a biomass facility up near Meadow Lake. We have a number of First Nation communities, and including [inaudible 00:25:02] First Nation and others that are partners in quite a few renewable projects here in Saskatchewan, and we anticipate more First Nation involvement in future energy projects as well.

**Kevin Powers:**

Thank you for that, Doug. And thank you, Darcy. Next on the line, we have Don from Prince Albert. Don, you're on the air.

**Don:**

Hello. I was just asking why... I think they answered my question prior to this with the, why not build a larger one than five or six small ones, but their lines are not large enough to supply from one or two large reactors. How many [inaudible 00:25:52]... Okay, answer the question.

**Kevin Powers:**

That's right, Darcy, is there anything you wanted to add to that?

**Darcy Holderness:**

No, I think you caught the answer correctly. If we build large nuclear today with our small grid, it means we're putting just too many eggs in one basket for one unit, and it makes it tough to manage that unit coming off and on to our grid. So large nuclear with grids our size aren't too feasible, but as we look out into the future, there may be more opportunity as the grid grows and industries look to electrify to help them decarbonize, it may become more feasible in Saskatchewan. But for now, we are focused on the small modular reactor technology.

**Kevin Powers:**

Thank you for that, Darcy. We'll do one more question before we move on. And don't worry, there's going to be more opportunities for questions. The next question is from Matthew in Saskatoon. Matthew, good evening.

**Matthew:**

Hello.

**Kevin Powers:**

Hi, there.

**Matthew:**

My question is also twofold. One will flow into the other. Number one, I'm wondering why this has taken so long. Saskatchewan is, as you've already said, has the richest source of uranium in the world. Why is it we would not be leading small modular reactors across Canada? This is something that could be a made in Canada solution driven by Canadians, driven by people from Saskatchewan. Is an opportunity to supply reliable power to all parts of the grid, particularly the north, which suffers from... Well, if there's a lightning strike down in PA, everyone in Wollaston Lake goes black. So that's a problem, and you could solve that with a small modular reactor. So, part one, why is it taking so long to get where we are, and how are you speeding things up? Number two, why'd you select a GE product over a CanDo? Since we're talking about made in Canada solutions.

**Kevin Powers:**

Good questions, Matthew. Darcy?

**Darcy Holderness:**

Yeah, thanks Matthew. Those are really good questions. And we often get challenged on the why not the CanDo design. CanDos are great. They're a Canadian designed reactor, and they've been operating successfully around the world. And our industry in Canada, our nuclear industry in Canada, has supported the deployment to those reactors around the world, and it's been a huge economic boost for us in Canada, and we are very proud of that. The CanDo reactors are large conventional designs though. And so the new CanDos are close to that 1,000 megawatts per unit. And again, it's really difficult with a 5,000-megawatt grid to have one single unit producing a fifth of your energy, or more if you look at actual consumption. So, if that unit has to come offline suddenly for some maintenance or an issue, or whatever, you have to have some backup power available. And that really makes the economics of large nuclear really difficult in Saskatchewan.

SMRs changed that. CanDo, did have a smaller version of the CanDo reactor, it was put together around the 80s. It didn't quite get to the point where it was really commercially available today. There's a concept there, but it hasn't been taken to the point where it's commercially available to us. So, we're moving on the project right now. We're in the planning phase. These regulatory processes do take time, and it's really important that we do all the work that we need to demonstrate that we have selected a safe site, we have a sound construction plan, and a sound operation plan to prove to

the regulator, the Canadian Nuclear Safety Commission, that we're ready for power reactors in Saskatchewan. And we can manage the technology safely and securely. We're [inaudible 00:30:26]. Thanks.

**Kevin Powers:**

Thank you, Darcy. And I see we have a number of questions still. If you have a question, please stay on the line. We're going to move on, but there will be more opportunities for us to answer those questions. Now I know that Sarah, who I introduced earlier, is leading the work finding a suitable location for an SMR, and I'm sure folks are interested to learn more about where we are in that process. Before we move on, let's do another quick poll. Now using your keypad, I'd like to know if you were aware prior to this call that SaskPower had started the planning process of developing an SMR. The poll question is, what was your level of awareness on small modular reactor development in Saskatchewan prior to this call? Press one on your phone if you were completely unaware, press two on your phone if you were vaguely aware, press three on your phone if you were pretty aware, press four if you were very aware.

