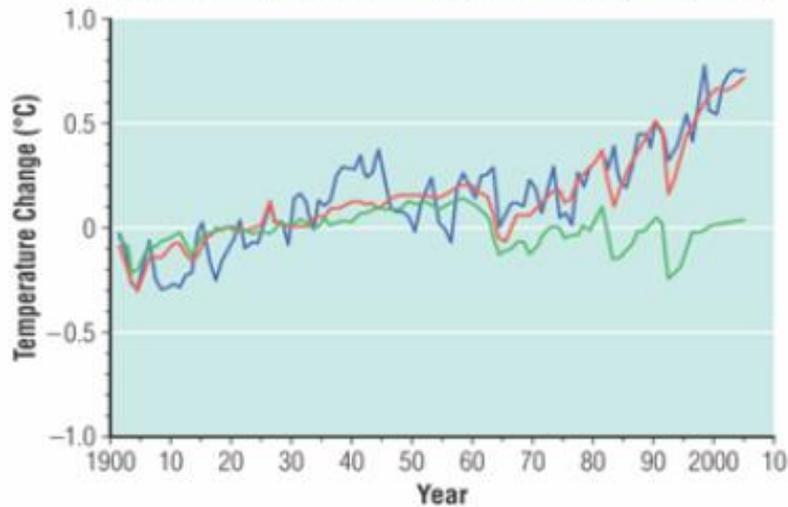


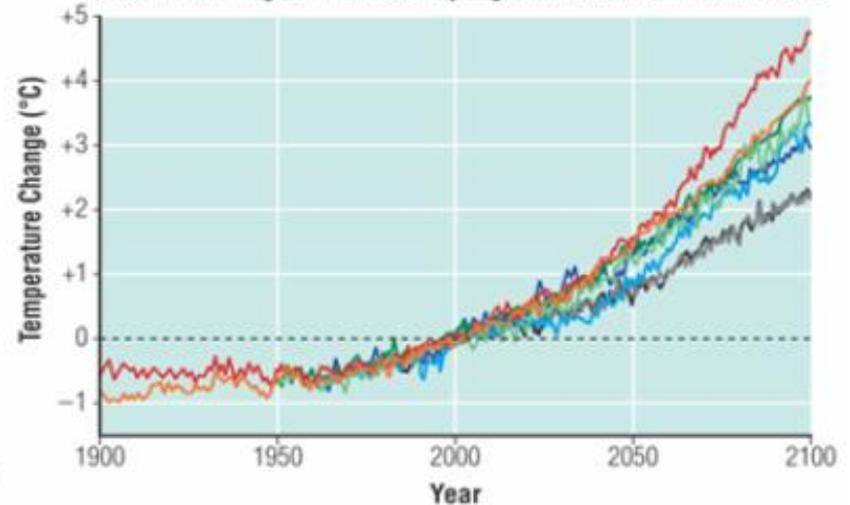
# POLITICS OF CLIMATE CHANGE

Modelled and Observed Temperature Changes over Time



- human and natural influences (modelled)
- natural influences only (modelled)
- observed temperature change

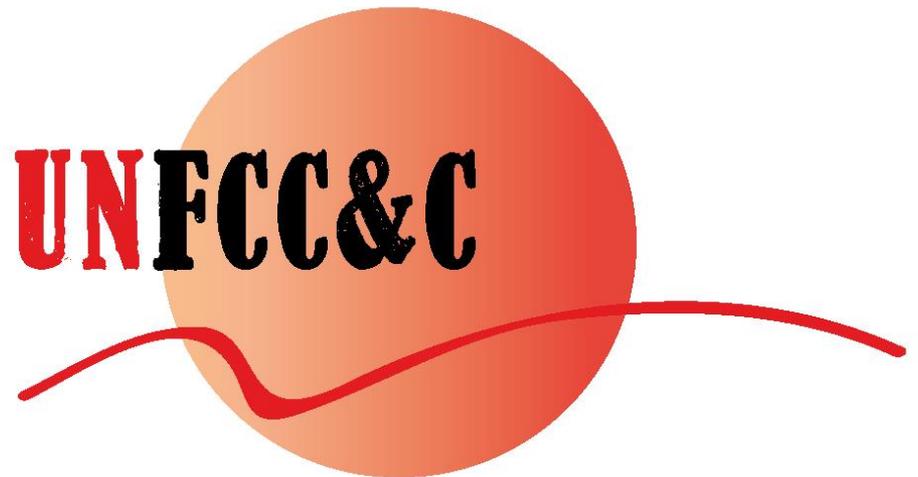
Global Warming as Predicted by Eight Different Climate Models



- CCSR/NIES
- CCCma
- GFDL
- MPIM
- CSIRO
- Hadley Centre
- NCAR PCM
- NCAR CSM

# Political Action on Climate Change

- The United Nations Framework Convention on Climate Change (UNFCCC) is an agreement by 192 countries to act to stabilize greenhouse emissions



# UNFCCC

- ① created in 1992, it enables representatives from different countries to meet to discuss scientific and political action
- ① Each year, the nations meet to discuss climate change strategies. These meetings are called COP (Conference of the Parties)



# UNFCCC

- The nations that signed the UNFCCC agreed not to hinder food production or economic interests of other countries as well as to support sustainable development within their own countries

