

# CLIMATE ACTION: PUBLIC HEALTH ADVOCACY

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# DISCLOSURE INFORMATION

## **Disclosure of Relevant Financial Relationships**

I have no financial relationships to disclose



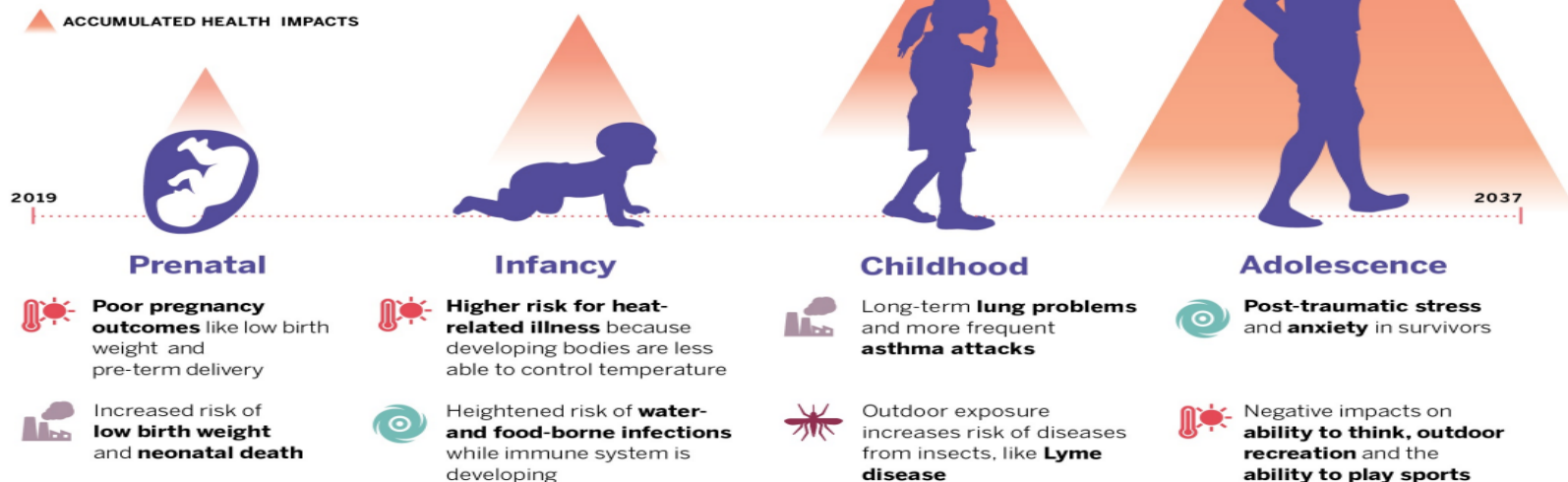


LANCET COUNTDOWN:  
**TRACKING PROGRESS**  
ON HEALTH AND  
CLIMATE CHANGE

# GENERATIONAL JUSTICE

## Climate Change Harms the Health of Children

Climate change poses risks to children throughout their development. Here we present a few examples of how climate change harms health from before birth to adolescence



Source: Lancet Countdown 2019 US Policy Brief



# PUBLIC HEALTH ADVOCACY



Source: Frieden T. Am J Public Health; 2010; 100 (4) Image source: Live Healthy Douglas



