SaskPower
Powering our future®

EARLY STAKEHOLDER ENGAGEMENT

NUCLEAR POWER FROM SMALL MODULAR REACTORS (SMRs)

for SaskPower

January 2022

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1. EXECUTIVE SUMMARY

In keeping with our values of openness and accountability, this report follows up on the commitment we made to those who took the time to attend our information sessions about nuclear power from small modular reactors (SMRs) in 2021.

This document summarizes what we did and highlights the key themes, questions and comments we heard.

Thank you to everyone who took the time to participate. We're using what we heard to plan the next phase of project engagement, which is focused on finding an ideal site for the first SMR facility. We expect this phase to begin in 2022.

To learn more about SaskPower's SMR Project please visit: saskpower.com/nuclear.

2. WHY NUCLEAR POWER AND WHY NOW?

SaskPower is on track to reduce greenhouse gas (GHG) emissions by at least 50 per cent from 2005 levels by 2030. We're now aiming for net-zero emissions from power generation as soon as possible. This means we'll need to change the way we supply electricity to the province.

Traditionally, much of the electricity that powers Saskatchewan's homes and businesses has come from conventional coal. Federal laws require this GHG-intensive power source be phased out across Canada by the end of this decade.

As we move forward, innovation and technology are key to finding an optimum energy mix for Saskatchewan. There is no singular option that will cost effectively meet the province's growing and changing power needs and support a zero-GHG emissions future.

All solutions need to be considered.

This includes carbon capture and storage (CCS), hydro, strengthening our network of regional transmission lines, natural gas, geothermal, biomass, wind, solar, storage technologies, efficiency and conservation programs, and nuclear power from SMRs.

3. INTRODUCING THE SMR PROJECT

In March 2021, SaskPower's Board of Directors approved a recommendation to move forward with the first year of a multi-year planning phase to develop nuclear power from SMRs as a potential zero-emissions baseload option for Saskatchewan in the mid-2030s.

Key deliverables in the approximately eight-year planning phase include selecting an SMR technology, beginning the regulatory and licensing process, the Impact Assessment process and finding a suitable location to build the first SMR facility.

Siting any power project is a complex process and the same is true for a nuclear power project. We'll need to consider a number of critical technical criteria to identify potentially viable geographic regions, study areas and, in 2024, an optimum site for the first facility. A significant period of Indigenous and public engagement is required to support this process, which we expect to begin in 2022.

Before we begin our site selection process, we wanted to introduce the SMR Project to Indigenous leaders and communities, key stakeholders and the public.

As a province that currently doesn't have nuclear power in its electricity mix, we felt it was important to provide context for why we are moving forward with the planning phase of an SMR project and share information about Saskatchewan's existing nuclear industry. We also wanted to help Saskatchewan residents become familiar with the organizations responsible for the safe and sustainable operation of nuclear power activities in Canada.

By introducing the project before decisions about siting are being discussed, we give people time to become informed, ask questions and share their perspectives, concerns and interests.

We presented at business association lunches, met with municipal leaders and engaged with members of Indigenous communities. We welcomed opportunities to share information when invited by key stakeholder organizations, and proactively hosted our own information sessions for the Saskatchewan public.

> Lots of room inside Boundary Dam for reactors. We would welcome nuclear technology with open arms.
> – *Tony S.*

In addition to the SaskPower SMR Project Team, we invited representatives from the federal nuclear regulator, the Canadian Nuclear Safety Commission (CNSC), the Canadian Nuclear Association (CNA), the Nuclear Waste Management Organization (NWMO), and two of Canada's nuclear utilities, New Brunswick Power (NB Power) and Ontario Power Generation (OPG). We asked them to share their experience, answer questions about the regulatory process, discuss how used nuclear fuel and waste is managed, and share information about the SMR projects moving forward in Ontario and New Brunswick.

As well, the First Nations Power Authority (FNPA) coordinated a series of meetings on our behalf with Indigenous leaders and communities to share information about nuclear power from SMRs, and the other power sources SaskPower is considering as we plan for a net-zero emissions future. A summary of those sessions is also available at saskpower.com/nuclear.

4. PARTICIPANTS

Between June and January 2021, we participated in or hosted 14 information sessions** attended by more than 600 people from across the province.