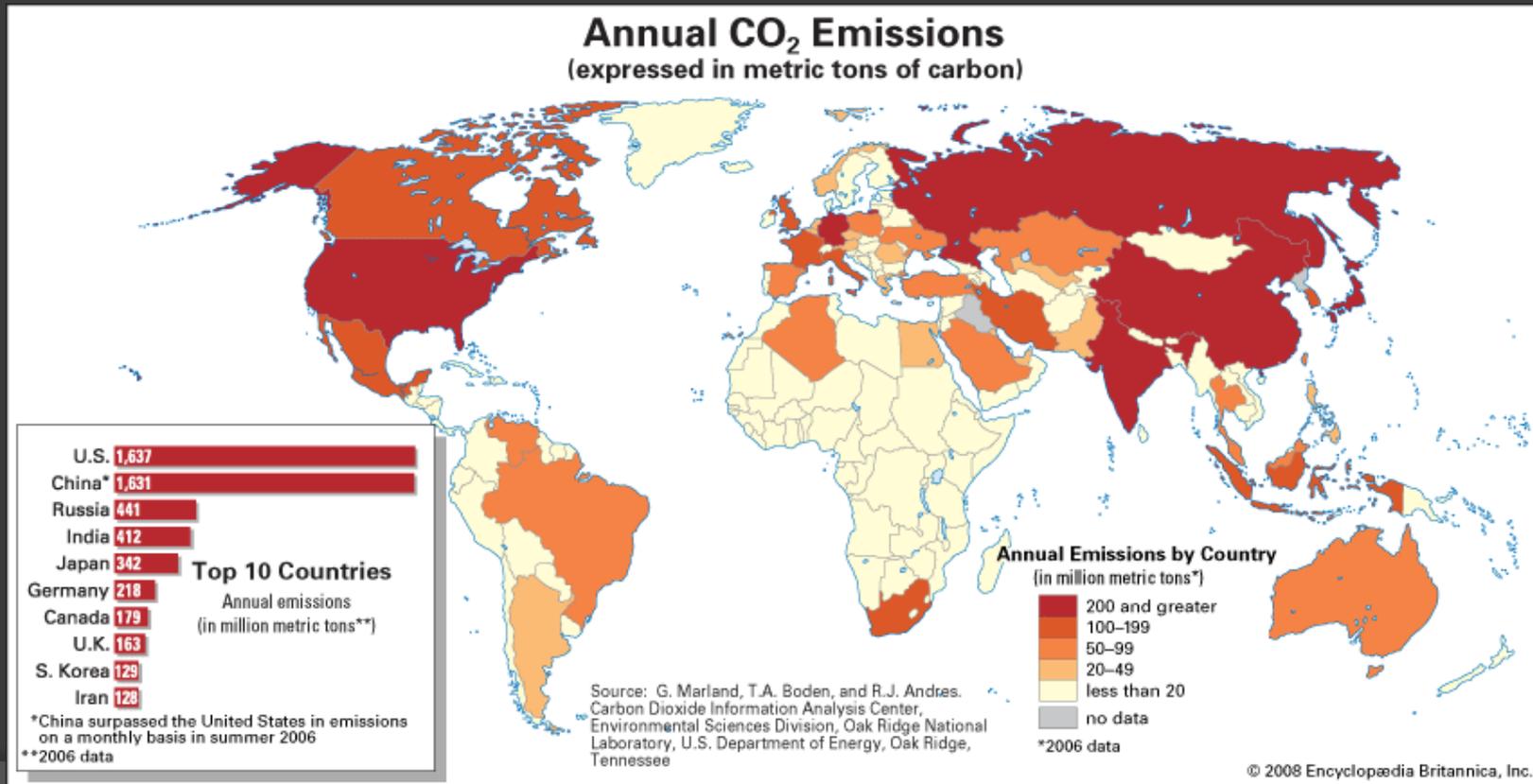


# Kyoto Protocol - 1997

- COP 3 held in 1997 in Kyoto, Japan
- Kyoto protocol is a plan within the UN, requiring industrialized nations to reduce their GHG emissions by 5% by 2012

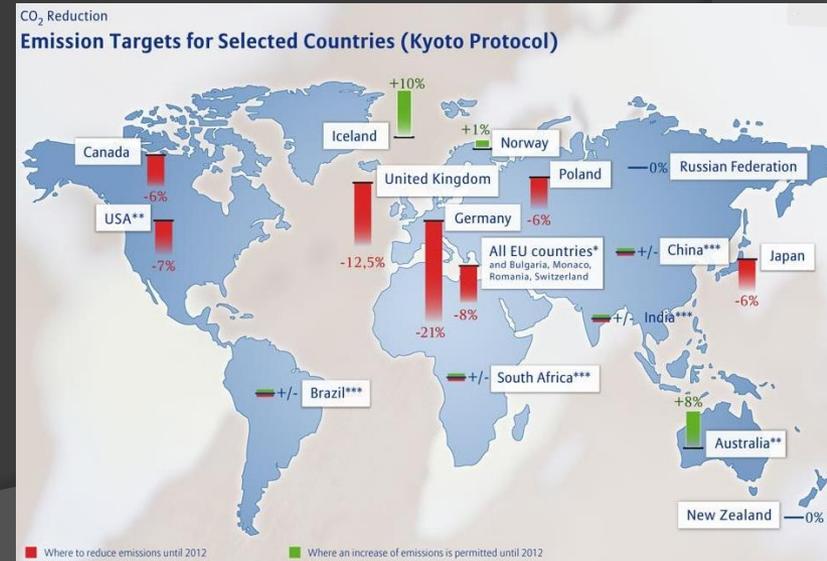
# Kyoto Protocol on Climate Change

- a UNFCCC agreement originally signed by 161 countries to curb greenhouse gas emissions to 5% below 1990 levels by 2012



