

Renewable & Appropriate Energy Laboratory
RAEL

Lecture 1: The Climate Crisis Reinvented

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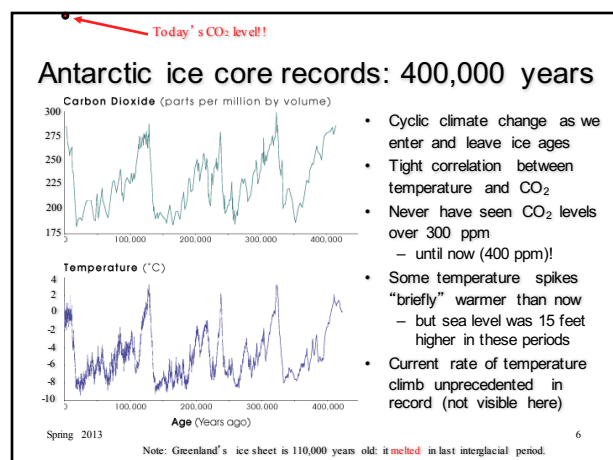
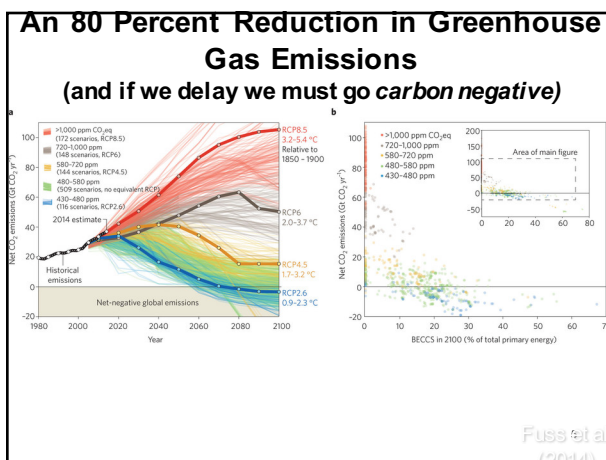
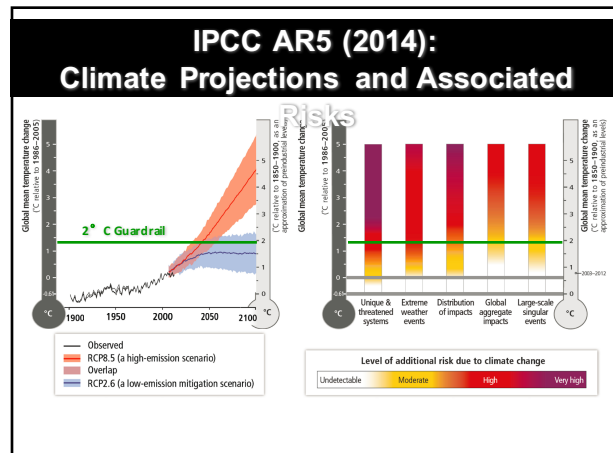
March 28, 2016

1. The climate crisis reinvented	(3.28.2016)
Klein, chapters 1 & 2 Optional: Dove & Kammen, chapter 1	
2. Our mistrust of the future makes it hard to give up the past	(4.4.16)
Klein, chapters 3 Optional: Dove & Kammen, chapter 5	
3. We don't tenure Mother Teresa	(4.11.2016)
Klein, chapter 9 Optional: Dove & Kammen, chapter 2	
4. What are the barriers to action?	(4.18.2016)
Klein, chapter 6 - 8	
5. A new economics of the planet	(4.25.2016)
Klein, chapter 4 Optional: Dove & Kammen, chapter 3; Klein 12	
6. Pasteur's Quadrant	(5.2.2016)
Klein, chapter 7, 11 Optional: Dove & Kammen, chapter 4	

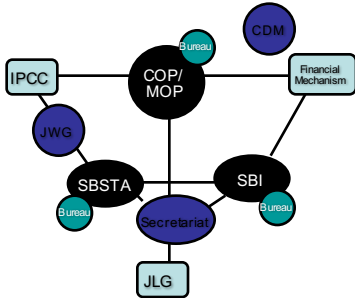
Resources:

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Twitter: [@dan_kammen](https://twitter.com/dan_kammen)



