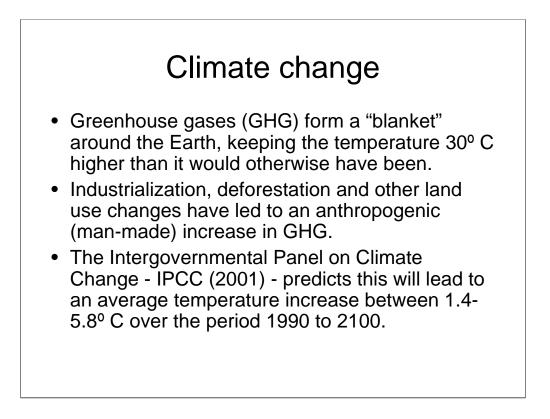
Global Public Goods and IEAs:

Global climate change



We're at a 370 ppm concentration of CO2 now. 500-1000 ppm expected by 2100.

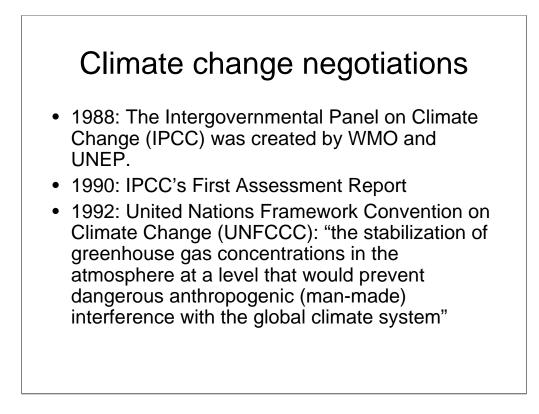
This is not debated. What has been debated is anthropogenic emissions' part of it... or rather the economic impact of climate change. Do the expected benefits of reducing emissions outweigh the net costs of mitigation?

The last century saw a temperature increase of 0.6 C.

Existing signs of climate change:

-declining snow cover, increased floods.

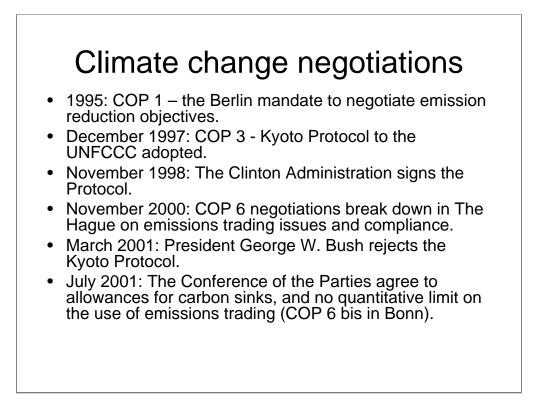
Impact: increased temperature gives increased incidence of vector-borne diseases like malaria. Agricultural crop yield effects. And much more...



IPCC reviews scientific research and issues assessment reports.

UNFCCC: open for signature June 1992 to June 1993, by then 166 signatures. It came into effect on 21st March 1994. Currently 189 signatories.

UNFCCC specifies a non-binding target to return GHG emissions to 1990 levels by the year 2000.



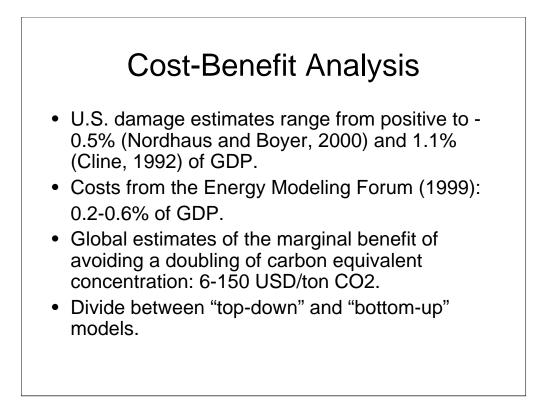
Byrd-Hagel Resolution, U.S. Senate 1997.

December 1997 : 84 signatories.

