



## Climate Change Presentation Script

1. This presentation has been prepared by the Saskatchewan Environmental Society and will outline:

The greenhouse effect, climate change impacts (globally, and locally), a few of the major greenhouse gases and where they come from, electricity production and other emissions in Saskatchewan, and will touch on some things we can do to reduce the severity of climate change.

2. We have our sun and our earth.

**Click:** Our earth has an atmosphere made up of gases, including some greenhouse gases

**Click:** energy comes from the sun to earth, mostly as visible light, but with some ultraviolet and infrared light.

**Click:** some of this energy reflects off the atmosphere, and back into space

**Click:** the rest comes through the atmosphere and hits the earth

**Click:** some of that reflects back into space

**Click:** The rest of that energy heats up the earth, and our atmosphere

**Click:** because the earth is warm, it now radiates, or gives off, infrared heat

**Click:** some of this heat radiates out into space

**Click:** but some of it is captured by the greenhouse gases in the atmosphere and stays in the atmosphere or radiates back to earth.

Capturing this heat or energy is called “the Greenhouse Effect”. It’s a very good thing. It’s what keeps our planet at temperatures we can live in. Overall, the average temperature of our planet is 15°C. Without the greenhouse effect, the average temperature would be about -25°C.

3. But we’ve been adding more greenhouse gases to the atmosphere.

**Click, click, click:** (no words)

**Click:** The energy still comes from the sun,

**Click:** and reflects off the atmosphere

**Click, click:** and earth

**Click:** The earth still warms up

**Click:** and Energy still radiates from the earth

**Click:** but less of this energy makes it through the atmosphere and out to space

**Click:** more of the energy is radiated back to earth

**Click:** making the earth and atmosphere warmer



This warming of the earth and atmosphere is called “global warming”. The impact of global warming is not that it will be a bit warmer everywhere, every day. Really, it is changing our weather patterns, and weather systems. It’s creating Climate Change.

4. There is a group of 195 countries who have hundreds of scientists look at the science of climate change and see what it will mean for the earth. This is the Intergovernmental Panel on Climate Change. They report on the work being done around the world to understand our climate, what is changing, and why.
5. Back in their 2013 report on the physical science, they reported that “Human influence on the climate system is clear”, which means that it’s clear that we are the cause of climate change. And really, we knew long before that.

**Extra:** the full quote is:

“Human influence on the climate system is clear. This is evident from the increasing greenhouse gas concentrations in the atmosphere, positive radiative forcing, observed warming, and understanding of the climate system. Human influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, in global mean sea level rise, and in changes in some climate extremes (Figure SPM.6 and Table SPM.1). This evidence for human influence has grown since AR4. It is *extremely likely* that human influence has been the dominant cause of the observed warming since the mid-20th century.” (*extremely likely* is defined as 95-100% certainty).

**Working Group I Contribution to the IPCC Fifth Assessment Report  
Climate Change 2013: The Physical Science Basis  
Summary for Policymakers**

6. Weather is what it’s like out today, or this week, or even this year.  
Climate is the pattern of weather over years and decades.
7. In order to hold the global temperature increase below 1.5°C, there is only so much greenhouse gas we can add to the atmosphere. That is called a carbon budget. We are currently on track to use up that budget by 2030. Although 1.5°C doesn’t seem like much, by comparison, during the last ice age, when our part of the world was under a kilometre of ice, the global average temperature was 5°C colder than it is now. A few degrees can make a huge difference in climate. The expectation is that there will be even more warming near the poles, so northern Canada and the arctic will see more extreme changes.



8. So, what does Climate Change mean for us and for our planet? Here are some of the things that climate change will cause:

We have seen that glaciers are shrinking.

**Extra:** With overall warmer weather, glaciers are melting more than they are growing each year, so are shrinking. These photos are of the Athabasca Glacier in the Canadian Rockies. See how much smaller the glacier was in 2011 than it was in 1918.

9. Storms are getting more powerful.

**Extra:** A warmer atmosphere holds more water vapour. Water vapour is the energy that fuels storms. The top photo is from Texas in 2017. The bottom photo is of Hurricane Sandy in 2012. The damage caused by Hurricane Sandy was made worse by the fact that sea levels are rising, allowing storms to push water higher and further into cities during storms.