# U.S. CALL TO ACTION: CLIMATE, HEALTH AND EQUITY POLICY ACTION AGENDA

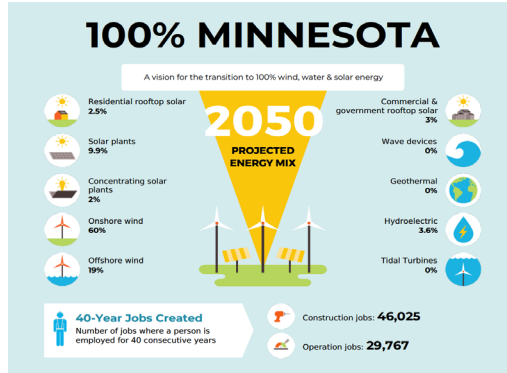


# CLIMATE ISSUES IN MINNESOTA



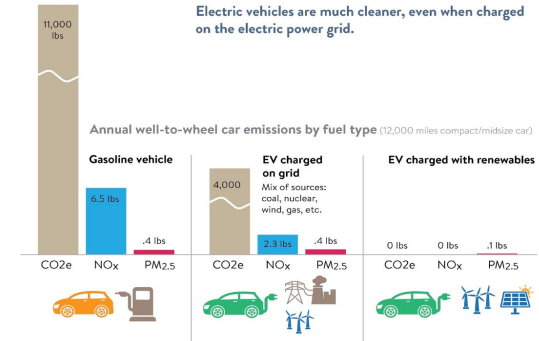
MPR News Graphic, William Lager

Transition rapidly away from the use of Fossil Fuels



Solutions Project

Transition to renewable energy

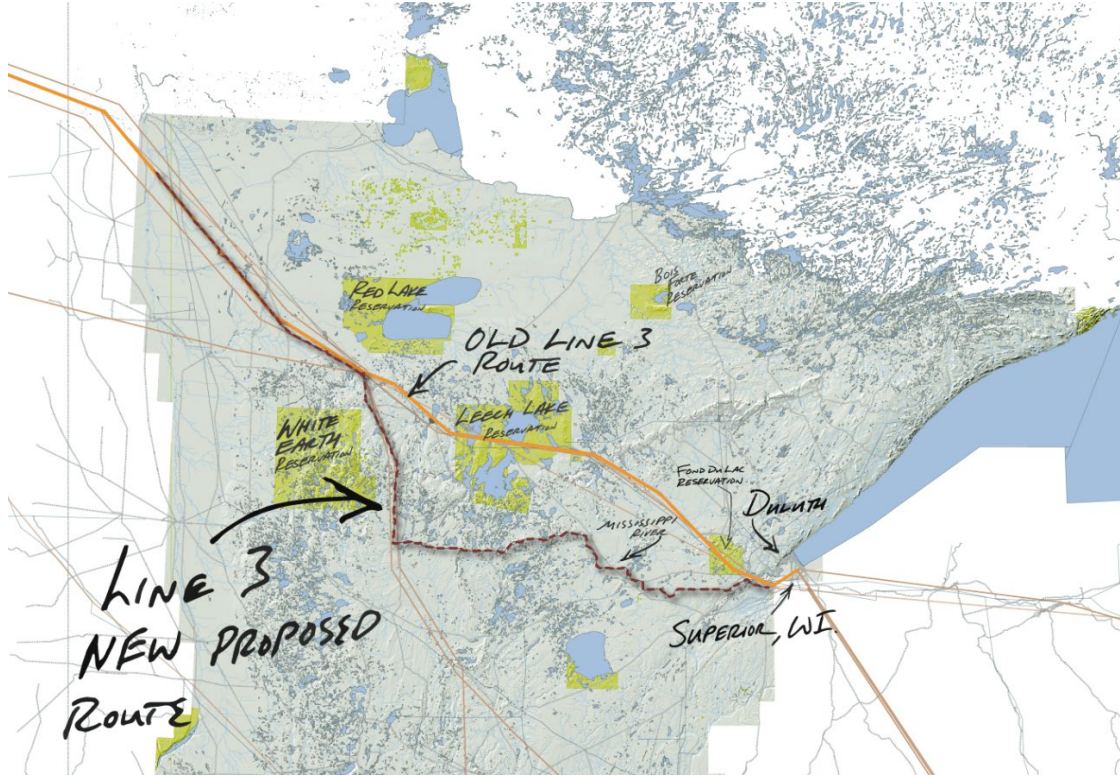


MPCA, Air We Breathe, 2019

Active transport + Zero-Carbon Transport



# LINE 3

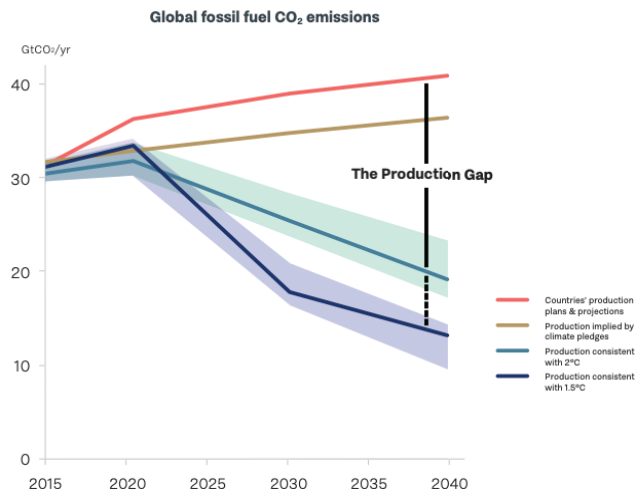


Source:: Enbridge Energy's proposed Line 3 pipeline, William Lager | MPR News Graphic