The Buenos Aires plan of action (1998) was only implemented in Marrakesh 2001.

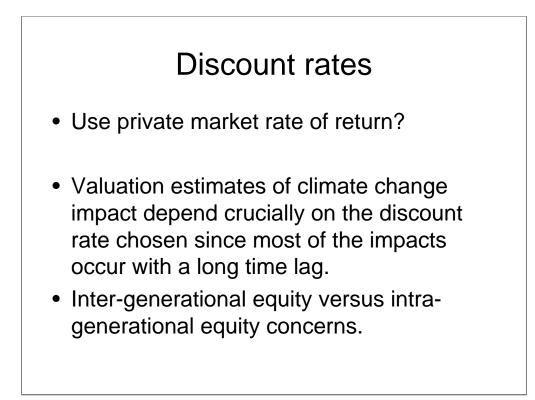
Climate change negotiations

- 2001: COP 7 –the Marrakesh Accords: carbon sinks allowed and compliance issue settled. Operative rules established for the CDM.
- 2004: Russian Federation ratifies the Protocol.
- 02.16.2005: The Kyoto Protocol enters into force.



Cost-benefit analyses are not well adapted to deal with problems implying large catastrophic events occurring with a small probability.

Discount rate debate...



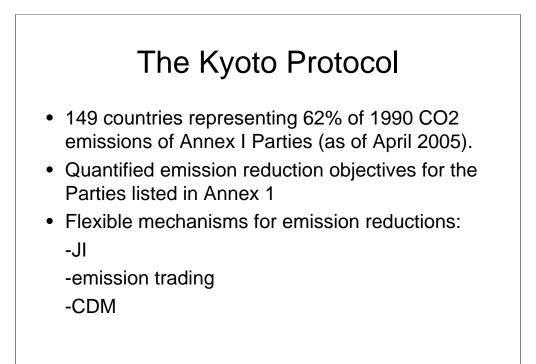
OMB: 7% interest rate.

Time preferences and valuation of the environment are interdependent.

Future discount rates are uncertain.

Use hyberbolic discounting (discount rate declines over time).

Intergenerational concerns: use zero discounting.



The Kyoto Protocol

What GHGs?
-carbon dioxide (CO2)
-methane (CH4)
-nitrous oxide (N2O)
-hydroflurocarbons (HFCs)
-perfluorocarbons (PFC)
-Sulphur hexafluoride (SF6)
Measured in CO2 equivalents.

	EU-15	-8%
Parties listed in		-0 /0
Annex B have assigned amounts for the "first commitment period" 2008-2012 (5% overall emission reduction). In percentage terms of 1990 emissions:	U.S.	-7%
	Canada, Hungary, Japan, Poland	-6%
	Croatia	-5%
	New Zealand, Russian Federation, Ukraine	0
	Australia	+8%

UNFCCC Annex I: OECD countries, Turkey +EIT Annex B: Annex I less Belarus and Turkey.

Burden-sharing

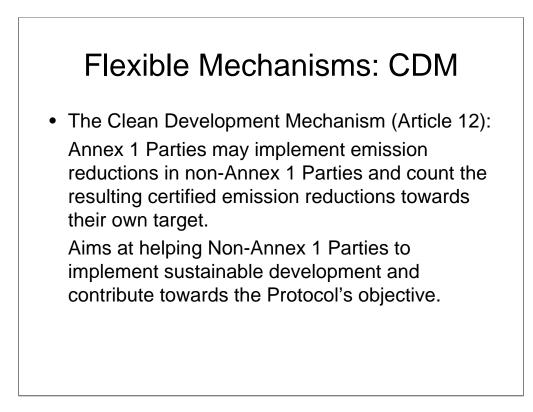
- "Common but differentiated responsibilities" : Annex 1 Parties versus non-Annex 1 Parties (China, India, Brazil)
- Bubble concept included: The European Union distributes its aggregate reduction goal of 8% among its member states.
- The Clean Development Mechanism and the Adaptation Fund.

