

# The Transition Institute 1.5°

L'ambition d'une vraie transition

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Journée de la chaire MPDD – 20/01/2025

*Fondements économiques des modèles : comment cadrent-ils le champ des possibles ?*



Financial Market Regulators  
House Oversight Committee

C-SPAN

LIVE  
10:41 am ET

# What is your 'ideology' ?



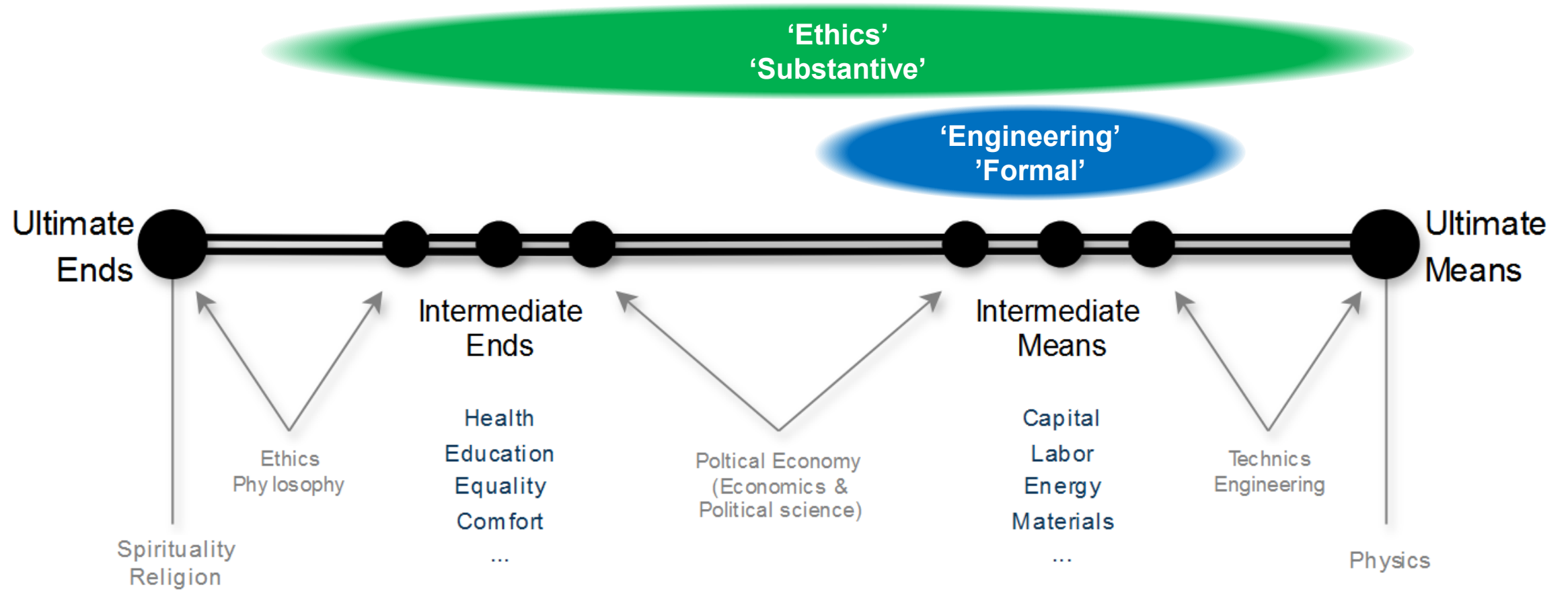
Alan Greenspan, chair of the Federal reserve from 1987 to 2006, during his audition concerning the subprime crisis:

*“Remember that what an ideology is, is a conceptual framework with the way people deal with reality. Everyone has one, to exist you need an ideology. The question is whether it is accurate or not .[...] Yes, I found a flaw, [...] in the model that I perceived is the critical functioning structure that defines how the world works. [...] I was shocked because I have been going for 40 years or more with a very considerable evidence that it was working exceptionally well.”*

<https://youtu.be/R5lZPWNFizQ?si=YndGNmMxMvZTSa5Q&t=335>

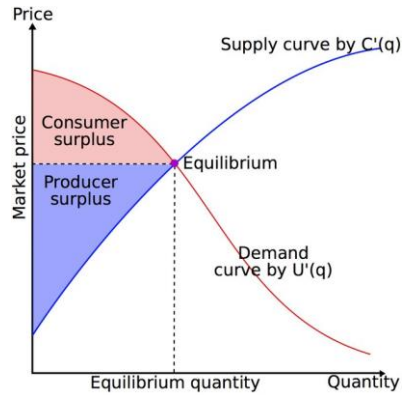


# What is economics ?

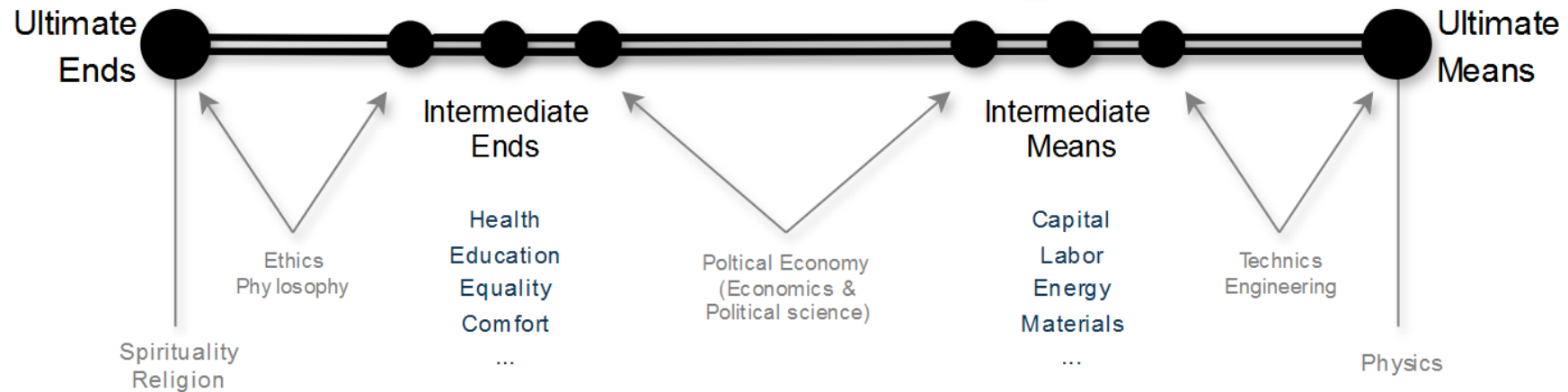
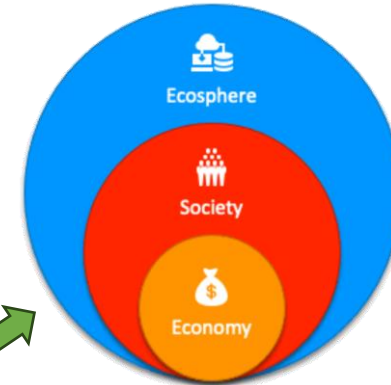