10. Floods are getting more frequent.

**Extra:** Our infrastructure (roads, storm sewers etc.) is designed to handle the type of weather we used to get. The top picture shows Calgary flooded in 2013 and a flood in Melville, SK in 2014. In Saskatchewan, we have already had "one in one-hundred-year floods" in 2011, 2014 and 2017. As we get more intense rainstorms, more roads will wash out, and more communities will be flooded.

11. And Droughts are getting more severe.

**Extra:** It seems counterintuitive, but as well as more storms and more flooding, we can expect longer droughts in many parts of the world. In Saskatchewan, we are expecting to get more of our precipitation in the spring and fall, and less in the summer, which will be very hard on plants. This photo was taken in California in 2014. Droughts affect our ability to grow food. (So do floods).

12. We've seen bigger, more dangerous forest fires.

**Extra:** can also expect more forest fires. This will be related to drought, disease and insects. For example, in British Columbia, normally many pine bark beetles die off in the cold each winter. However, a few warm winters in a row allowed the beetles to thrive. The beetles killed many trees. With so many dead trees in the forest, forest fires



burned easily. Communities in forested areas are at greater risk from fire as we've seen in BC, California, Fort McMurray and La Ronge in the past number of years.

13. Heat waves make the news from across the planet.

**Extra:** We can expect hotter heat waves. The picture was taken in Russia in 2010. That summer, as well as the heat, there were major forest fires burning in Russia, causing all the smoke you can see in the air in this photo. Currently, in Saskatoon, we average 9 days per year with temperatures over 30°C. That could go up to an average of 55 days per year.

14. And, we'll have less snow for playing in.

**Extra:** As our winters get warmer, there may not be enough snow for skiing, snowshoeing, tobogganing, or making snowmen. And here in Saskatchewan, warmer winters tend to mean icier streets and sidewalks.

15. In Saskatchewan, we can expect more extreme weather events, and more frequent and more serious flooding. But as the century goes on, there is also greater risk of longer and more intensive droughts.

In the southern part of the boreal forest – for example around Prince Albert National Park – we can expect things like fire and insects to kill off many of the trees, and that area is likely to become more open farmland.

The glaciers are a major source of water in Saskatchewan, so our river flows will be less when the glaciers are smaller, particularly in late summer and early fall.

16. Climate change will impact our health as well. Infants and children, elderly, and outdoor workers will be the most affected by temperature increases.

Vectors are insects and animals that carry disease. Due to our milder winters, we can expect to see an increase in vector borne diseases like West Nile virus and Lyme disease. Hotter, more humid weather causes breathing problems for some people.

**Extra:** We can expect to have more smog in Saskatchewan because smog forms more easily in hotter weather. If it becomes more humid as well, we can also expect more mold, fungus and pollen. All these things cause breathing problems for people.



17. The IPCC put out a report in 2018 to help us understand the impacts of the earth warming by 1.5°C or 2°C and what the difference might be between those. This graphic comes from the World Resources Institute and summarizes some of the findings from that report. We will have a 14% increase in extreme heat events if the planet warms by 1.5°C, but a 37% increase if it warms by 2°C. This chart shows how much worse the impacts on Arctic Sea ice, loss of species, changes to ecosystems, and the loss of fisheries will be if we let the earth heat by 2°C. **(Pause for students to look at image.)**

18. So, what are these greenhouse gases, and where do they come from? There are many greenhouse gases. The IPCC tracks about 30. Three of the main ones are:

**Click:** CO<sub>2</sub> or Carbon Dioxide

**Click:** N<sub>2</sub>O or Nitrous Oxide, and

**Click:** CH<sub>4</sub> or Methane

Most often when we hear people talk about greenhouse gases, we hear them talk about Carbon Dioxide. To keep things simple, we talk about the equivalent amount of Carbon Dioxide that would have the same global warming potential as the other gases have.

**Click:** So, we add up the effect of all the greenhouse gases, and state it as an equivalent amount of Carbon Dioxide.

19. Carbon Dioxide comes mainly from burning things. We burn natural gas (**click**) to heat our homes and businesses, we burn gasoline and diesel (**click**) to run our vehicles, and SaskPower burns coal and natural gas (**click**) to make our electricity. The carbon dioxide we put into the atmosphere today will stay in the atmosphere for (**click**) an average of 100 years. This is very important, because it means our actions today will affect the planet and future people for a very long time.