We co-hosted virtual events with the Saskatchewan and Estevan Chambers of Commerce in June; and the Regina & District Chamber of Commerce, the Saskatchewan Urban Municipalities Association (SUMA) and the Saskatchewan Association of Regional Municipalities (SARM) in October. In November, we hosted two of our own virtual public information sessions.

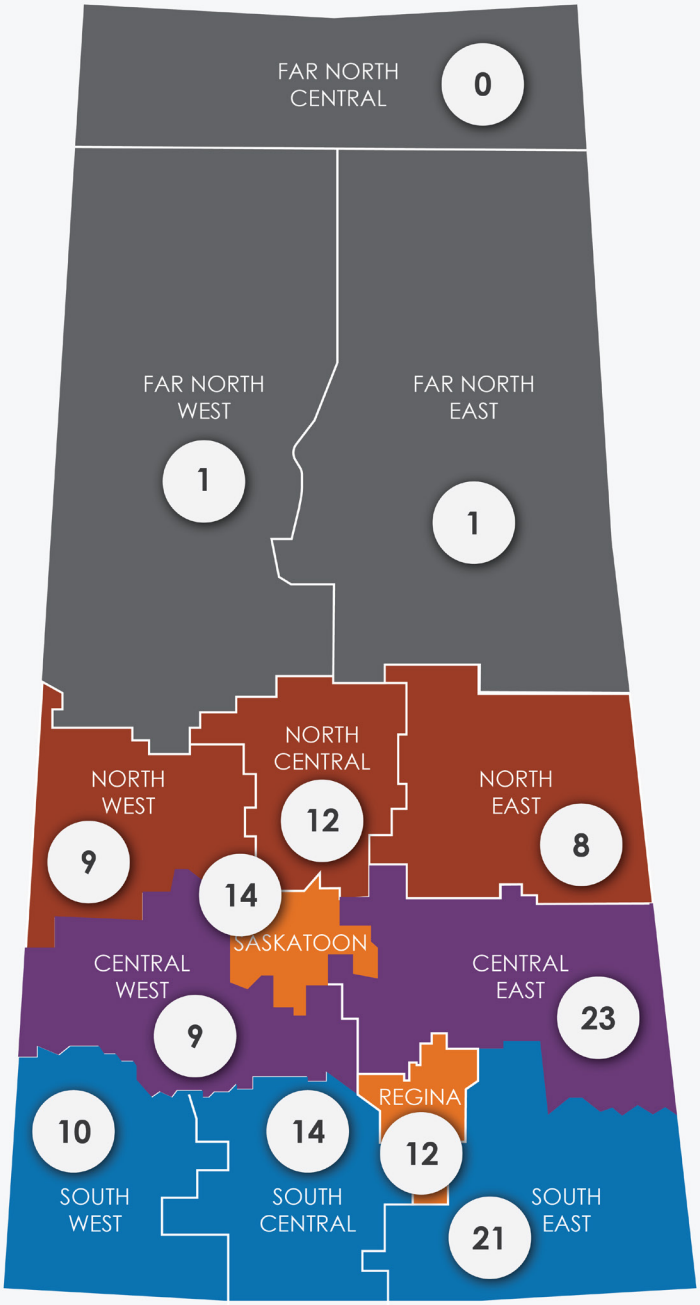
In January 2022, we presented information about the SMR Project to residents in the province's southeast, at a public information session co-hosted by the Estevan Chamber of Commerce and Coronach Economic Development.

> I have an open mind to learn about an energy source to assure a prosperous future.
> *– Lois R.*

Recordings of our information sessions held on November 18 and 30, 2021 can be found here.

***Includes those coordinated by the First Nations Power Authority (FNPA).*

PARTICIPANTS FROM **134** COMMUNITIES



Total does not include sessions coordinated by the FNPA.

- Saskatchewan Chamber of Commerce and Estevan Chamber of Commerce – June 29
- Regina Chamber of Commerce – Oct. 20
- SUMA – Oct. 28
- SARM – Oct. 29
- Estevan Chamber of Commerce and Coronach Economic Development – Jan. 26

JUN | JUL | AUG | SEP | OCT | NOV | JAN

- Indigenous Engagement Sessions (7) coordinated by FNPA
- SaskPower Public Information Sessions – Nov. 18 & 30

2021 2022

5. WHAT WE HEARD

During the information sessions, participants expressed interest in learning more about the future of nuclear power and SMRs in Saskatchewan. We were pleased to see diverse perspectives ranging from strong support for and familiarity with nuclear power, to those who were curious but had a number of questions to those who strongly disagree with nuclear power development.