# Kyoto Protocol on Climate Change

- It went into effect in 2005, as of 2008, 183 countries had ratified it. It outlined a framework in which each country was assigned a target greenhouse gas reduction
- USA never ratified the Kyoto protocol
- Canada ratified in 2002



# Common, but differentiated responsibilities:

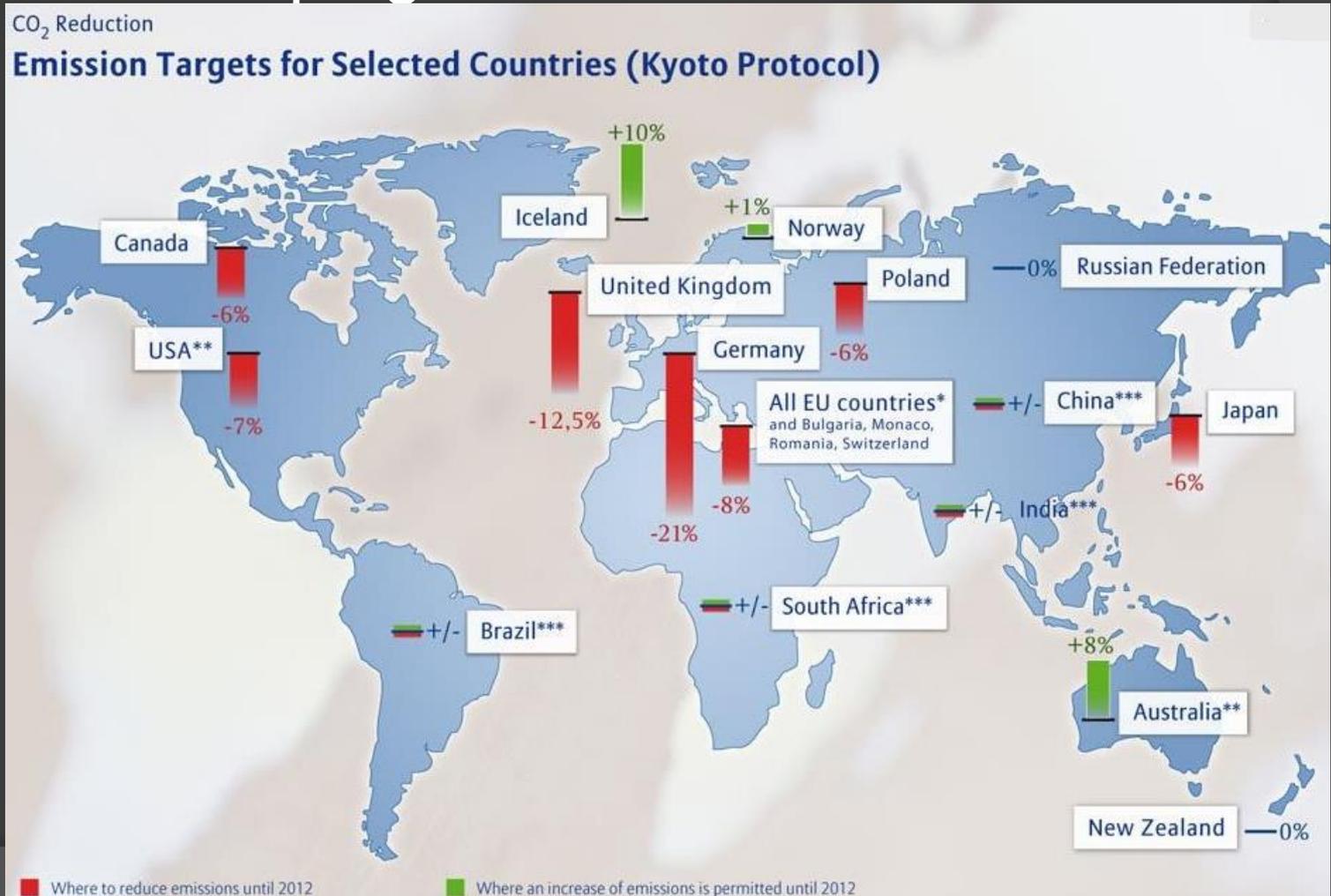
- ⦿ Developed countries (US, UK, Canada) have already polluted the atmosphere with greenhouse gases (GHGs) through industrialization. So they're the one who created/started global warming and all the mess.
- ⦿ While Developing countries (India and Brazil) have started polluting the world only recently.
- ⦿ Therefore, the developing countries such as India, Brazil should share less of the burden of lowering overall emissions.

