



POTSDAM INSTITUTE FOR
CLIMATE IMPACT RESEARCH

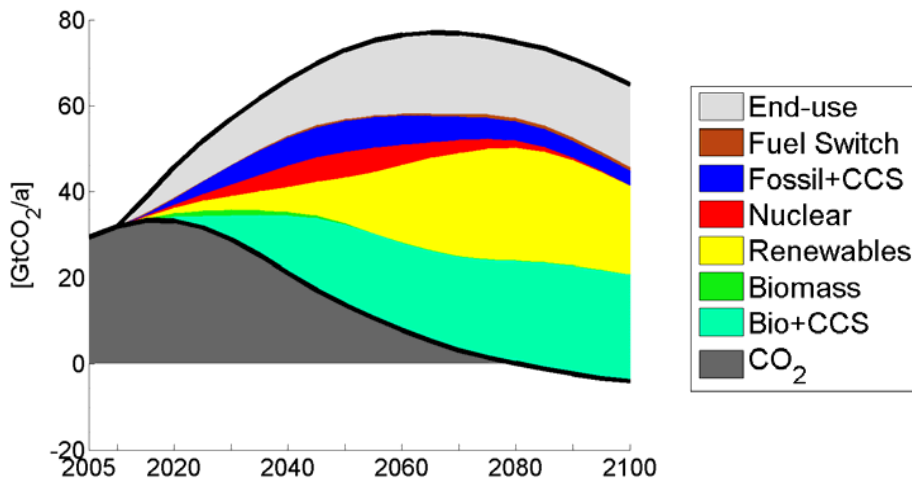
PIK meets HPI

14. Februar 2013

Die Modelle

REMIND

- Energiesystem+ Makroökonomie
 - Nuklearenergie ja/nein
 - Kosten von Klimaschutzoptionen



Lavinia

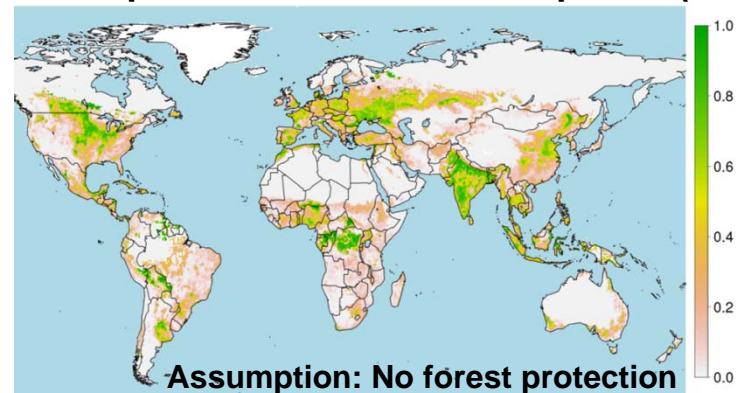


Anastasis

MAGPIE

- Globale Landnutzung
 - Emissionsvermeidungskosten
 - Zukünftige Rolle von Bioenergie

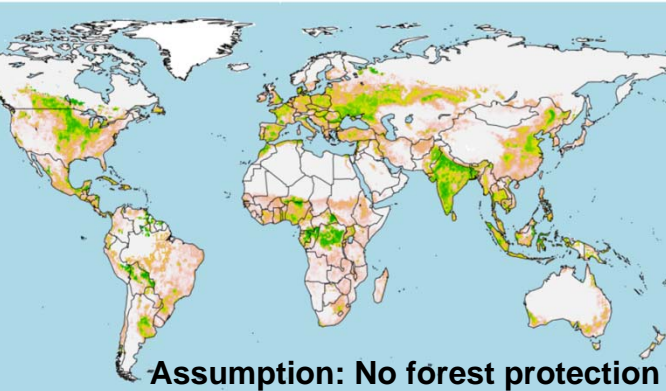
Cell-specific share of total crop land (2095)