Audiences of the Saskatchewan and Estevan Chambers of Commerce and Regina & District Chamber of Commerce, as well as SARM and SUMA, had questions about how nuclear power might impact their local communities and provide employment and other economic benefits to the province.

Reasons for participating were mixed. Many participants chose to attend because they were interested in reliable and sustainable power generation and were also curious about SaskPower's plans to incorporate renewable power sources into Saskatchewan's electricity mix. Others wanted to know more about the costs associated with SMRs, and there were several questions about how used nuclear fuel and waste is managed in both the short and longer terms.

How important is it to you that SaskPower achieves net-zero emissions from the power system?

Very important - **60%**

Somewhat important - **32%**

Not important at all - **8%**

We received many questions, comments and general inquiries about nuclear power and/or SMRs either during the information sessions or through feedback surveys. We are pleased to see this level of interest in our SMR Project. We'll continue to work hard to acknowledge and address the range of questions, concerns and interests. We've categorized these questions into themes and provided responses below.

1. What is SaskPower's plan for managing used nuclear fuel and waste?

SaskPower will follow the regulations of the Canadian Nuclear Safety Commission (CNSC) for all aspects of operating an SMR facility, including the safe management of nuclear waste and used fuel.

Nuclear waste is categorized three ways, depending on the level of radioactivity – low, intermediate, and high (high being used nuclear fuel).

Canada has a long history of safely managing and storing all forms of radioactive waste. The licensing process for any nuclear activity in Canada – from medicine to research to power generation – must include a plan for used fuel and waste management.

Although all forms of power generation result in a waste stream of some sort, nuclear power is the only one that has regulations in place to store and track all the waste it generates and has a transparent and fully funded plan for safe and responsible long-term management.

We continue to work on a plan to manage the various levels of radioactive waste that will come from this project. We are working with experienced nuclear operators to ensure our waste management strategy aligns with best practices for the industry and follows all regulations.

Currently under development in Ontario, the NWMO's Deep Geological Repository is intended to permanently store all of Canada's spent nuclear fuel once completed, including SaskPower's.

2. How much consideration is SaskPower giving to renewable energy such as wind, solar and geothermal?

Achieving net-zero emissions from power generation requires all low- or no-GHG emissions sources. As we transition from fossil fuels, we are increasing the amount of power generation from solar and wind in an aggressive, but sustainable manner.

We support the Deep Earth Energy Production (DEEP) project in southern Saskatchewan, which will be the first demonstration of utility-scale geothermal in Canada. We are partnering with DEEP to buy power from the project once it's in service.

Did you know that while uranium is not a renewable resource, it is a very dense form of energy production – so a little goes a long way while producing zero GHGs. Recently, the United Nations Economic Commission for Europe (UNECE) released a report comparing the carbon emissions of various sources of electricity. They found that nuclear power represents the lowest life cycle carbon emissions when compared to wind, solar and hydroelectricity. Check out the report, Carbon Neutrality Toolkit, for more information.

3. Will SMRs be built and operated by people from Saskatchewan?

SaskPower continues the development of a roadmap for workforce training to support the construction and operation of future nuclear power facilities. Partnerships with Canada's existing nuclear industry will be key to managing risk through the construction and operation of the first reactors in Saskatchewan.

There is a significant opportunity to develop a skilled SMR workforce in Saskatchewan. According to a Conference Board of Canada study, the development of four 300-megawatt (MW) SMRs could create more than 1,700 new direct and indirect jobs during construction between 2029 and 2042, as well as more than 700 new direct and indirect jobs once the SMRs are fully operational between 2033 and 2099.

Saskatchewan has a skilled workforce to meet this need as many aspects of nuclear power plants are the same or similar to coal- or natural gas-fired thermal power plants. We will work with the province's post-secondary institutions to create programs to support the deployment of nuclear power.

4. How much will SMRs cost the province?

Understanding and evaluating the cost and risks is an important part of developing this supply option for Saskatchewan. The SMR Project must be competitively priced against other baseload, non-emitting power generation options available in the 2030s to proceed. Based on feasibility work done to date, SMRs have strong potential to be a competitive option.