# Common but differentiated responsibilities:

- ⦿ Developed countries (US,UK) should bear more responsibility in fixing global warming because they're the one more responsible for it.
- ⦿ So, while it is the “Common” responsibility of every nation of this world to reduce Green House Gas emission, there should be some difference between the responsibility given to developed countries and developing countries.
- ⦿ Kyoto Protocol follows that principle and assigns separate responsibilities to the countries.

# Kyoto Protocol on Climate Change

- Developed countries agreed to higher targets than developing countries



# Kyoto – differential requirements

- Developed nations (USA,UK), will compulsorily reduce their green house gas (GHG) emission by 2012.
- Emission targets were set based on the level of pollution created by each developed nation
- Developing nations like Brazil, South Africa, India and China, should reduce GHG emission but not compulsory.

## History of Climate Change Negotiations:

- <http://www.youtube.com/watch?v=B11kASPfYxY>

# Kyoto Protocol



As an incentive to follow through with the targets outlined in the Kyoto Protocol, countries were offered **emission reduction credits** for the following:

1. Helping a developing country reduce its emissions
2. Helping a developed country reduce its emissions during a temporary economic problem
3. Engaging in practices that help to remove CO<sub>2</sub> from the atmosphere (eg: planting trees)

# Carbon Credits & Trading

- Each country is given an emission target quota (1 Kyoto Unit = 1 carbon credit = 1 metric tonne of CO<sub>2</sub> emitted)
- Countries are expected not to emit more than their quota
- However, if you need more carbon credits, you can purchase them from other countries who haven't reached their quota

# Carbon Offset Credits

- ① If you are big polluter, you can purchase carbon offset credits
- ① Those who buy offsets are essentially investing in other projects that reduce emissions on their behalf, either because they are unable to do so themselves or because it is too expensive to make their own reductions.

# Carbon Offset Credits

- ⦿ One thing to note is that not all carbon offsets are created equal. Because the market is new and largely unregulated, some offsets are unlikely to have any benefit for the climate. This is one reason why carbon offsets have gotten a bad rap.
- ⦿ Good offsets should be permanent and actually reduce GHG emissions that would have otherwise not been reduced without this offset

How does emission trading scheme work:

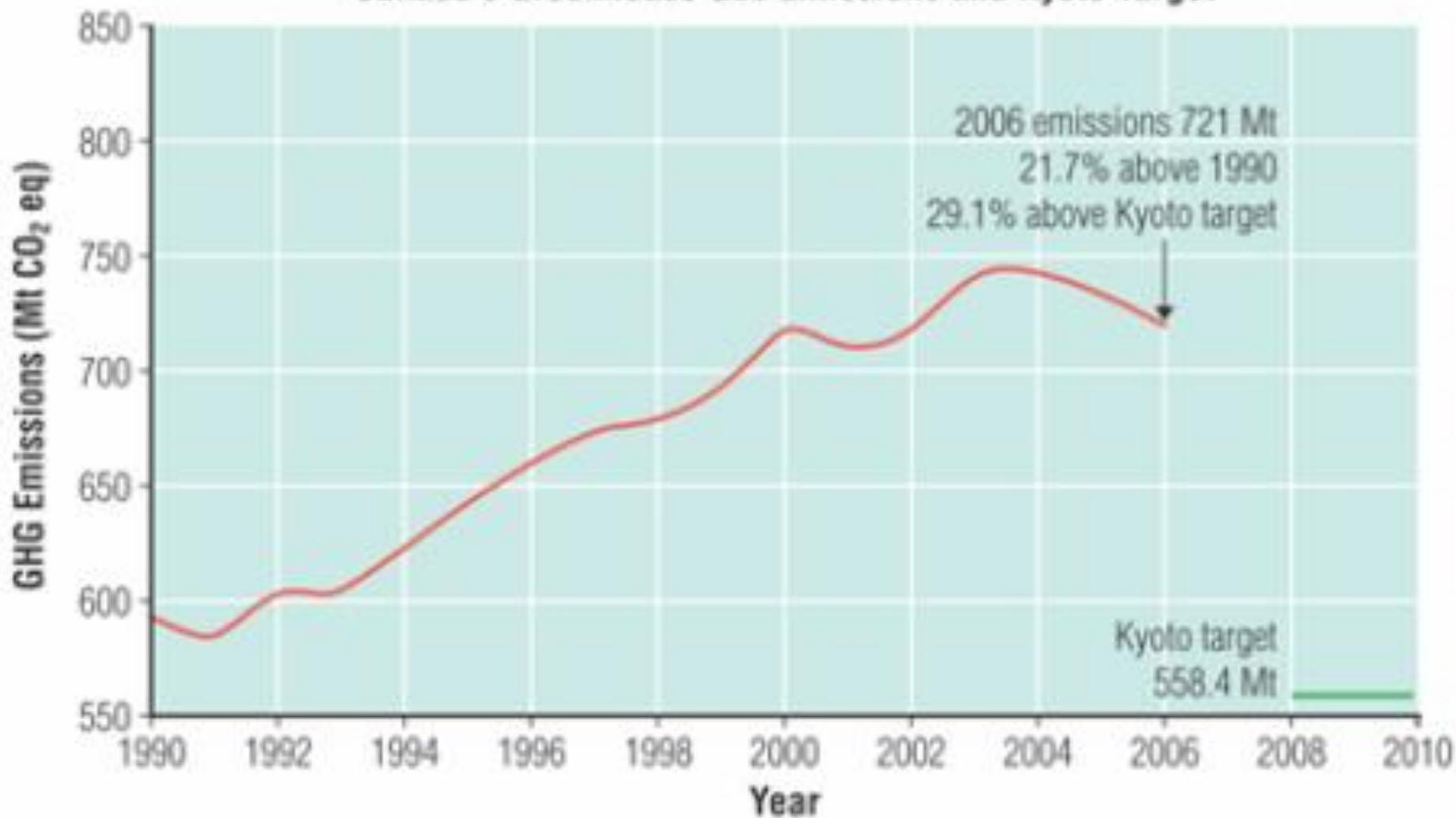
- ◎ <http://www.youtube.com/watch?v=ReOj12UAus4>