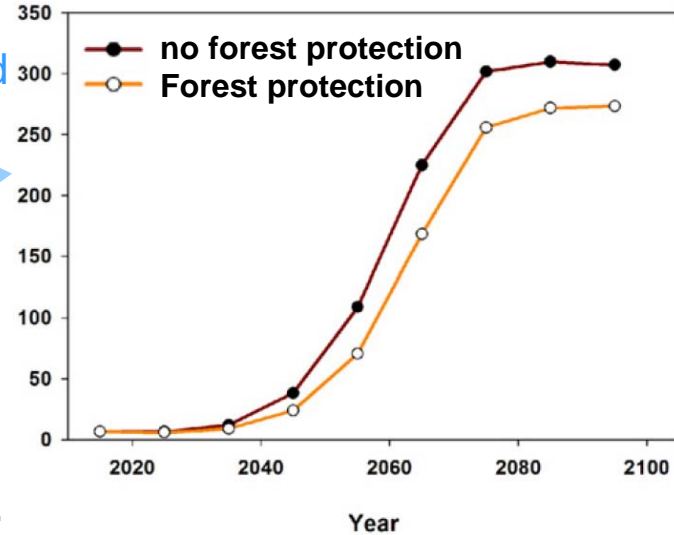
Jan

Global Bioenergy Assessment

Cell-specific share of total crop land (2095)

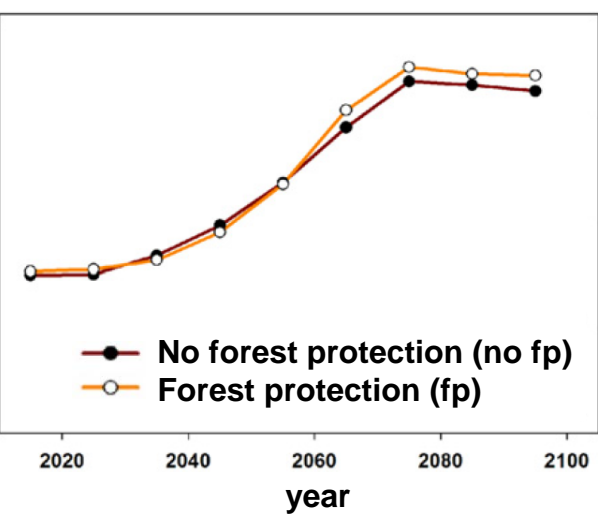


Bioenergy demand [EJ/Year]