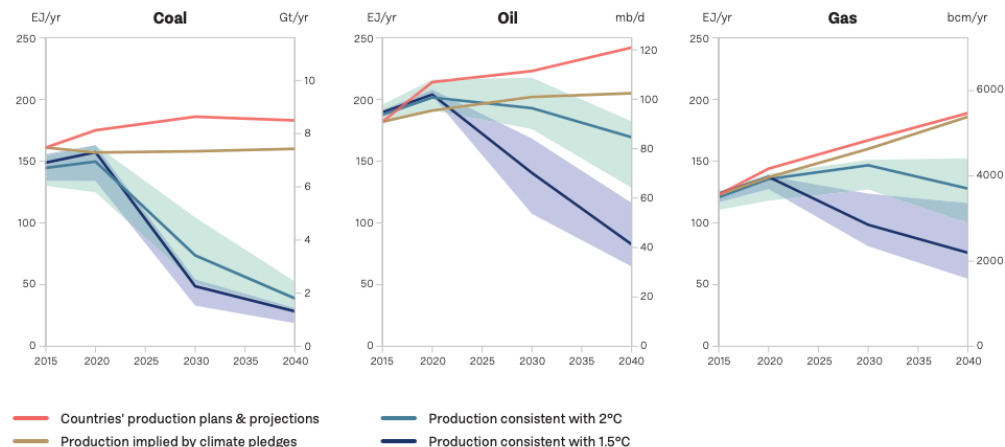


# KEEP IT IN THE GROUND

The fossil fuel production gap — the difference between national production plans and low-carbon pathways (1.5°C and 2°C), as expressed in fossil fuel carbon dioxide (CO<sub>2</sub>) emissions — widens between 2015 and 2040.



The production gap is widest for coal but grows rapidly for oil and gas. By 2040 the production gap, in energy terms, is as large for oil as it is for coal. Physical units are displayed as secondary axes: billion tonnes per year for coal, million barrels per day for oil, and billion cubic meters per year for gas.



