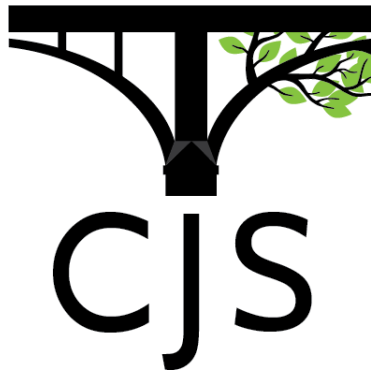


# Finding meaningful climate solutions in Saskatchewan

Town Hall meeting | April 9 2018



# What do we KNOW about climate change?



## IT'S WARMING

17 of the 18 warmest years on record have occurred since 2001



## IT'S US

The main cause of the current global warming trend is human expansion of the "greenhouse effect"



## IT'S BAD

Climate change is expected to flood cities, devastate food production, cause wide-ranging health impacts,, exacerbate pre-existing conflicts and have a much greater impact on more those with less access to power



## WE'RE SURE

The raw data and software used to produce our temperature data is publically available and has been tested both inside and outside of government agencies, around the world



## WE CAN FIX IT IF WE HURRY

It is technically possible to limit global average temperature rise to well below 2°C if we peak emissions soon and steadily reduce them

# The Paris Agreement

F O R T H E P L A N E T



## Article 2

1. This Agreement, in enhancing the implementation of the Convention, including its objective, aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by:
  - (a) Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;
  - (b) Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production;
  - (c) Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.
2. This Agreement will be implemented to reflect equity and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.

## Article 4

1. In order to achieve the long-term temperature goal set out in Article 2, Parties aim to reach global peaking of greenhouse gas emissions as soon as possible, recognizing that peaking will take longer for developing country Parties, and to undertake rapid reductions thereafter **in accordance with best available science**, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century, **on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty.**
2. Each Party shall prepare, communicate and maintain successive nationally determined contributions that it intends to achieve. Parties shall pursue domestic mitigation measures, with the aim of achieving the objectives of such contributions.
3. Each Party's successive nationally determined contribution will represent a progression beyond the Party's then current nationally determined contribution and reflect its highest possible ambition, reflecting its common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.
4. Developed country Parties should continue taking the lead by undertaking economy-wide absolute emission reduction targets. Developing country Parties should continue enhancing their mitigation efforts, and are encouraged to move over time towards economy-wide emission reduction or limitation targets in the light of different national circumstances.

Why?

# 4°C (business as usual):

- substantial species extinction
- extensive loss of ecosystem functioning
- **large risks to global and regional food security**
- high temperature and humidity **compromising normal human activities, including growing food or working outdoors** in some areas for parts of the year
- significant global **sea rise** threatening small island states and coastal communities
- potential to pass “tipping points”, activating changes which drive climate change even faster



**2°C** (less devastating, but):

*“In conjunction with other development challenges, the impacts of climate change represent a fundamental challenge for regional food security, and may trigger new poverty traps for several countries or populations within countries.”*



## 2°C:

- Long periods of **intense heat extremes** in Africa, S America, SE Asia - “new climate regime”
- Long dry periods in Mediterranean, Central America, the Amazon, southern Africa

So **crop yield reductions & serious risks to health**

United Nations Framework on Climate Change Subsidiary Body for Scientific and Technological Advice (2015), 42<sup>nd</sup> session: Report on the structured expert dialogue on the 2013-2015 review.

Carl-Friedrich Schleussner, Tabea K Lissner, Erich M Fischer, Jan Wohland, Mahé Perrette, Antonius Golly, Joeri Rogelj, Katelin Childers, Jacob Schewe, Katja Frieler, Matthias Mengel, William Hare & Michiel Schaeffer (2016), Differential climate impacts for policy-relevant limits to global warming: the case of 1.5°C and 2°C, Earth System Dynamics vol 7 pp327-351, 2016:Apr:21

## Significant differences between 1.5 and 2°C for:

- intense heat extremes in Africa, S.America, SE Asia - “new climate regime” – **serious health issue**
- dry periods in Mediterranean, Central America, the Amazon, southern Africa – **crop yields impacted**
- sea level rise
- loss of coral, and other ecosystem damage
- frequency and extent of extreme weather events (floods, droughts, cyclones, heatwaves, forest fires,...)



# Carbon budgets

or the total amount of CO<sub>2</sub> we can emit, effectively for all time

IPCC best estimate for 67% chance of 2°C starting beginning 2012: **1000 billion tonnes**

2018: reduced to less than **800 billion tonnes**

For 50% chance of 1.5°C, now about **350 billion tonnes**

# Staying within the budget:

Demand side (consumption)

Supply side (production)

Implications for consumption

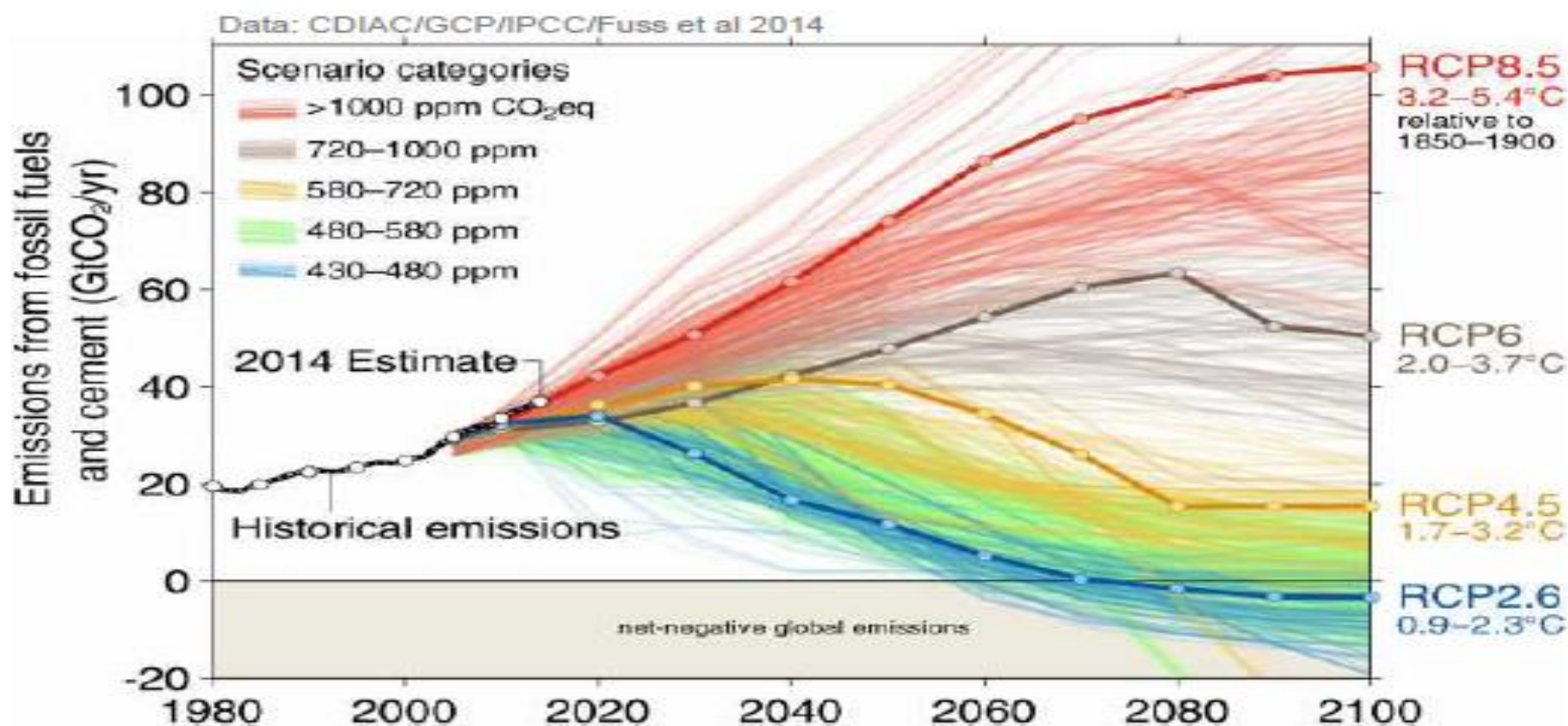
# Reduce emissions!