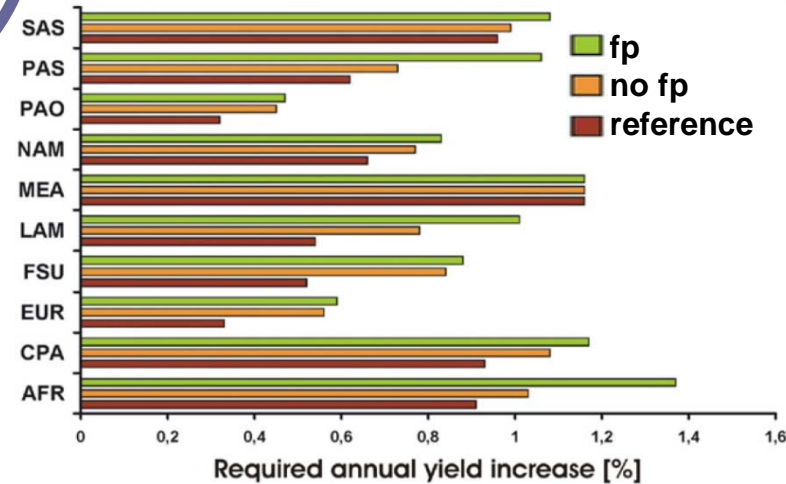


ReMIND

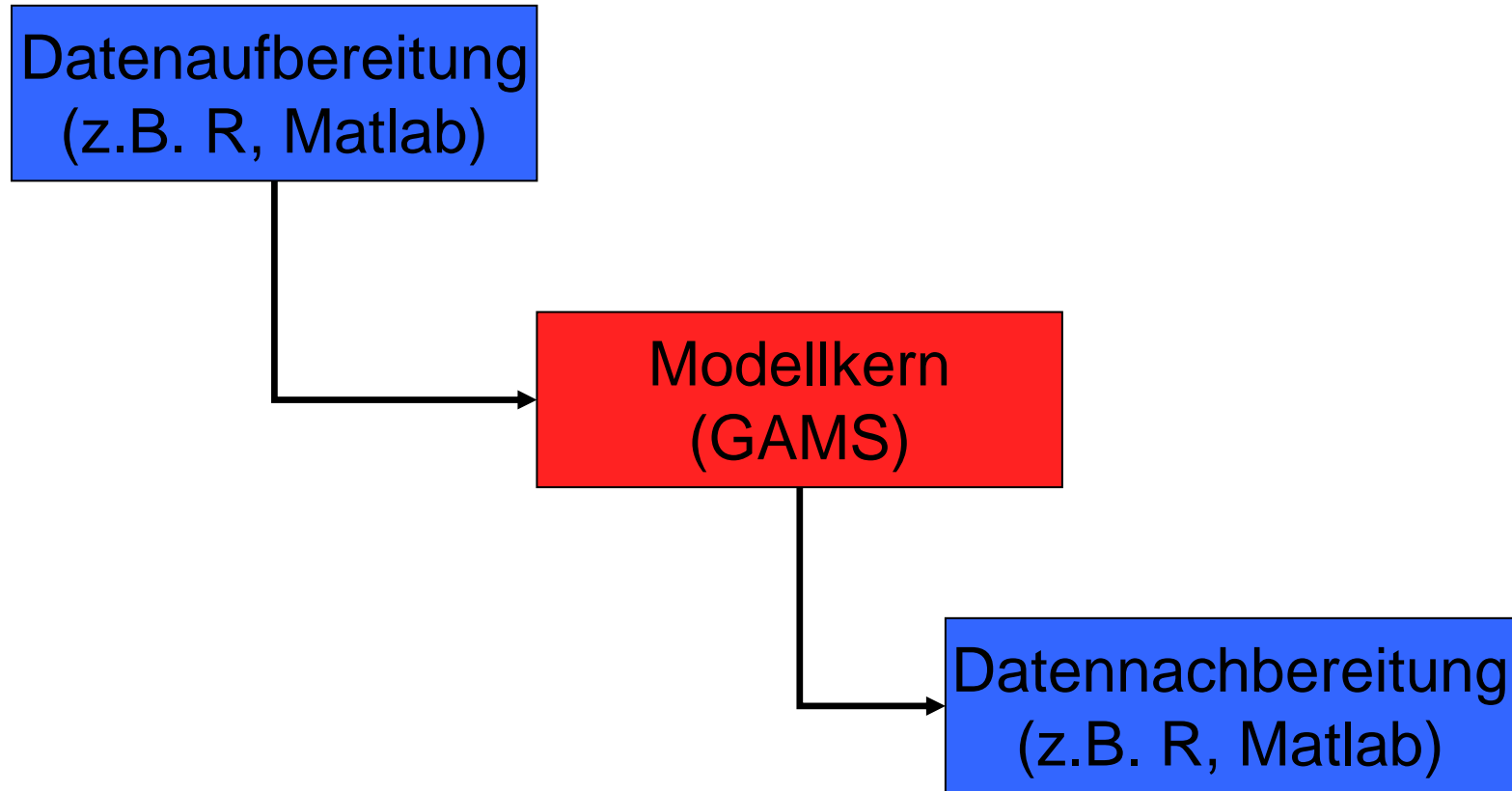
MAGPIE



Bioenergy Prices [US\$/GJ]



Die Modelle



Die Modelle

Modellkern (GAMS)

MAgPIE

- main.gms
 - [113] sets.gms
 - + [114] include.gms sets
 - [117] declarations.gms
 - + [118] include.gms declarations
 - + [121] input.gms
 - [122] include.gms input
 - + [L5] 10_fbask.gms
 - + [L6] 11_scenarios.gms
 - + [L7] 12_coupling.gms
 - [L8] 13_tc.gms
 - + [3] endo.gms
 - [4] exo.gms
 - [3] declarations.gms
 - + [4] input.gms
 - [5] presolve.gms
 - + [5] ts_corrected.gms
 - + [L9] 14_emissions.gms
 - + [10] 15_nr_impact.gms
 - + [11] 16_land.gms
 - + [12] 18_residues.gms