Source: Production Gap Report 2019, Executive Summary



# EVERY DEGREE MATTERS

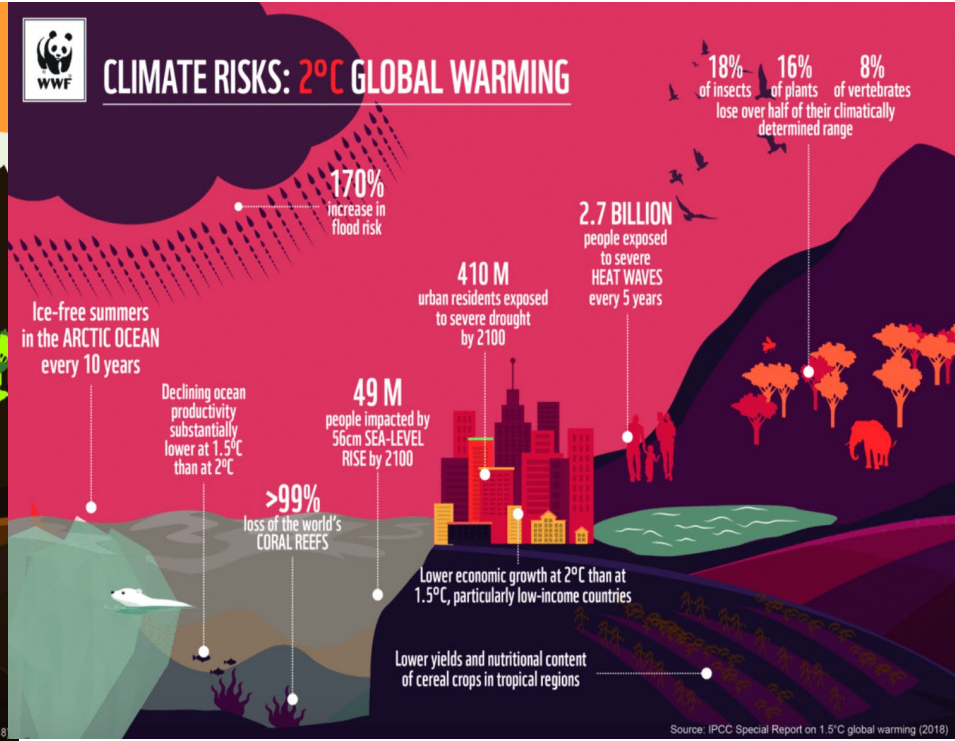
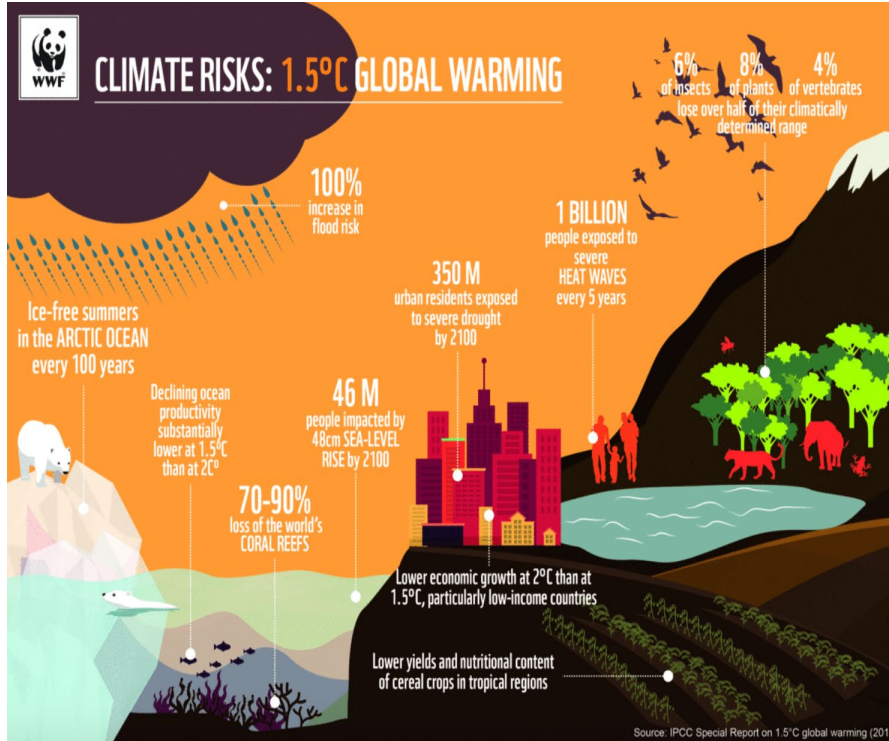
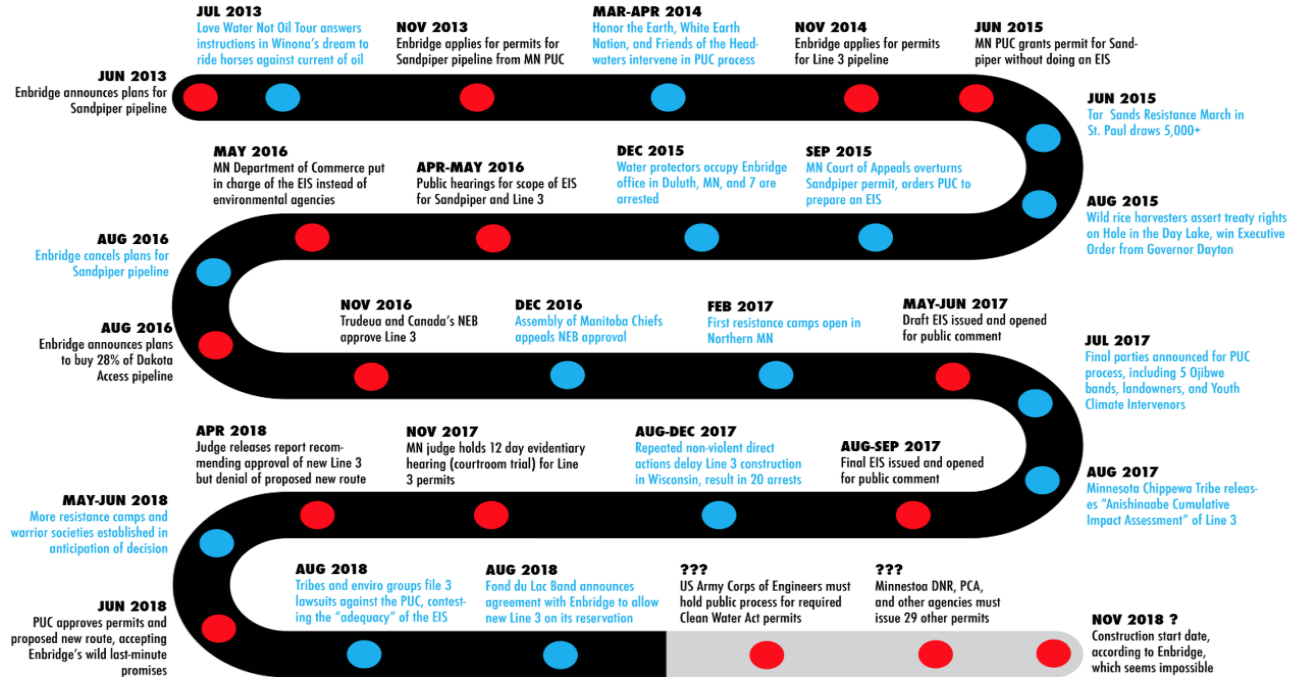