Flexible Mechanisms: JI

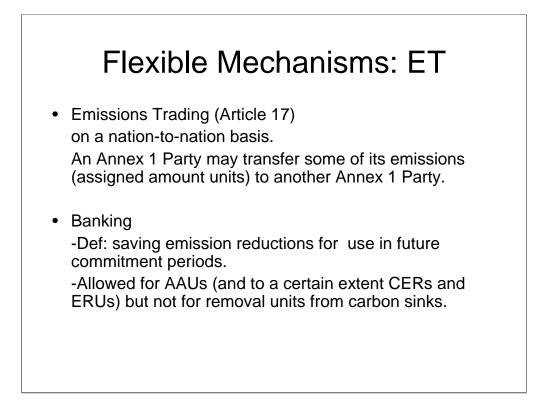
• Joint Implementation (Article 6):

An Annex 1 Party can implement an emission reduction project in the territory of another Annex 1 Party and count those emission reduction units towards its own target.

Emission Reduction Units (ERUs)

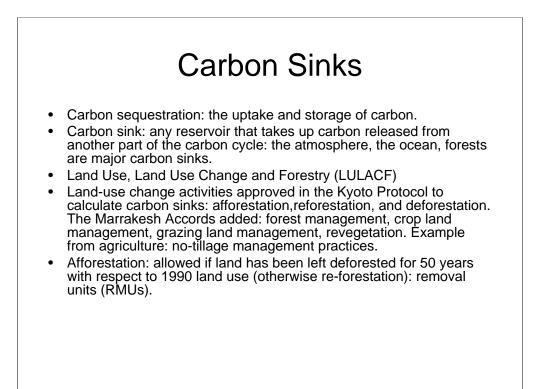


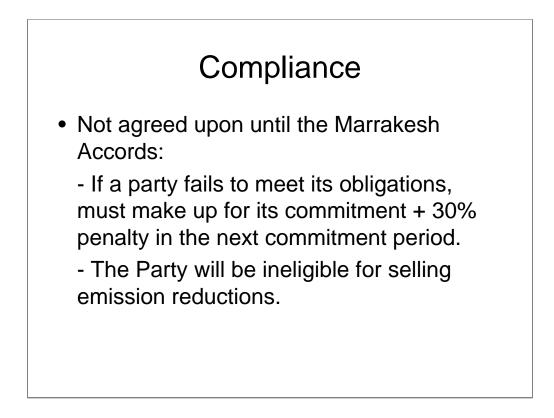
Certified Emission Reduction Units (CERs)



Parties are required to hold a commitment period reserve of assigned amounts.

EU had insisted on meeting the objectives primarily by domestic action, but abandoned quantitative limits on ET at COP6 bis. Currently, the Protocol states that "significant efforts be made for achieving emission reductions domestically".



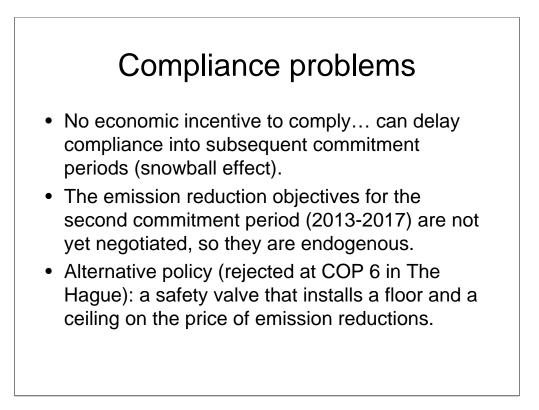


Very ineffective compliance rule:

There are no economic incentives for complying; if a party failed to comply in the first commitment period, why would it have incentives to make 1.3 times the reduction in the second commitment period? Can delay compliance into subsequent periods...

Above all, the emission reduction periods for the second commitment period (2013-2017) are not yet negotiated, so they are endogenous ; a party that anticipates a compliance problem in the first commitment period will negotiate for weaker objectives in the second commitment period.

Compliance rules can only be changed by an amendment to the Protocol that requires 2/3 majority vote.