REMIND

- main.gms
 - [L4] IDIR "scenario/in"
 - [26] config.gms
 - [31] sets.gms
 - + [32] include.gms sets
 - [33] sets_calculations.gms
 - [38] declarations.gms
 - [39] include.gms declarations
 - + [L5] 10_climate.gms
 - + [L6] 20_taxes.gms
 - [L7] 30_biomass.gms
 - + [3] exogenous.gms
 - + [4] hoogwijk.gms
 - [5] magpie.gms
 - [L3] sets.gms
 - [L4] declarations.gms
 - + [L5] datainput.gms
 - [L6] equations.gms
 - [L7] preloop.gms
 - [L8] bounds.gms
 - [L9] presolve.gms
 - [10] postsolve.gms
 - [11] output.gms
 - + [L8] 31_fossil.gms
 - + [L9] 35_transport.gms
 - + [10] 80_optimization.gms

Projektidee #1: datenbankbasierte Modellkopplung

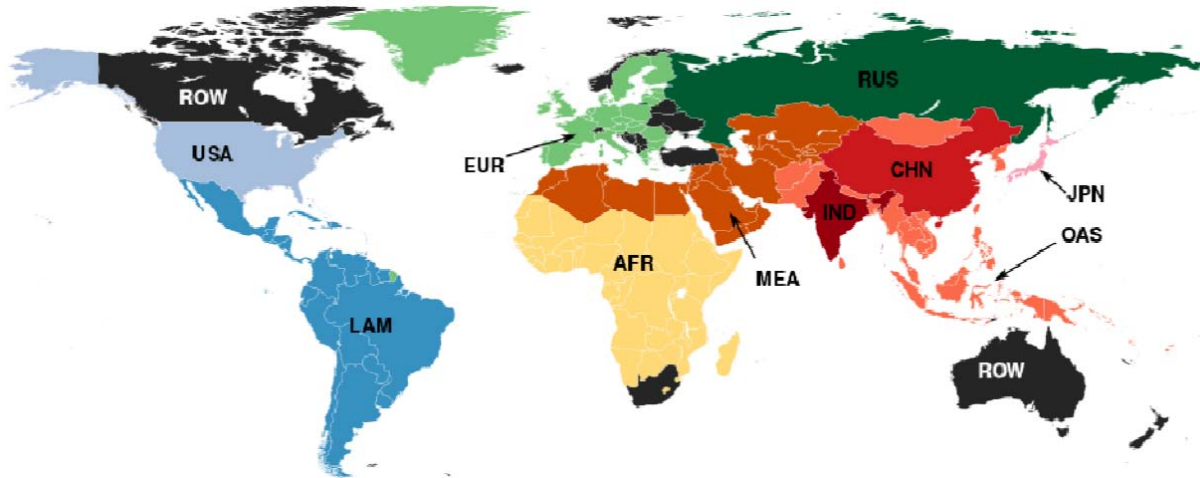
- **Ausgangssituation:**
 - **Kopplung zweier komplexer Modelle (LPJmL & MAgPIE)**
 - **Daten teilweise vorhanden, teilweise fehlend**
 - **Große Datenmengen (ca. 60.000x150x30 Datenpunkte pro Lauf)**
 - **Existierende Daten → Auslesen aus Datenbank**
 - **Fehlende Daten → Start LPJmL-Modell und Einspeisen in Datenbank**
 - **Datenaggregation**
 - **Performance**