**Extra:** For more information on the lifetime of carbon dioxide in the atmosphere see: Climate Change 2007: The Physical Science Basis, Working Group 1 of the Contribution to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, page 824. "If Emissions of Greenhouse Gases are Reduced, How Quickly do Their Concentrations in the Atmosphere Decrease?"



20. All that burning that produces Carbon Dioxide also produces Nitrous Oxides.

**Click:** Nitrous Oxides are also produced in some farming practices.

**Click:** Nitrous Oxides will stay in the atmosphere for 114 years.

21. Methane comes mainly from cattle and from oil and gas production.

**Click:** Because of the way they digest food, cattle fart (burp) large volumes of methane.

**Click:** During oil and gas production, some gas leaks out, and other gas is vented (released directly to the atmosphere) or flared (being burned, without being used for anything).

**Click:** Methane only lasts 12 years in the atmosphere, but it is a much more potent, or stronger, greenhouse gas while it is in the atmosphere.

22. In Saskatchewan, 32%, or about 1/3, of our greenhouse gas emissions come from the oil and gas industry.

20%, or 1/5, come from making electricity;

24% from agriculture;

14% from transportation - both moving people (passenger transportation) and moving stuff (freight transportation)

Other industries produce about 5%

Our buildings produce about 4% and

Waste or garbage produces about 1%

Remember that we use oil and gas, the products that industries produce, and the electricity SaskPower makes.

23. Coal has long been SaskPower's main way of making electricity. Because coal is mostly carbon, when we burn it, it produces a lot of carbon dioxide.

Gas produces about half as much carbon dioxide as coal does. When SaskPower builds new generation facilities, they normally use gas.

Making new dams for hydro creates a lot of methane, because of the plants that get flooded in a reservoir. Other than that, hydro has almost no greenhouse gas emissions. Once wind turbines are built, they have no greenhouse gas emissions from generating electricity.

“Other” refers to things like diesel operated generators in the far north.

Every year, SaskPower buys a bit of power from other utilities, such as Manitoba Hydro. That is what is referred to as “imports”.

SaskPower is starting to use solar energy. So far, our solar production is mainly on rooftops, or people's farms. There is too little of it to show up on this chart.

24. Sometimes people say that since Canada produces less than 2% of the world's greenhouse gas emissions that our emissions don't matter. Certainly, the big



producers like China and the US must reduce their emissions, but the big blue section and the bigger green section of this chart – 40% of the total – are made up of countries like ours that don't produce much.

25. If we look at how much greenhouse gas emissions each person is responsible for, the picture looks quite different. China and the USA are the biggest overall emitters, but each person in those countries has a relatively small share. Each Canadian is responsible for more emissions than any person in the countries with high emissions. Partly because our province is large and cold with not many people, but mainly because of the types of industry we have and how we make our electricity, here in Saskatchewan, we have very high per capita emissions. Our per capita emissions are higher than any country in the world. Every country, and every person needs to do our share to reduce overall emissions.
26. Autumn Peltier is an Anishinaabe teenager who has been a water activist since she was 8 years old. She is now the Chief Water Commissioner for the Anishinabek Nation. Autumn says "Kids all over the world have to pay for mistakes we didn't even make. This is our future, we're the next elders, we're the next leaders. This is our future".
27. Greta Thunberg, a Swedish teenager, has done a lot to get world leaders talking about and acting on climate change. Greta says "We do need hope. Of course, we do. But the one thing we need more than hope is action. Once we start to act, hope is everywhere. So instead of looking for hope, look for action. Then and only then, hope will come."
28. In 2019, Saskatoon made a plan of actions for the City to meet our greenhouse gas emission goals. Some of these are big actions, such as upgrading everything that plugs in at City buildings to more efficient things; and some are even bigger, such as retrofitting existing homes to use less energy.
29. So, what can we do about it?

With action projects you take at school or at home, you can reduce greenhouse gas emissions. Things that will help are using less, or generating renewable, energy; using less water; reducing waste; eating less meat; and reducing our use of vehicles by using active transportation; and, improving biodiversity where we live.

We're looking forward to your projects to reduce greenhouse gas emissions.