Again, the question is, what was your level of awareness on SMR development in Saskatchewan? Press one if you were completely unaware. Two, vaguely aware or heard a little bit about it. Three, if you are pretty aware. Or four if you were very aware. And while you do that, I'll ask Darcy an audience question that's come in online. If you're just joining us, we're talking with SaskPower about small modular nuclear reactors. And here we have a question from Grace Potter. And Grace asks, what is a small modular reactor's life expectancy?

**Darcy Holderness:**

That's a great question. Well, the SMRs that we are looking at will operate for about a 60-year life, and that's from the time that you finish construction and go into commercial operation. We're planning for a 60-year life per reactor.

**Kevin Powers:**

All right, thank you for that question, and thank you for that answer, Darcy. While you were answering that, Darcy, the poll results have come in and it looks pretty even here. 28% said that they were very aware of development plans around an SMR. 24%, that's now changed to 25, were pretty aware. 28% were vaguely aware, and 20% were completely unaware prior to this call. Hopefully, as a result of this call, we'll have more people aware of that process. But back to business. If I've got this right, to apply for a license to run a nuclear plant you need to have a technology, which SaskPower has chosen and Darcy talked to us about, and then comes a site which SaskPower hasn't chosen yet. Now, I know that SaskPower has two areas in mind, Lake Diefenbaker in the elbow region, and the Rafferty and Boundary reservoirs near Estevan. How did SaskPower narrow it down to these two areas? Sarah, you're leading the charge to find a site. Would you mind helping me understand?

**Sarah Klein Bentley:**

Sure. Thanks, Kevin. Sorry. A lot goes into selecting a site, and it starts with the technology. We need to understand the BWX 300's specific requirements to know where we could potentially site it. The most important requirement for this design, or any SMR for that matter, is to be close to a large body of water. Ideally, it should also be near existing infrastructure. It needs to have access to nearby emergency services and be close to places where employees can live. With these requirements in mind... Sorry, just one second. I got a from in my throat. With these requirements in mind, we were able to narrow down our potential sites to a 10-kilometer radius around Lake Diefenbaker and the Rafferty and Boundary reservoirs. Hey, Kevin, I'm not getting any audio.

**Kevin Powers:**

Oh, sorry. So, you narrowed it down to two big areas. How do you then narrow it down to two small areas?

**Sarah Klein Bentley:**

Ultimately, we're looking for two half sections of land within these large areas. To narrow it further, we analyzed over 50 criteria to find the areas that best met environmental, social, and technical needs. When you take those 50 criteria and layer them on top of one another, you can really start to see the most suitable areas, but we still have more work to do.

**Kevin Powers:**

Okay. What more work do you have to do? What's next?

**Sarah Klein Bentley:**

As mentioned, we're looking for half sections of land for a site. Our goal is to have two potential half sections chosen by the end of this year. The suitability areas gave us our starting point to find those half sections, but we're also looking for sites close to the best water intake locations along each lake. So, once we have a shortlist, we will rank sites using four factors, safety and technical, environmental, social and cultural, and economic. And we'll use these criteria to identify the sites that perform the best and to understand trade-offs for each site.

**Kevin Powers:**

Can you take me through how that works?

**Sarah Klein Bentley:**

Well, the first thing we're looking at is safety and technical criteria, that's our top priority. We want to choose land that's stable to build on, and we want to avoid areas that are prone to extreme weather

events or have things like a high-pressure gas pipeline, for example. The environmental criteria is largely focused on avoiding impacts on sensitive lands and habitats. The less impact, the better. So, sites further from species at risk, for example, they would rank higher.

The social and cultural criteria help us to pick a site that will be far away from things like burial grounds or communities, but close enough to places where people live so the employees would have reasonable commute times. And then finally, economic priorities consider the financial implications of choosing a particular site. The farther a site is from existing grid infrastructure and highways, the more infrastructure we have to build and the more expensive it becomes. No site is perfect, there are trade-offs, and evaluating those trade-offs is what we are doing over the next few months while we narrow it down to two half sections. And then again, we'll do that again when we narrow it down to one site next year.

