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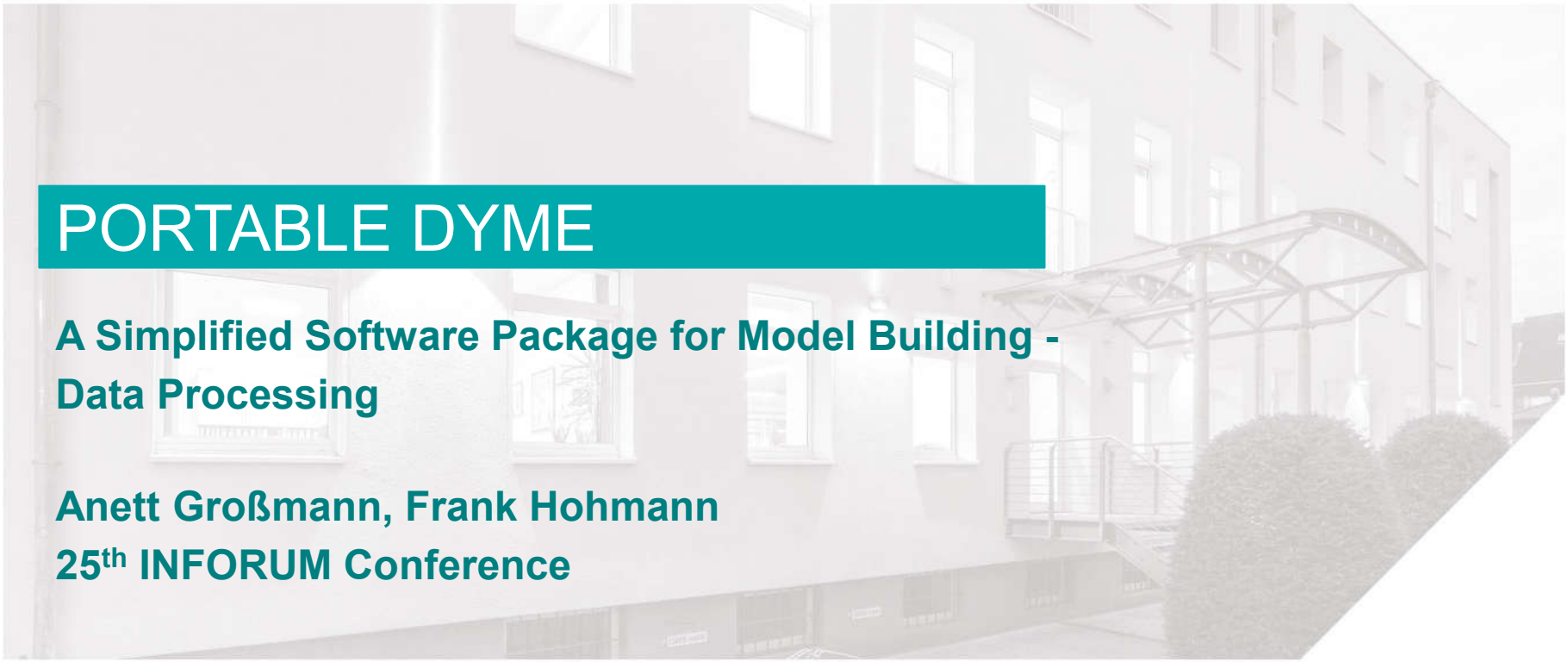