The Institutions



The Convention



The Negotiations



The Ongoing Negotiations

- UNFCCC Timeframe
 - COP 13, 2007: Bali Road Map, detailed plan on how to move forward
 - COP 14, 2008: Poznan "half way"
 - COP 15, 2009: Copenhagen, foreseen as the conclusion of the negotiations under the AWGs, failure
 - COP16, 2010: Cancun, pragmatic/incremental approach
- Other International Processes
 - Major Economy Forum, G8, G20
 - Bilaterals and Regional Consultations
 - REDD + Partnership
 - High-level Advisory Group on Climate Change Financing (AGF)
Sometime more political momentum, but less transparency and inclusiveness

The Ongoing Negotiations



The parties to the Convention

The developed Countries (Annex I)

- EU
- Umbrella
- JUSCANNZ

The developing countries (Non-Annex I)

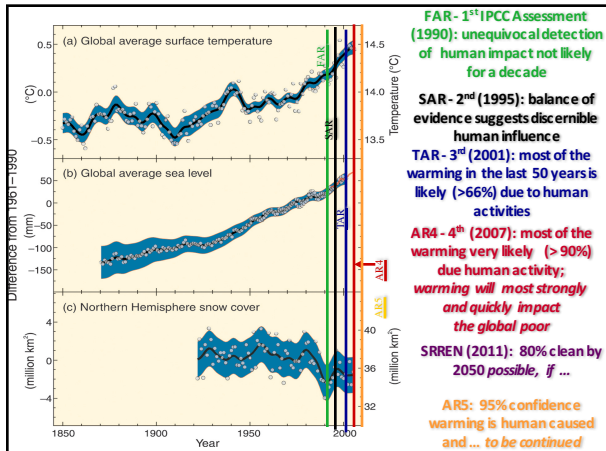
- G77/China (130+ countries)
 - LDCs: Least developed countries
 - OPEC: oil producing and exporting countries...
 - AOSIS (SIDS): Small Islands States
 - Africa
- One country might join more than 1 grouping: e.g. Algeria is a member of Africa, OPEC and G77/China

The Environmental Integrity Group, with both developed (Switzerland) and developing countries (Mexico, South Korea)

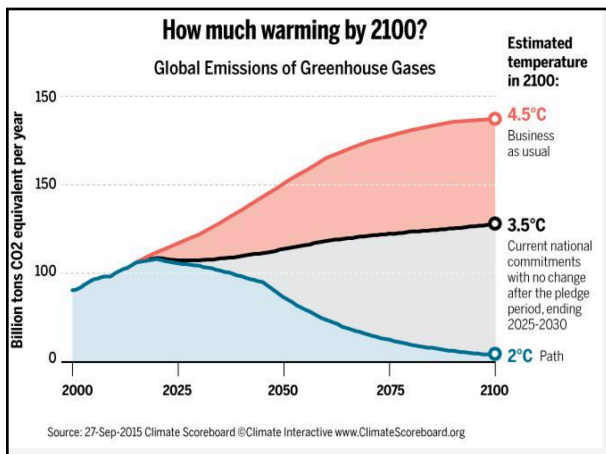
The Process of Negotiations

14. [In reflection of] [Because of] their historical responsibility for the accumulation of greenhouse gas emissions in the atmosphere, [developed country Parties [and other Parties included in Annex I of the Convention] [must] [should] [show leadership] [in the global effort to build a low-carbon economy that ensures continued growth and sustainable development and strengthens capacity to adapt to the impacts of climate change] [shall take the lead in combating climate change] [and the adverse effects thereof] [in] [by] [in particular on taking corresponding measures in] [mitigation] [in taking on ambitious economy-wide quantified emission limitation and reduction] commitments [immediately implementing ambitious and legally binding emissions reductions] [through deep reductions in their emissions.] [for actions.] Developed country Parties and other developed Parties included in Annex II of the Convention [should] [must] [shall fulfill their commitments under the Convention in] supporting all developing country Parties, particularly the most vulnerable, in undertaking adaptation measures and enhanced nationally appropriate mitigation actions (NAMAs), in a measurable, reportable and verifiable manner, and in [assisting] [providing support] [enabling] them through the [provision of] [transfer of] technology cooperation and transfer and capacity building and financial resources [that help these countries] to move towards a low-emission development path.