**Kevin Powers:**

All right. Well, this sounds like a good opportunity for another poll. And what I'd like to know from the audience is, which of the three priorities that Sarah mentioned do they think is most important in siting a small modular reactor? I'd like you to press one if you think it's the environment that's the most important priority. Press two if you think it's social and cultural priorities. Press three if you think it's economic. Or press four if you think they're all equally important.

Once again, which of the three priorities do you think is most important in siting an SMR? One for environment. Two for social and cultural. Three for economic. And four if you think they're all equally important. I want to thank those who are voting. You can also find the same question on saskpower.com/engage until the end of the month. So, we encourage you to go there yourself or send friends and family to fill it out, because we want to hear what matters most to you. While we wait for the poll results, let's take an audience question. We have a question here from Preston in Saskatoon. Preston, you're on the air.

**Preston:**

Hi. Yeah, I was just wondering what the plan was, if there was a plan in place to use Saskatchewan uranium for the SMRs?

**Kevin Powers:**

Good question, Preston. And I'll throw that question to Darcy.

**Darcy Holderness:**

Yeah, you bet. When we were doing technology evaluation, we definitely wanted to make sure that we found technologies that could use the resource we have here with the uranium we produce, and we produce high quality uranium that's suitable for almost any nuclear reactor that uses uranium as a

source. Our objective, and we will use sourced Saskatchewan uranium for the SMRs that we're going to operate in Saskatchewan. The uranium has to be enriched to a low level of enrichment, and it'll have to be fabricated into a fuel bundle that's appropriate for the SMRs, and those might not happen in Saskatchewan right off the get-go. But the fuel will be sourced from Saskatchewan.

**Kevin Powers:**

Great, thank you for that answer, Darcy. But before we move to another question, why don't we look at the poll results. Thank you again everyone for voting. Our top priority is all of those priorities. 44% of respondents said all of the priorities are equally important. Next with 31% is environment, that's followed by 21% who believe economic priorities are most important, followed by 3% who feel that social and cultural priorities are most important. Thank you again for voting on that.

Now for those of you who are still with us, and there are quite a lot of you, we've gone through a lot of material, we have quite a few questions in line here. But if you have any questions, please press three on your phone at any time to let us know if you'd like to speak live on the call. If you prefer not to ask your question live on the air or have comments or ideas about something that was not addressed in tonight's event, please leave us a message at the end of this call. Now we do have a number of questions from our callers, so let's get to those now. We'll start with Randy from Wayburn. Randy, are you with us?

**Randy:**

Yes, I am. Thank you.

**Kevin Powers:**

Hi, Randy.

**Randy:**

My question is, I'm sure you've done a lot of studies on this, but I'm thinking as all of these other technologies like wind and solar have come to fruition over the years, how does the cost comparison between this SMR compare to the current state of cost per megawatt hour over the other traditional renewable energy sources?

**Kevin Powers:**

Good question, Randy. And I think I'll throw this question to Doug, our energy planner.

**Doug Opseth:**

Yeah, thanks a lot, Randy. That's a really good question. We get asked that one quite a bit. I'll say it's difficult to compare wind and solar to things like nuclear power, because they're different forms of

energy. Nuclear power is base load energy. And as Darcy mentioned in his talk, base load energy are those types of energy that are available 24 hours a day, seven days a week, regardless of the weather. And things like wind and solar are variable generation, meaning they're only there when available. So, while they both have costs, they're both very difficult to compare, because they are different forms of energy. And both of them will play a big role in how we provide power to Saskatchewan in the future.

**Kevin Powers:**

Thank you, Doug. We've got another question here from Derek in Prince Albert. Derek.

**Derek:**

Hi, there.

**Kevin Powers:**

Hi, Derek.

**Derek:**

I just had a question concerning location. There was mention before about properly supplying the northern community with adequate power. Was one of the northern communities ever up for debate as far as location such as Wollaston, or near the Flin Flon area, anything like that?

**Kevin Powers:**

Good question, Derek. Sarah, you're our siting expert, would you mind answering?