# What is economics ?

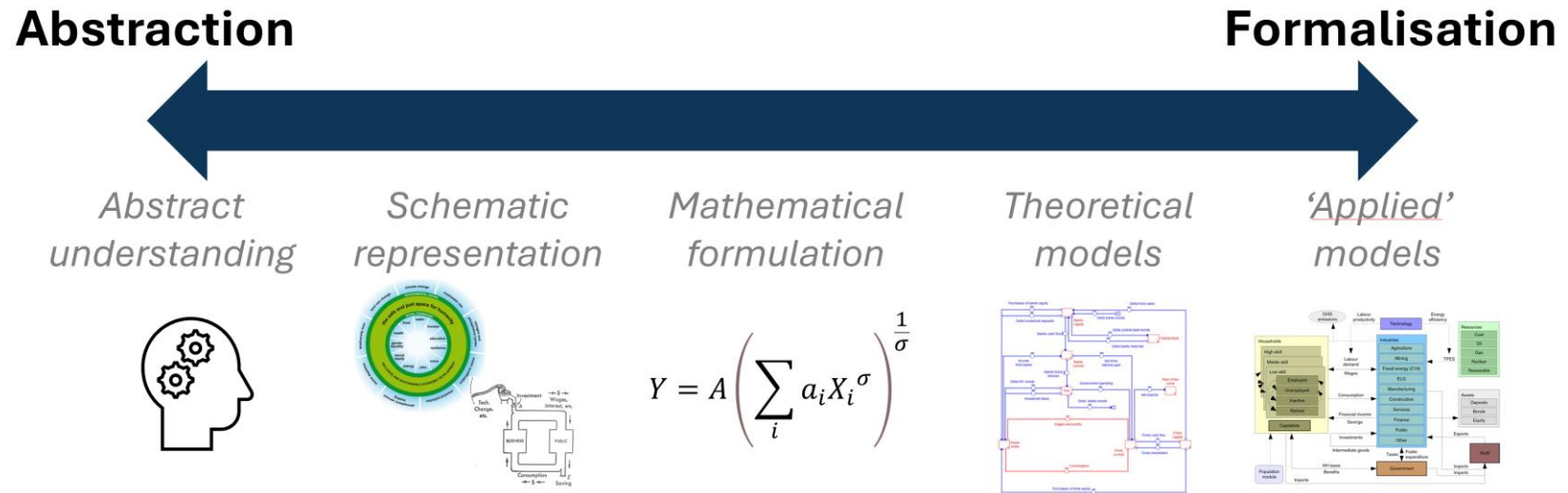
Neoclassical economics  
*Welfare (consumption) maximization*



Ecological economics  
*Need satisfaction*



# Modeling process



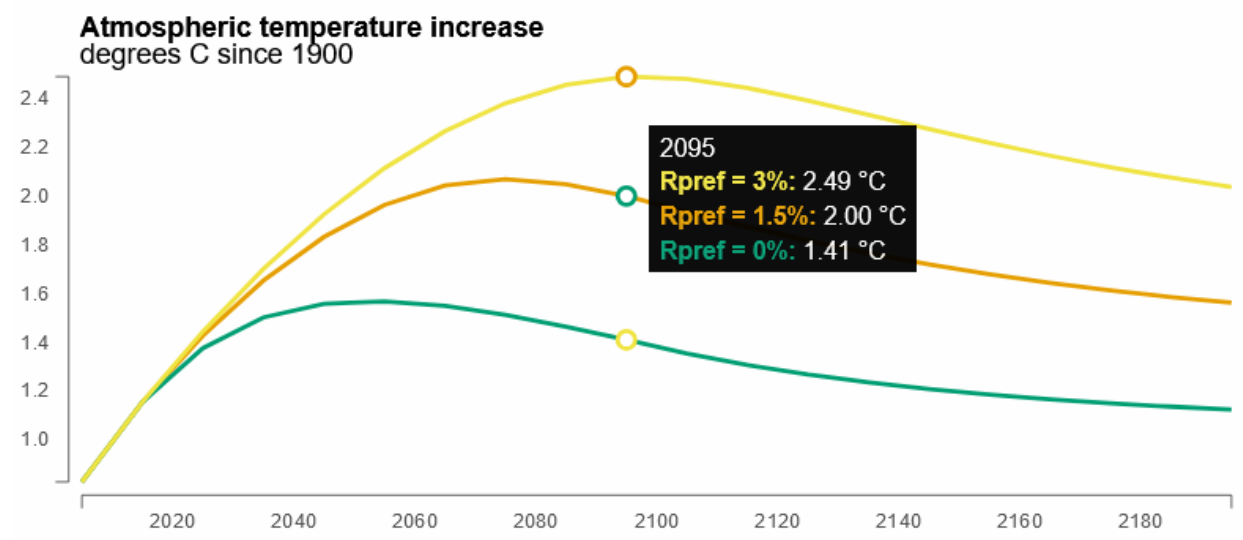
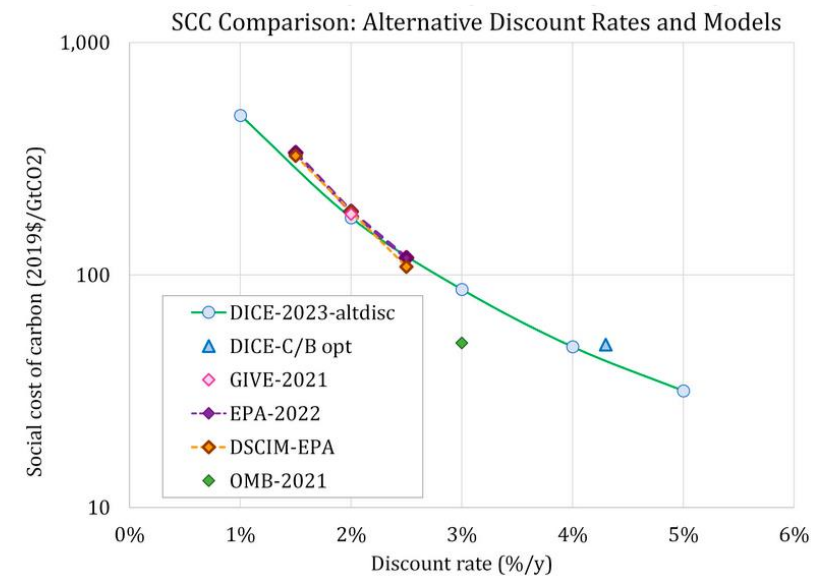
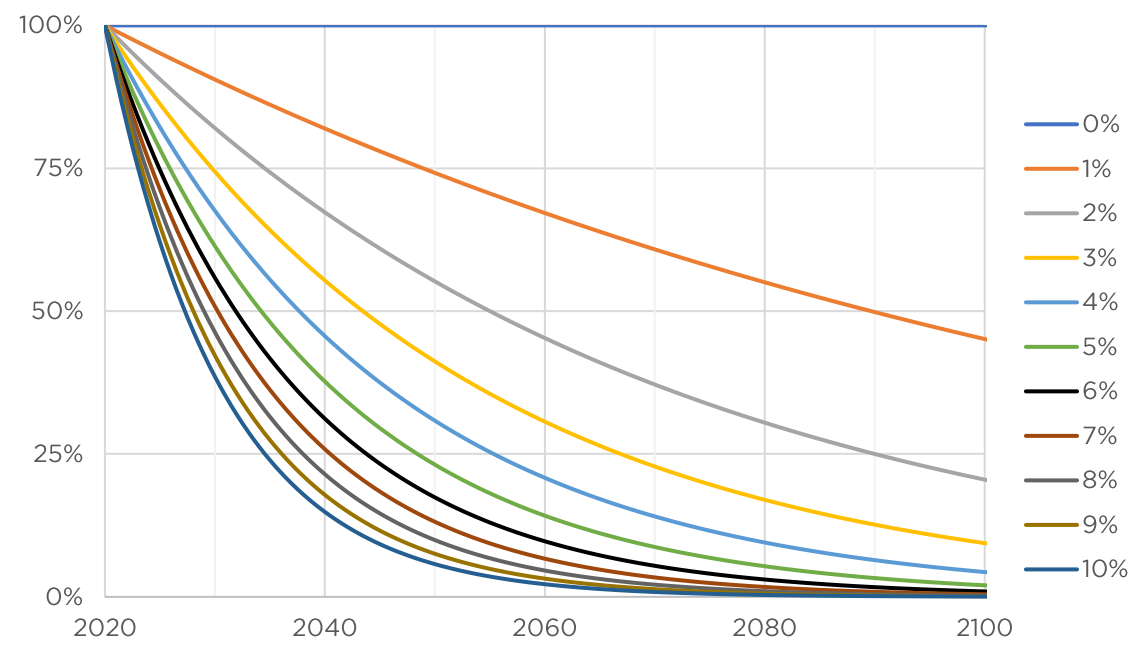
# How do you interpret model results ?

