

## "ClimTrans2050"

*Open source model for analyzing Austria's  
transition to a low carbon society by 2050 –  
A research plan*

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**Klimatag**

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- **The project team**

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# Why a research plan for an open source model?

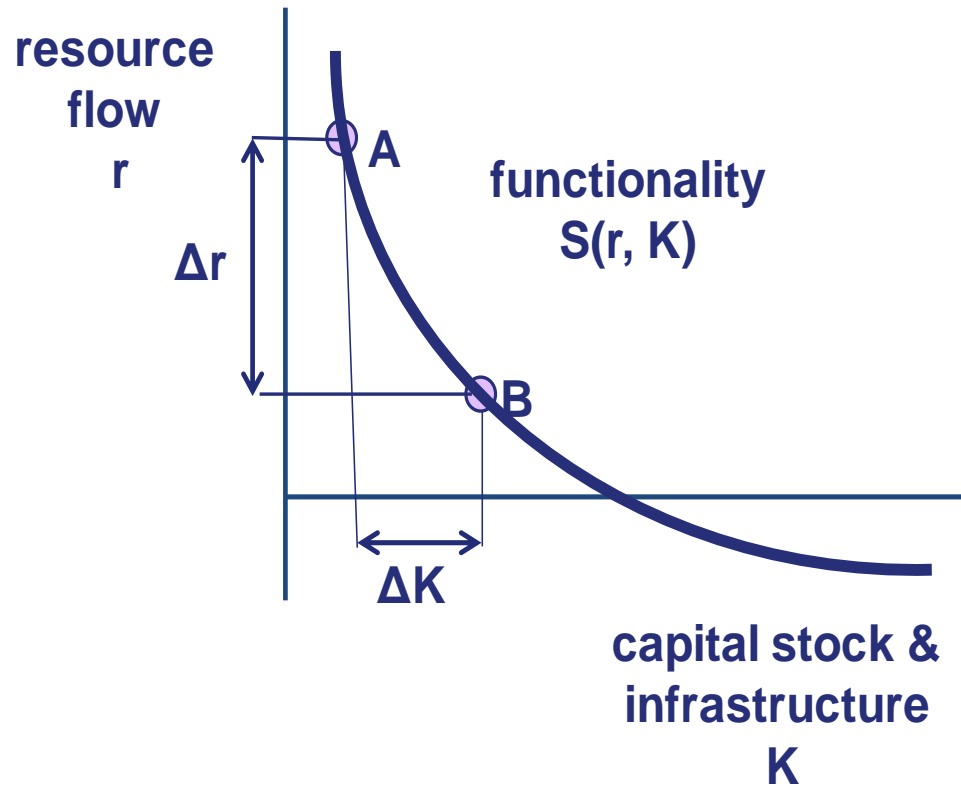
- **Policy needs guidance for long run transition**
- **Available tools to capture these processes not sufficient**
- **Application of existing economic models to the very long run faces limitations (Pindyck (2013, 2015), Rosen (2015), State of EU Environment Report (2015))**
  - **Changes in the capital stock (Breakthrough technologies) need to be addressed**
  - **Analysis of radical vs. incremental path changes**
  - **Detailed modeling of energy, emissions and economic structures – deepened structural modeling**
- **Guiding questions:**
  - **What kind of modeling framework for assessing long term transformation process?**
  - **Which model extensions allow a better understanding of transformation options?**