Image Source: Carbon Credentials/ Content Source: IPCC Special rEPORT



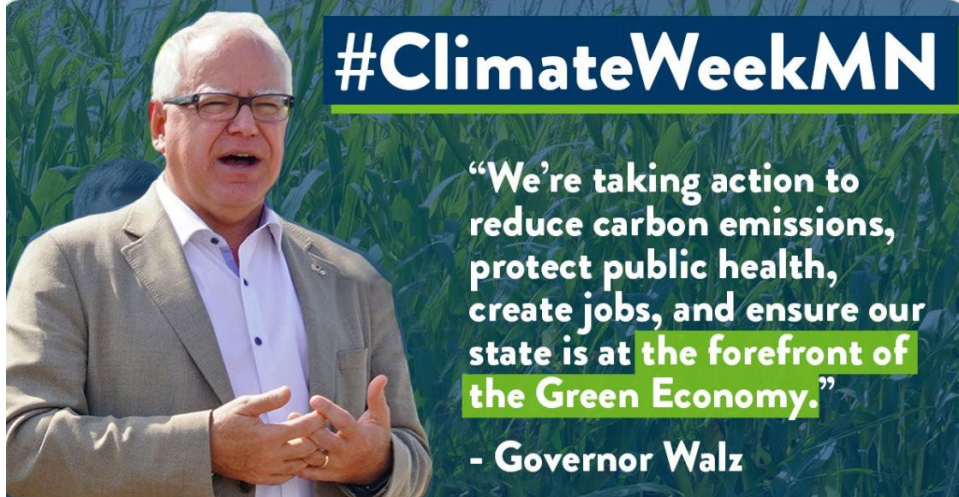
# LINE 3 TIMELINE



Source: StopLine3.Org



# WHAT CAN YOU DO?

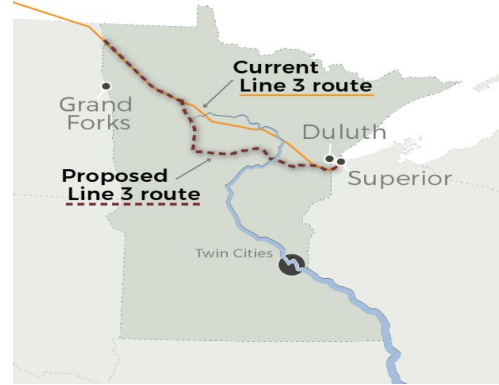


Contact: <https://mn.gov/governor/contact/>  
Twitter: @GovTimWalz & @LtGovFlanagan

Contact: Office phone: 651-757-2014  
Email: [laura.bishop@state.mn.us](mailto:laura.bishop@state.mn.us)  
Twitter: @lbishopw (personal) and @MnPCA (general)

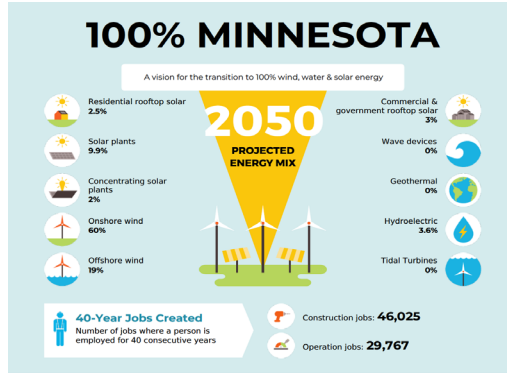


# CLIMATE ISSUES IN MINNESOTA



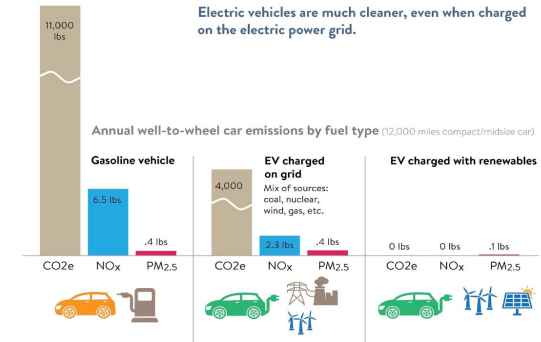
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MPCA, Air We Breathe, 2019

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# XCEL IRP- New Natural Gas Plant



Source: Natural gas plant, Vineyard, Utah, Mscalora /Wikimedia Creative Commons License, Sept 2019



# THE PROCESS



Source: Richard Tsong Taatarii, Star Tribune, Sept 2018



# WHAT CAN YOU DO?

The PUC is accepting comments

**In writing by a date TBA, but at least until January 8th**

**By email: [consumer.puc@state.mn.us](mailto:consumer.puc@state.mn.us)**

By mail: To Minnesota Public Utilities Commission, 121 7th Place East, Suite 350, St. Paul, MN 55101-2147

In written comments, make sure to reference Docket No. 19-368, and please note that, if you include personally identifying information in your comments, that will become public.



