

Modelling Artificial Societies with climate- economic impact

NILS FEYERABEND

Agenda

Motivation

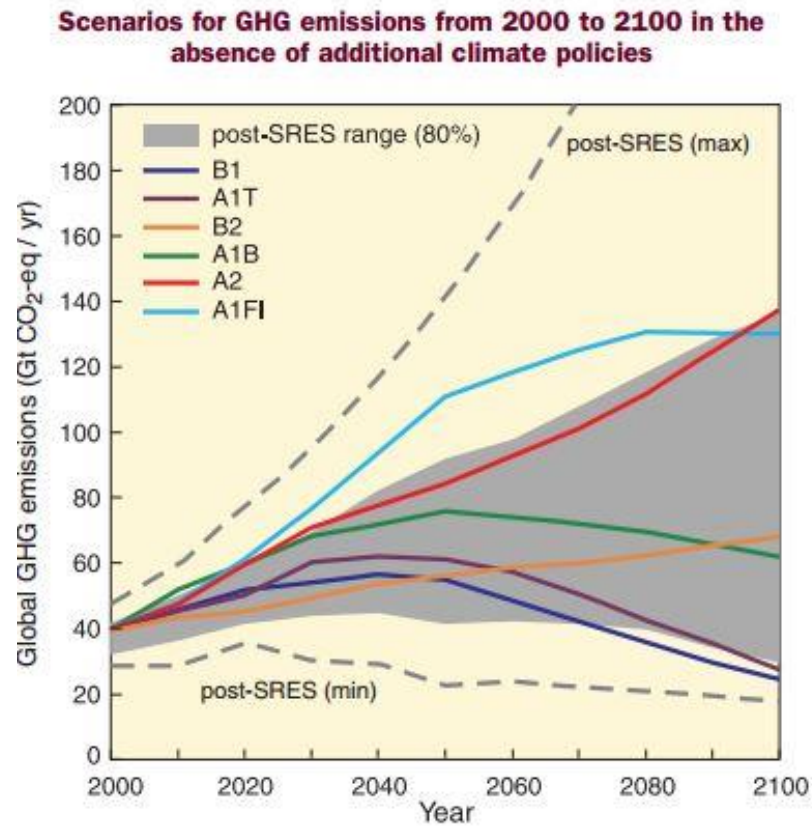
Einführung

Interessante Papers

Konferenzen

Ausblick

Motivation



[1]

Artificial Society

“An artificial society is an agent-based, computer-implemented simulation model of a society or group of people, usually restricted to their interaction in a particular situation.”

[4]

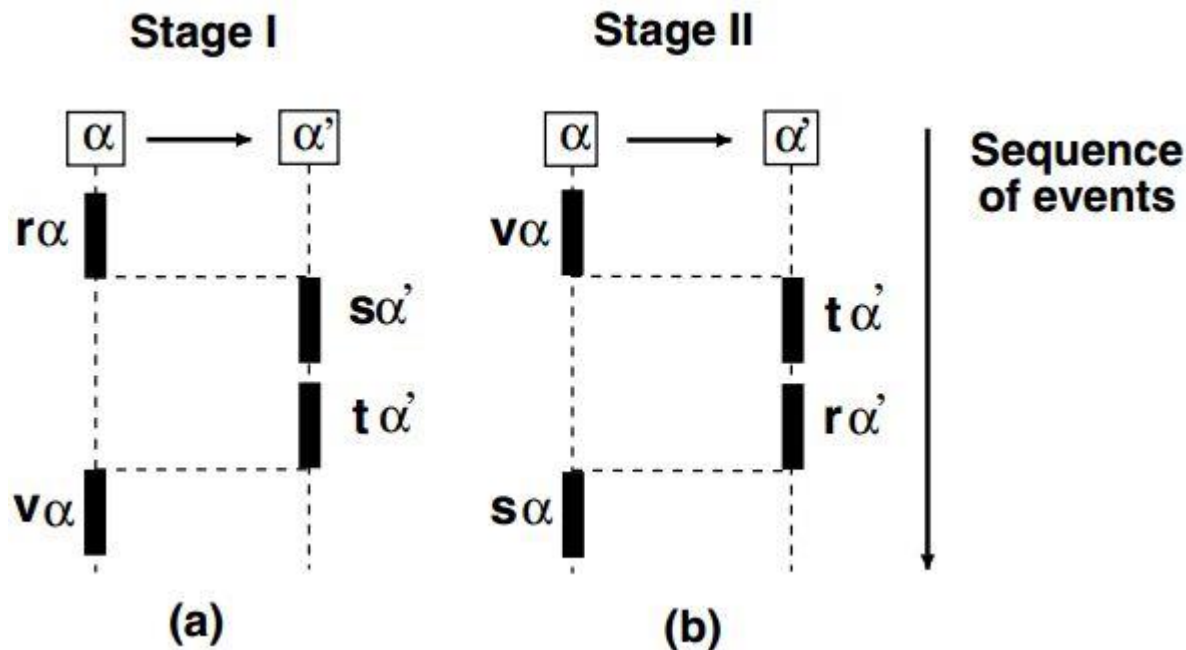
Was haben Artificial Societies damit zu tun?