**Sarah Klein Bentley:**

Yeah. The reasons why we're looking in the areas that we're looking is they are really close to that proximity to existing workforce, closer to that population that's going to be able to support it from an employment perspective. Also, we look at where the generation is needed on the grid. And so, when we're looking at a site for 300 to 600 megawatts, that drives those locations to be in the southern regions in comparison to the north. The north would have to be looked at for different technologies or different sizes at this point.

**Kevin Powers:**

Thank you, Sarah. We have next on the line, Garth from Prince Albert. Garth, are you with us?

**Garth:**

Yes, I am.

**Kevin Powers:**

Hi, Garth.

**Garth:**

Hi. I remember about 15 years ago there was a lot of public meetings about trying to find a permanent storage site for nuclear waste, and they were looking all through northern Saskatchewan and whatnot. Has there been a permanent storage site established anywhere?

**Kevin Powers:**

Thank you for the question, Garth. Darcy, do you want to answer this question? And perhaps, Doug, if you want to chime in as well, that would be great.

**Darcy Holderness:**

Yeah, you bet. Thanks, Garth. That same siting exercise for a permanent disposal facility for used nuclear fuel in Canada is still active. They're down to two sites. It's an entity called the Nuclear Waste Management Organization, or the NWMO, who's in charge of putting that facility in place. And so, they're looking to have a first facility in operation by the mid 2040s, and then they'll start relocating used nuclear fuel from existing nuclear power plants in Canada today into this facility. And they do have a mandate to look after all waste products, high level waste products from existing reactors and research reactors, and those reactors that produce medical isotopes and any new designs that are being considered as well. We work closely with the NWMO in terms of planning for our waste products that we may potentially start generating in Saskatchewan.

**Kevin Powers:**

Thank you for that, Darcy. Next up we have a question from Gail in Prince Albert. Gail, are you still with us?

**Gail:**

I am. Basically, Garth asked the same question that I was wondering about how they dispose of the waste, but he didn't tell us where. Do they know where these locations are going to be?

**Kevin Powers:**

Good question, Gail. Darcy?

**Darcy Holderness:**

The NWMO is down to, they have two sites for their first project, and both of them are in Ontario. The first project will go in one of those two sites in Ontario. The type of facility that they're going to build

is known as a deep geological repository, a DGR. And so, where the right geology is in place, we're going to take the used nuclear fuel and permanently dispose of it in the proper geology formation underground. It's about five to 800 meters below surface.

**Kevin Powers:**

All right, thank you for that, Darcy. Next up we have a question from Mark in Prince Albert. Hi, Mark.

**Mark:**

Hi. Thanks for the opportunity. I want to say that at the outset I'm a huge proponent of this technology, and it just makes so much sense for where our province is at and where it's going. I'm also pleased to hear that the uranium will be locally sourced in the province. What assurances will it be that the employment opportunities will not only be saved for primarily Saskatchewan residents, but also will be representative of First Nations and Metis people within our province?

**Kevin Powers:**

Good question, Mark. Darcy?

**Darcy Holderness:**

Yeah, you bet. That's a great question. And it's a foundational principle that we work with at SaskPower is creating opportunity for an economic opportunity for the people that live, work, and play in Saskatchewan. And that's especially so on the indigenous side of things. When we look at the workforce requirements, the training requirements, Canada has a big depth of nuclear capacity and competence, and it's about bridging that over to Saskatchewan and building it here in Saskatchewan so that we can train our own workforce and maximize on the opportunity that this technology represents. Those opportunities are there, and at SaskPower we are proud to prioritize that economic opportunity for everyone here.

Kevin, are you there?

**Kevin Powers:**

Sorry, Ken, can you hear us? Ken from [inaudible 00:50:13] Resort.

**Ken:**

Yes, I can. Thanks for taking my call. I have basically three questions. One is the warming effect on Diefenbaker Lake from the cooling towers or not, how it'll affect the environment, for instance, the fish, the algae, and things like that. Now my second question is in relation to nuclear snow and condensation, is that going to affect our weather patterns in Saskatchewan or around the lake? And my third question is, I think some of it's being answered, but I can't for the life of me believe while

you're considering Lake Diefenbaker, when Rafferty Dam is far less populous. This Lake Diefenbaker feeds South Saskatchewan River. Saskatoon gets their water from here; numerous other communities get their water from here. I have a well on the edge of the lake, I get my water and we use summer water in the thing. Now, I just don't understand why it doesn't go to Rafferty. You have a power grid now coming from the probably old coal generation system at Coronach. Those are my three questions. I hope I explained it right. Thank you.

