Karlsruher Institut für Technologie

otello:
An Integrated Assessment and Allocation Model to Support the Development of Clean Air Strategies in Germany

NIAM meeting – Laxenburg 22.-23.03.2010

French-German Institute for Environmental Research (DFIU)

DFIU

ISI Institut System- und Innovationsforschung

IWW

ÖÖW

Agenda

- framework
- focus of the project
- modelling structure
- timetable
- conclusion

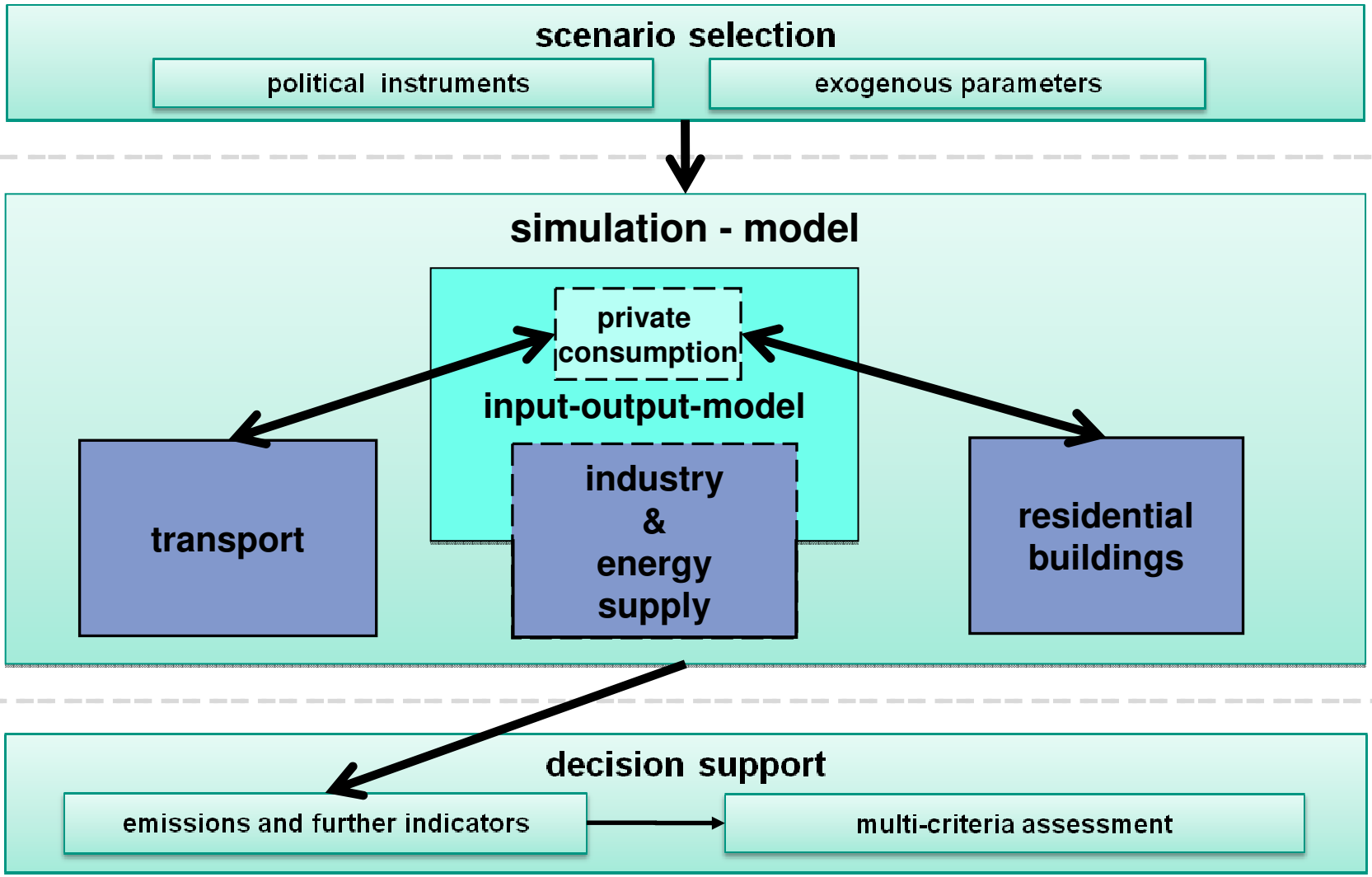
otello-Project: framework

- Grant by the German Federal Ministry of Education and Research (BMBF) within the program Economics for Sustainability.
  - i.e. otello is an independent research project