5. What is SaskPower doing to avoid catastrophes like those that took place at the Chernobyl, Fukushima or Three Mile Island power stations?

The accidents at Chernobyl, Fukushima and Three Mile Island were difficult lessons for the nuclear industry. These reactors were designed in the 1960s and built in the 1970s. After the accidents, the nuclear industry made numerous changes in the design and operation of the reactors to improve safety.

Canada's nuclear industry has an impeccable safety track record. It's built on more than 70 years of innovation with safety and environmental protection at its core. In Canada, there are no reports of anyone being harmed or injured as a result of the industry's nuclear operations.

The Canadian Nuclear Safety Commission (CNSC) – the federal nuclear regulator – has extensive management and oversight responsibility with stringent reporting requirements. The results of annual inspections are used to confirm the safety of power stations today and in the future. CNSC staff and independent commissioners ensure facilities are safe for workers, the public and the environment.

Nuclear power stations have many layers of protection, so if there's ever an issue multiple systems keep the plant safe. Many international organizations like the International Atomic Energy Agency (IAEA) and the World Association of Nuclear Operators (WANO) are now established to learn from prior mistakes to ensure major nuclear accidents do not occur.

SMRs are considered to be an advancement of existing nuclear power technology. The safety systems provide protection for people and the environment beyond that of conventional reactors. Passive safety features are inherent in all the nuclear reactor designs SaskPower is evaluating.

6. Who will protect SMR facilities from vandalism, terrorists, or protesters and demonstrations?

The CNSC's security requirements are well established. A main focus of the federal nuclear regulator is the non-proliferation of nuclear materials and protection of the power stations. Before being granted a licence, SaskPower would have to meet all CNSC's requirements for cyber and physical security.

7. Where could you build an SMR facility?

Many of the regulatory processes involved in the planning phase of an SMR project are site-specific, including the Impact Assessment process and the CNSC licensing processes.

> I am really appreciating the transparency that SaskPower is developing with stakeholders.
> *- Participant*

This means that even though a construction decision won't be made until 2029 we need to find a suitable site to continue the planning phase work.

We are currently concluding the first step in the siting process, which will establish technically suitable regions and study areas within the province. To do this we are working to understand what technical criteria will be required to accommodate up to 600 MW of nuclear power from SMRs and what regions of the province appear to align with that technical criteria.

The technical siting criteria are defined by the SMR technology, nuclear regulations and standards, as well as SaskPower business considerations and learnings from past generation siting projects. They include things like:

- cooling water supply;
- proximity to existing power infrastructure;
- proximity to an existing work force and emergency services;
- environmentally sensitive lands and habitat; and
- archaeological and heritage resources.

Continued engagement is critical to the site selection process. We expect to move into the siting phase of engagement in 2022, at which time we'll introduce areas of the province that appear to align with the technical criteria to build an SMR facility. This allows us to locally tailor our studies and exchange relevant information with people in these areas of interest.

8. Can SaskPower retrofit decommissioned coal facilities for SMRs?

Areas surrounding existing coal facilities could be good candidates because of their access to the same amount of cooling water required for SMRs of similar sizes, and some of that infrastructure could be refurbished for use with an SMR. They also have transmission infrastructure in place and a skilled workforce. We are not considering converting the actual coal-fired boilers to nuclear reactors.

9. How much water does it take to operate an SMR?

The exact amount of water needed for an SMR will vary depending on the specific technology. Generally, the amount of water is very similar to the amount needed at our existing coal-fired power stations. Like Saskatchewan's coal-fired power plants, a certain amount of make-up water is required for the steam loops that spin the turbines and generate electricity. This make-up water is used to compensate for losses and maintain quality of the steam loop and is typically taken from a local potable water or ground water supply and then demineralized by a water treatment facility that will be built at the site of the power plant.

A large waterbody may also be needed to cool and condense steam once all the thermal energy is removed and converted into electricity. The cooling water that would come from a nearby water body is separated from the nuclear reactor to ensure the water source never becomes contaminated. The cooling water is returned to the water body at a higher temperature which may increase the amount of water that evaporates. This can have an effect on wildlife in the waterbody. This is why water use and water supply are important topics of thorough study for all thermal power projects, including an SMR project.