**Kevin Powers:**

Thank you, Ken. Sarah, two of the questions are around Lake Diefenbaker, why Lake Diefenbaker, and what impact might this have on the lake temperature?

**Sarah Klein Bentley:**

Yeah, thanks Kevin. Lake Diefenbaker scores really high, as does the Savannah area, based on when we talk about that regional criteria, we factor the technical requirements of the plant or the cooling water need. And we also looked at the environmental points within those regions as well, as well as the social indications as well. That is why we're looking at them. I guess your concern regarding the warming of the lake, those thermal impact studies, we are studying the thermal effects on all three reservoirs at the moment right now, and should have an idea of what those impacts will be. We're expecting them to be minimal, but we are looking at what the impacts will be, the thermal effect, water levels, and I guess when we look forward into the climate models as to how it'll affect those water bodies into the future into the 60-year lifetime of the plant.

**Darcy Holderness:**

Maybe I'll just add-

**Ken:**

Third question-

**Kevin Powers:**

Yep, go ahead Darcy.

**Ken:**

On the Lake Diefenbaker stuff, a little bit of context. Lake Diefenbaker is our biggest water resource in Saskatchewan, and we really do appreciate that at SaskPower, we get a lot of hydropower from the lake today at Gardiner Dam. But we're able to, when you think about a cooling effect or a warming effect on the lake with a thermal power plant, we can take the cold water from the bottom and then heat it up and return it to maybe close to the surface temperature. A lot of that study needs to happen with the studies that Sarah's talking about. But we're not expecting to have a warming effect

on the lake. There'll be a localized effect on where we discharge that water. And so, a lot more analysis needs to get done and we'll have to do that through the impact assessment. But the resources are quite suitable there for this type of technology.

**Kevin Powers:**

And I believe the third question was around a term I'm not familiar with, which is nuclear snow. I don't know if Darcy, you might be familiar with that term?

**Darcy Holderness:**

Yeah. No, I am not too familiar with it, so I'm not going to speak to it here. I can tell you that through the regulatory assessment for a nuclear power plant, potential effects on local environment are looked at very closely. And so, I haven't come across a concept of a nuclear snow, but it'll be assessed very methodically through the regulatory assessment, and we'll have to show the CNSC that all of those impacts that we can avoid or mitigate.

**Kevin Powers:**

All right, thank you for that, Darcy. Next up we have a question from Jennifer in Radville. Jennifer.

**Jennifer:**

Hi, there. Thanks for taking my question. I actually live quite close to Rafferty, and there has been a lot of talk about that potentially being a site, and that there is a lot of fear around any health implications that there could be. Everyone watches a lot of TV, and we've all seen the Chernobyl series, and we read about Fukushima. And I know these are small reactors, but I think a lot of us don't know enough about them. I guess my question is, can SaskPower, can you guys touch on any health implications that nuclear could have, and can SaskPower guarantee us that this isn't going to cause health problems? And then when people are talking about, put it at Rafferty, not at Diefenbaker, because we drink the water here. But that just feeds fear down here because we drink this water here. So, could you touch on that a little bit, please?

**Kevin Powers:**

Great question, Jennifer. Darcy, do you want to start there?

**Darcy Holderness:**

Yeah, you bet. It's a really important thing to understand are the practical implications of living near a nuclear power plant in Saskatchewan. And it's something that we have to do a lot of education and awareness on to make ensure that people are comfortable. The CNSC, the Canadian Nuclear Safety Commission, their mandate is to ensure all nuclear activity, be it mining, power reactors, research reactors, or waste management, people in the environment are kept safe. And I would encourage you

to go to their website and look up radiation dose examples. They can compare typical radiation exposure from living within proximity to a nuclear power plant, it's about one-fifth of a dental X-ray for one year. So, it'd be like having one-fifth of a dental X-ray is your annual exposure. These are background level of radiation levels, and it's something that we want to make sure people understand how the CNSC, that works, and how this is managed, and people are kept safe.