- Duration: 01/2008 - 12/2010 (planned)
- Partner Institutes:
  - French-German Institute for Environmental Research (DFIU-IFARE)
  - Chair of Sustainable Management of Housing and Real Estate (ÖÖW)
  - Institute for Economic Policy Research (IWW)
  - Fraunhofer Institute for Systems and Innovation Research (ISI)
- Co-operation with Federal Environment Ministry and Federal Environment Agency
- general objective:
  - to development an IAM to support clean air politics in Germany

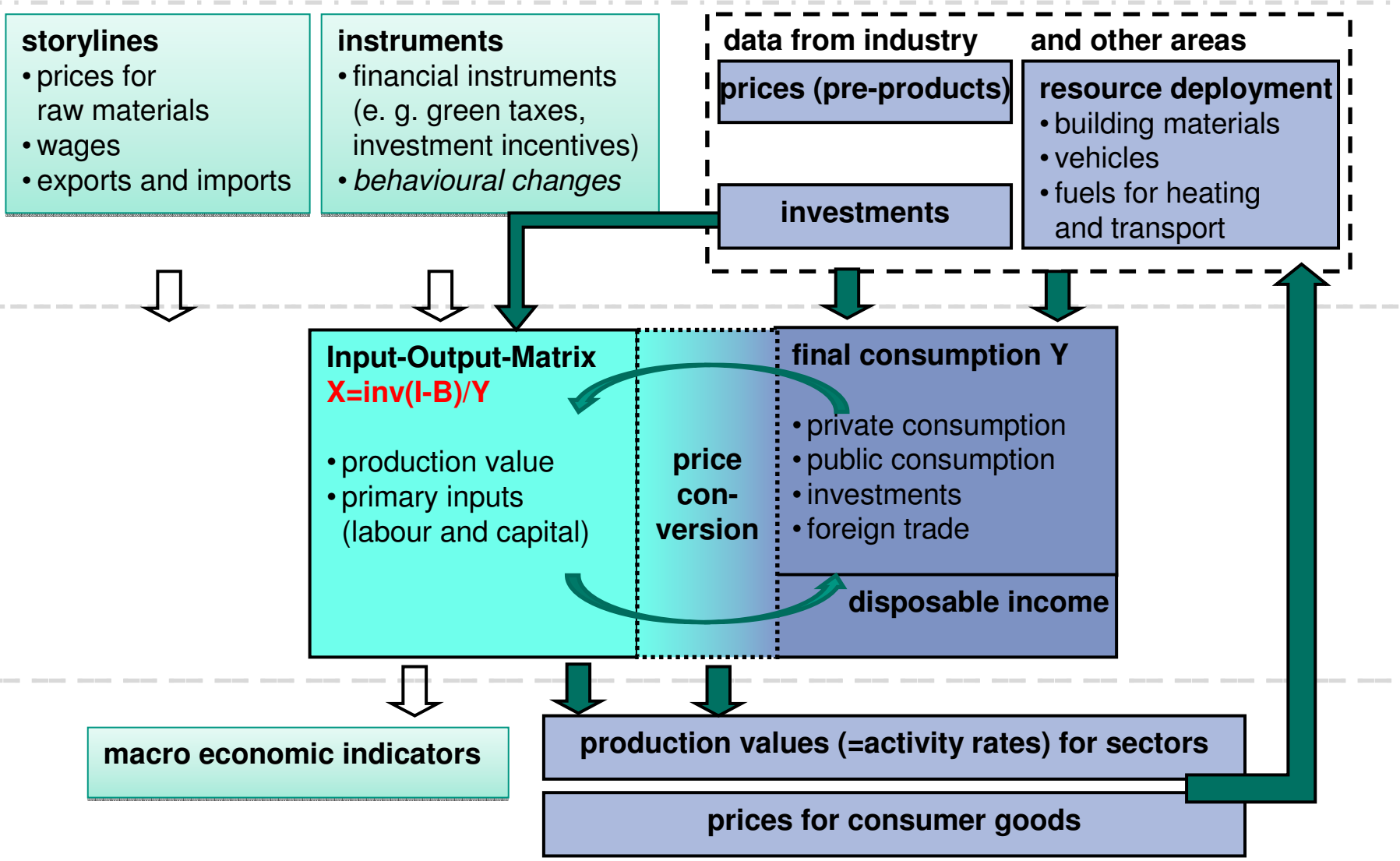
Focus on development and adaption of new methodological concepts for IAM