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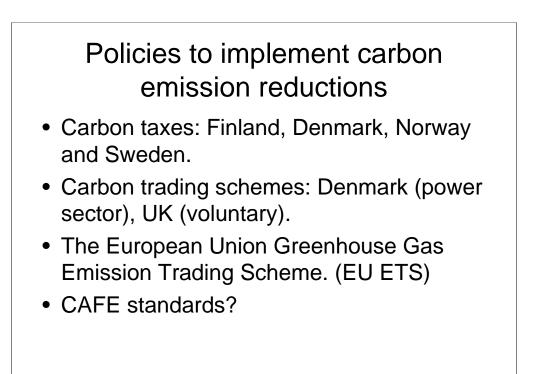
The safety valve: If a party's compliance costs turn out to be high, they would pay a unit amount per ton of CO2. Such a hybrid mechanism is preferable when there is uncertainty.

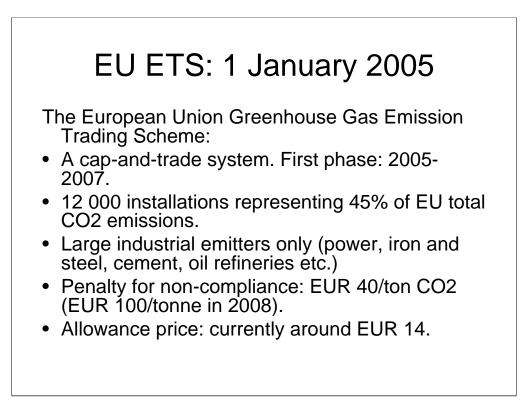
Burden-sharing and economic efficiency

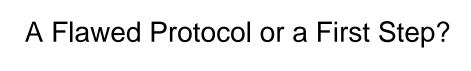
 The Marrakesh Accords instituted a levy on CDM projects to fund an Adaptation Fund (basically a tax on such projects – reduces the quantity of emission reductions from the CDM).

Show incidence of a tax on the use of the CDM. May limit the use of CDM with respect to the other flexible mechanisms.

Leakage Def: indirect effects that lead to emission increases outside of the territory of the Parties to the Protocol. Example: decrease in demand for fossil fuels depresses world fossil fuel price and increases the demand for fossil fuels elsewhere. Border tax adjustments difficult to implement.



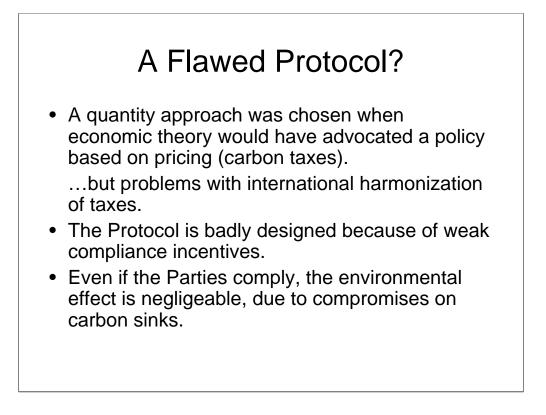




• Two contradicting views:

1) An inherently flawed protocol,

2) Not perfect, but just the first step towards further emission reduction commitments.



Analysis on the lines of the Weitzman Theorem for stock pollutants show that a price policy tends to dominate a quantity policy for climate change policy (Hoel and Karp, 2001; Newell and Pizer, 2003).

A First Step towards Stronger Policy?

- Yes, the environmental impact has been diluted by the Marrakesh Accords on carbon sinks amongst others, but the framework is there to set further emission reduction objectives for the second commitment period (2012-2017).
- The Montreal Protocol started out modestly, but then added more ODS at subsequent renegotiations.

Alternative propositions

- International emissions trading with a safety valve. Set emission reduction targets in per capita levels.
- Coordinate on carbon levy. Developing countries to participate once their GDP per capita reaches a certain level.
- Coordination of domestic policy measures such as R&D of less carbon-intensive technologies.
- Set international technology standards.