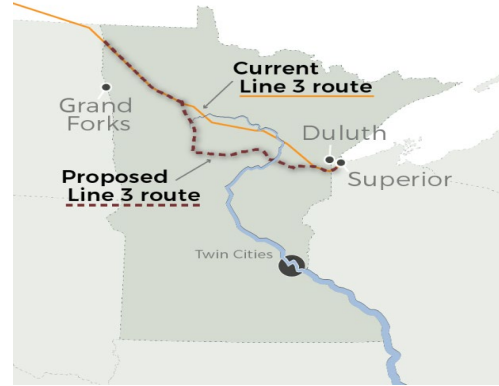
# RESOURCE CURSE



Source: Patrick T.Fallon/Bloomberg , April 2019

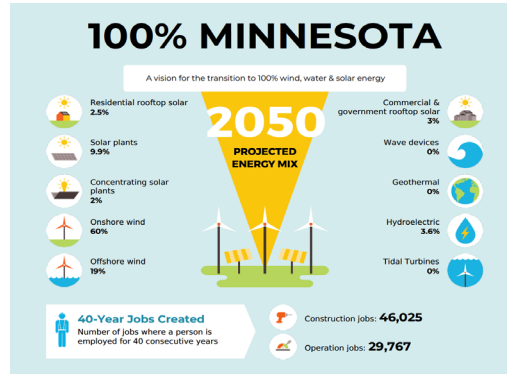


# WHAT IS THE PLAN FOR THE DAY?



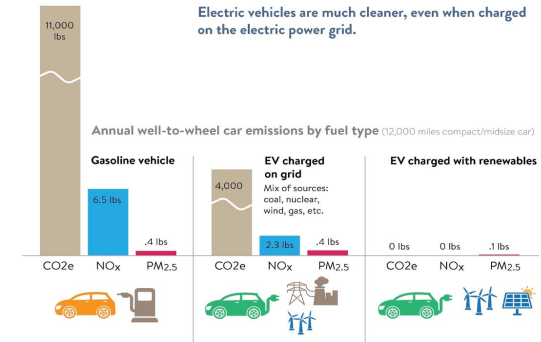
MPR News Graphic, William Lager

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# CLEAN CARS MN

Minnesota's #1 source of greenhouse gases is transportation.



Minnesotans will breathe easier.



Minnesotans want more options for cleaner vehicles.



Source: MPCA, Why Clean Cars MN



# WHAT CAN YOU DO?

Email your comments in support of clean air to  
[Sheena.denny@state.mn.us](mailto:Sheena.denny@state.mn.us)

**DECEMBER 6<sup>th</sup> Deadline**



# LETTER TEMPLATE

- **Paragraph 1: Who are you?**

Eg: I'm an doctor.

- **Paragraph 2: Why do you care? Personal Story**  
highlighted by facts

Eg: I take care of patients with heat stroke. Heat related illnesses are on the rise.

- **Paragraph 3: What's your ask?**

Eg: Please deny the 401 water permits to Line 3

Eg: Please deny the proposed Becker Natural Gas plant in Xcel's IRP

Eg: I support the Clean Car Rule Implementation



# THINK- PLAN- SHARE

- **THINK** Pick an action
- **PLAN** Mark a time in your calendar- personal deadline
- **PLAN** Who else you will motivate to take action
- **SHARE** **Hold yourself accountable**→Text someone now/  
Post on social media



# UMN CHAPTER SIT-IN

**DEMAND PRESIDENT JOAN GABEL  
AND THE UNIVERSITY TO DIVEST FROM FOSSIL  
FUELS AND ENACT GREEN POLICIES**

**FRIDAY, DECEMBER 6  
12:00-2:00**

**12:30  
MARCH TO  
MORRILL  
HALL**



**RIVERBEND  
PLAZA**

**BEHIND STUDENT UNION**

**MN  
STRIKES  
BACK**



**UMN  
STRIKES  
BACK**



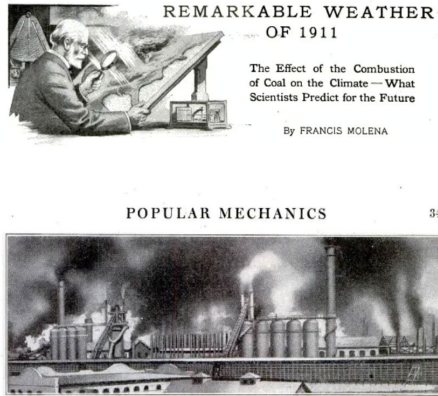
**UMNCLIMATESTRIKE**



**UMNCLIMATESTRIKE**



## Popular Mechanics, 1912



The furnaces of the world are now burning about 2,000,000,000 tons of coal a year. When this is burned, uniting with oxygen, it adds about 7,000,000,000 tons of carbon dioxide to the atmosphere yearly. This tends to make the air a more effective blanket for the earth, and to raise its temperature. The effect may be considerable in a few centuries.