PORTABLE DYME

A Simplified Software Package for Model Building - Data Processing

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25th INFORUM Conference

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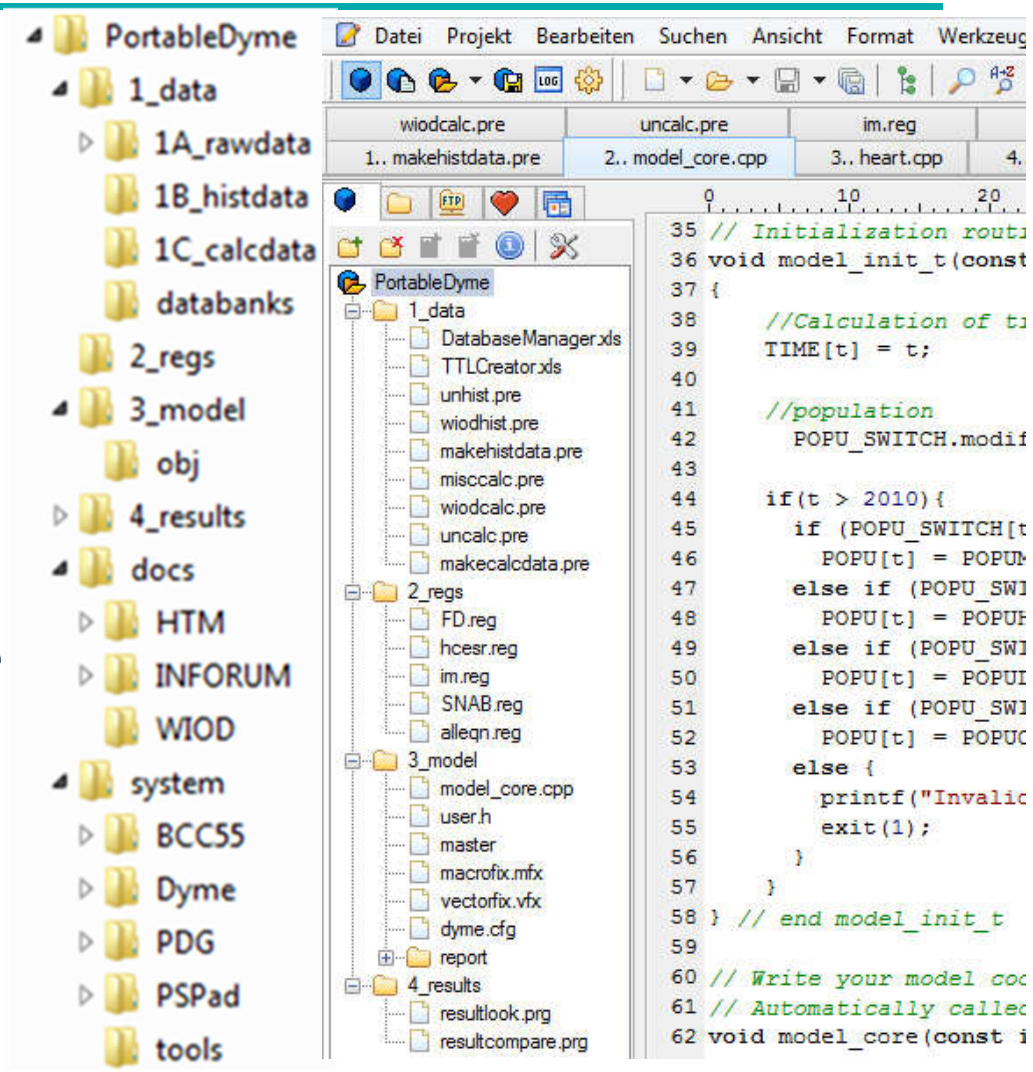
PART I: PortableDyme – An Overview

PortableDyme Model Building Framework

- What is PortableDyme?
  - ⇨ Complete model building framework (software and basic model)
  - ⇨ „Portable“ means „runs on any Windows computer without installation“
  - ⇨ „Dyme“ comes from the econometric programming library „Interdyme“ published by INFORUM, USA
- What‘s in there?
  - ⇨ Project management and editing tool
  - ⇨ Database maintenance tools
  - ⇨ C++ compiler (needed to write and execute the statements which form the model)
  - ⇨ G7 regression software
  - ⇨ Interdyme econometric programming library
  - ⇨ Basic macroeconometric Input-Output model template
  - ⇨ Evaluation tools based on Microsoft Excel

PortableDyme Model Building Framework

- The four major steps of model building:
  1. Building the historical database
  2. Performing regressions
  3. Writing model code
  4. Performing impact analysis and evaluating
- PortableDyme reflects these steps both on disk and in the project editor
- Each step contains preconfigured scripts and instructions
- Model building is an iterative process!