# Canada & the Kyoto Protocol



Canada agreed to reduce its greenhouse gas emissions to 6% below the 1990 level

## Canada's Greenhouse Gas Emissions and Kyoto Target



# Kyoto Protocol



- Between 1990 and 2006, Canada's greenhouse gas emissions increased by 22%
- One reason that we can not make our Kyoto commitment is due to development of the Alberta oil sands
- The U.S.A. signed the Kyoto Protocol but never ratified it

# Kyoto Protocol

That was then.....this is now.....

# From the Toronto Star

## Canada first nation to withdraw from Kyoto Protocol

Article

Comments (143)

Published On Mon Dec 12 2011

Email | Print | (143) |     



“The Conservative government has pulled Canada out of the world’s only binding climate treaty.

“Canada’s Kyoto withdrawal ‘regrettable’, says China”

“Canada signed Kyoto in the late 1990s, but neither the current Conservative government nor their Liberal predecessors met targets.”

“The Tories have always insisted that meeting Canada’s Kyoto commitments would tank the economy. “

“They have instead set a less stringent goal to lower greenhouse gases that is in line with the United States.”

“The environment minister said the move saves Canada **\$14 billion** in penalties for not achieving its Kyoto targets.”

Kent called Kyoto **“radical and irresponsible”** and claimed the penalties would cost Canada **“the loss of thousands of jobs** or the transfer of \$14 billion from Canadian taxpayers to other countries — the equivalent of **\$1,600 from every Canadian family** — with absolutely no impact on emissions or the environment.”

- RMR – Part of Our Heritage
- <http://www.youtube.com/watch?v=UHm9qJ7p18s&list=RDUHm9qJ7p18s#t=71>

# For another point of view...

## (The National Post)

“Big developing economies such as **China, India, Brazil and Indonesia** were never given limits. Since they are far bigger polluters than developed nations on a per-dollar-of-GDP basis – **China is outright the biggest carbon emitter on the planet** – it was always going to be impossible to make substantial reductions in greenhouse gases.”

# The End of Kyoto 2012

**CBCnews** | Politics

## **Kyoto climate change treaty sputters to a sorry end**

**Kyoto Protocol aimed for 5% cut in carbon emissions — instead, we got a 58% increase**

By Max Paris Environment Unit, CBC News | Posted: Dec 31, 2012 6:24 AM ET | Last Updated: Dec 31, 2012 10:21 AM ET



# More shame on Canada!!

- <http://www.cbc.ca/fifth/episodes/2013-2014/the-silence-of-the-labs>
- <http://www.cbc.ca/fifth/blog/federal-programs-and-research-facilities-that-have-been-shut-down->



FRIDAY JANUARY 10, 2014 IN SCIENCE AND TECHNOLOGY

**Federal programs and research facilities that have been shut down or had their funding reduced**

# But what do we see?

- <http://www.youtube.com/watch?v=j0vYTFve7tA>

# What's Next? Copenhagen Accord 2013

- The Copenhagen Agreement took effect in 2013 after Kyoto expired
- Not legally binding
- Countries voluntarily made emission pledges
- Canada's commitment is to cut emissions 17% below 2005 levels by 2020

<http://www.climatechange.gc.ca/default.asp?lang=En&n=AA3F6868-1>

- ◎ <http://www.cbc.ca/news/politics/canada-failing-to-meet-2020-emissions-targets-1.2223930>

# So, what can WE, as individuals do?!

- Reduce your emissions
- Try to achieve carbon neutrality by purchasing certified, good carbon offset credits

<http://www.davidsuzuki.org/publications/resources/2009/purchasing-carbon-offsets/>