- dynamics in the economic system
  - interdependencies between activities and measures
  - between emission-areas (industry, buildings and transport)
  - between industrial sectors
- evaluation of non-technical-measures
  - process-integrated measures (structural measures)
  - demand side measures (behavioural changes)
- decision support
  - multi criteria decision analysis
  - scenario based decision support

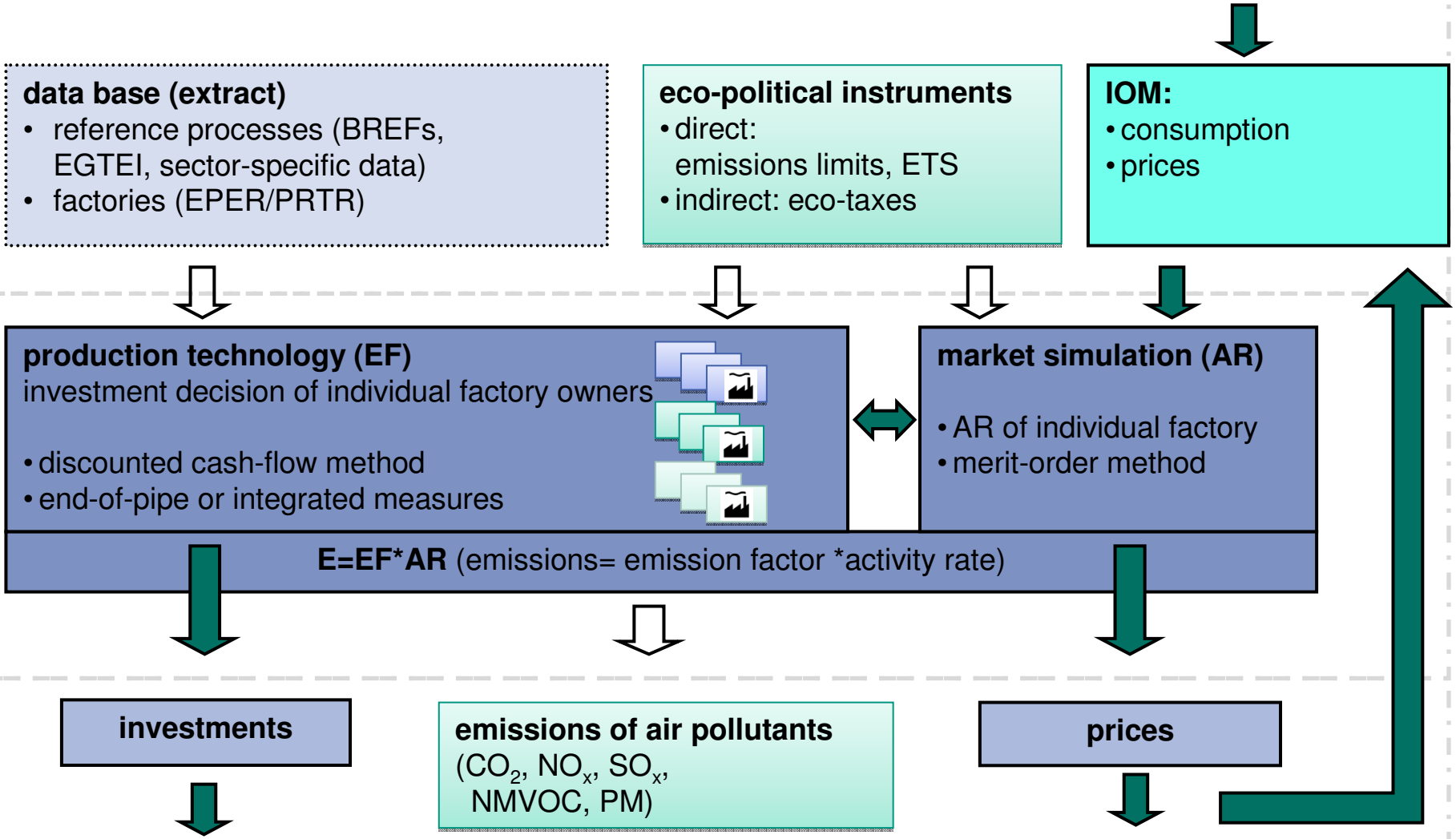
otello model structure



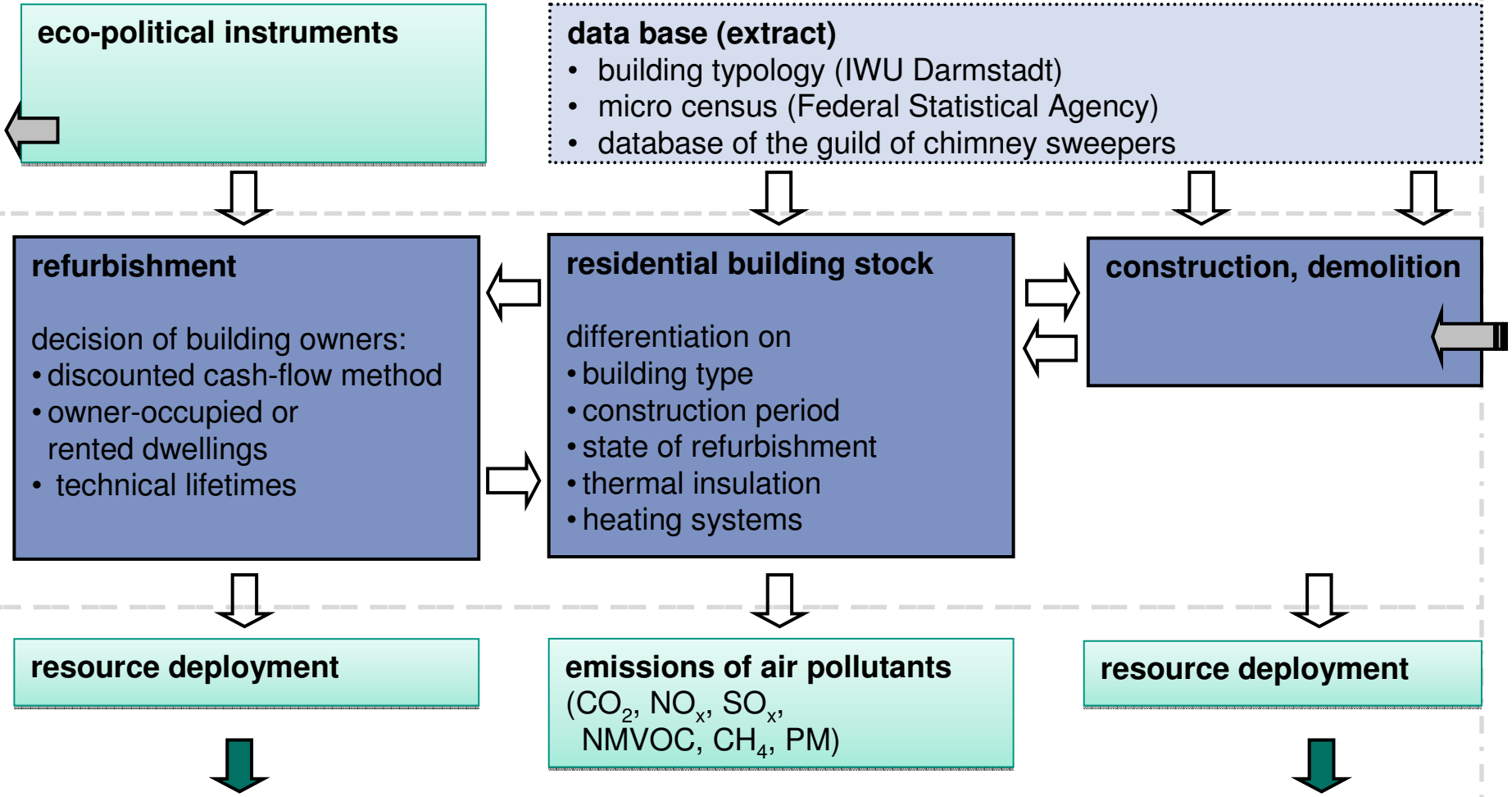
Input-Output-Model



Actor-oriented industry model



Dynamic building stock model



Transport model

eco-political instruments

data base (extract)
- saving potentials of single technical measures
- saving potentials of non-technical measures
- interdependencies between measures, transportation modes