PortableDyme Model Template

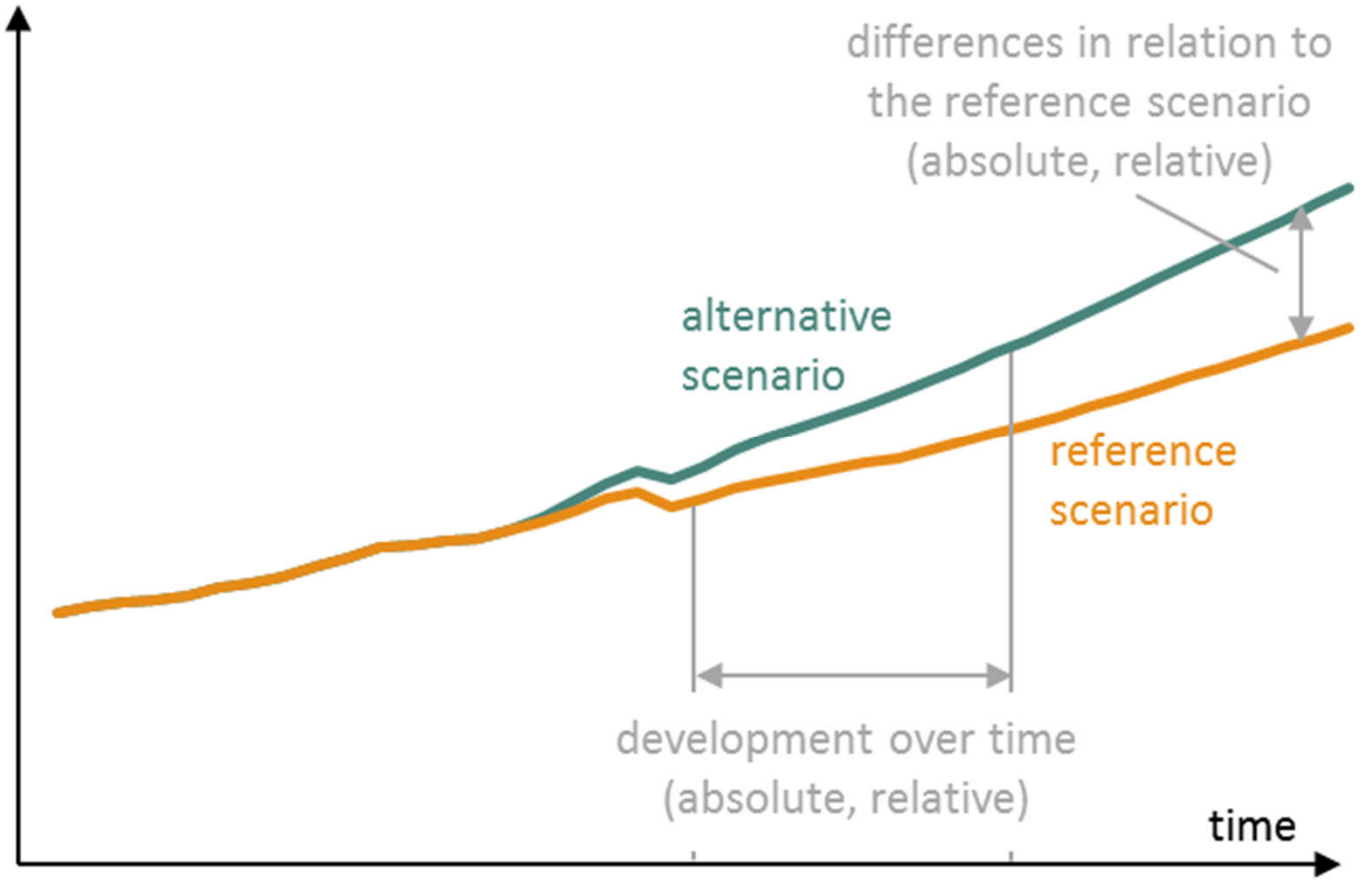
- Model characteristics (depending on data,…)
  - ⇨ Macro models
    - Consider GDP and its components, employment and prices
    - Include national accounts
    - Depict economic circuit (production, income, consumption etc.)
  - ⇨ Input-Output models
    - Show industry detail in production, employment,…
    - Depict direct, indirect (and induced) effects
  - ⇨ Econometric models
    - Have an empirical foundation
    - Based on past observations (historical data)
    - Assume that past behaviour is valid in the future
  - ⇨ Combinations possible!