## Brannon Report, 1957

**Transactions  
American Geophysical Union**

VOLUME 38      OCTOBER 1957      NUMBER 5

**Radioactive Evidence on the Dilution of Atmospheric and Oceanic Carbon by Carbon from Fossil Fuels**

H. R. BRANNON, JR., A. C. INAGUTI, D. FRAY, W. W. WITTENBERG, and M. WILLIAMS

The dilution of atmospheric carbon dioxide by carbon dioxide from fossil fuels is estimated to be about 15 ppt, on the basis of radiocarbon analysis of the range of known ages from several times of different periods, after allowance has been made for effects attributable to isotopic differences. The composition of fossil carbon dioxide derived from the atmosphere is 1.3 x 10<sup>-6</sup> per cent, equivalent to about 14 ppt of the carbon dioxide in the atmosphere. Based on these data, the estimated part of the carbon dioxide which enters the ocean each year is equivalent to be 6000. Radiocarbon assays of several nineteenth century marine shells and of their carbon contents indicate a one to two per cent dilution of shallow oceanic carbonates by carbon dioxide from fossil fuels. One of these data is a simplified mathematical model of atmospheric oceanic yields information on mixing time of the ocean.

**Introduction**—The effects of addition to the carbon cycle in terms of carbon dioxide from industrial activities have been the subject of speculation in several fields of science. Of particular interest is the question of the carbon dioxide which has been introduced into the atmosphere since the beginning of the industrial revolution in the 17th century, and the measure to which the added carbon dioxide has been distributed in the carbon cycle. Although approximate measures of carbon dioxide have undoubtedly been added from such by filling of such apparently a lack greater accuracy has resulted from the combustion of fossil fuels.

Calder [1946] pointed out that direct measurement of the carbon dioxide concentration in air, made over a number of years by various investigators, indicate a significant increase in concentration over the period 1866-1935. From this he concluded that most of the carbon dioxide from the industrial revolution has remained in the air and, consequently, that the rate of carbon dioxide from the ocean is very slow. Brannan [1956] suggested that the radiocarbon content of rocks from times which have lived during the industrial revolution might differ from the natural radiocarbon content. These data, the radiocarbon content of fossil fuels, and the radiocarbon content of the atmosphere, carbon dioxide by carbon dioxide from the combustion of fossil fuels. Calder [1946] at about the same time determined the radiocarbon content of tree rings of known ages from several trees. These results indicated a dilution of about 15 ppt. In later work Shaw [1955], on the basis of results on additional samples, re-

**RADIOCARBON EVIDENCE OF CARBON FROM FOSSIL FUELS**

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Simultaneous solution of (1) and (2) yields:

$$\frac{dC}{dt} = \left[ \left( \frac{1}{\tau} - 1 \right) - \frac{1}{\tau} \frac{dC}{dC_0} \right] C_0$$

Introduction of

$$\frac{dC}{dC_0} = 1$$

gives:

$$\frac{dC}{dC_0} = \frac{1}{1 + \frac{C}{C_0} \frac{dC}{dC_0}}$$

where  $\tau$  = transit time through the pipes.

Combining (7) and (8) permits calculation of the transit time  $\tau$  which can be assigned to the quantity  $\frac{dC}{dC_0}$ .

A value for  $\tau$  may be obtained by assuming that a radiocarbon fractionation of four per cent occurs in photosynthesis, and by use of extrapolated values of radiocarbon assays of historically dated shell and wood samples. Values of  $M$  may be obtained by use of estimates of the dilution of radiocarbon in near-oceanic oceanic carbonates and in atmospheric carbon dioxide, and by consideration of the total masses of carbon dioxide in the atmosphere and in the ocean. In the estimation of the mass of carbon dioxide in the atmosphere and in the ocean, several sources of data were considered. The values chosen for carbon dioxide contents were:

$M_a = 1.4 \times 10^{16}$  gms.  
 $M_o = 1.4 \times 10^{16}$  gms.

The value of  $\tau$  has been estimated in a preceding section. Use of these quantities in (7) and (8) yields the results shown in Table 2.

In this tabulation, the thickness of the upper ocean was computed from  $M_o$  and from data on depth and volume of the oceans given by Stodard and others [1942].

In the particular model used, the value of the transit time, or transmittance, is strongly dependent on the values chosen for  $\tau$  and for  $\tau_a$ . These, in turn, depend strongly on the values used for the constant of dilution, for the extrapolated contemporary assays of rocks and of shells, and for the isotopic fractionation of radiocarbon. An increase either in  $\tau$  or in  $\tau_a$  leads to a smaller transit time.

