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Next generation of advanced integrated assessment modelling to support climate policy making

NAVIGATE (and) climate policy after the pandemic

NAVIGATE stakeholder workshop on
„Robustness and legitimacy of models for climate policy assessment“

Elmar Kriegler, 26.05.2020

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 821124.

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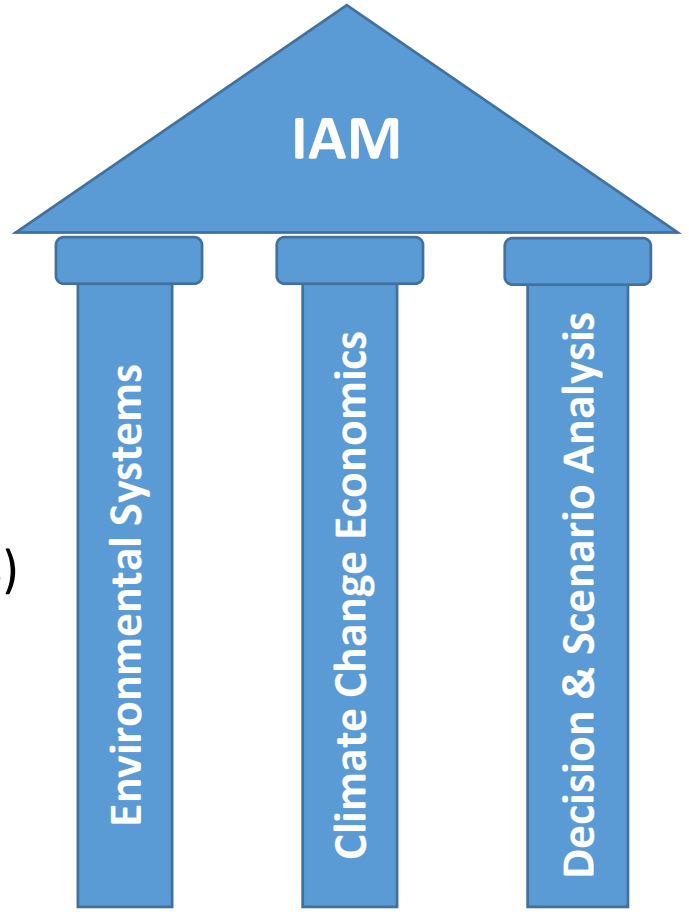
The Integrated Assessment Modelling Approach is more relevant than ever

Quantitative exploration of response options to public policy challenges in complex and coupled systems

- Connecting dynamic systems
- Exploring solution strategies
- Informing societal discourse about available courses of actions

(as opposed to forecasting systems behaviour or analysing decisions /policies)

➔ Climate change and pandemics are both public policy challenges, but on very different time scales and with very different response options



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Integrated Assessment of COVID-19 and Climate Change: Similarities and Differences

	Climate Change	COVID-19
Time scale	Decades to several hundred years, distant impacts	1-5 years, immediate impacts
Regional scale	Global, with distributed impacts	Global, with local impacts
Models	IAMs and individual component models (CGEs, energy, land use, transport, industry, buildings)	Epidemiological models: SIR model (ODEs), ABMs ➔ Not (yet) integrated with economic models
Policies	Public policy & international cooperation problem Economic and regulatory, gradual, long-term	Public policy & international cooperation problem Mandatory and behavioural, disruptive, short-term
Science-policy interface	Active from both sides mixed influence in most countries	Active from both sides strong influence in most countries
Targets and indicators	Carbon budgets, temperature limits	Reproduction number, Incidence, Doubling time
Public perception	Science advice perceived as consequential In parts rejected as elitist and technocratic	Science advice perceived as consequential In parts rejected as elitist and technocratic

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Potential long-term effects of the pandemic

Politics
- Reshaping geopolitics, the role of the state, and international and national public policy

Economics
- Changes to globalisation trends
  (e.g. deglobalizing supply chains, constraining international mobility)
- Structural changes in the economy may be triggered, accelerated or slowed
  (e.g. impact on industrialization; growth of services)
- Changes to the workplace