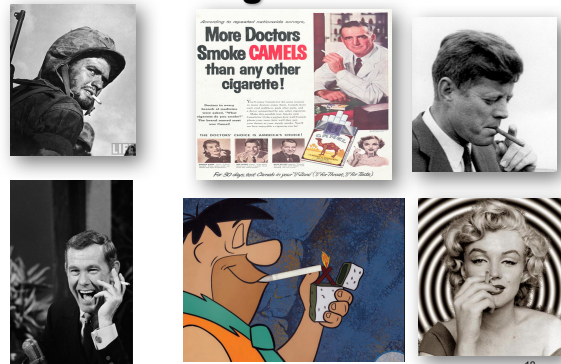
The Actors

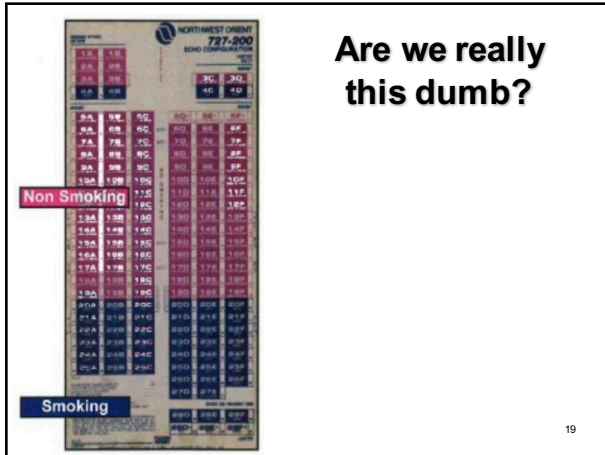


And then



Smoking in the US





AMERICANS FOR NONSMOKERS' RIGHTS
FLYING THE SMOKEFREE SKIES
Milestones

1964 The US Surgeon General's Report identifies smoking as a cause of increased mortality and as a contributing factor to a heart disease.

1965 The first federal law making all interstate commercial travel smokefree takes effect.

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1971 United Airlines becomes the first carrier to offer separate smoking and nonsmoking sections.

1973 The Civil Aeronautics Board requires separate smoking and nonsmoking sections on airplanes.

1982 Most US airlines (almost all) opt to ban for business as a smokefree cabin.

1986 The US Surgeon General's Report identifies secondhand smoke as a cause of death and disease and states "The simple separation of smokers and nonsmokers within the same airplane cabin reduces non-smoker exposure to secondhand smoke and decreases the risk of death and disease."

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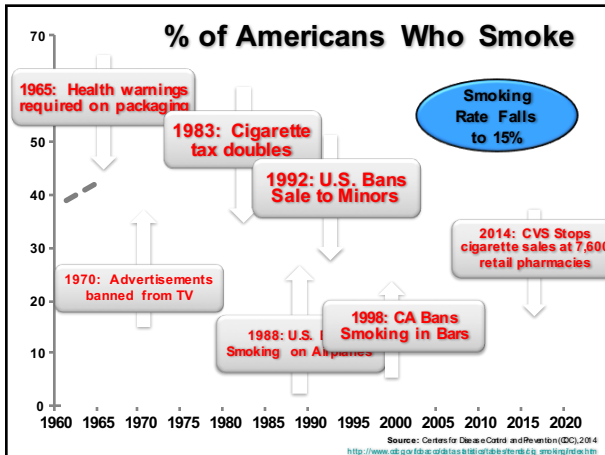
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Smoking sections on airplanes

**THE SEVENTIES
THE ENVIRONMENTAL DECADE**

- *Three books inspired the environmental awareness:*
 1. Silent Spring; by Rachel Carson.
 2. The Population Bomb; by Paul Ehrlich.
 - The Closing Circle; by Barry Commoners.