- Positive/descriptive ?
- Normative/prescriptive ?
- Consistency test ?



# Ethics and model structure

- Discount rate



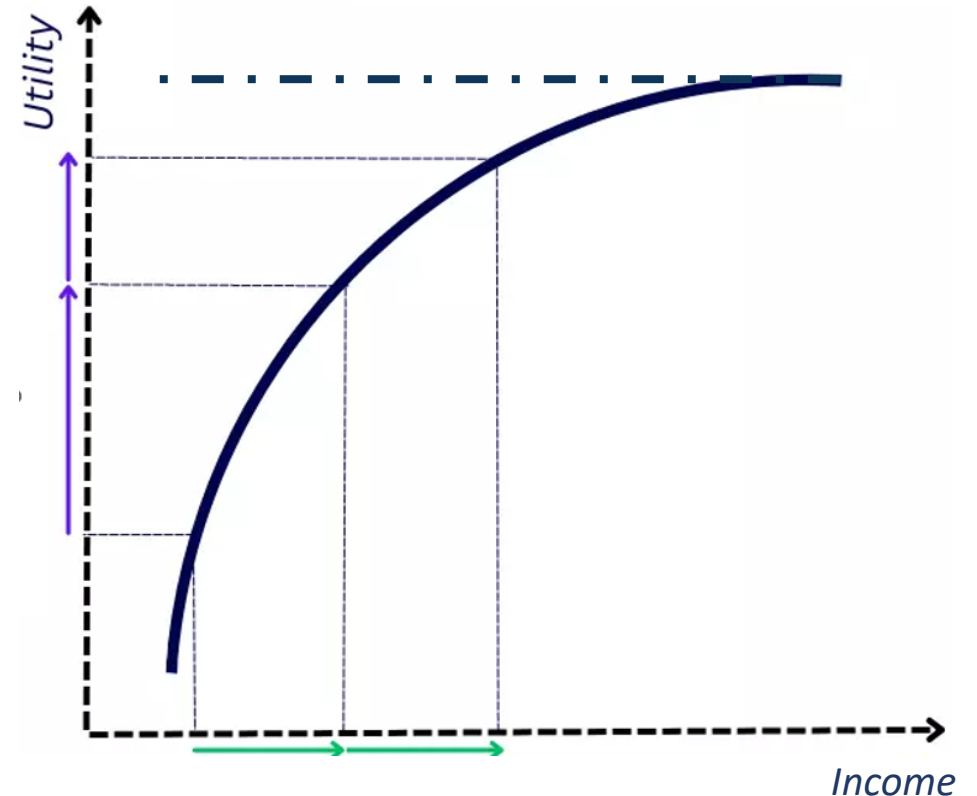


# Ethics and model structure

- Negishi weighting

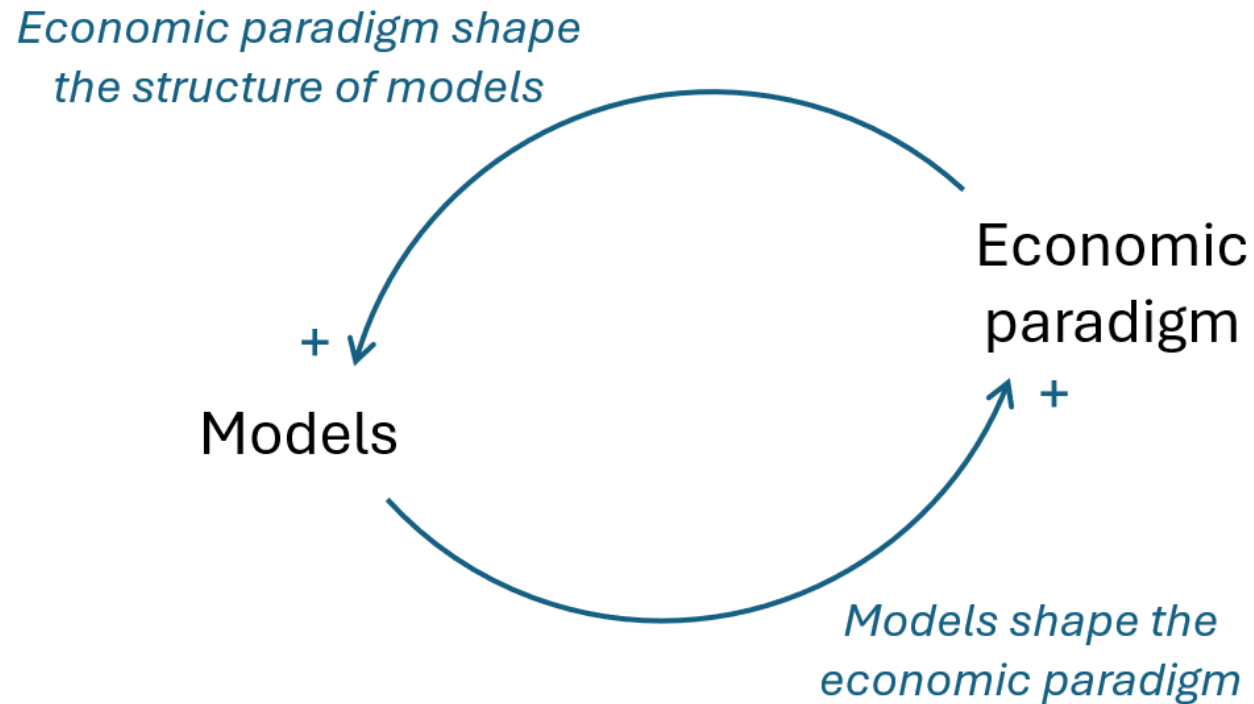
$$W^{Negishi}(cIt) = \sum_t \sum_{n \in cIt} w_{t,n} l(t,n) \frac{\left(\frac{C(t,n)}{l(t,n)}\right)^{1-\eta} - 1}{1-\eta} \beta^t$$

