INSTITUT FÜR ENERGIE- UND UMWELTFORSCHUNG HEIDELBERG

Structural and production technology-based determinants of resource efficiency (DeteRess)

Dr. M. Dittrich (ifeu), B. Ewers (ifeu), Dr. K. Schoer (SSG), Claudia Kämper (ifeu), Sabrina Ludmann (ifeu), Jürgen Giegrich (ifeu), Christian Sartorius (ISI), Torsten Hummen (ISI), Frank Marscheider-Weidemann (ISI)

on behalf of UBA, Germany

Contact: monika.dittrich@ifeu.de

Research question

Background:

- **Update of German Resource Efficiency Program (ProgRess)**
- **Search for an reasonable aim for resource efficiency indicator**

Research question:

- **What are chances and limitations of a technology-oriented dematerialization policy in Germany? What is the „corridor of action“ for policy?**
  - *What will happen without dematerialazation policy*
  - *What can be achieved with an additional ambitious, technology-oriented dematerialization policy?*

Scenario Development: AZE and TW

The corridor of action is described by:

- **Scenario "Expected Future Development (AZE)": estimats raw material use in 2030 based on known general developments and already adopted policies and measures to be implemented in the future**
  - e.g.: measures of *Energiewende*, population growth, transportation and population projections, urbanization trends, housing demand, improvements of recycling, …

And

- **Scenario "Technological Change" (TW): shows the additional reduction potential resulting from the use of selected innovative technologies**
  - E.g. new cement technologies, light weight construction in vehicles, improvement of particular recycling, measures in sustainable construction, …

Method development: URMOD

URMOD (Umweltökonomisches Rohstoffmodell)

- **is an emprically well founded, comprehensive and highly differenciated IO-based model; differenciation include, amongst other**
  - Construction sector (supply- and consumption side)
  - Metal processing sector (supply-side)
  - Recycling sector (supply-side)
  - Energy sector, including differentiation of renewable energies (supply- and consumption side)
  - Transportation sector (supply- and consumption side)
- **is harmonized with European RME-Model, including relevant information for differenciated calcultation of RME from european and non-european countries (e.g. energy-mix, recycling rates, ore grades)**
- **models the future in a static-comparative way which allows the analysis of single and combined effects of assumed changes and assumed measures**

Results: effct of assumtions and measures on RMI in 2030

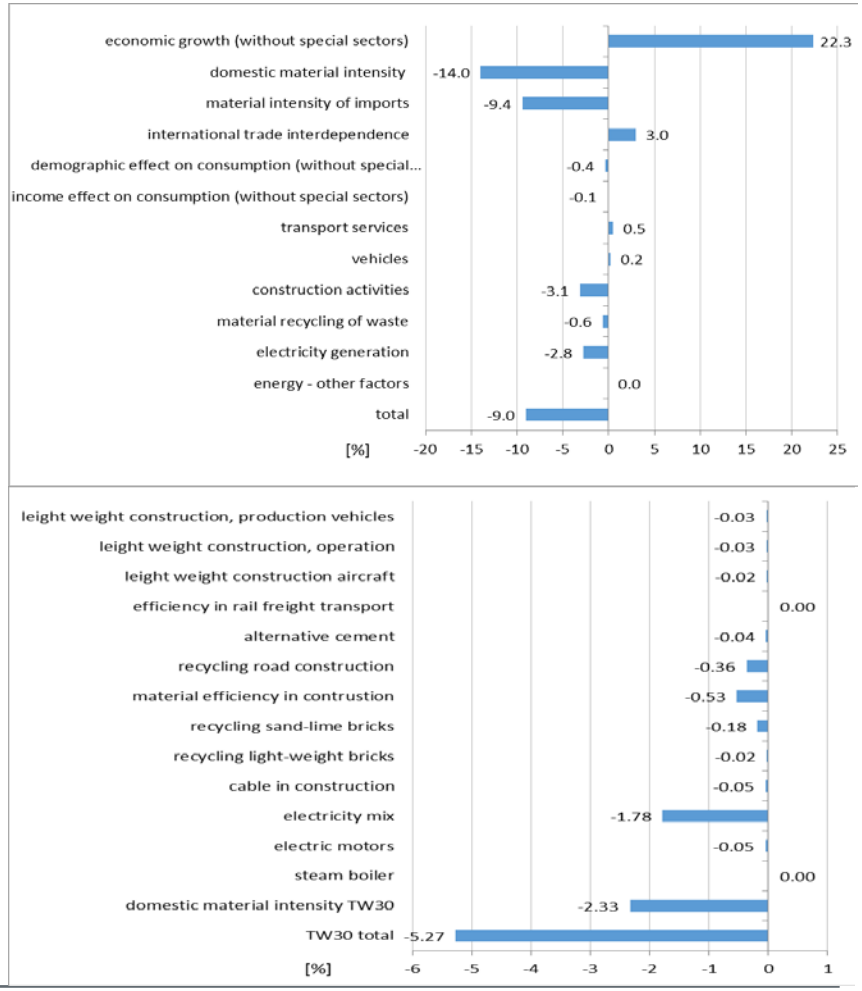
AZE, surprising results for 2030:

- Demand changes due to aging of population and due to effect of increasing income has rather small effects
- Decline of area sealing has higher effect than politically adopted measures of Energiewende

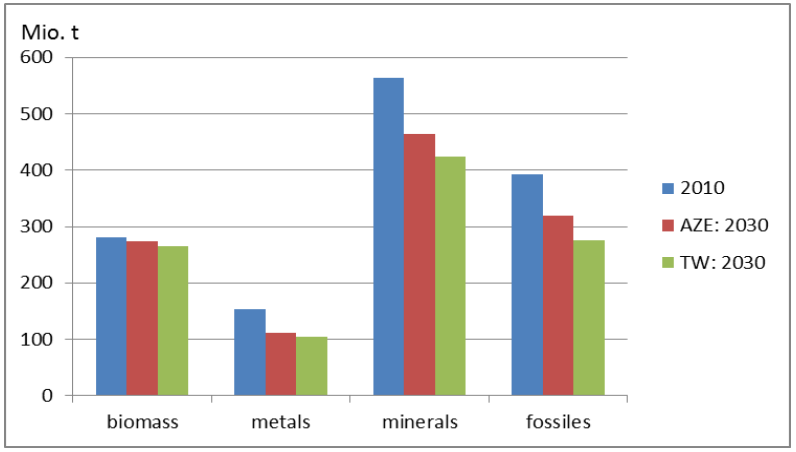
TW, surprising results for 2030:

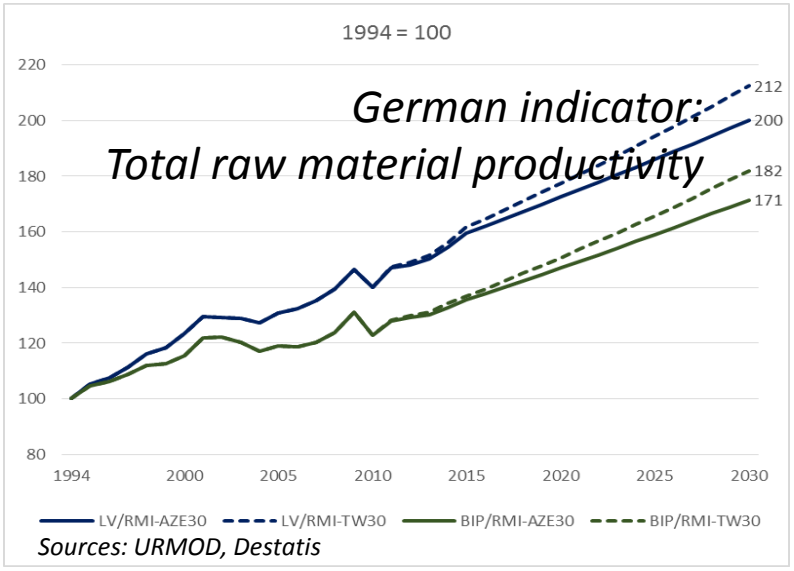
- High impact of increases in recycling measures
- High impact of further changes in electricity mix
- Overall result: technology-based measures contribute little, and in sum they contribute much

Effect on RMI in 2030, c.p.



Overall result and recommendation





Changes by material category (RMC):
Main decline in fossiles and minerals
Constant consumption in biomass

Corridor of action for technology-based dematerialization policy in Germany exists, it is small but it is worth to realize to potentials

Current aim of indicator „Total raw material productivity“ in ProgRess II (continuing the trend until 2030) is not ambitious enough