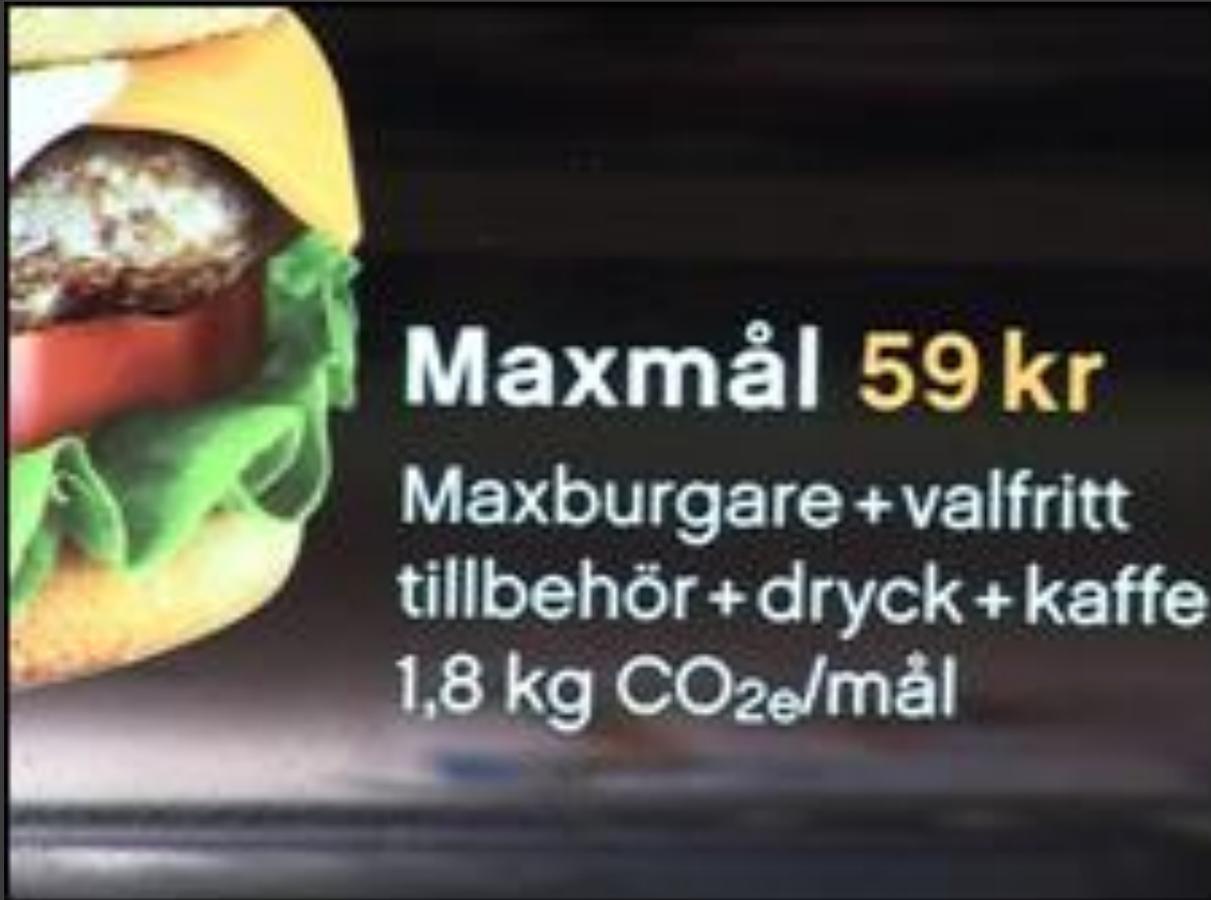
- Be an environmental steward

- ◎ [https://www.ted.com/talks/alex\\_laskey\\_how\\_behavioral\\_science\\_can\\_lower\\_your\\_energy\\_bill](https://www.ted.com/talks/alex_laskey_how_behavioral_science_can_lower_your_energy_bill)
- ◎ <http://www.davidsuzuki.org/what-you-can-do/top-10-ways-you-can-stop-climate-change/>