$$w_{t,n} = \frac{\frac{1}{c(t,n)^\eta}}{\sum_{n' \in cIt} \frac{1}{c(t,n')^{-\eta}}}$$

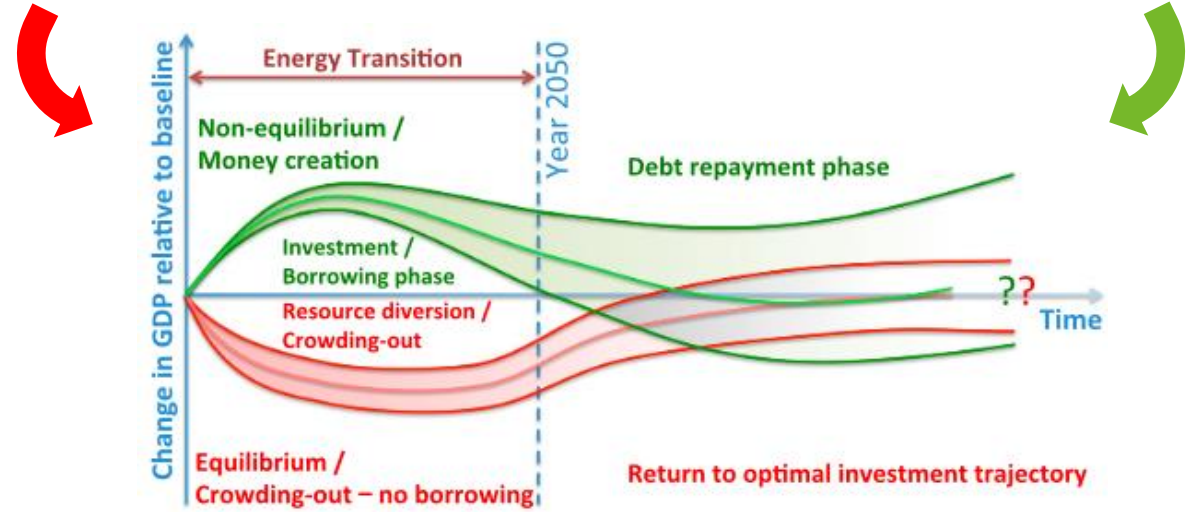
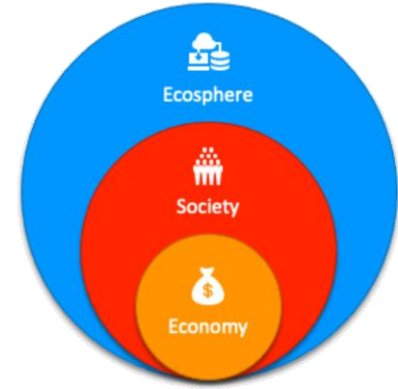
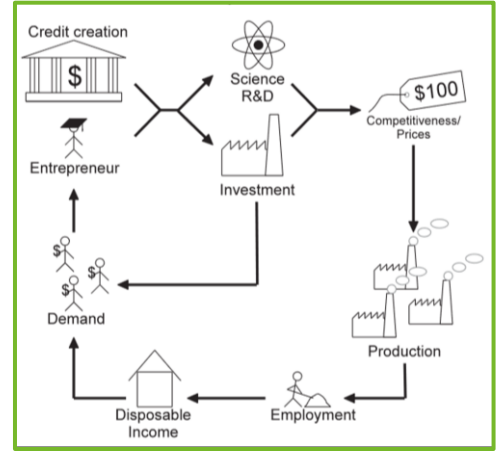
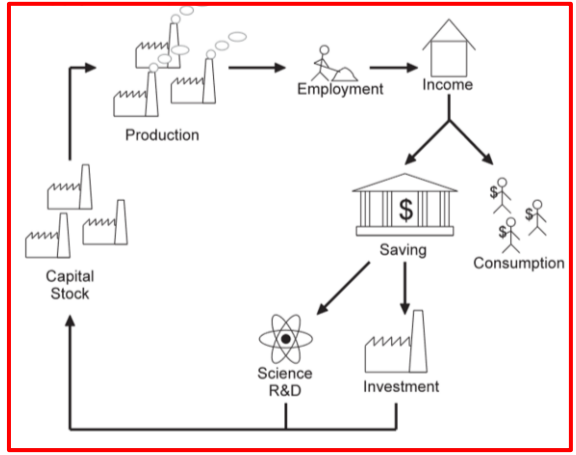
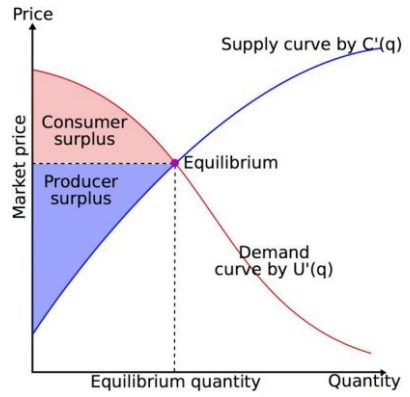


Stanton, E.A., 2011. *Negishi welfare weights in integrated assessment models: the mathematics of global inequality*. *Clim. Change* 107, 417–432