10. What have you heard from Indigenous communities so far?

Finding mutually beneficial partnerships and economic opportunities is an important part of a meaningful engagement and consultation process, which is crucial to SaskPower's SMR Project.

On our behalf, the First Nations Power Authority (FNPA) facilitated a series of early engagement sessions in the fall of 2021. The sessions invited representatives from First Nations into the conversation about SaskPower's future electricity system, including a future with nuclear power from SMRs. We are now working with the Métis Nation-Saskatchewan to coordinate and deliver early engagement sessions with their members in early 2022.

What we've heard through our engagement sessions so far is the importance of Indigenous participation as equity partners in an SMR project, in workforce training and in supply chain opportunities. We've also heard how important it is that we protect Mother Earth as we build the future power system and transition away from fossil fuels.

We're committed to ongoing, meaningful engagement with First Nations and Métis through the planning phase work. This early feedback will help us design a more specific and robust engagement process going forward.

Your Feedback

We encouraged participants to contact us directly with their questions and/or provide feedback in a brief survey shared after each event.

Here's a snapshot of the survey feedback.

Was the information provided helpful?

Based on feedback, 89 per cent of respondents said the information we provided was helpful; four per cent responded negatively and seven per cent remained neutral.

Do you understand the need for the project?

Of the 176 survey responses we received, 87 per cent understood why SaskPower is considering SMRs for the future energy mix while seven per cent responded negatively and six per cent remained neutral.

Were questions answered to your satisfaction?

Overall, 65 per cent of respondents felt questions were satisfactorily answered with 15 per cent responding negatively and 20 per cent remaining neutral.

Nearly half of respondents indicated their questions were not addressed or answered in a manner that provided enough information, so we've done our best to follow up to make sure participants receive the information they are looking for. Some participants said they attended specifically to learn more about nuclear-power generation and felt the discussion was too technical to understand.

Some participants told us the chat box feature should be disabled in future virtual events. They found the amount of "chatter" too distracting – there were too many comments to keep track of or respond to, or it was being used to post negative rather than constructive comments.

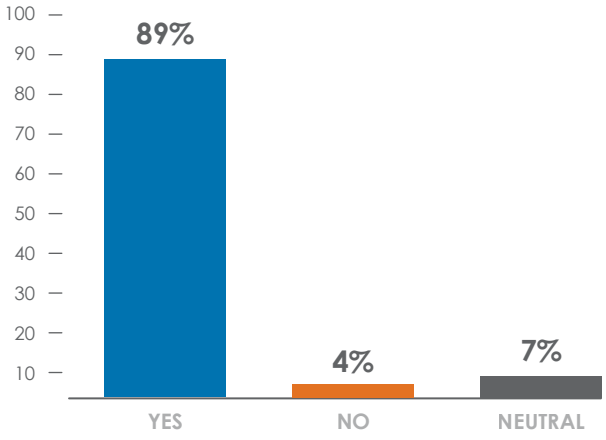
Some individuals indicated they would have preferred the sessions focused more on sharing the pros and cons of SMRs and allowing people to enter "breakout" rooms with "experts" to discuss future energy sources for Saskatchewan.

We'll use this feedback to develop future information sharing and engagement opportunities through the planning phase of the SMR Project.

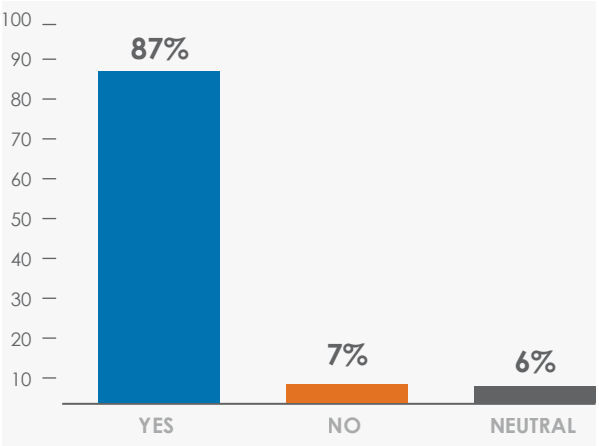
Was participating a good use of your time?

The majority of respondents, 90 per cent, indicated participation in the engagement sessions was worth their time, four per cent responded negatively and six per cent remained neutral.