Projektidee #2: Intelligente Inputdatenbank

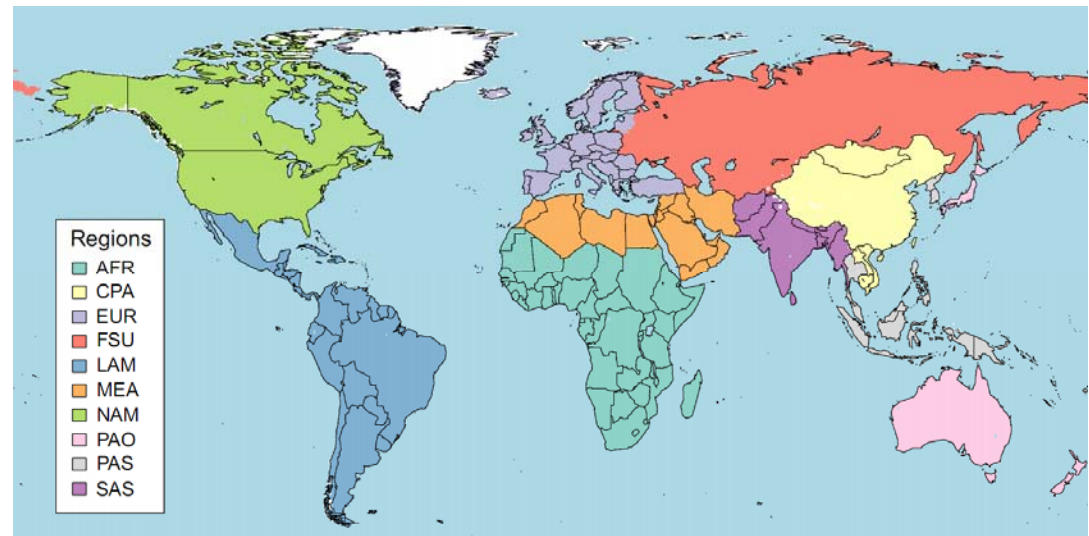
- **Generisches Problem in datenbasierter Modellierung:**
 - verschiedene räumliche, zeitliche und thematische Auflösungen
 - Datenlücken
- **Daten müssen vereinheitlicht werden**
- **Variable Aggregationsschemata benötigt**

Projektidee #2: Intelligente Inputdatenbank

REMIND

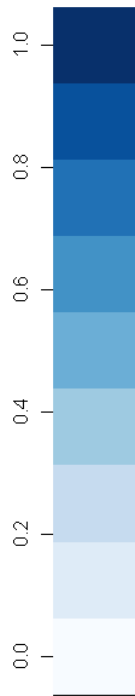
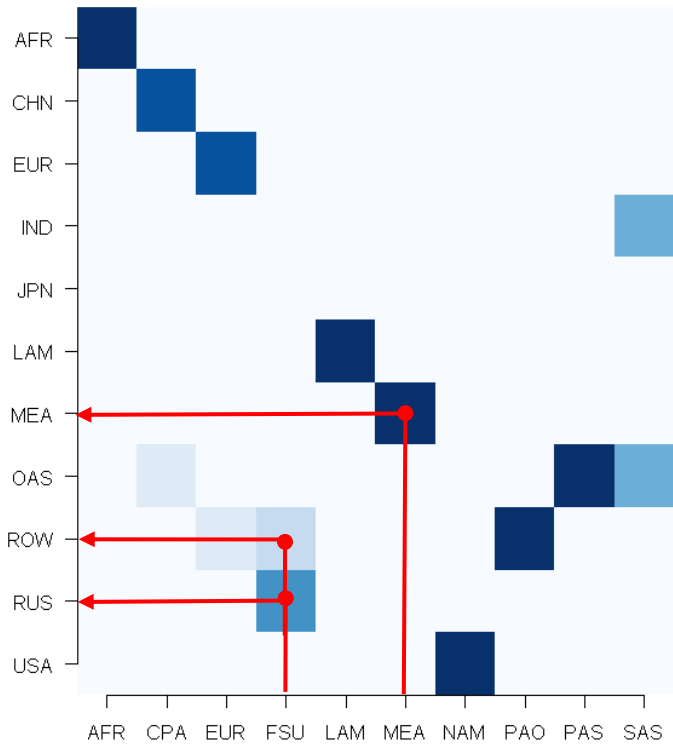