Energy
- Changes to energy demand, in particular for mobility services
- Changes in international energy markets

Society
- Increase in inequality and social unrest
- Reshaping perceptions of the future (e.g. decline in societal optimism)

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Climate policy after the pandemic and needs for IAM

Common theme: Climate policy and sustainable development considerations need to play central role for recovery policies

- Stimulus packages - affecting consumer demand and investments – should be steering towards a low carbon future, either directly or by combining them with strong steering instruments like a CO_2 price

  ➔ *Can IAMs play a role given their focus on the long-term? Would need good representation of transient processes after a shock (also very relevant for climate policy „shock“ scenarios)*

- Rise in inequality need to be addressed jointly with climate change

  ➔ *IAMs need to be able to investigate the interplay between climate impacts, climate policy and inequality to study policy responses to pandemic shock scenarios that give an „exogenous“ rise in inequality*

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Climate policy after the pandemic and needs for IAM

- Structural changes in the economy reducing carbon intensity should be accelerated and new risks of carbon lock-in („build more of the same“) avoided

  ➔ *IAMs need to be able to model structural change and its interplay with climate policy and the low carbon transition to study policy responses to an „exogenous“ pandemic shock on structural change*

- Shift to demand reducing carbon-intensive consumption (mobility, services, …) should be accelerated and rebound effects of carbon-intensive consumption mitigated

  ➔ *IAMs need a good representation of the demand sector (from lifestyles to service demand) to study synergies for climate policy in the presence of an „exogenous“ pandemic shock on demand.*

- Strong counterveiling forces (trying to diminish the role of public policy and science) will need to be addressed

  ➔ *Further strengthening science-policy and science-society communication activities building on transparency and validity*

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IAM and the Social Sciences (Bird's eye view)

Paradigmatic difficulties

- **IAM:** Forward looking quantitative exploration of solution strategies for public policy problems
- **Social sciences:** Description of societal / institutional change in the past

Important shifts to improve connections

- **IAM:** Add the institutional dimension to the systems dimension
- **Social sciences:** Embrace forward looking (futures) analysis and deliberate exploration of public policy options beyond purely descriptive approaches

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IAM and the Social Sciences: Lines of connection

IAMs and socio-technical transition theories (e.g. Multi-Level-Perspective)