PortableDyme Model Template

- ⇨ Only a few exogenous variables, all others are endogenously calculated
- ⇨ Combines econometric-statisticial analysis with IO analysis
- ⇨ Dynamic models (year by year solution)
- ⇨ Non-linear model due to many feedback effects
  - Requires iterative solution algorithm (≠ explicit solution)

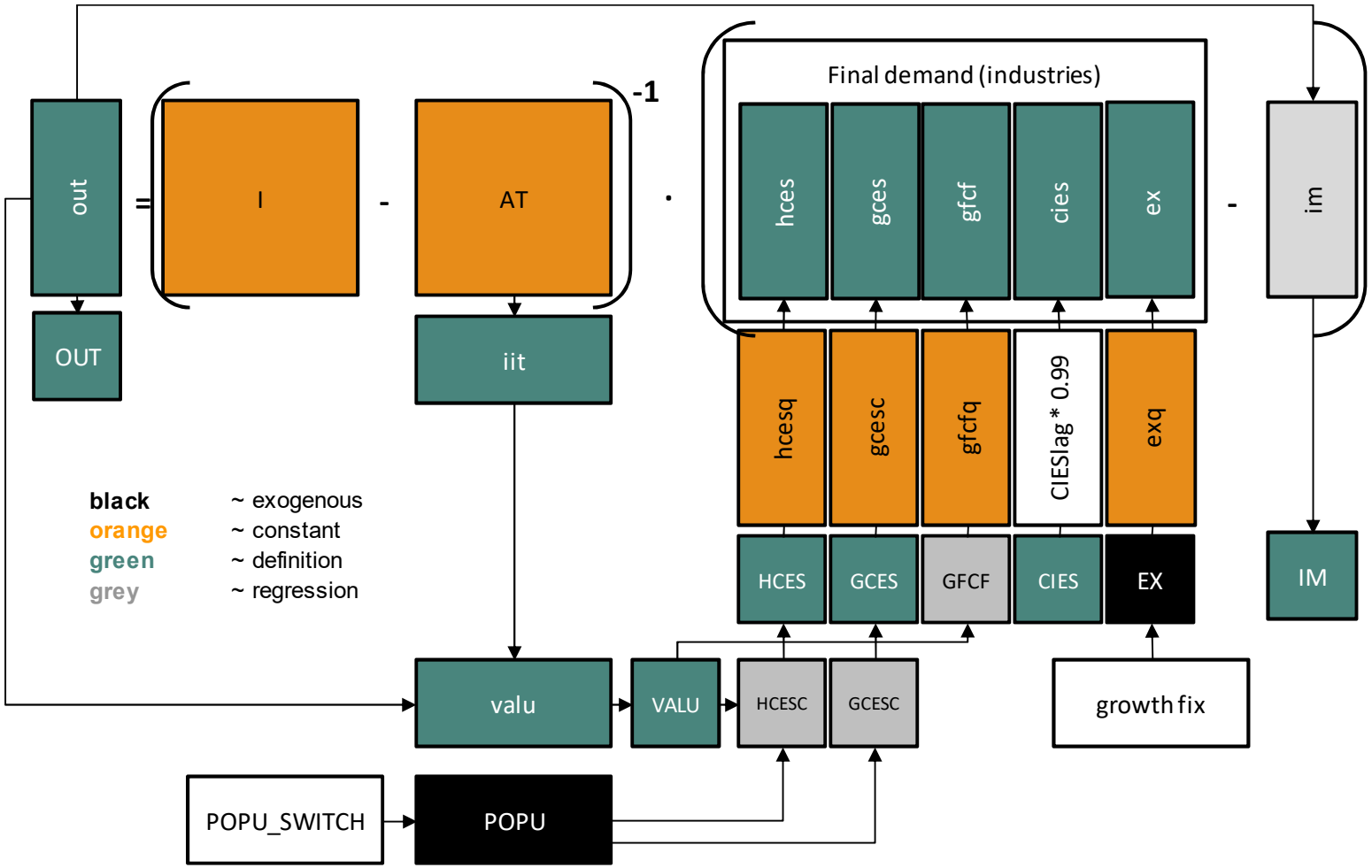
- ► What can such a model be used for?
  - ⇨ Evaluation of historical developments due to rich database (ex post analysis, monitoring)
  - ⇨ Forecasting (ex ante analysis)
  - ⇨ Impact analysis (answering ‚what if' - questions)
  - ⇨ Developments over time or comparison of different situations at a particular time