MAGPIE

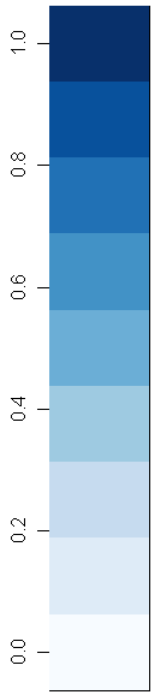
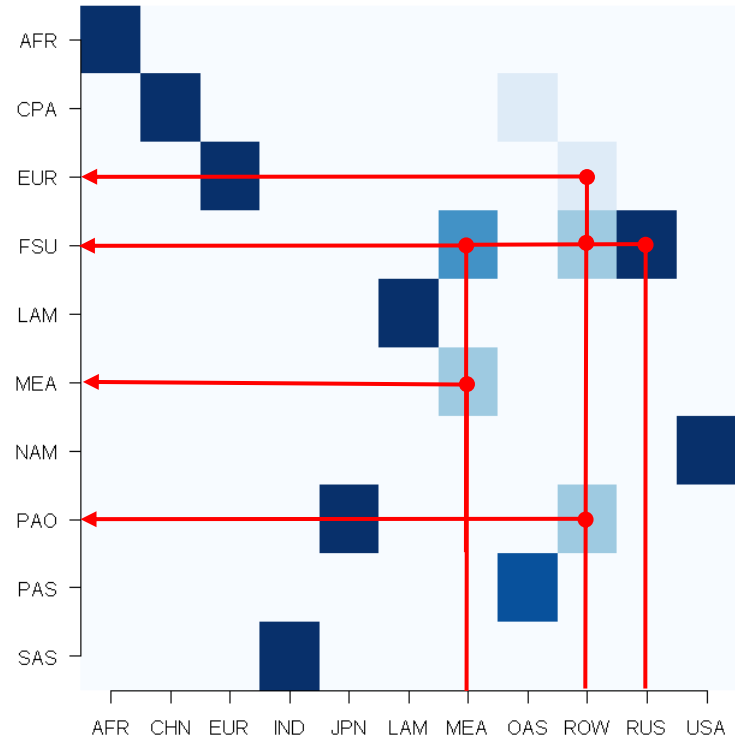