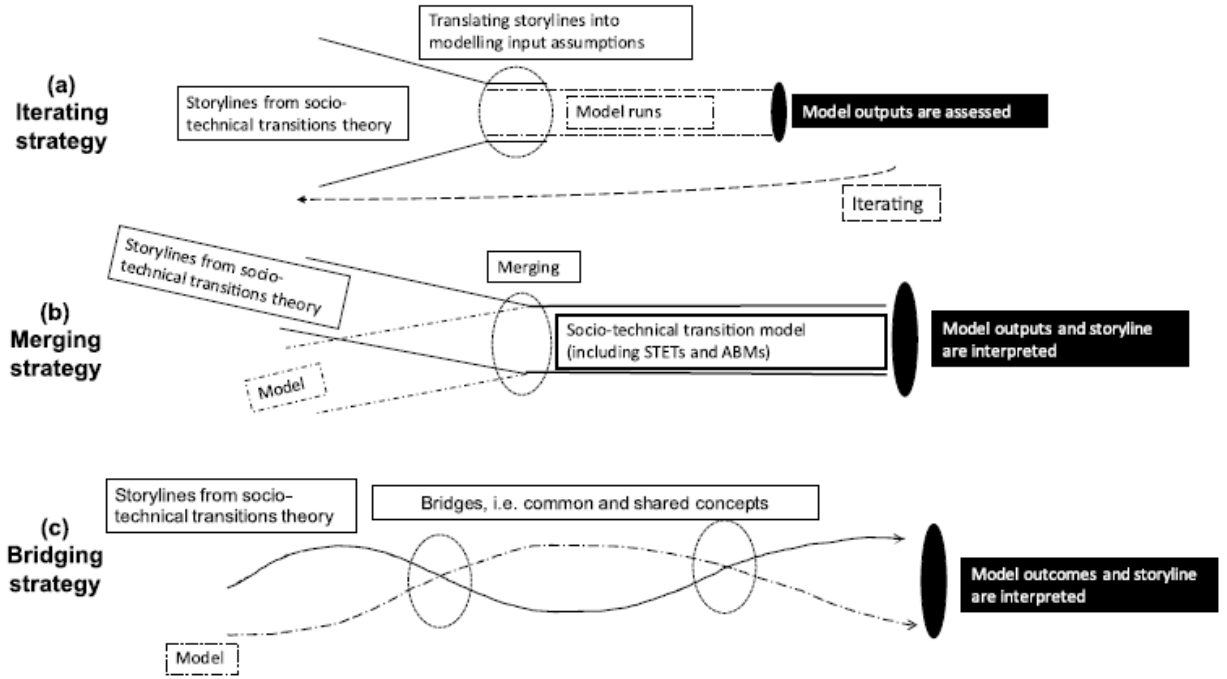

Fig. 4. Three methodological strategies for linking models and socio-technical transitions theories and frameworks that were identified in the reviewed literature (a. Iterating, b. Merging, c. Bridging).

Trutnevyte et al., 2019, One Earth 1: 423-433
Hirt et al., 2020, Env Innov Soc Trans 35: 162-179

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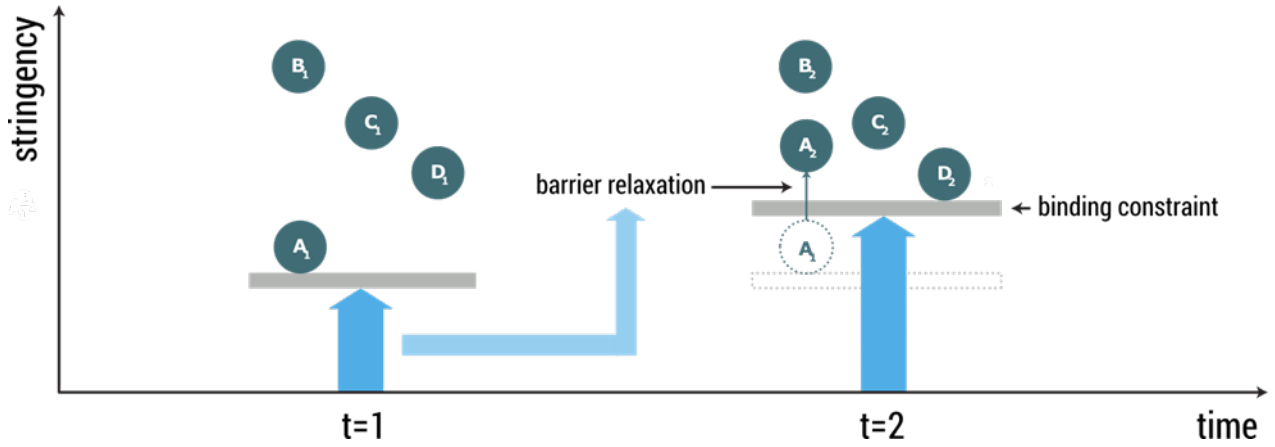
IAM and the Social Sciences: Lines of connection

Combining IAM pathways and policy sequencing to take into account societal and political barriers and opportunities



Pahle et al., 2018, Sequencing to Ratchet Up Climate Policy Stringency, Nature Climate Change 8: 861-867

Barriers to transition ➔ Ways to overcome them

- Vested interests ➔ Build new constitutiencies
- Sunk costs ➔ Help writing them off
- Accumulated expertise ➔ R&D and mainstreaming new technologies
- Self-fullfilling expectations of persistence ➔Set new expectations
- Standardization ➔ Strong policy guidance

Rosenbloom, 2020, Breaking carbon-lock in through innovation and decline, WRI perspective

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Thank you!

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