Klimapolitik hat Auswirkungen

- Bevölkerung
- Ökonomie
- Ökologie
- ...

Exchange Values to support Social Interaction in Artificial Societies

Exchange Values to support Social Interaction in Artificial Societies



[3]

Exchange Values to support Social Interaction in Artificial Societies

Voraussetzungen

- Wissen über andere Agenten
- Moralische Schulden und Kredits
- Historie von Transaktionen
- Regeln und Werte
- Transaktion Strategie

Exchange Values to support Social Interaction in Artificial Societies

Mögliche Strategien

- Der Agent kann die gewünschte Aktion nicht ausführen
- Der Agent möchte die Aktion von einen anderen Agenten ausgeführt haben
- Der Agent möchte Kredits sammeln

mögliche Auswahlstrategien

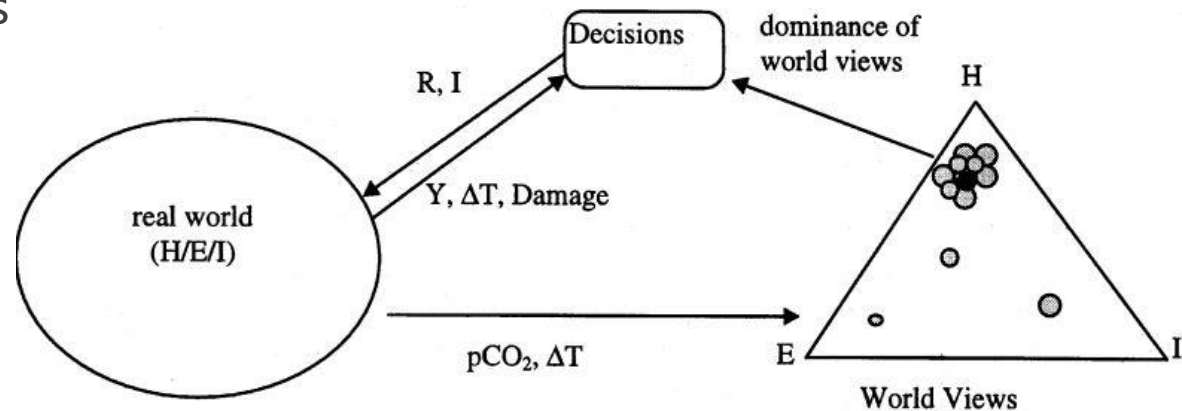
- Historie des Partners
- Bestes Angebot (value)

The battle of perspectives

The battle of perspectives

Kulturtheorie

- Hierarchists
- Egalitarians
- Individualists



[2]

The battle of perspectives

	Individualist	Hierarchist	Egalitarian
Technological development	High	Moderate	Low
Climate sensitivity	Low	Best-guess	High
Damage Cost	Low	Moderate	High
Mitigation Cost	High	Moderate	Low

The battle of perspectives

Welt

- Entspricht einem bestimmten Weltbild
- atmospheric CO₂
- concentration pCO₂
- actual temperature rise ΔT