Scenario analysis

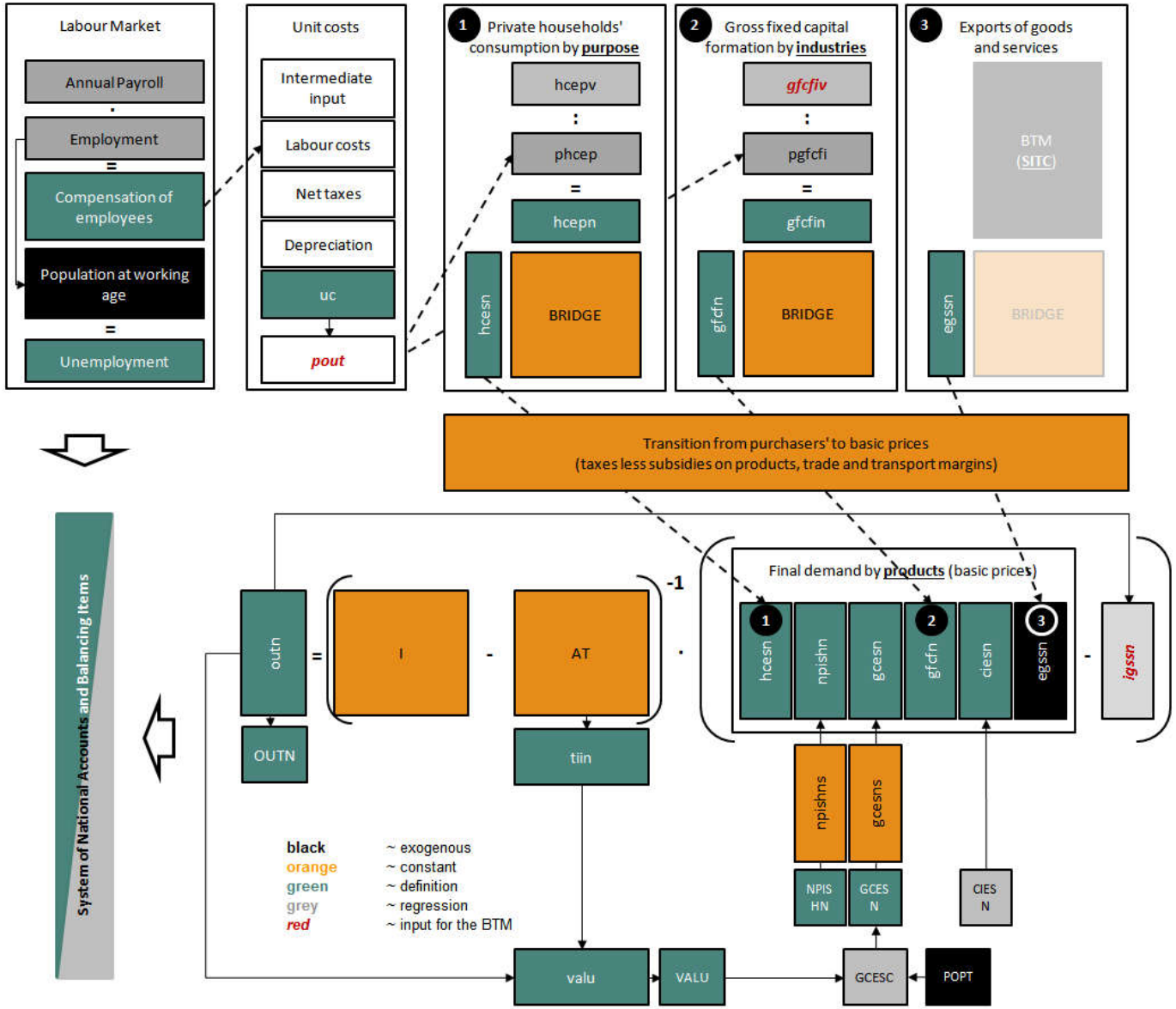


PortableDyme Model Template

- Basic macro-econometric input-output model (excl. prices)