Options could include:

- Conservation & efficiency measures
- Shift to zero-emissions energy
- Electric vehicles (using renewables-generated electricity)
- Electrification of high-temperature industrial processes
- Change in the structure of the economy
- [Negative emissions technologies]

## Observed Emissions and Emissions Scenarios

Emissions are on track for 3.2–5.4°C “likely” increase in temperature above pre-industrial  
 Large and sustained mitigation is required to keep below 2°C

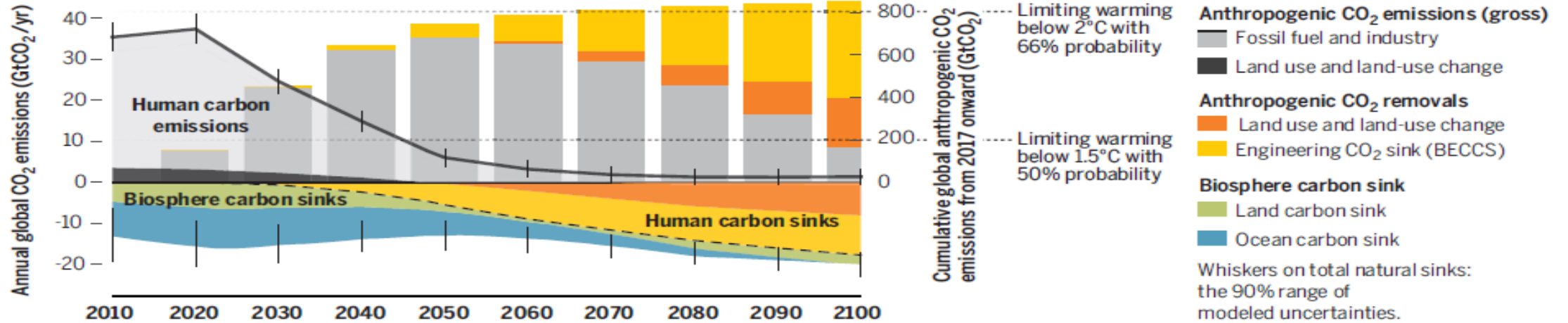


Over 1000 scenarios from the IPCC Fifth Assessment Report are shown

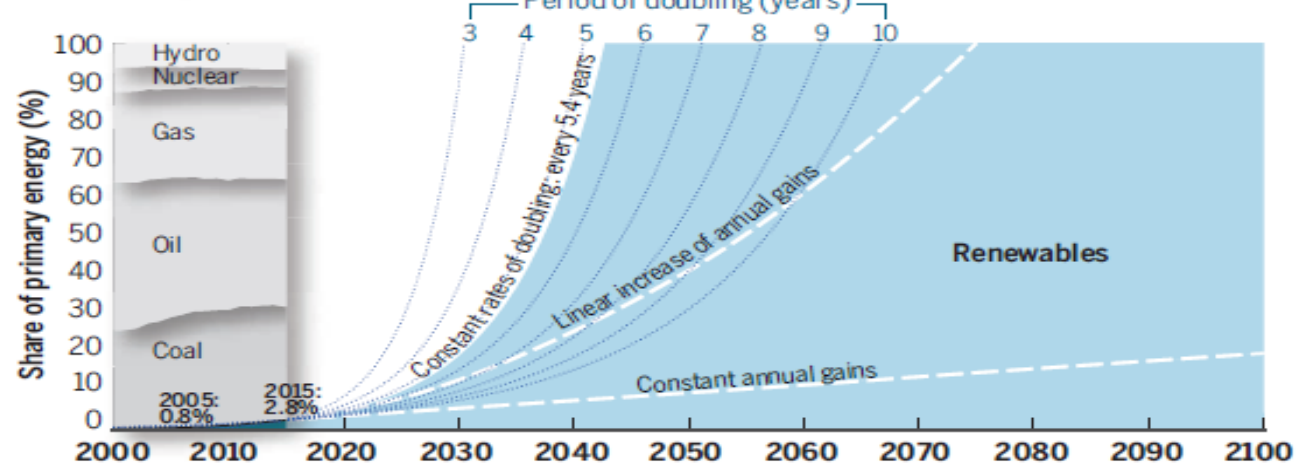
Source: [Fuss et al 2014](#); [CDIAC](#); [Global Carbon Budget 2014](#)