- data from engineering journals, research reports, existing data bases and interviews with industry representatives

ASTRA
- macro-economic system dynamics model
- detailed vehicle fleet module

- differentiation on:
- transport modes: street transport, shipping and aviation
- transport sectors: passenger or freight transport
- fields of technology

emissions of air pollutants
(CO_2, NO_x, SO_x, NMVOC, CH_4, PM)

resource deployment

Decision support

combination of

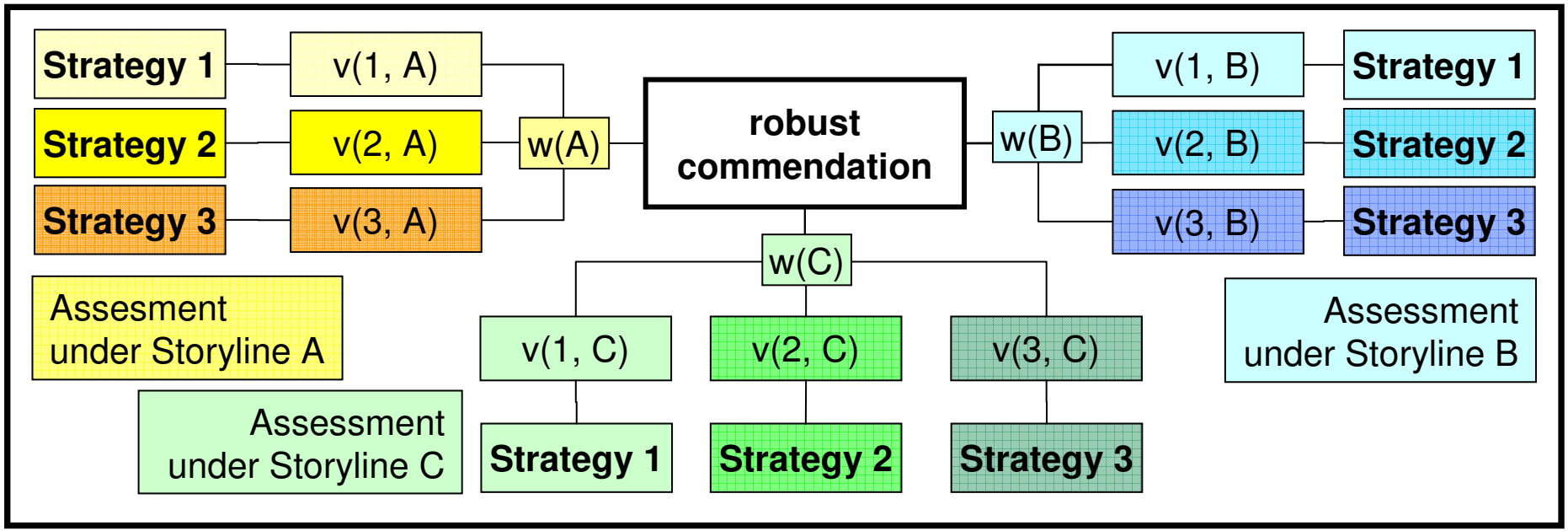
- ***scenario-based decision support***

  explores multiple plausible developments of a situation

- ***Multi-Criteria Decision Analysis* (MCDA)**

  operationalizes conflicting goals by an hierarchical attribute tree

  according to preferences of users



Status and Outlook

- current state:
  - modules are to a large extent implemented
  - calibration is on-going
- in April
  - assembly of the different modules and overall calibration
- from May on
  - analysis of different scenarios
  - reporting of the results

Conclusion

- Assessment of political instruments to deliver decision support

- Macro-economic input-output-model enables modelling of
  - **activity rates:**
    depending on measures taken in the transport, buildings and industry modules
  - **financial instruments:**
    e.g. green-taxes on fuels and electricity; support of RES, investment incentives
  - **demand-side measures (behavioural changes):**
    fuel switch and efficiency measures in transport or buildings, preference of „green“ products

- Consideration of process integrated measures in industry module
- Consideration of non-technical measures in the transport model
- Consideration of interrelations of measures
- detailed building stock model to estimate emissions of households

Karlsruhe Institute of Technology

Thank you for your attention.

Are there any questions or remarks?