# From models to scenarios



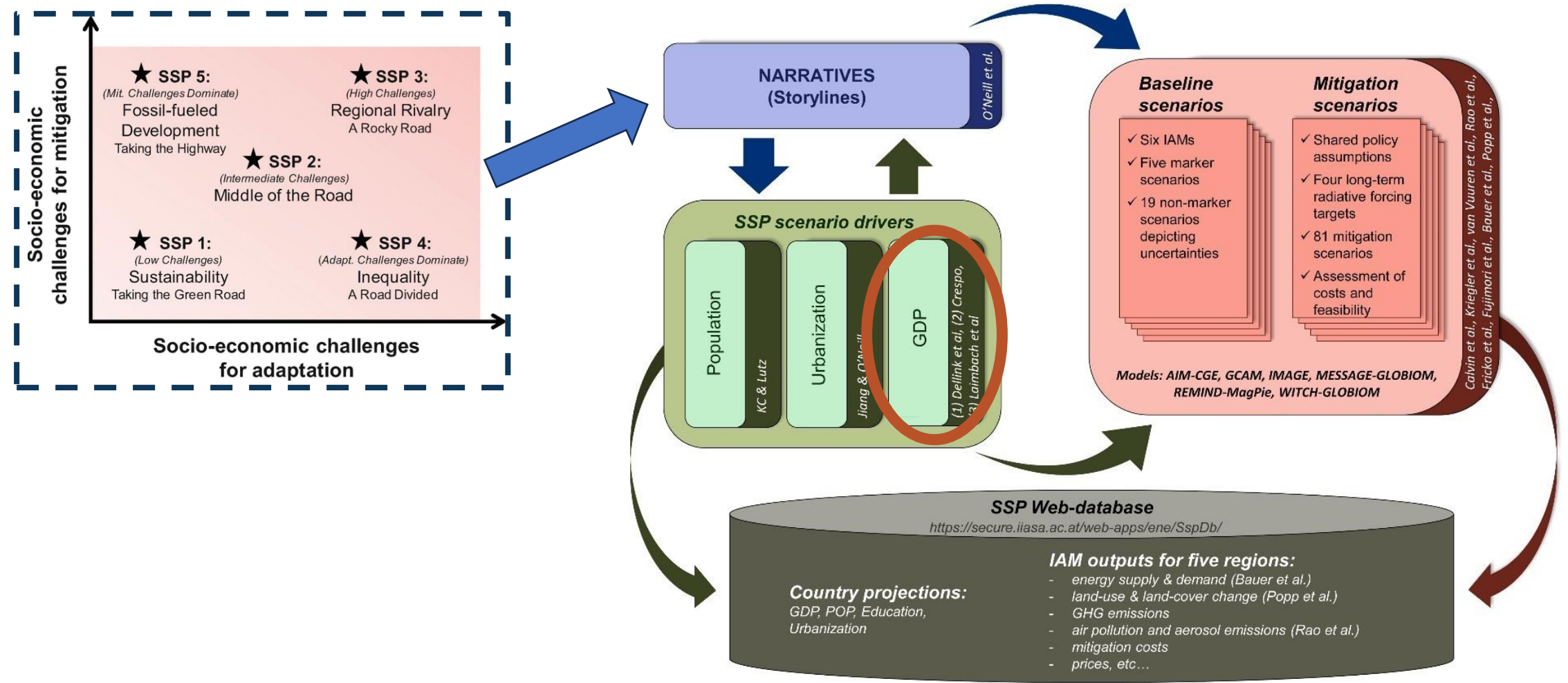
# From models to scenarios



E3ME-FTT (PKE-Green) "vs" GEM-E3-FIT (general equilibrium-Red)

# From models to scenarios

## Shared Socio-economic Pathways

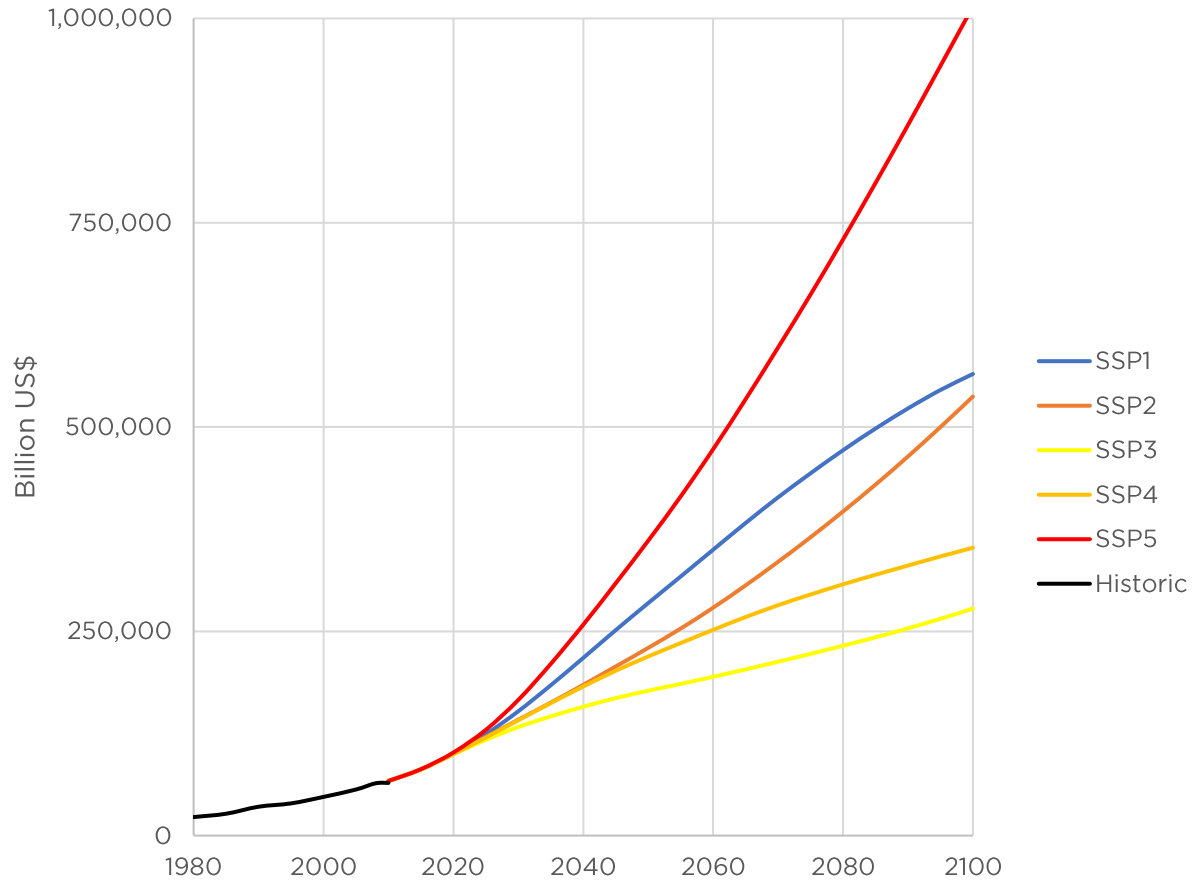


O'Neill et al., 2017, The roads ahead: Narratives for shared socioeconomic pathways describing world futures in the 21st century. Glob. Environ. Change 42