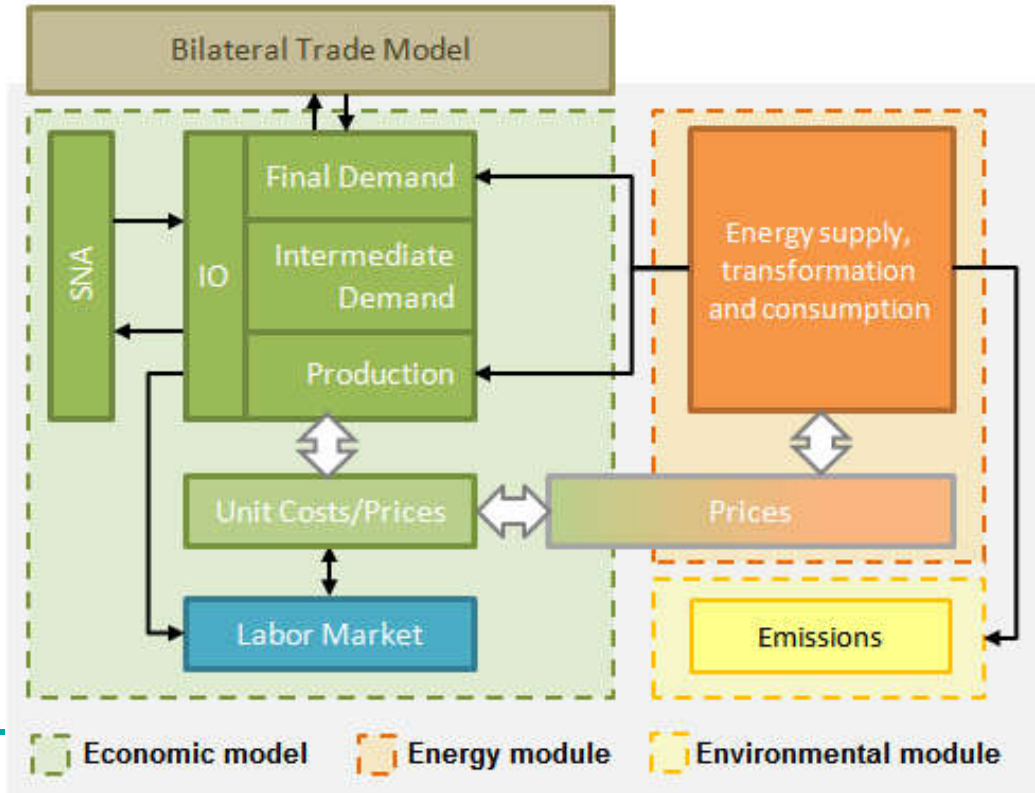


Example for comprehensive economic model



E3 model structure

- E3 model: Covers the interactions between the economy, energy system and environment
  - ⇨ Comprehensive modeling of the economy incl. inter-industry linkages (IO approach)
  - ⇨ Integration of energy balances into the modeling system
  - ⇨ Modeling of the inter-relations between economic growth by industries and energy consumption
  - ⇨ Energy prices influences production and consumer prices



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Part II: Hands-on Training

Setting up PortableDyme

- Drag and Drop the PortableDymeVanilla directory from the USB drive to your computer‘s **C:** drive

Basic PortableDyme Commands

- To launch the PortableDyme environment, double-click the rocket (launch.exe)
- Commands will have to be typed in the command box; pressing ENTER executes them
- The most important PortableDyme commands are:
  - ⇨ edit Opens the project editor tool
  - ⇨ help Opens the documentation
  - ⇨ 1 to 4 Switch between model building steps
  - ⇨ g7 Start G7 program
    used in step 1 for database creation and
    used in step 2 for performing regressions
  - ⇨ idmodel compiles model from human-readable into machine-readable form (step3)
  - ⇨ run Run the model (step 3)

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1_Data collection and preparation with G7

- Original data files („raw data“) will have to be placed in appropriate folder
- Raw data will be put into corresponding database files