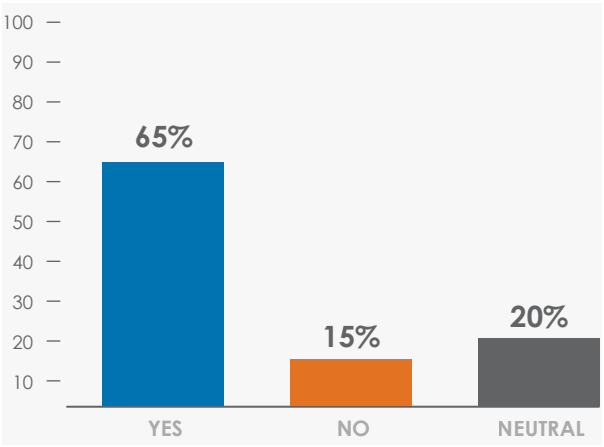
WAS THE INFORMATION PROVIDED HELPFUL?



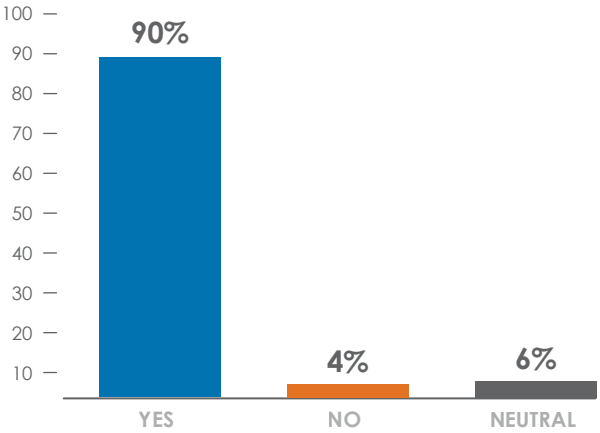
DO YOU UNDERSTAND THE NEED FOR THE PROJECT?



WERE QUESTIONS ANSWERED TO YOUR SATISFACTION?



WAS PARTICIPATING A GOOD USE OF YOUR TIME?



When it comes to finding an ideal location for a nuclear power facility, what would you want SaskPower to consider?

Participants indicated they want us to carefully consider the location of an SMR facility. Some suggested specific communities while others wanted to ensure SaskPower did its due diligence to consider the long-term environmental impacts, access to a skilled workforce and safety and security of all operations.

> Please consider all options, including battery storage and gel thermal.
> – *Participant*

6. NEXT STEPS: HOW WE'LL USE WHAT WE HEARD

Your time is valuable. The future of electricity in Saskatchewan affects all of us. Thank you again to everyone who took the time to participate in one of our information sessions.

We also want to extend our thanks to SUMA, SARM, the Regina & District Chamber of Commerce, the Saskatchewan Chamber of Commerce, the Estevan Chamber of Commerce and Coronach Economic Development for helping us facilitate these early information sessions.

Our efforts at this early stage were intended to introduce the planning phase of our SMR Project and open a dialogue with Indigenous communities, stakeholders and the public.

We'll continue this approach as we move into the siting engagement phase in 2022. We'll ensure we reach out directly to communities within and in close proximity to the regions of the province eventually identified as technically feasible to locate an SMR facility.

We plan to have shortlisted study areas (regions) identified and shared publicly in 2022.

Of course, feedback from people in the areas of technical suitability to host an SMR facility is critical through this process.

We'll incorporate learnings from this early engagement phase to our siting engagement plans by:

- Including a variety of ways to learn and ask questions about the project
- Helping you find answers to your important questions about the project
- Continuing to keep you updated on the many other power supply options in development as we work to achieve net-zero greenhouse gas emissions from power generation
- Connecting you with information and resources about nuclear power operations in Canada
- Taking steps to ensure the information we share is clear and factual

> I recognize that we will need SMRs to get to carbon zero as quickly as possible.
> – *Myra F.*

We'll continue to follow all COVID-19 public health orders to ensure the safety of all through the many conversations we'll be hosting during the siting engagement phase.

We'll also keep our project information updated online: saskpower.com/nuclear.

If you have questions about this report or SaskPower's SMR Project, please contact us: PublicConsultation@saskpower.com