# A global carbon law and roadmap to make Paris goals a reality

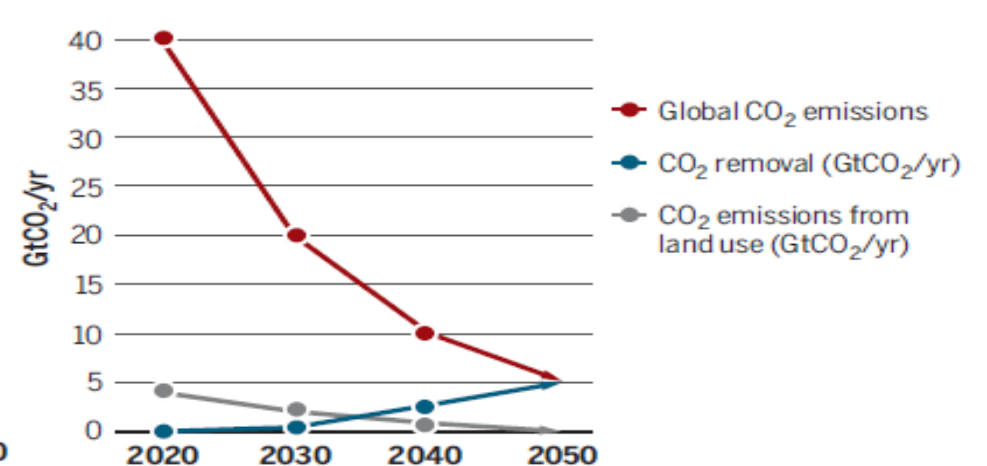
## Decarbonization pathway consistent with the Paris agreement



## Fossil fuel phase out



## Global carbon law guiding decadal pathways



Johan Rockström, Owen Gaffney, Joeri Rogelj, Malte Meinshausen, Nebojsa Nakicenovic & Hans Joachim Schellnhuber (2017), A roadmap for rapid decarbonisation, *Science* 355 (6331), 1269-1271.

What does “on the basis of equity” mean?

- an equal share of the global budget for every individual?
- in which case, Canada would exhaust its allocation within 7 years at present emissions rates,
- and Saskatchewan in about 2 years.



Implications for production

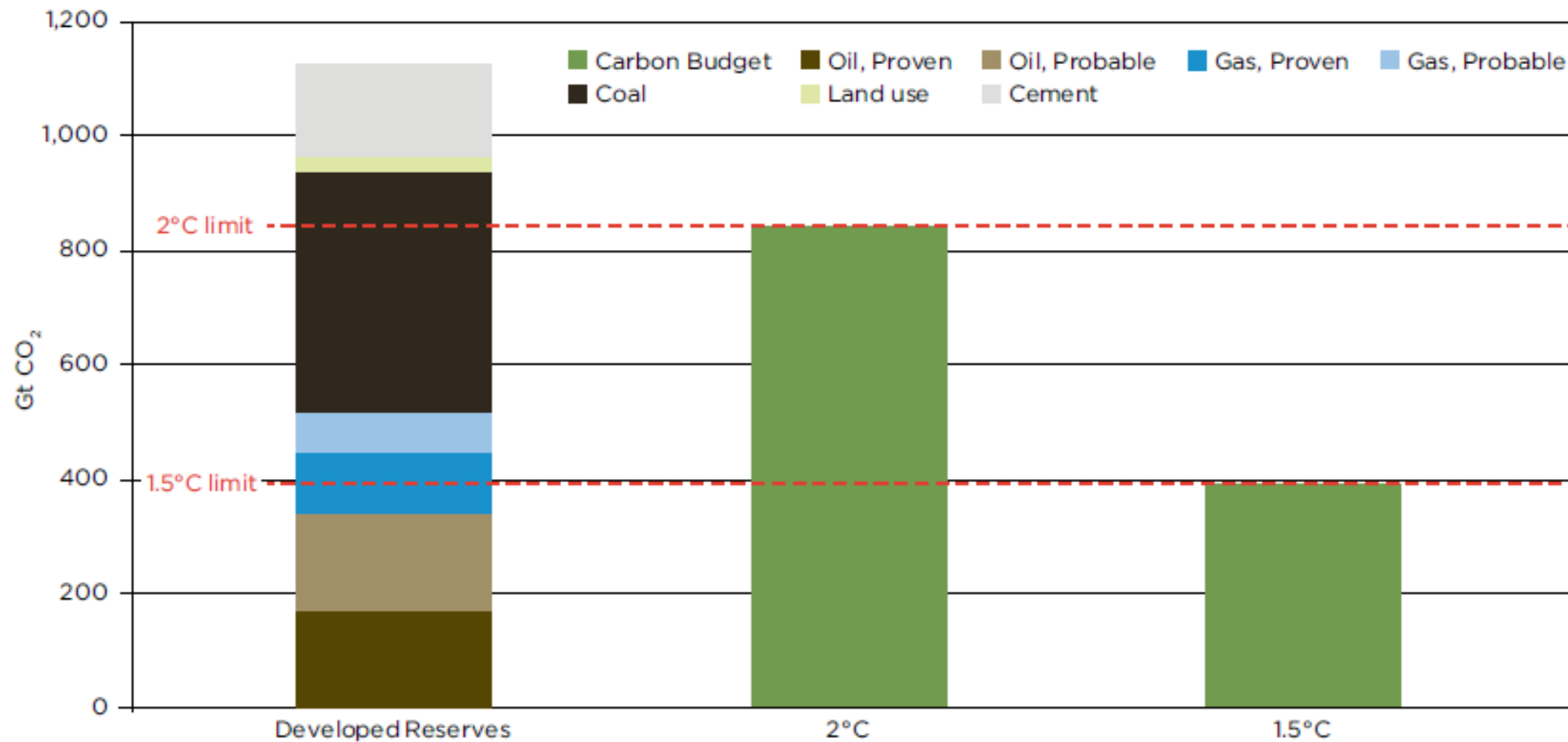
**2 °C budget (2/3 chance): 800 Gt CO<sub>2</sub>**