Riahi et al., 2017, The Shared Socioeconomic Pathways and their energy, land use, and greenhouse gas emissions implications: An overview. Glob. Environ. Change 42

# From models to scenarios

GDP projections from the SSP



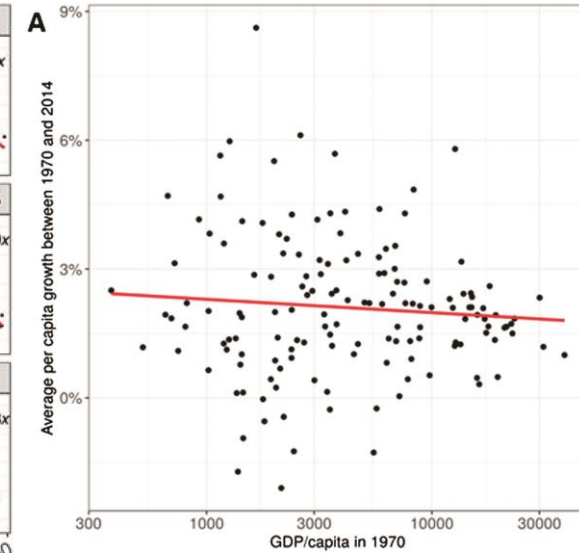
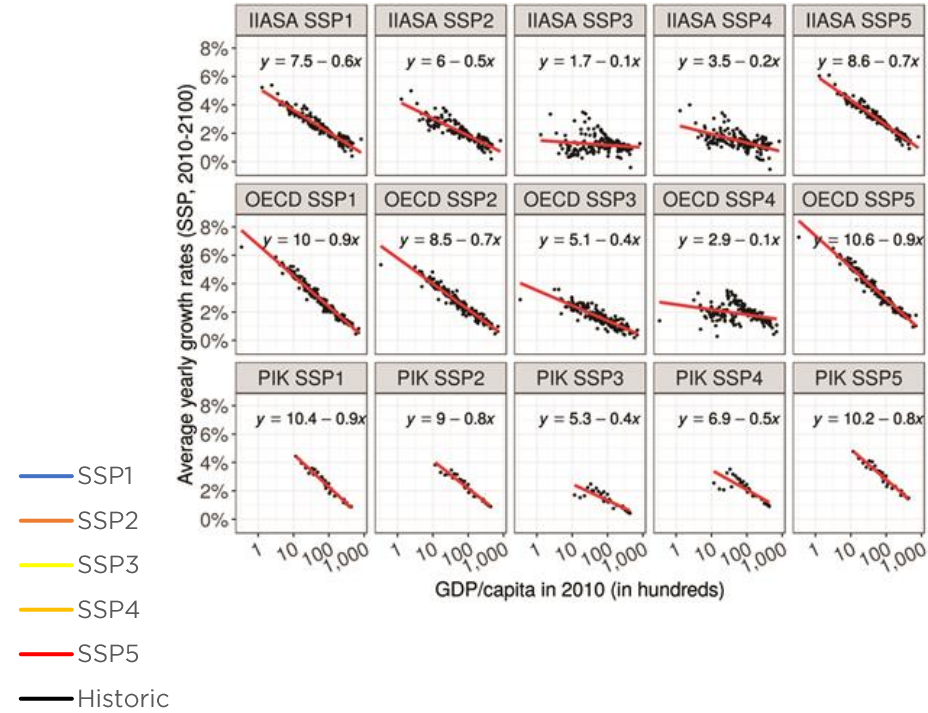
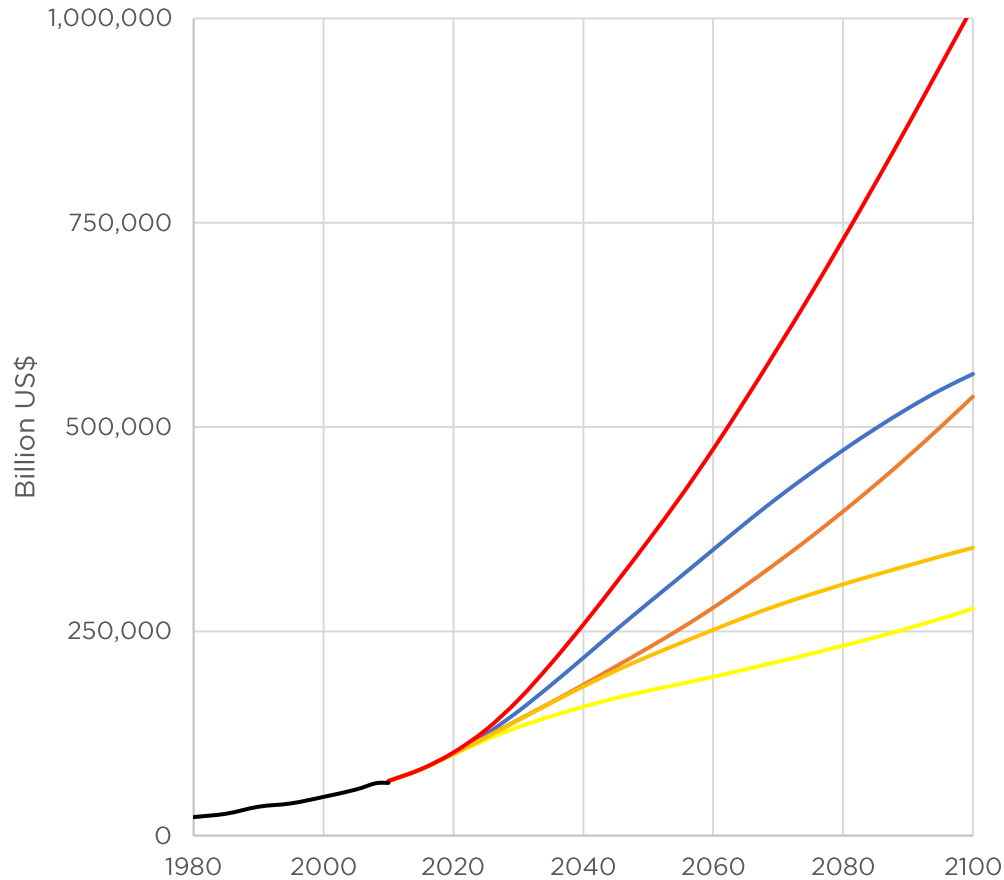
Optimal growth model