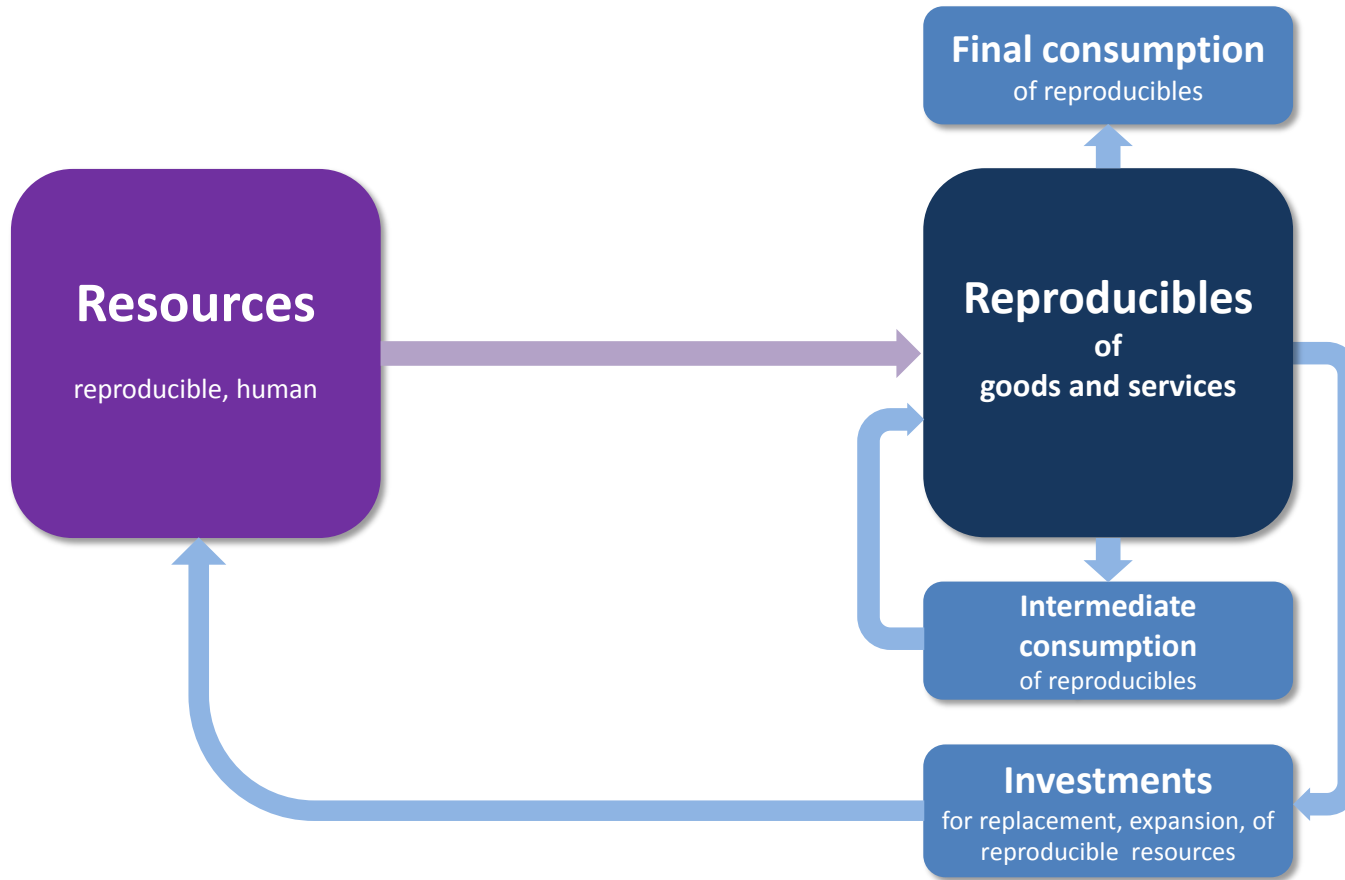
- Research Plan presents a first step for a new modeling approach
- Aims at coherent and understandable modeling guidelines that put the focus on functionalities (relating to housing, mobility, nutrition, etc.)
- Focus on stocks and flows that together supply functionalities
- A setting that allows to integrate the research activities in a stepwise manner, ultimately arriving at an open-source model that fully covers the Austrian emission inventory in relation to the three tiers.
- A new perspective for modeling activities in view of a 2050 horizon
- A modeling framework that is able to analyze transition processes
- A new perspective on energy, emissions and economic structures
- Embedding of national emission target paths consistently into global context

- Deepened structural modeling framework along a three tier approach
  - Physical, economic and institutional dimension
- An exemplary model module as illustration and application of the deepened structural approach to analyzing energy systems.
- Web-based platform for disseminating the research plan and exemplary model modules to stakeholders and the research community
- Identification and guidance for the next research steps
  - following the three tier approach