**1.5 °C budget (50:50): 350 Gt CO<sub>2</sub>**

**Fossil fuel reserves: 3000 Gt CO<sub>2</sub>**

**So satisfying the budget means leaving most of the  
fossil reserves in the ground**

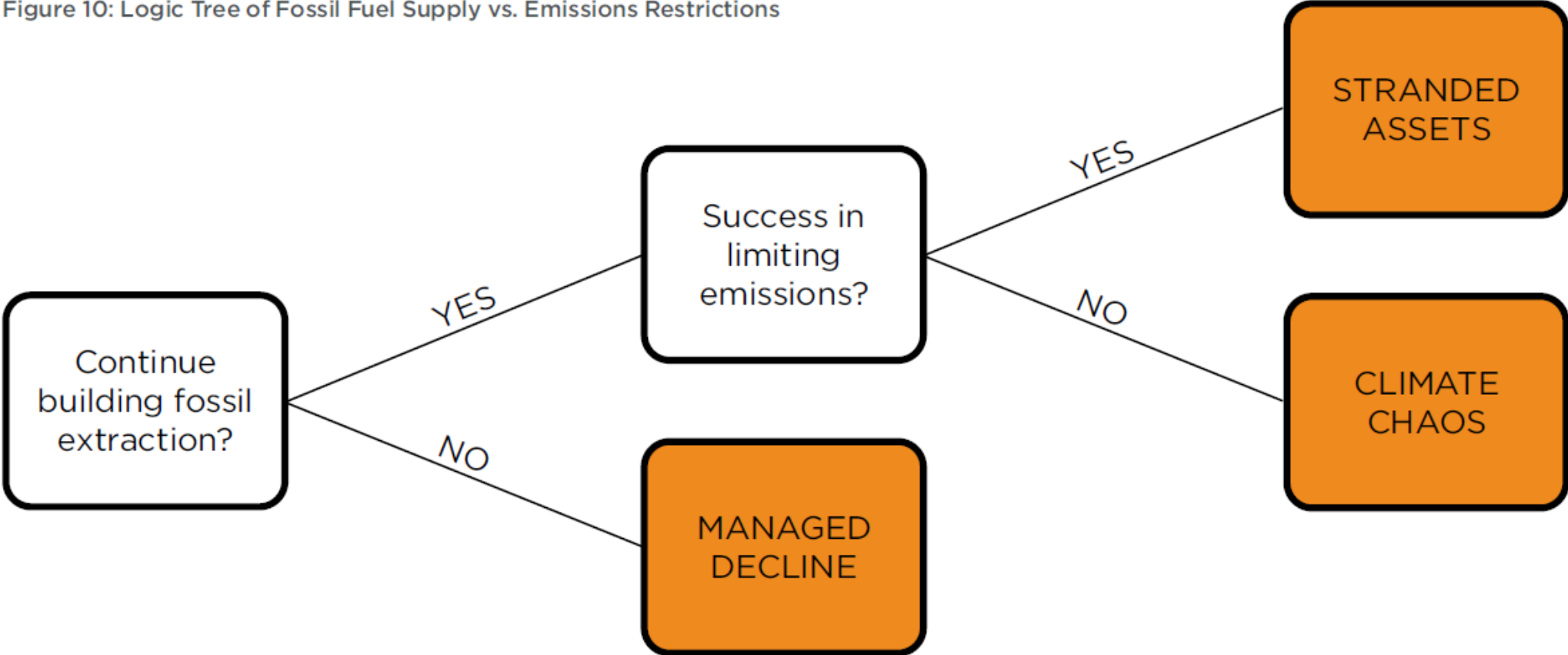
Figure 5: Emissions from Developed Reserves, Compared to Carbon Budgets for Likely Chance of 2°C and Medium Chance of 1.5°C



Sources: Rystad Energy, IEA, World Energy Council, IPCC (From Oil Change International, *The Sky's Limit*, 2016)

from Greg Muttitt (2016), *The Sky's Limit*, Oil Change International

Figure 10: Logic Tree of Fossil Fuel Supply vs. Emissions Restrictions



Source: Oil Change International

from Greg Muttitt (2016), The Sky's Limit, Oil Change International

# *Federal Policy*

## **PAN-CANADIAN FRAMEWORK**



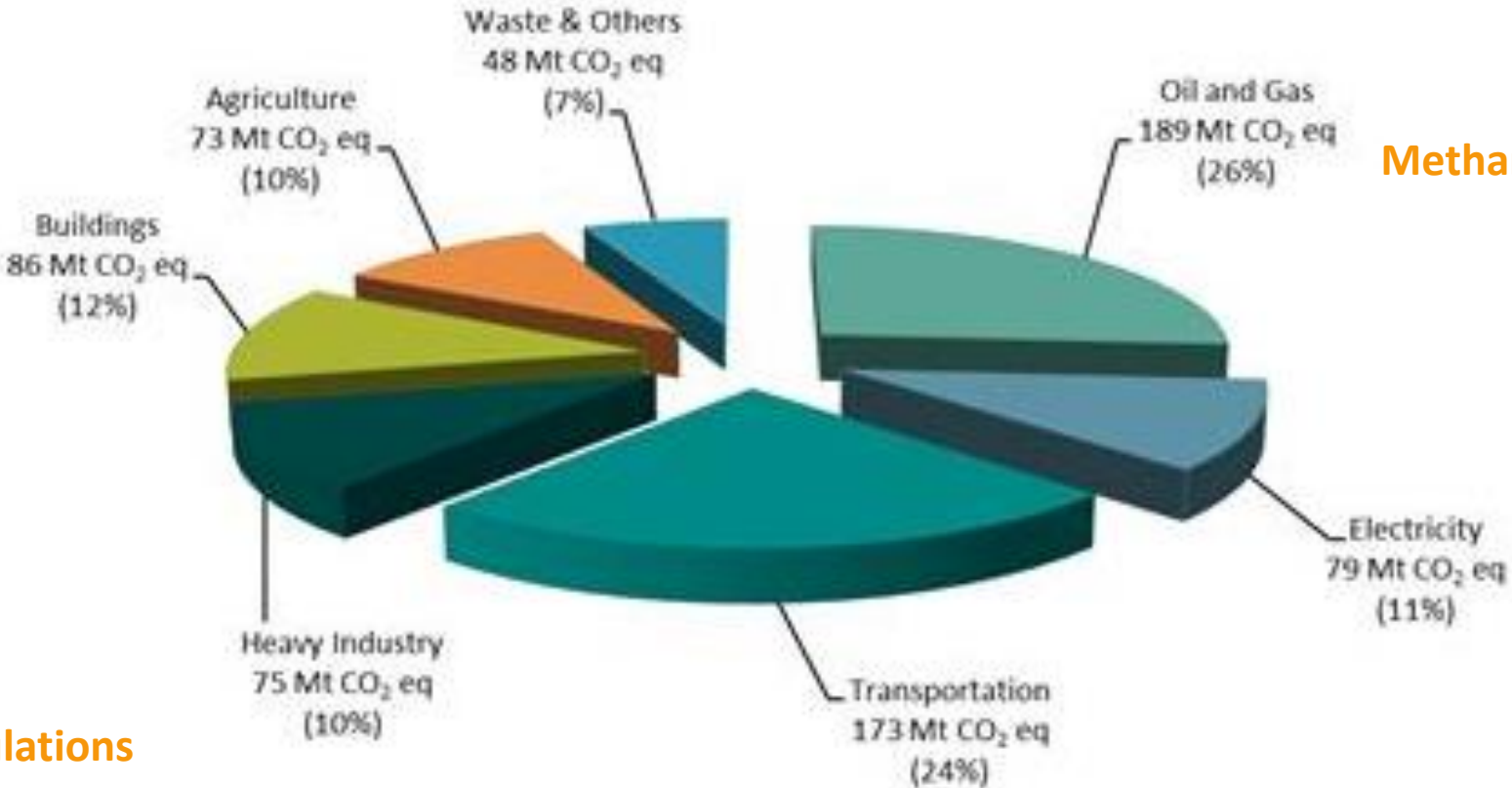
## **on Clean Growth and Climate Change**