Regional mapping

Mapping MAGPIE - REMIND

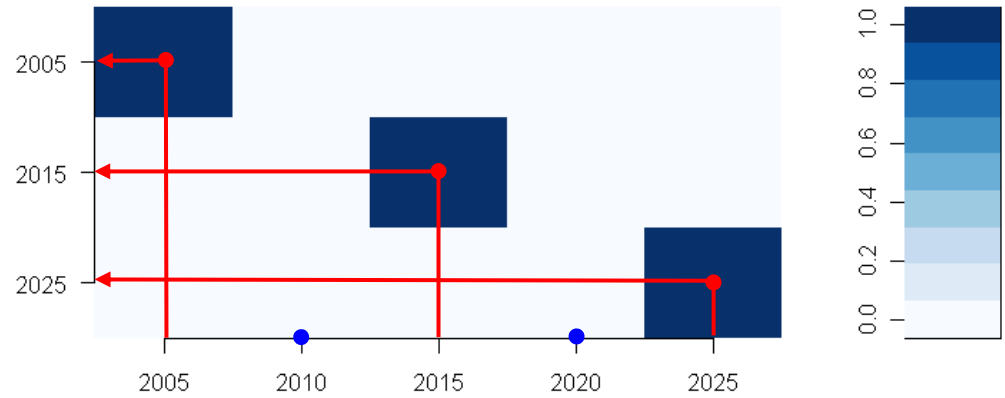


Mapping REMIND - MAGPIE

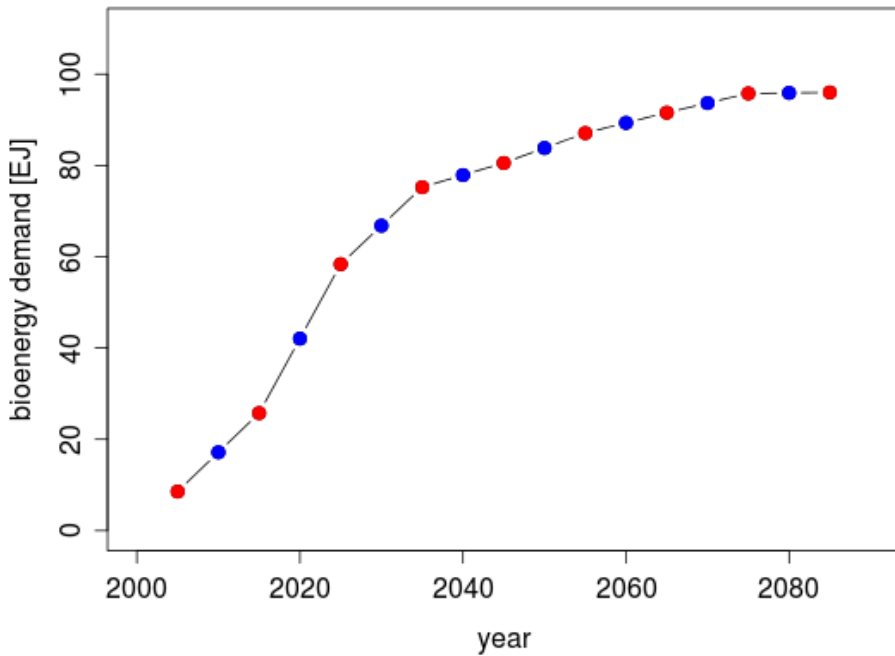


Temporal mapping

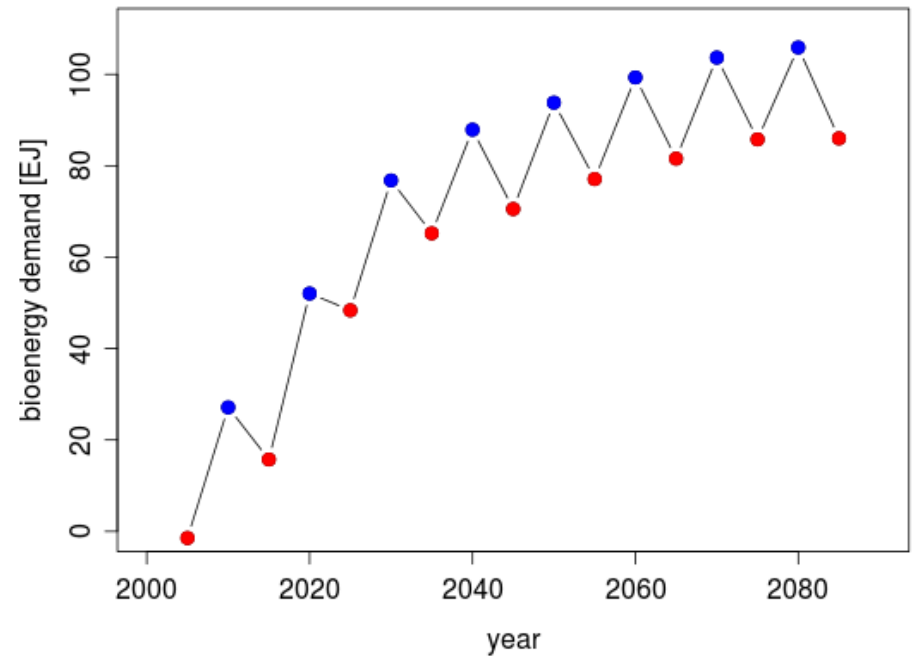
Mapping REMIND - MAGPIE old



expected behaviour



observed behaviour



Projektidee #2: Intelligente Inputdatenbank

- **Eigenschaften Inputdatenbank:**
 - **Verlustfreie Informationsspeicherung**
 - **Automatische, anwendungsbezogene Aggregation der Daten**
 - **Interpolation und Extrapolation fehlender Information**
 - **Einfache Einspeisung von Daten und Bedienbarkeit der Datenbank**

- **Anwendungsgebiete:**
 - **Modellierung**
 - **Validierung**
 - **Datenanalyse**