  - ⇨ .BNK Time series (macro) database
  - ⇨ .VAM Vector and matrix database
- Each variable needs to be described in DatabaseManager.xls → Name, type, description, etc.
- Vector and matrix variables need to have row & column titles described in TTLManager.xls

1_Data collection and preparation with G7

- G7 provides the „xl“ command for reading Excel files into databases, e.g.
  xl open Opens a workbook
  xl vecread Reads data from a sheet into a vector
  ⇨ See chapter 2.3.11 in „INFORUM Help”
  → execute help command from the prompt to find it
- For every data provider, a .pre (“preparation”) file containing “xl”-commands needs to be created
- Other essential G7 commands, e.g. looking at a variable, graphs, etc.:
  ⇨ See chapter 2.1.7 in „INFORUM Help”

Hands-on Training: Data Input

- Goal: get the data into the model
- Data sources:
  - ⇨ OCED http://stats.oecd.org
  - ⇨ UN https://esa.un.org/unpd/wpp/
  - ⇨ Eurostat http://ec.europa.eu/eurostat/data/database
- Data are organized differently, structure is not harmonized
  - ⇨ Data for different years can be stored in rows, columns, worksheets or workbooks
- Next: Examples for processing data with G7
  - ⇨ Examples for time series, vectors and matrices
  - ⇨ Data processing for more than one country

Hands-on Training: Data Input

- 1. Example: **time series data** (e.g. population)

  ⇨ Download data from https://esa.un.org/unpd/wpp/

  ⇨ Store the Excel-files in 1_data\1A_rawdata\UN

  ⇨ Each variable needs to be described in DatabaseManager.xls
  → Name, type, description, etc.