Canada's Plan to Address Climate  
Change and Grow the Economy

# Carbon Pricing Funding for emissions-reducing projects

2030 Building Code

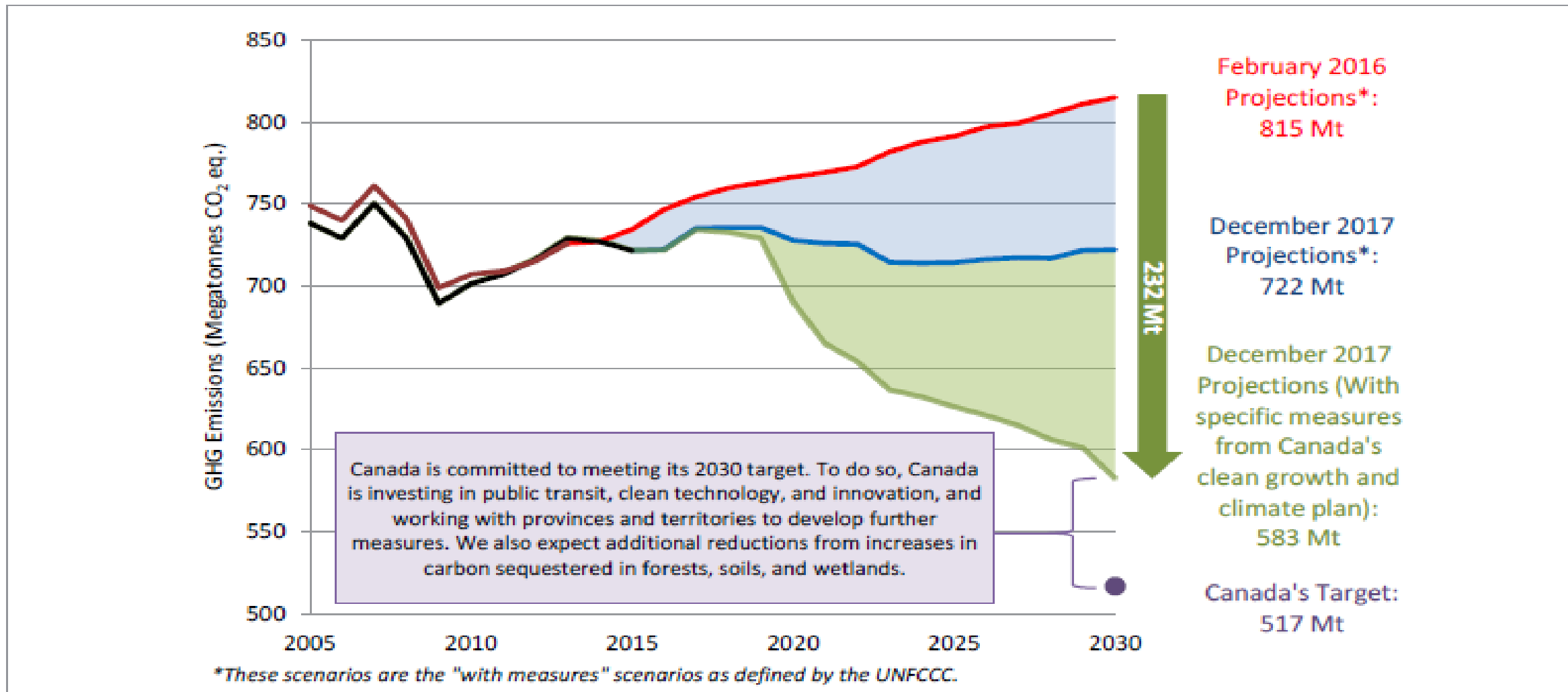
Methane Regulations



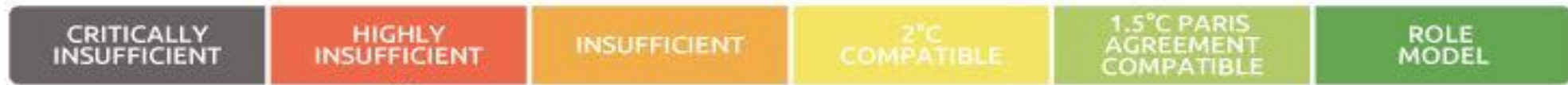
2030 Coal Phase-Out

HFC Regulations

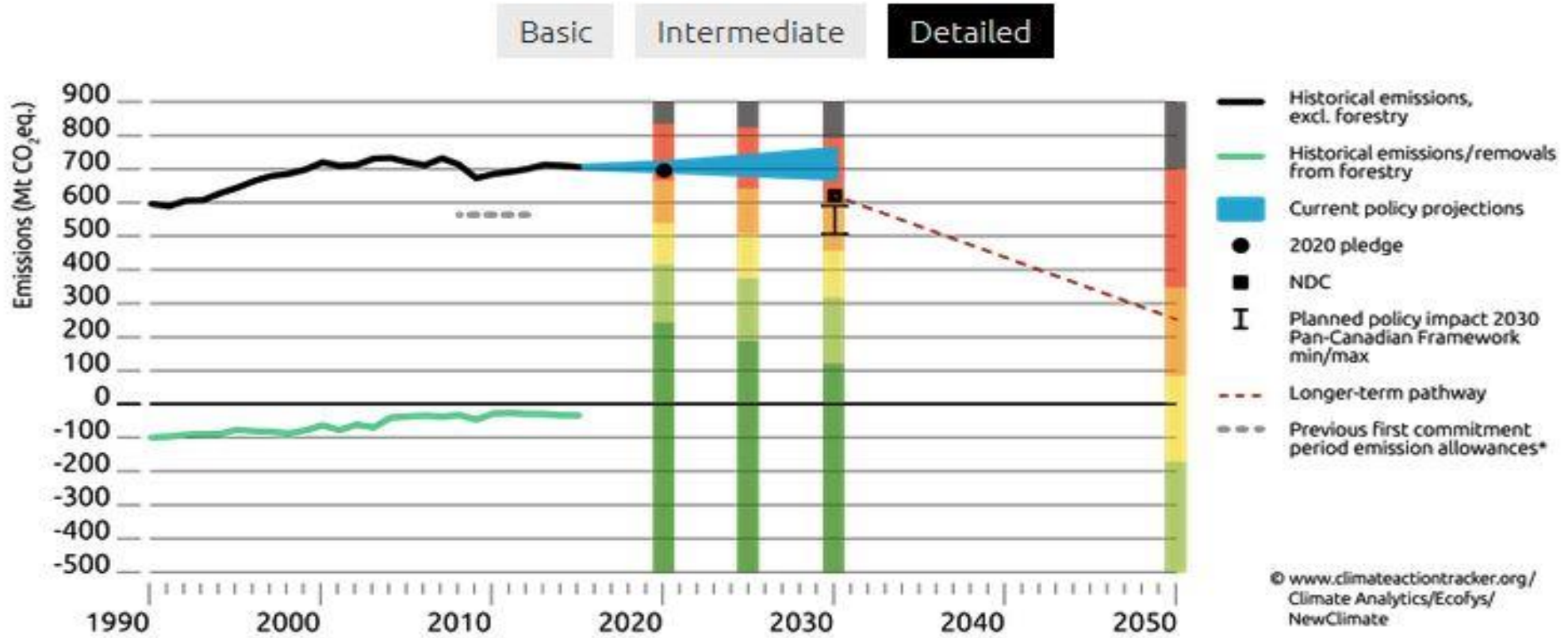
Clean Fuel Standard