- **Functionalities (e.g. nutrition, shelter, mobility) are the outcome of the interaction of stocks (e.g. buildings and machinery) and flows (e.g. energy, materials)**
- **The concept of functionalities**
  - aims at capturing the ultimate purpose of economic activities
  - emphasizes the interaction between stocks and flows
  - allows to capture the impact in the investment and operating phase
  - allows to capture details in technologies
- **The concept of functionalities is made operational along three tiers**
  - **Tier 1** is dealing with the physical structure of the system that finally determines the amount of emissions
  - **Tier 2** represents techno-economic dimension (capital stocks and flows; availability of technologies, investment and operating costs)
  - **Tier 3** considers the embedding of tier 1 and tier 2 into an institutional setting (instruments, mechanisms, behavioral change)

# Stock-flow interactions for providing functionalities

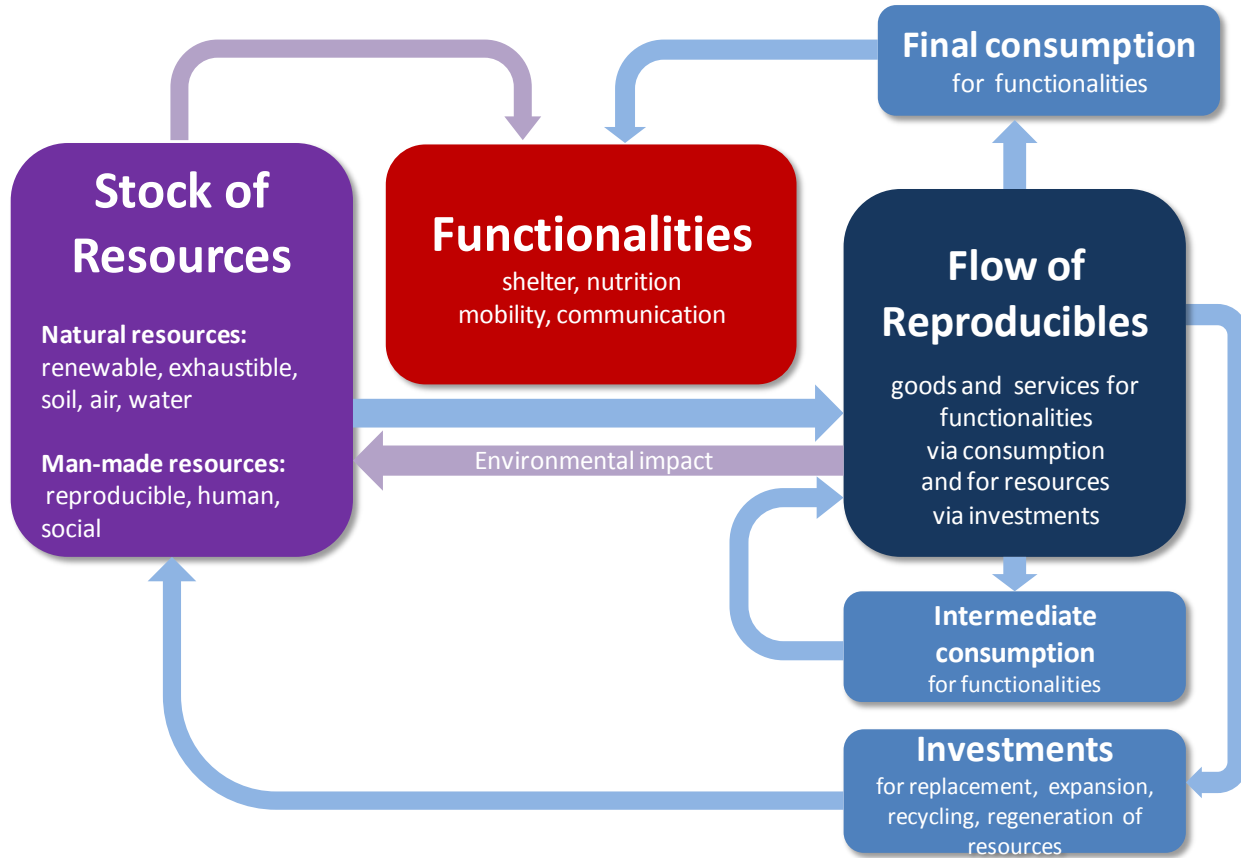


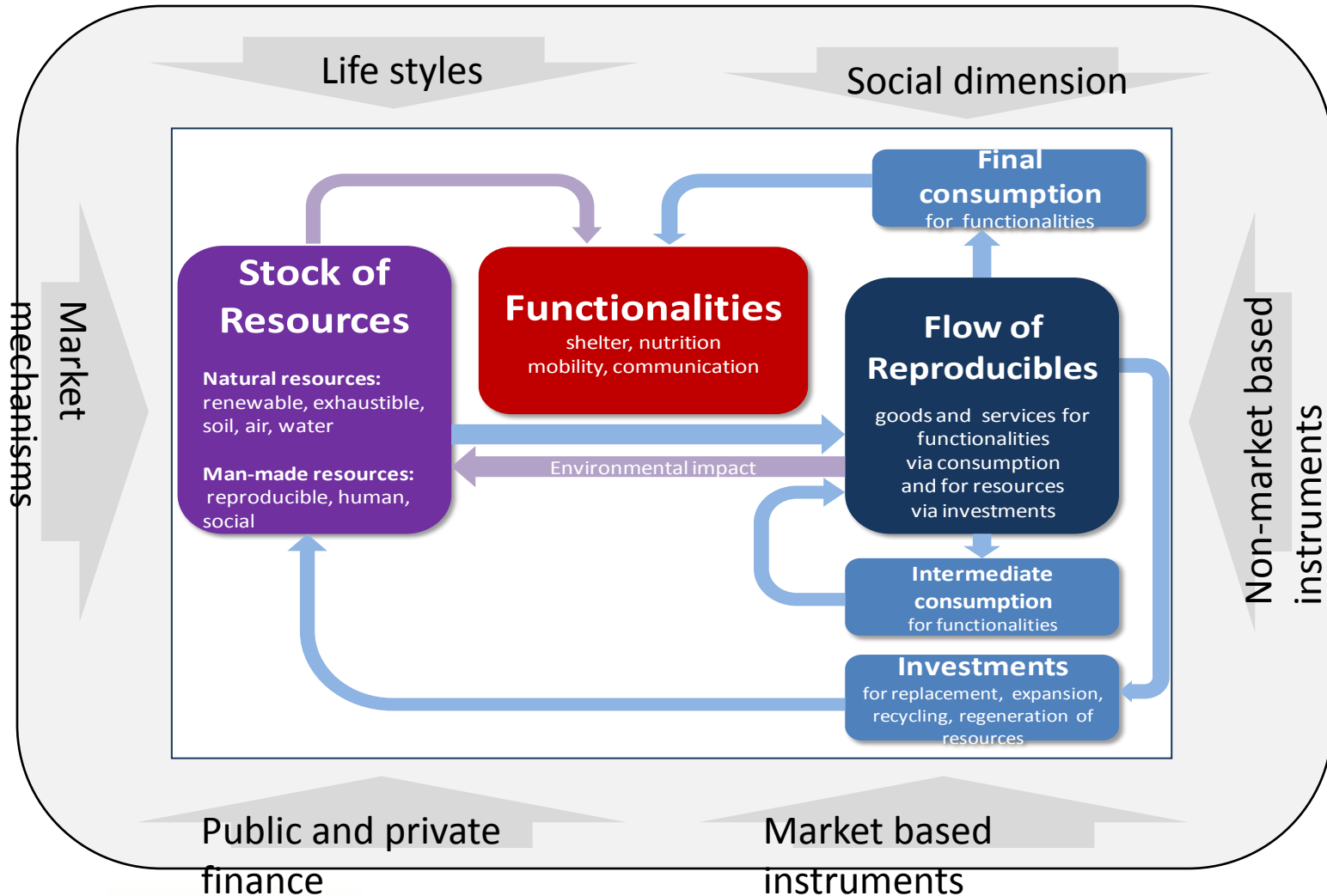




# Deepened Structural Modeling for the Three Tiers Approach

Deepened structural modeling





## Web based Platform:

[http://climtrans2050.wifo.ac.  
at/tiki-index.php](http://climtrans2050.wifo.ac.at/tiki-index.php)

**Thank you for your attention**