Hands-on Training: Data Input

- ⇨ Create a pre-file and save as unhist.pre in the folder 1_data\1B_histdata
- ⇨ Open Excel workbook with original data — *xl open*

  (check the directory!)
- ⇨ Select the worksheet where the data is in — *xl open ws*
- ⇨ Read the data into the databank — *xl read*
- ⇨ Close Excel workbook — *xl close*

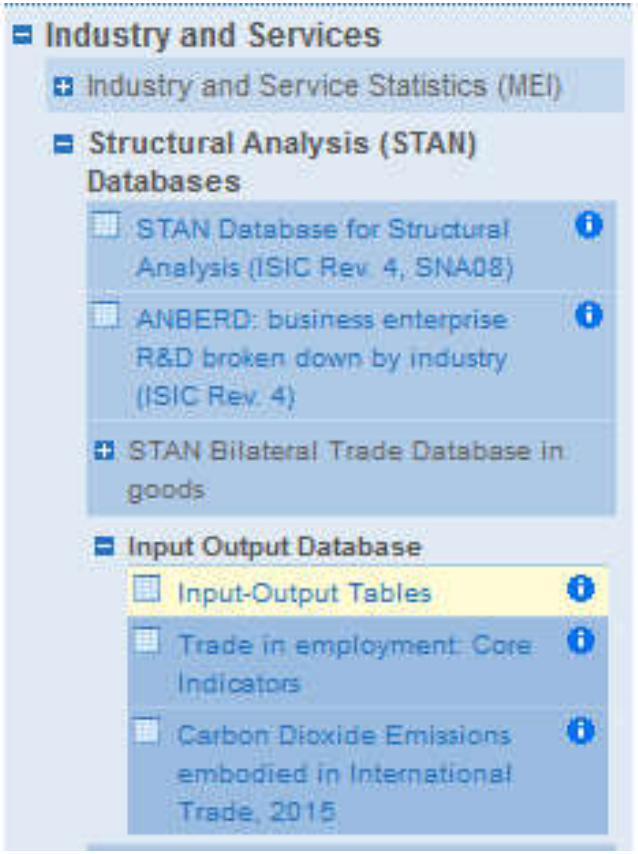
- ▶ Add the command *add unhist.pre* in makehistdata.pre after *xl open* and before *xl close*!

```
xl open
add unhist.pre
xl close
```

- ▶ Open G7 and type add makehistdata.pre in the command line
- ▶ Check your results!

Hands-on Training: Data Input

- 2. Example: **vector and matrix data** (e.g. flow matrix)
  - ⇨ Download data from http://stats.oecd.org
    - IO tables
    - Save the data per year as CC_IO_year.xlsx, e.g. DE_IO_2010.xlsx (CC means **c**ountry **c**ode)
  - ⇨ Store the Excel-files in 1_data\1A_rawdata\OECD
  - ⇨ In DatabaseManager.xls each variable needs to be described
  - ⇨ In TTLManager.xls row/column titles need to be given for vector and matrix variables



Hands-on Training: Data Input

- ⇨ Create a pre-file and save as oecdhist.pre in the folder 1_data\1B_histdata

- ⇨ Use the previously used G7 commands to read in the data

- ⇨ Add the command *add oecdhist.pre* in makehistdata.pre after *xl open* and before *xl close*!

```
xl open
add oecdhist.pre
xl close
```

- ⇨ Open G7 and type add makehistdata.pre in the command line

- ▶ Check your results!

Hands-on Training: Data Input

- 3. Example: **use one script with parameters to read in data for many countries**

  ⇨ Download data from http://stats.oecd.org

  - GDP components for at least 2 countries
  - Save files as GDP_cc.xlsx, E.g. GDP_DE.xlsx
    (CC means **c**ountry **c**ode)
  - Store the Excel-files in 1_data\1A_rawdata\OECD

  ⇨ In DatabaseManager.xls each variable needs to be described

Hands-on Training: Data Input

- Create a pre-file and save it as gdp_oecd.pre in the folder 1_data\1B_histdata

- Use the previously used G7 commands to read in the data

- Go to the oecdhist.pre file and add the following commands

```
cd ..\..\1B_histdata
add gdp_oecd.pre CC1
add gdp_oecd.pre CC2
cd ..\1A_rawdata\OECD
```

CC1, CC2: country codes, e.g. DE, RU

- Open G7 and type add makehistdata.pre in the command line

- To be continued…

Thank you for your attention.

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