**Figure 4: Scenarios of Canadian Emissions to 2020 and 2030 (Mt CO<sub>2</sub> eq) (Excluding Land Use, Land-Use Change and Forestry)**




 Current Rating:  
**HIGHLY INSUFFICIENT**



Carbon Action Tracker's rating for Canada, 2017. <http://climateactiontracker.org/countries/canada.html>

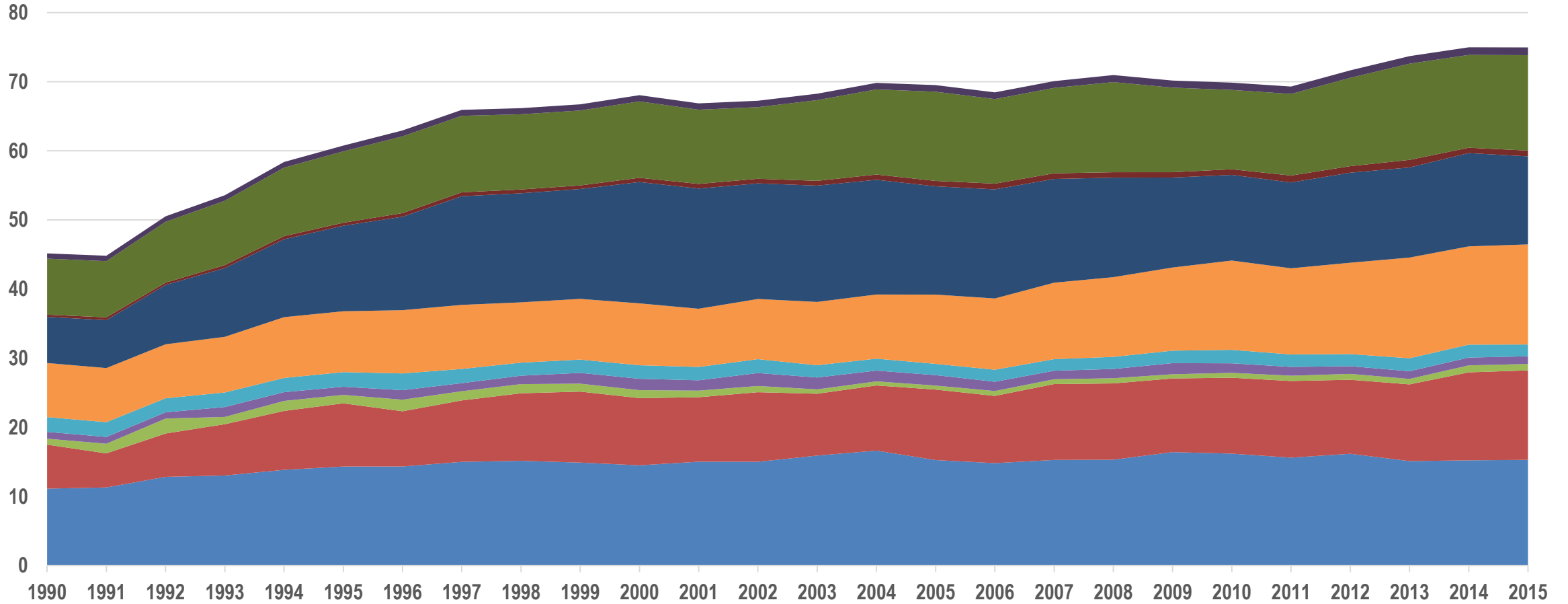
Prairie Resilience:

A Made-in-Saskatchewan Climate Change Strategy

*Provincial  
policy*



# Annual emissions, Saskatchewan, 1990-2015

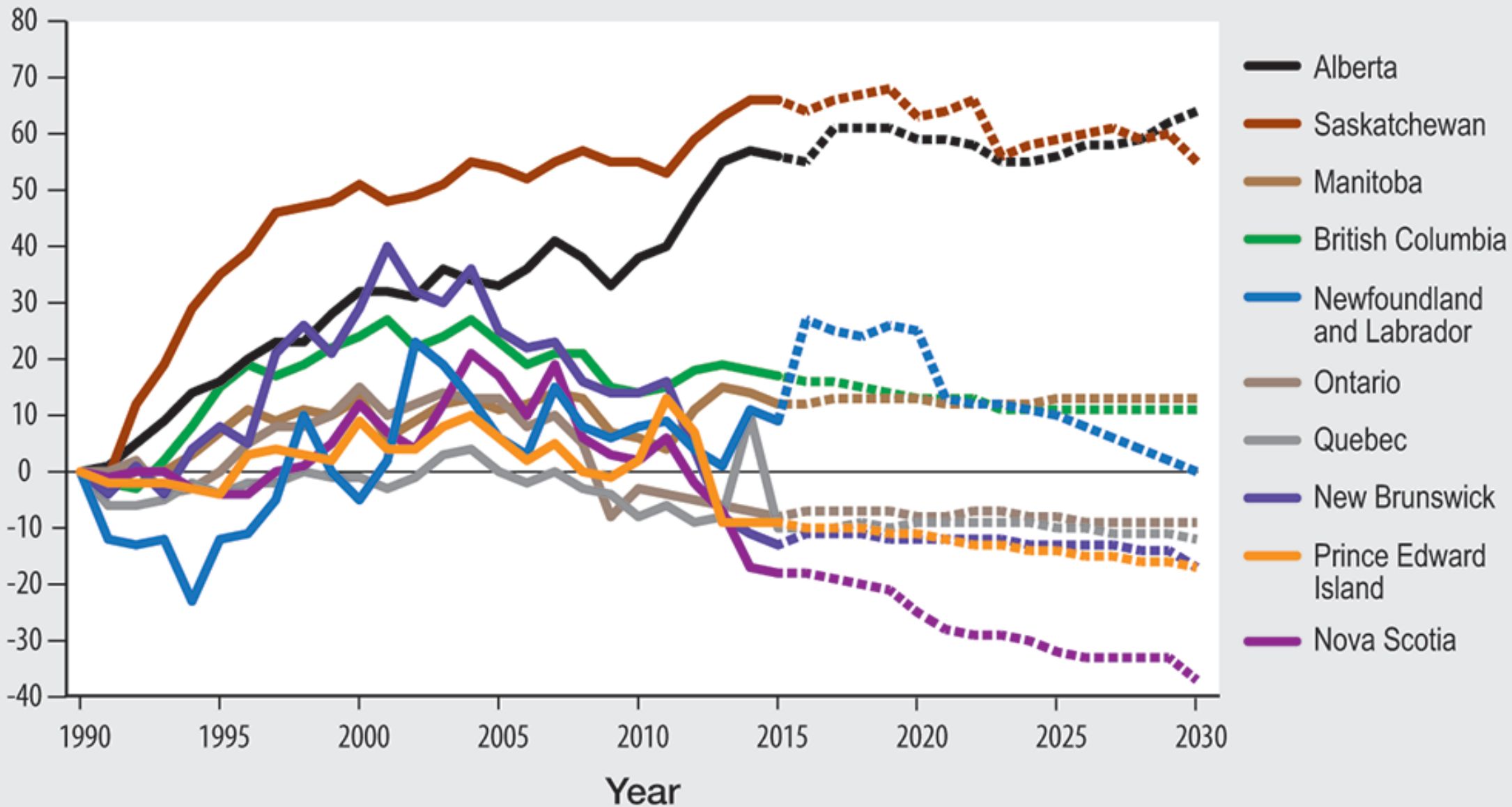


- Electricity & heat
- Mining, oil, gas & pipelines
- Manufacturing & construction
- Commercial & institutional buildings
- Residential buildings
- Transport
- Fugitive sources
- Industrial processes & product use
- Agriculture & Forestry
- Waste

