



Universität für Bodenkultur Wien
Department für Wirtschafts- und
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Institute of Social Ecology

MAT_STOCKS Kick-off: Modul 4 – A dynamic stock- flow model of future option spaces

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Goals for Module 4: dynamic modelling



Overarching goal: Establish a global, dynamic model suitable to characterize option spaces for future socioeconomic metabolism (stocks, flows & services) until 2050, including a GHG module

Specific goals:

- Calculate resource requirements resulting from estimates of future stocks required to achieve selected SDGs (2030 & beyond)
- Evaluate the implications of resource constraints respectively emission budgets compatible with 2.0°C and other targets for building up stocks and delivering services
- Calculate emission trajectories up to 2030/50 for selected scenarios

Highly relevant results for climate assessments, modelling communities and sustainability transformations

Draft model specifications



- **System-dynamic simulation model** without cost-optimization integrating a stock-flow model (dynamic stock model) with the analysis of biophysical **option spaces** (similar to BioBaM)
- Calculate resource requirements, GHG emissions and recycling potentials in both „**what-if**“ and „**forced future**“ (backcasting) applications
- Can calculate stock trajectories from predefined changes in future input flows, and conversely, assess implications of resource scarcity or emission budgets on stock development
- 10-20 world regions

Timeplan: 07/2019 – 10/2022



Table B2-1. Time plan of MAT STOCKS

Year	1				2				3				4				5			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
M 0 Project management	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
M 1 National level data	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
M 2 Mapping material stocks		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
M 3 Stock/flow/service nexus													■	■	■	■				
M 4 Dynamic stock/flow model									■	■	■	■	■	■	■	■	■	■	■	■
M 5 Implications for sustainability									■	■	■	■	■	■	■	■	■	■	■	■

- ~17 MM SEC Staff & 1 PhD
- PhD project: ?
- Close interactions with M3 required?
 - Analytical insights useful to „parametrize“ the model?
 - Two joint PhDs between M3 & M4?



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