Agenten

- Beobachten Welt
- Verändern Ansicht
- Managementstyle

The battle of perspectives

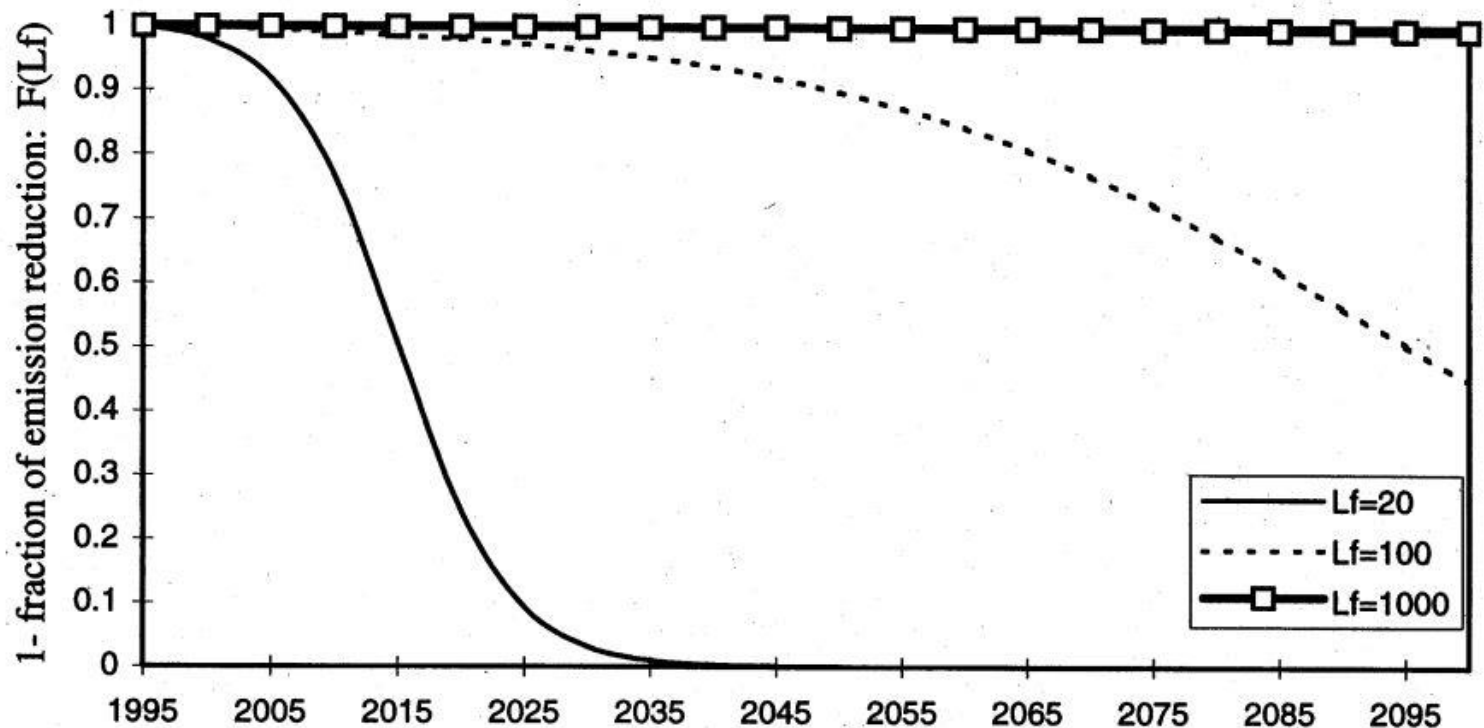
Drei Weltansichten, ein Weltmodell

- The sensitivity of the temperature for increasing CO₂ concentration
- The pace of technological improvement (economic and energy conservation)
- The economic costs to reduce CO₂ emission
- The economic damage incurred to the economy by climate change