CBC.ca metromorning

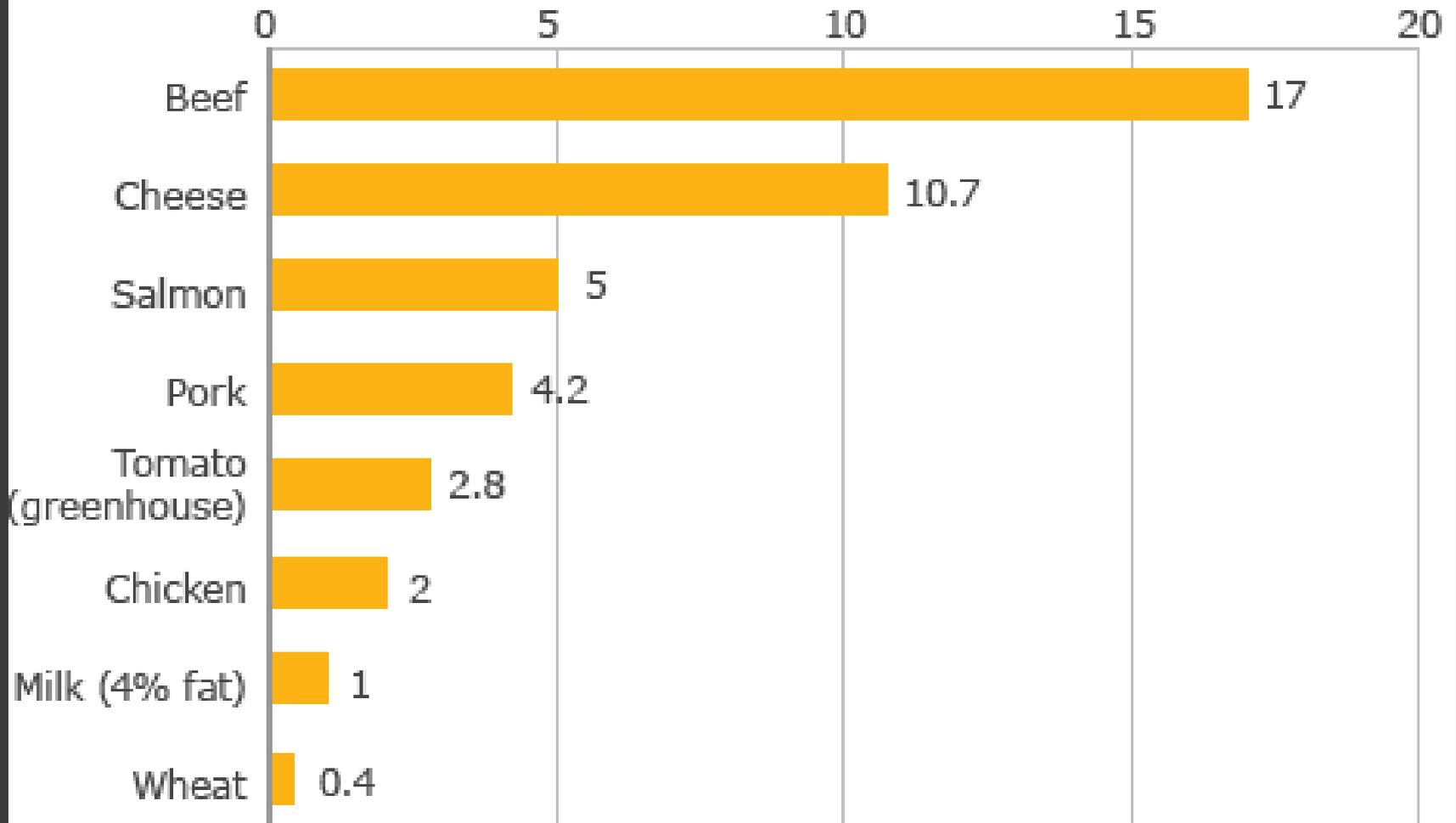
# LESSONS FROM EUROPE

# CO<sub>2</sub> emissions labels



# The carbon footprint of food

Kg CO<sub>2</sub>/Kg



Source: Lantmannen Foods

# Waste - to - Energy

- Stockholm (Sweden) burns garbage to produce heat and electricity.
  - About half the city is heated by incinerators
  - Some cities in Sweden and Norway have run out of garbage and are importing from England, Ireland



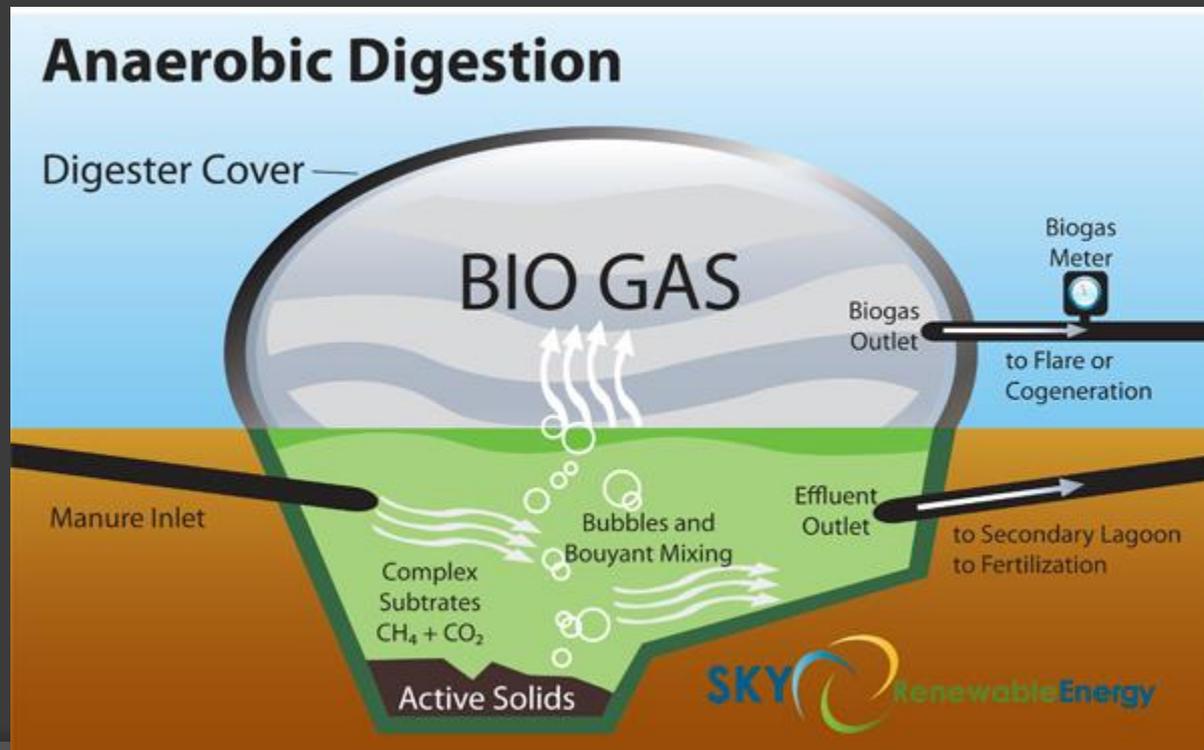
# Waste - to - Energy

- ① When waste breaks down in landfills, it emits methane
- ① Incineration prevents methane from escaping into the atmosphere