**Kevin Powers:**

Great. Thank you for that answer and thank you for that question. We are running close to the full hour here. I think we have time for a couple more questions. Gordy from Regina, you're on the air.

**Gordy:**

Hello. My question is, what deficiencies or shortcomings does geothermal have that made it a less competitive option than nuclear?

**Kevin Powers:**

Good question, Gordy. Doug, do you want to answer this?

**Doug Opseth:**

Yeah, sure. Geothermal is certainly one of the options we looked at. When a lot of people think of geothermal power, they think of places like Iceland where you've got volcanoes and you've got steam coming out of the ground, and people are using that to generate power. What we have in Saskatchewan, about two or three kilometers underground, we've got a big ocean of warm water down there. There are companies in Saskatchewan right now looking at the potential to go down that far, a couple of kilometers underground, and extract that warm water and bring it up and generate electricity from it. There's still a lot of questions to be determined whether that's a viable or economic way of doing it, but we're certainly hopeful that it proceeds and that it proves to be a potential source in the future. The reality is though, even if it does work, we won't be able to deploy geothermal on a scale large enough to replace all the fossil fuel generation here in Saskatchewan.

As we certainly make that transition from conventional coal, but eventually have to make that transition from gas, we do need to develop larger scale base load energy supply options. Those are things like carbon capture on natural gas in the interim, and certainly some things like nuclear power. Things like geothermal power, biomass power, and a bunch of other sources certainly may have a role in Saskatchewan, but it likely will be a minor role as opposed to the large role that things like nuclear power could potentially play here. But certainly geothermal, like many forms of power, is certainly something that we continue to monitor and take a look at, just like a lot of other technologies.

**Kevin Powers:**

Okay, thank you Doug. And we have one final question before we move to the final poll, and that is from Kevin in Moose Jaw. Kevin.

**Kevin:**

Hi, how are you today?

**Kevin Powers:**

Good, thanks. How are you, Kevin?

**Kevin:**

Good, thank you. I'm just curious, I've worked in this industry a long time. Not in your industry, I apologize, but I'm in construction. I've worked at Chinook, I've worked in Moose Jaw, the power plant. I'm just curious as to why the government is... Not the government. SaskPower is going towards LNG. We're still investing that money towards LNG when we have nuclear availability. I just don't understand why we're investing billions of dollars into LNG when we have this potential, which is safer and cleaner for the environment. Thank you.

**Kevin Powers:**

Great question, Kevin. It sounds like a question for Doug. Doug?

**Doug Opseth:**

Yeah, thanks Kevin. That is a good question. Why are we continuing to look at natural gas and why do we still need to build natural gas? The reality is, as we're retiring conventional coal here in Saskatchewan, we need to continue to provide base load energy supply. And coupled with that, we also have a growing demand for power in Saskatchewan, as we have people moving here and businesses moving here, and people starting to electrify. So, we need a base load energy supply. And the challenge for us is, how do we build or maintain that energy we need while we're making that transition to other things like nuclear power?

And so, the reason we'll continue to build natural gas in the interim is that things like nuclear power are still not yet available. Our plans right now around our first SMR have it coming online by 2034, which means that between now and then we need to continue to provide power as we retire conventional coal and as we see load growth. And even beyond that, we may still need to build some natural gas as we potentially build more nuclear in the future. The reality is, we just need to have a reliable base load energy supply. And in the interim, between the retirement of conventional coal and the time when we have nuclear power, we'll need something, it'll have to be natural gas.

**Kevin Powers:**

Thank you, Doug. And thanks to everyone who's joined us here tonight. This has been a great event, and I'm glad we were able to speak with so many people from across Saskatchewan. But before we go, we have one last poll, and we'd like to know if you feel that the information provided today was useful to you. If you feel yes, please press one, press two for no, press three for somewhat, press four for unsure. Question again, did you feel the information provided today was useful to you? Press one for yes, two for no, three is for somewhat, and four for unsure. Also, please know that if you want to stay up to date with the SMR project, please go to saskpower.com/nuclear. And remember, you can stay on the line to leave us a message. Thank you all once again for joining us tonight. Have a good evening. This is the end of the call. Thank you.