$$\approx GDP = AK^\alpha L^{1-\alpha}$$



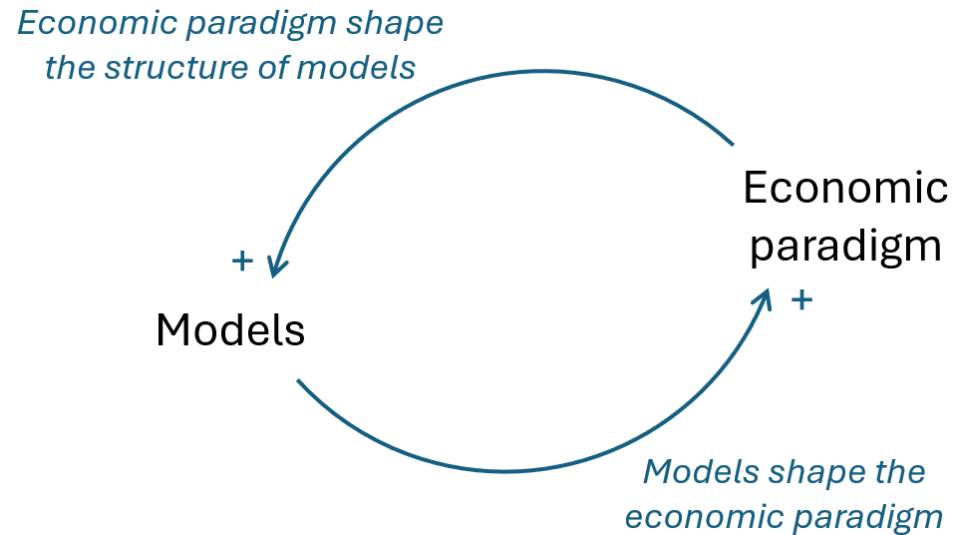
# From models to scenarios

GDP projections from the SSP



- The model computes the maximum potential growth
- Should not be interpreted as a descriptive behavior

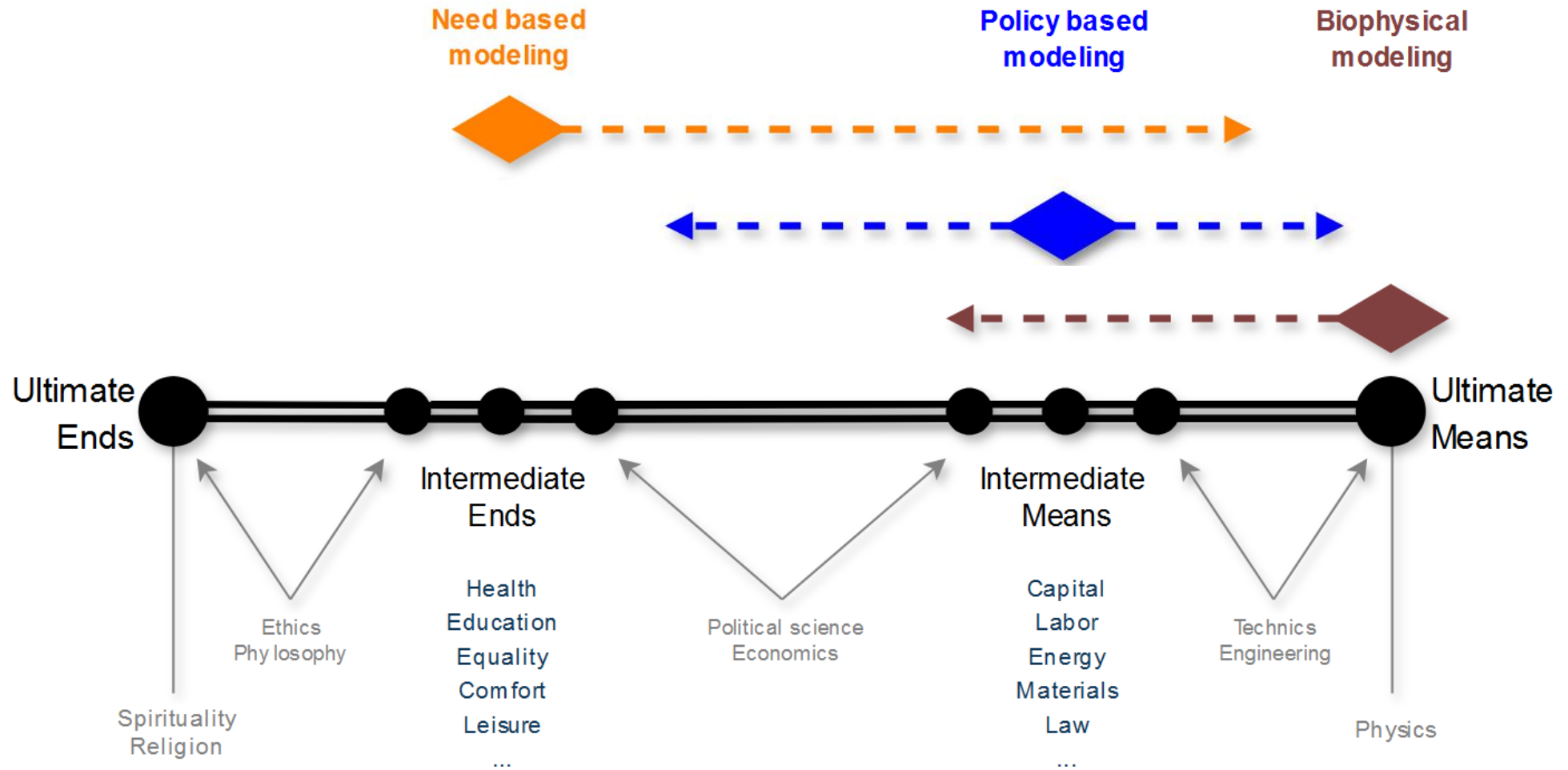
# Towards novel modeling approaches ?