The transit times based on the above table have been obtained by using the values of  $\tau$  and  $\tau_a$  given in parentheses as being very great, on the ground that they are not consistent with estimates of turnover time made by use of data on heat flux through the ocean floor. In view of the evidence of the model, the results, quantitatively, are entirely open to question.

## API SRI Report, 1968



Notice from API President, 1965



"The substance of the report is that there is still time to save the world's peoples from the catastrophic consequences of pollution, **but time is running out.**"

**One of the most important predictions of the report** is that carbon dioxide is being added to the earth's atmosphere by the burning of coal, oil, and natural gas at such a rate that by the year 2000 the heat balance will be so modified as possibly to cause **marked changes in climate** beyond local or even national effects."

— API President Frank Ikard, commenting on report of U.S. President's Science Advisory Committee at the API Annual Meeting, 1965

## James Hansen Testimony, 1988

### 1988: FORK IN THE ROAD

- Scientist James Hansen testifies to Congress
- Five bipartisan climate change bills in Congress
- VP George Bush: *I'll tackle the Greenhouse Effect with the White House Effect*
- IPCC formed
- Fossil fuel companies organize disinformation campaigns



Source: Images 3 & 4 courtesy of Vic Sher, Sher Elding LLP, Presentation titled Climate Change Damages Litigation by Public Agencies



# GLOBAL CARBON EMISSIONS

Annual total CO<sub>2</sub> emissions, by world region

Our World  
in Data

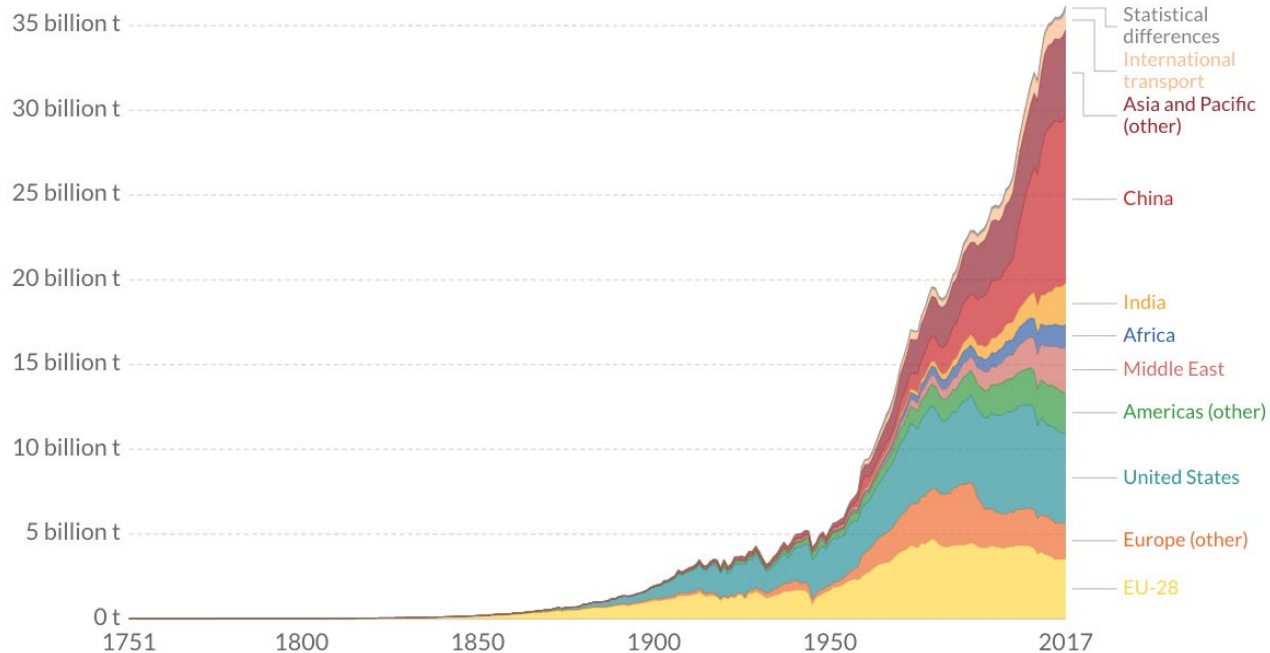


Image Source: Our World In Data, Data Source: Le Quéré et al. (2018). Global Carbon Project; Carbon Dioxide Information Analysis Centre (CDIAC)



# Who is telling your story?



UNIVERSITY OF MINNESOTA

**Driven to Discover®**

Crookston Duluth Morris Rochester Twin Cities

The University of Minnesota is an equal opportunity educator and employer.