AIR QUALITY CONTROL

- The 1970 Clean Air Act targeted Auto and Smokestacks Emissions, it significantly improved air quality.
- The major air pollutants are:
 1. Sulfur Dioxide SO₂; sources are volcanic emissions, and the burning of high-sulfur containing coal. It is highly corrosive and can damage the respiratory tract
 2. Nitrogen Oxides; sources are lightning, decomposing organics, and auto and industrial emissions. It can damage the respiratory tract and deplete the ozone layer

Continue; Major air pollutants

- 3. Carbon Monoxide; sources are natural and also from incomplete burning of fossil fuels, mainly auto emissions, it contributes to the global warming and to the formation of ozone at low altitudes
- 4. Ozone; Is the primary ingredient of smog, causes eye irritation, nasal congestion, asthma, damage to lung and immune system. (The Ozone layer is ozone at high altitude and protects life by blocking ultraviolet radiation)

Continue; Major air pollutants

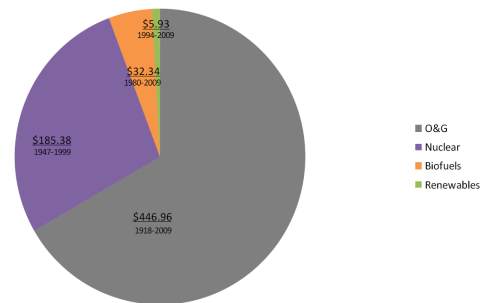
- 5. Particulates; Natural sources include soil erosion, pollen, volcanoes. Human made sources include diesel engines emissions, cement manufacturing, road construction, wood-burning stoves, etc. Particulates finer than 10 micrometers may not be filtered from the lungs, some particulates are carcinogenic, some are irritants

The Cuyahoga River Fire, 1969



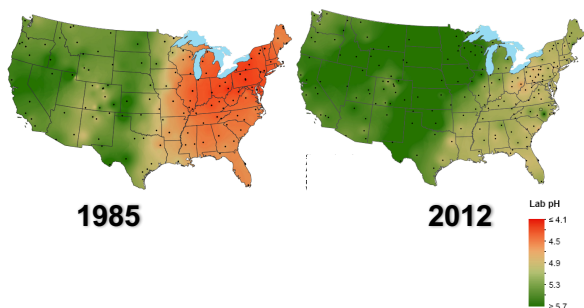
Federal Subsidies Overwhelmingly for Fossil Fuels

Cumulative Historical Federal Subsidies
2010\$, billions



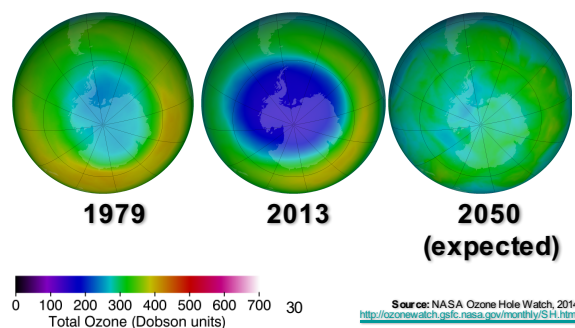
Source: "What Would Jefferson Do?", DBL

Reduction in Acid Rain

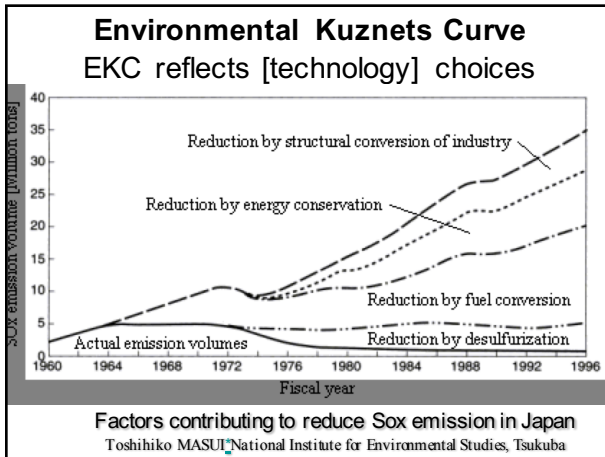


29 Source: National Atmospheric Deposition Program, 2014
<http://nadp.sws.uiuc.edu/nna/annualrpts/ByYear.aspx>

The Ozone Hole



Source: NASA Ozone Hole Watch, 2014
<http://ozonewatch.gsfc.nasa.gov/monthly/SH.html>



4) Abatement technology

- Is technology sufficient to explain why there can be EKC?
- Even without preferences for environmental quality or externalities and institutions to internalize them, increasing returns to scale in abatement technology can explain the appearance of an EKC (Andreoni and Levinson, 2001).