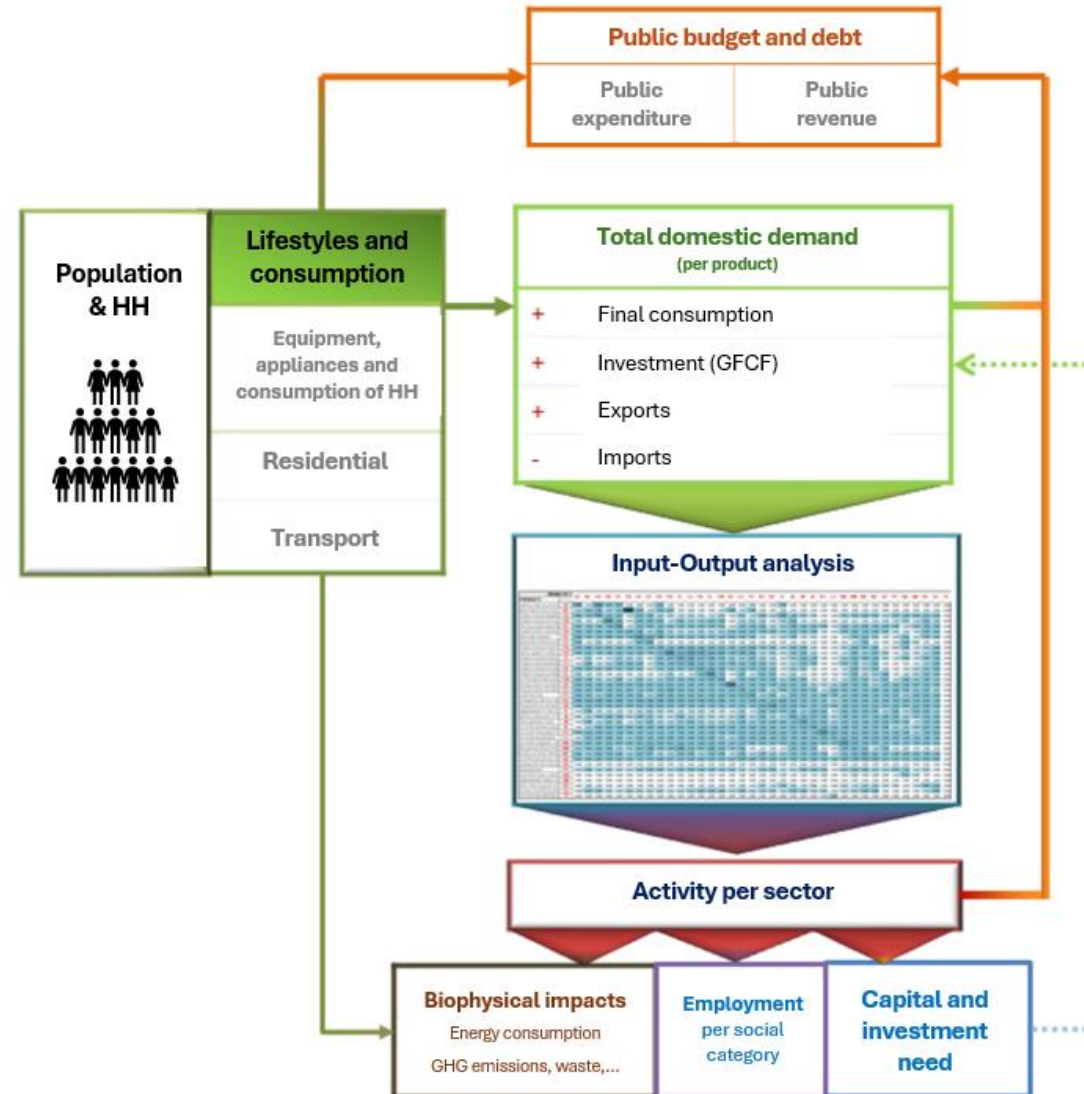
Other possible approaches to modeling:

- Least risk
- ‘optimal’ environmental pressure
- Need-based

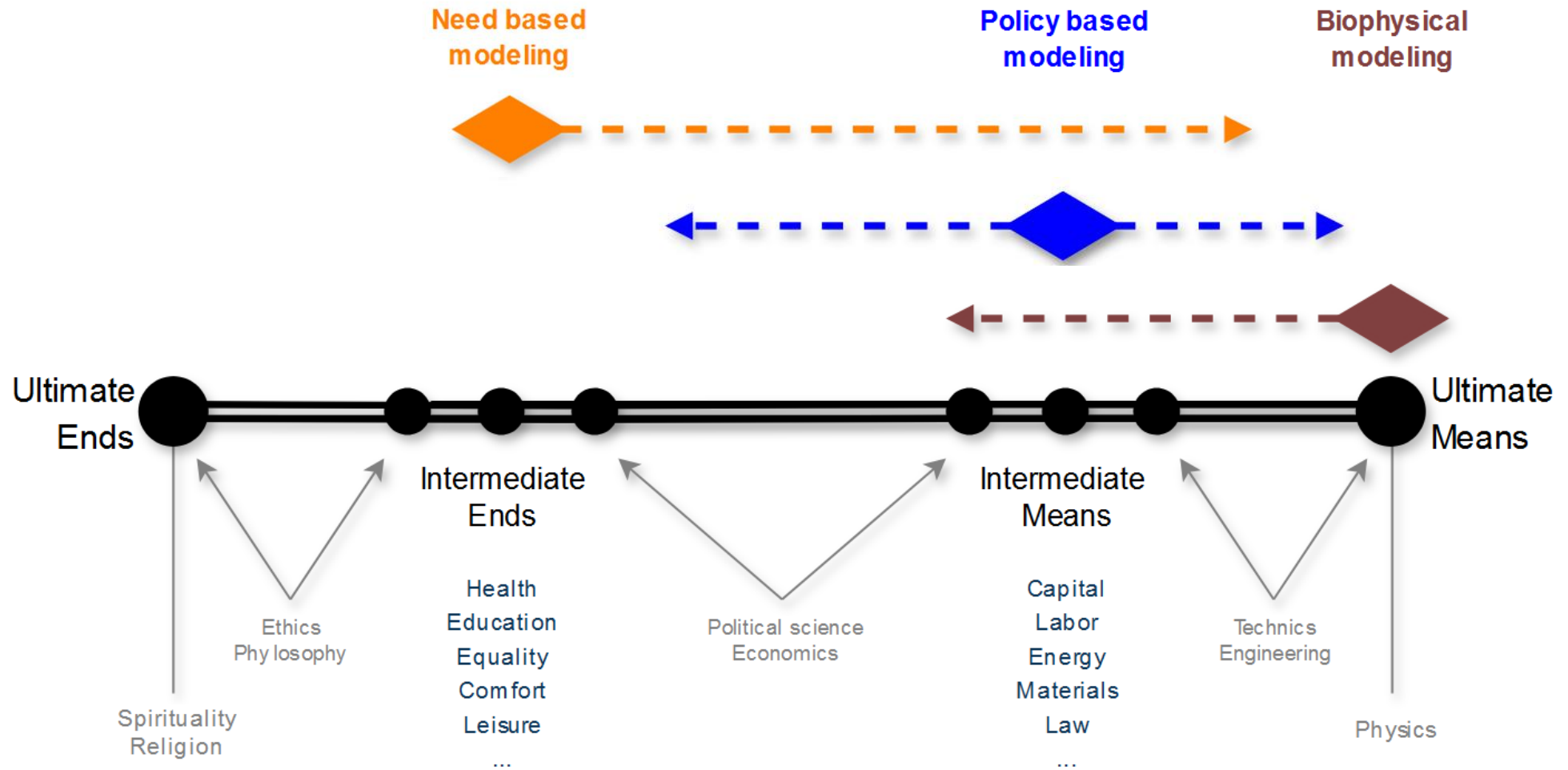
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