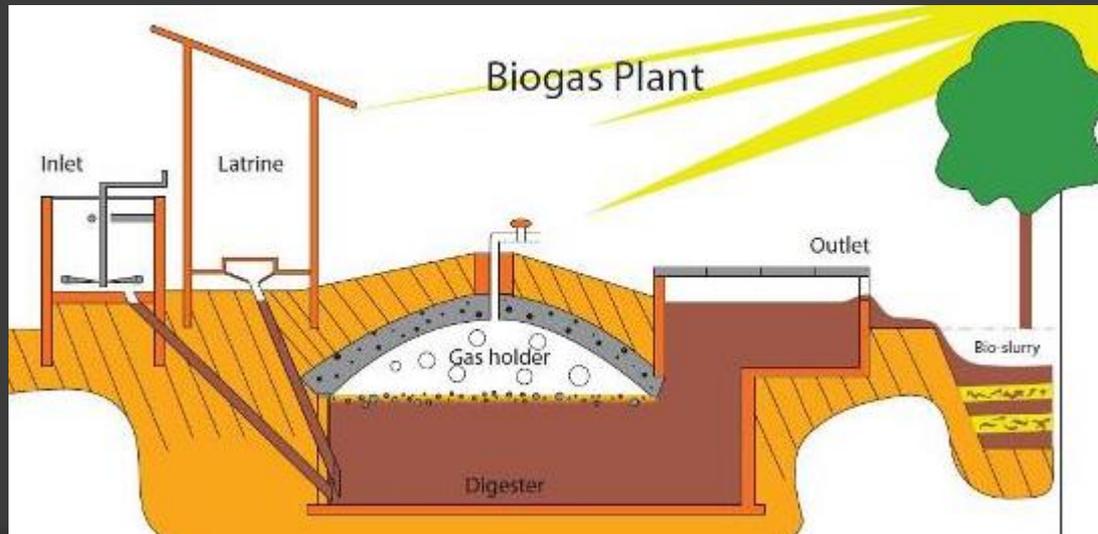
# Biogas

- produced by breakdown of organic matter without oxygen (anaerobic)
- renewable energy source



# Biogas

- produced from manure, sewage, municipal waste, green waste, plant material, and crops.
- It is primarily methane ( $\text{CH}_4$ ) and carbon dioxide ( $\text{CO}_2$ )



# Congestion Tax in Stockholm

The day after congestion tax was introduced



# Congestion Tax in Stockholm

Between 6 pm and 6 am travel to the core is free and the rest of the day has a variable amount depending on the time (about \$3 during rush hours)



# Malmö, Sweden

- No Ridiculous Car Trips



# Malmö, Sweden

## ● No Ridiculous Car Trips



Compete for the most ridiculous car trip – win a bicycle

Have you made a ridiculously short car trip? Or do you know anyone who drives when he/she could just as well cycle?

Visit [ingafjlgabilresor.nu](http://ingafjlgabilresor.nu) and confess to a ridiculously short car trip. You can win a brand new bicycle.

Compete at [www.ingafjlgabilresor.nu](http://www.ingafjlgabilresor.nu)

**My partner parked the car**

Today Anna walks or cycles to work. But it hasn't always been like this. Only a year ago she drove to work every day. But last May something happened that changed her travel routine. Anna and her partner Johan saw the "No ridiculous car rides" campaign at Gustav Adolfs Square. You could win a bicycle by telling a story about a ridiculous car ride. Anna doesn't remember what she wrote on the competition stub, but her partner Johan's quip became legendary: "My partner 'commutes' between Söngstadalen and Saltzargatan." Johan won the contest. Anna got the bike, of course.

- Before they had only one bicycle. Now we cycle anytime we go somewhere in the weekends, says Anna.

How about Johan, then, is he happy with his quip?

- He is very happy with me, laughs Anna.

Today Anna cycles or walks the long kilometre to work between Söngstadalen and Saltzargatan.



# Malmö, Sweden

- Parking at a Train Station



# Malmö, Sweden

- No Ridiculous Car Trips



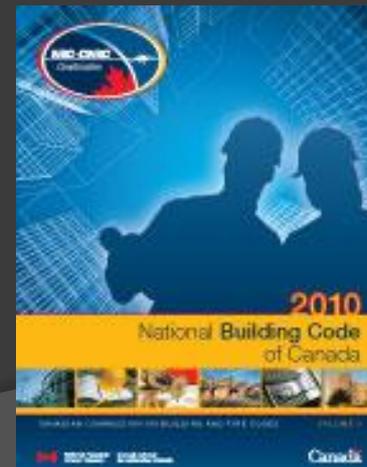
# Malmö, Sweden

- No Ridiculous Car Trips



# Changing Building Codes

- ⦿ All houses in Sweden are required to have more energy efficient windows, insulation, etc. to cut heating costs
- ⦿ Use 25% of the energy we use in Canada to heat a home



# Homework:

- ⦿ Read pg. 423-428 #2, 3, 4, 5
- ⦿ Read pg. 429-433 #1, 2, 5, 6, 7, 10
- ⦿ Discuss some REAL, sustainable changes that YOU can make to help reduce GHG emissions. Look online to find some good resources

# Resources

Kyoto explained simply: <http://mrunal.org/2012/09/enb-kyoto.html#36>