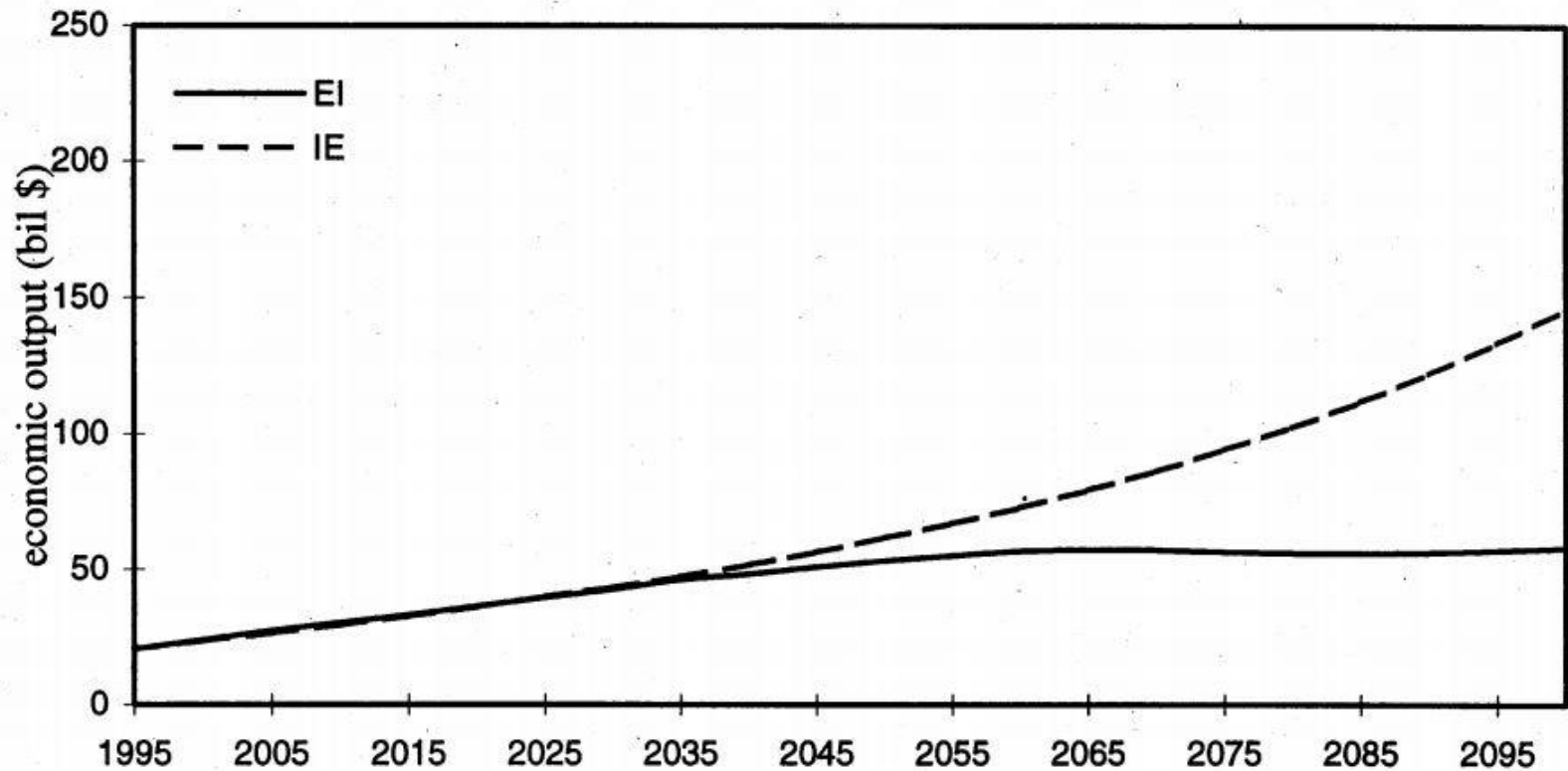
The battle of perspectives

Decision rules characterising	Individualist	Hierarchist	Egalitarian
Investment decision	At least 2%/yr growth of Y	Stable economic growth of 1.5%/yr	No expansion of capital stock
Indicator for climate policy	Damage cost	Temperature	Emissions
Climate policy	If damage > 1% of Y decrease L_f else $L_f = 1000$	If temperature rise decreases L_f else $L_f = 100$	50% reduction of fossil fuels in 20 years : $L_f = 20$