## Provincial emissions per capita, average 2009-2013 (tonnes CO<sub>2</sub> equivalent)



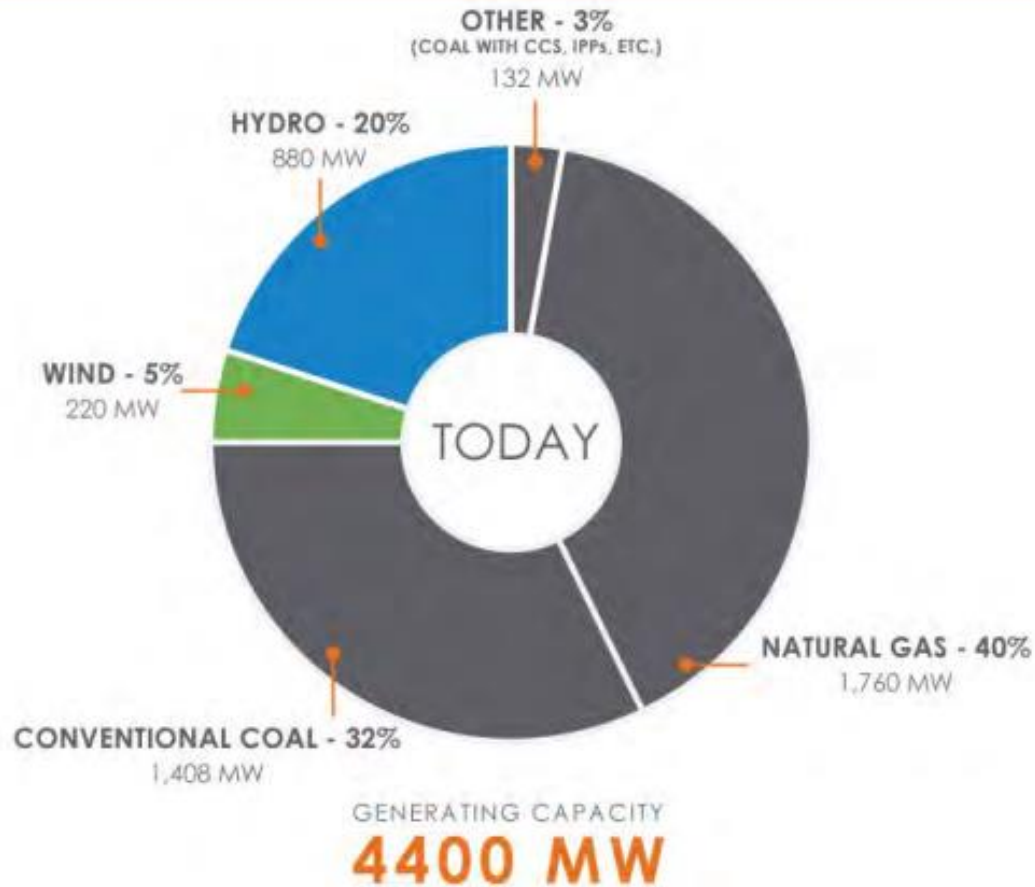
Percent



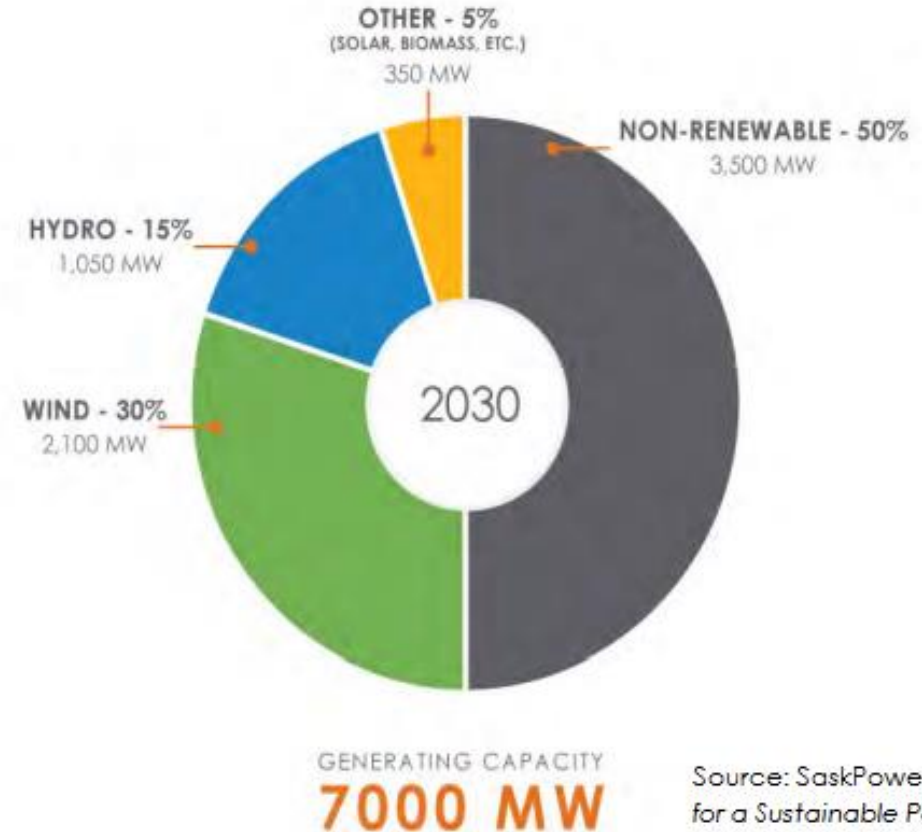
from Auditors General Report, March 2018, using data from National Inventory Reports

# SaskPower Renewables Plan

## GENERATING CAPACITY - TODAY

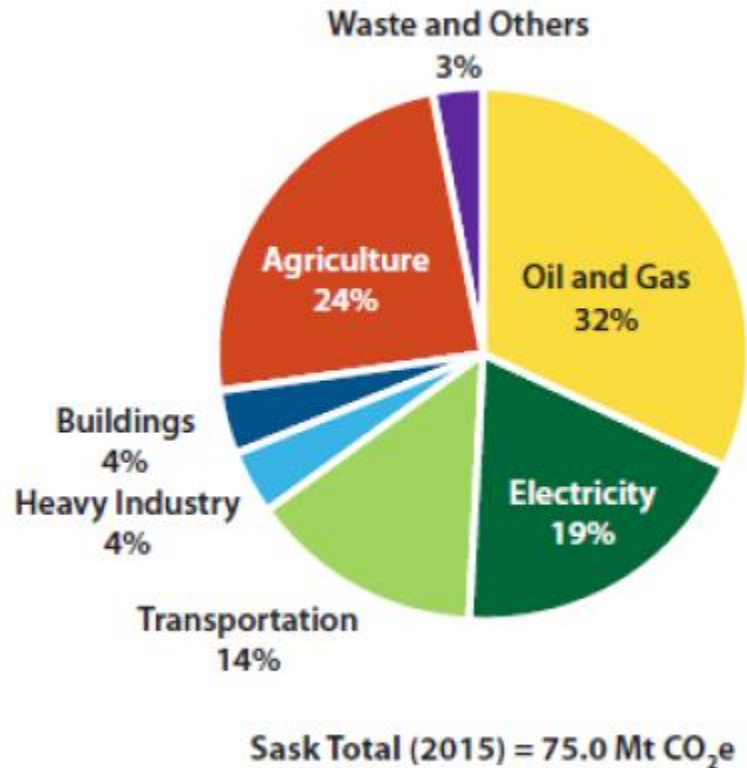


## POTENTIAL GENERATING CAPACITY - 2030



Source: SaskPower 2016, Plans for a Sustainable Power Future

### Saskatchewan's GHG Emissions by Economic Sectors (2015)



Sources: Canada's National Inventory Report 1990-2015 (2017)

Sector-specific output-based performance standards on facilities emitting more than 25,000 t CO<sub>2</sub>e per year

Regulations to reduce greenhouse gas emissions from oil and gas wells and facilities using a results-based system

Adopt 2015 national building energy codes (for new buildings)

Develop and implement an offset system that creates additional value for actions that result in carbon sequestration

# Auditors General Assessment of Saskatchewan climate action (2018)

Is developing policies related to reducing GHG's

Leading development of a coordinated adaptation plan

Absence of an emission reduction target for 2020

Absence of an emission reduction target for 2030

Provincial mitigation plan not implemented

Provincial risk assessment not undertaken

Provincial adaptation plan not implemented

No regular reporting on provincial GHG sources



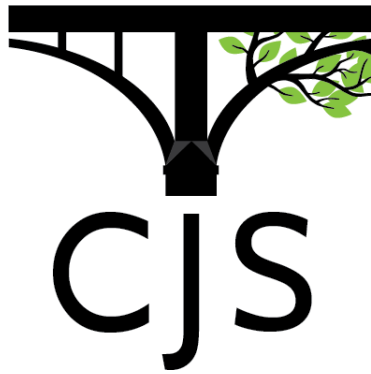
POSITIVE FINDING

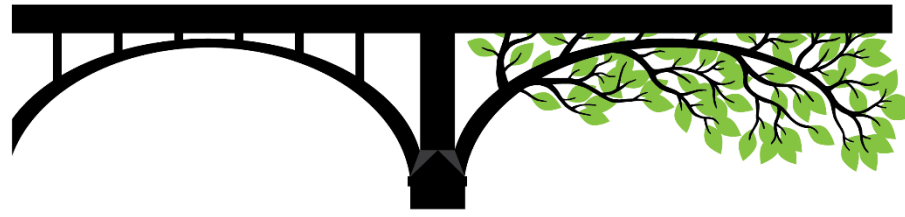


NEGATIVE FINDING

# Finding meaningful climate solutions in Saskatchewan

Town Hall meeting | April 9 2018





CLIMATE JUSTICE SASKATOON

[climateactionsk@gmail.com](mailto:climateactionsk@gmail.com)

[climatejusticesaskatoon.ca](http://climatejusticesaskatoon.ca)

CFCR 90.5 FM, Wednesdays at 6:30pm

[soundcloud.com/ClimateJusticeSaskatoon](https://soundcloud.com/ClimateJusticeSaskatoon)



Climate Justice Saskatoon



@CJSaskatoon