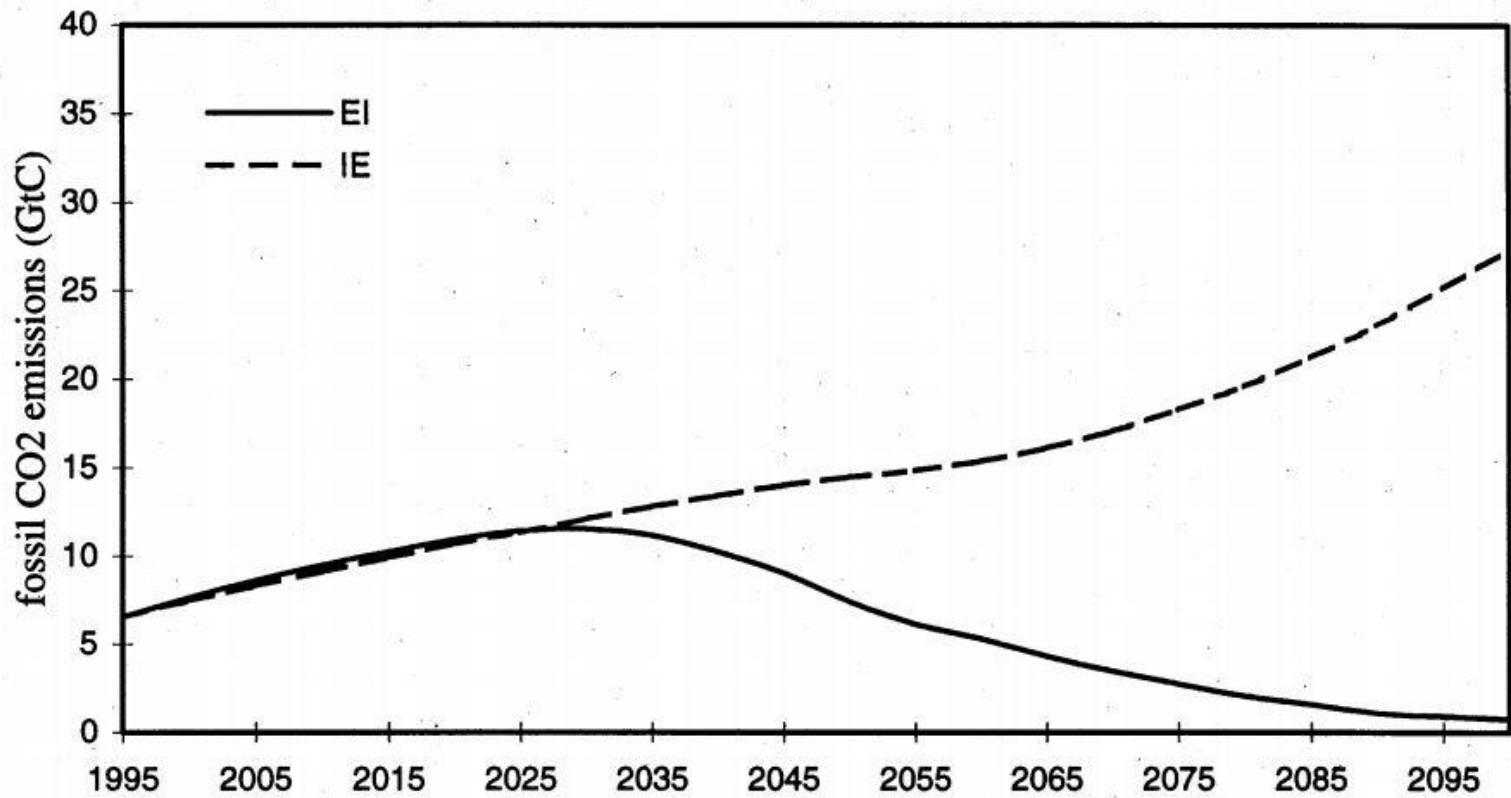
The battle of perspectives



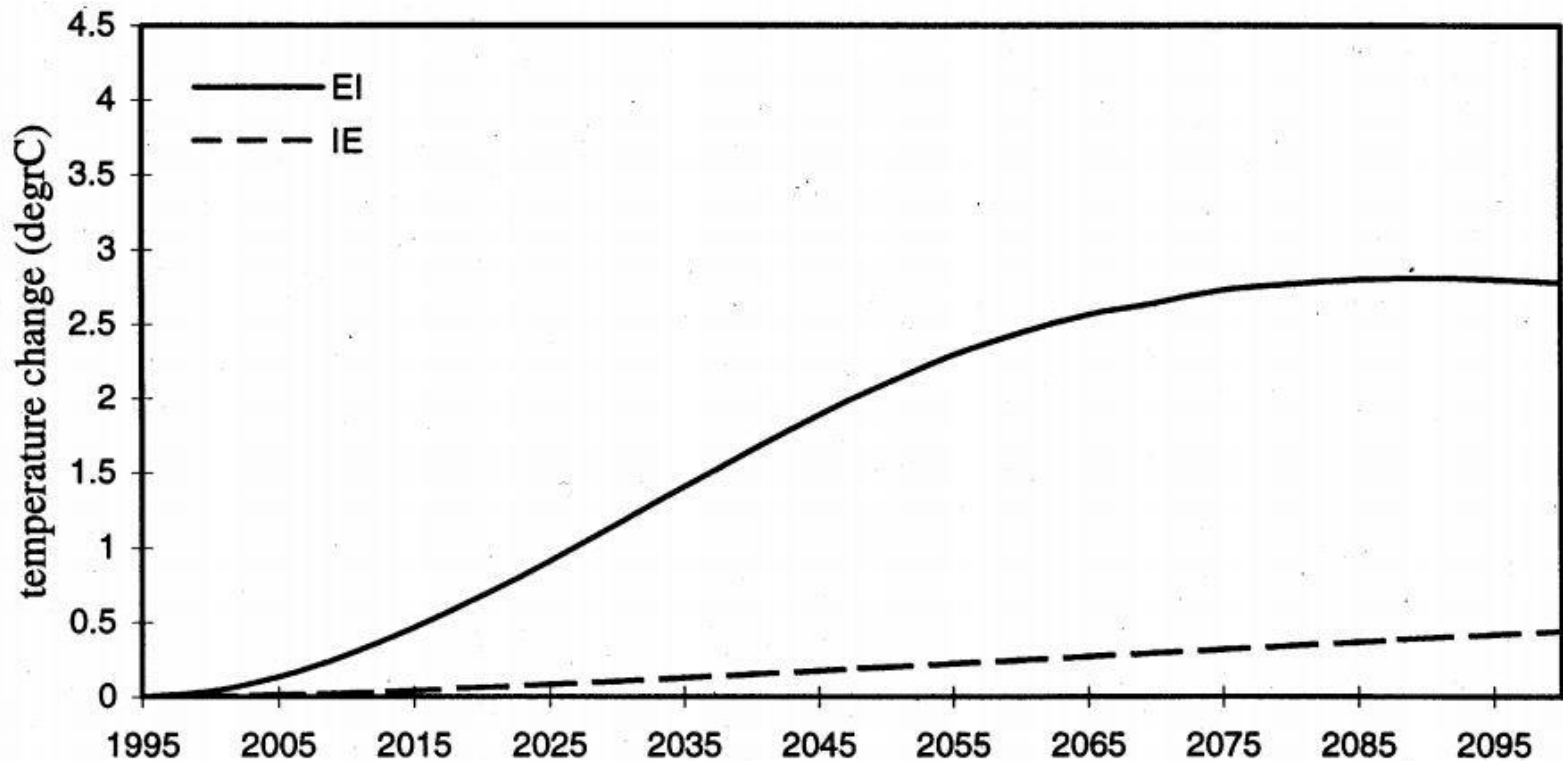
The battle of perspectives



The battle of perspectives



The battle of perspectives



Ausblick

Modell für Artificial Society erstellen

- politische Entscheidungen aufgrund von ökologischen und ökonomischen Einflüssen

Tiefer einsteigen in Kulturtheorie

Problemstellung:

- System of Systems
- Geeignete Vereinfachung finden

Konferenzen

AICI – Artificial Intelligence and Computational Intelligence

IFAAMAS - The International Foundation for Autonomous Agents and Multiagent Systems

ESSA - European Social Simulation Association

upcomming

- ECAI 2014 : 21st European Conference on Artificial Intelligence
- AAAI 2014 : 28th AAAI Conference on Artificial Intelligence

Journals

JASSS – The Journal of Artificial Societies and Social Simulation

TOMACS - ACM Transactions on Modeling and Computer Simulation

Quellen

[1] Climate Change 2007: Synthesis Report[IPCC, 2007]

[2] The battle of perspectives [Janssen & Vries, 1997]

[3] A System of Exchange Values to support Social Interactions in Artificial Societies[Rodrigues et. al., 2003]

[4] Onlinequelle – Zugriff am 15.12.2013 :

www.springerreference.com/docs/html/chapterdbid/178748.html