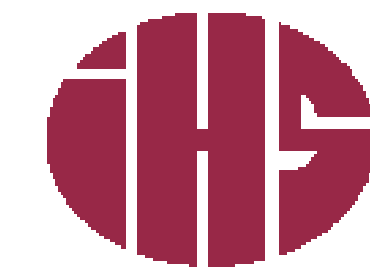


HYBRID TOP-DOWN BOTTOM-UP CGE MODEL



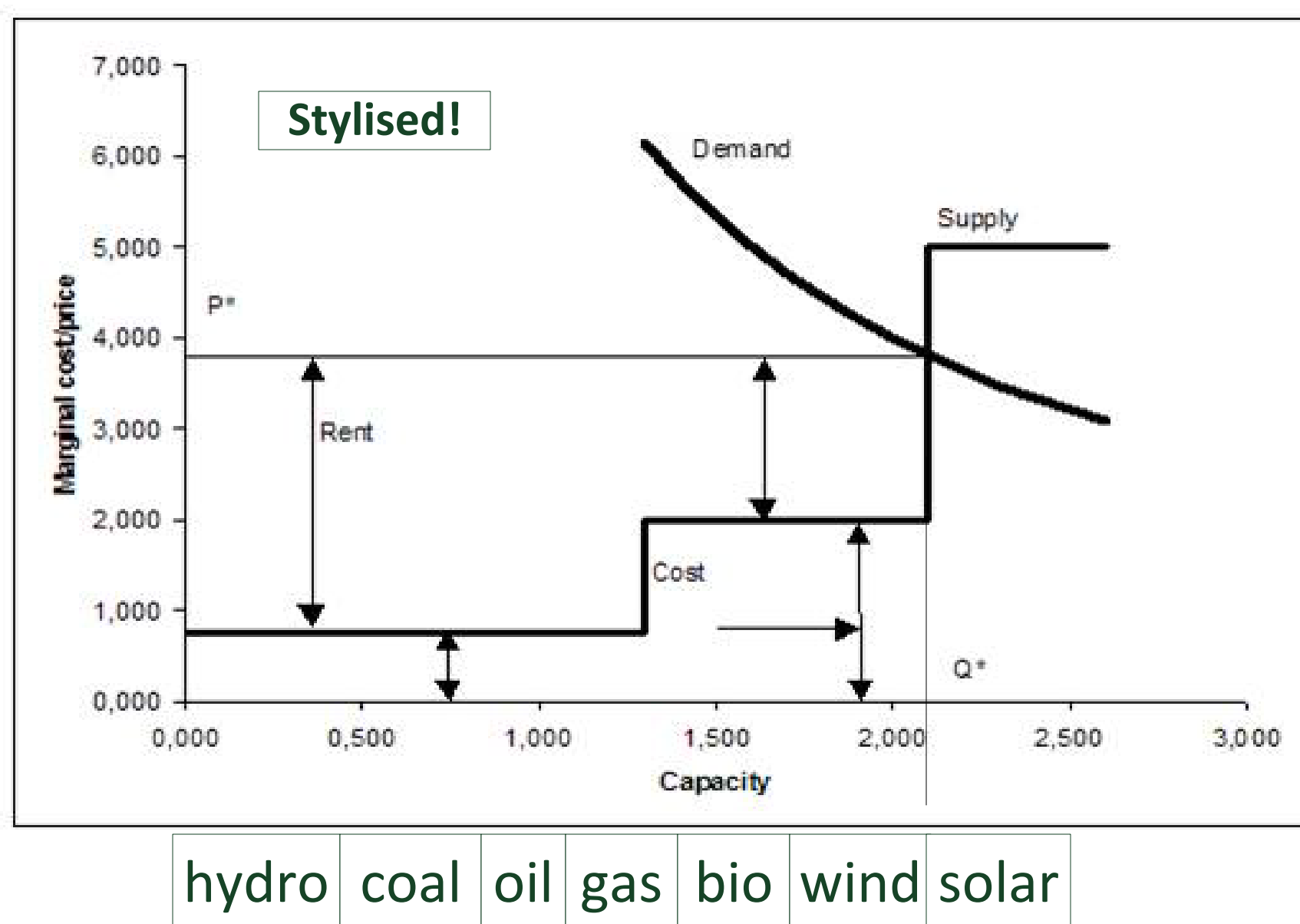
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- The computable general equilibrium (CGE) model provides a detailed **assessment** of developments of **macroeconomic parameters** as model results. It was used in applications regarding different issues for Austrian ministries.
- The model consists of a **top down** macroeconomic part and a **bottom up** partial equilibrium part that depicts the electricity sector in detail. Demand for energy is generated in the top down part, the prices and the technology mix are determined in the bottom up part; the two parts are solved together in an integrated fashion.

Bottom up: Electricity sector:

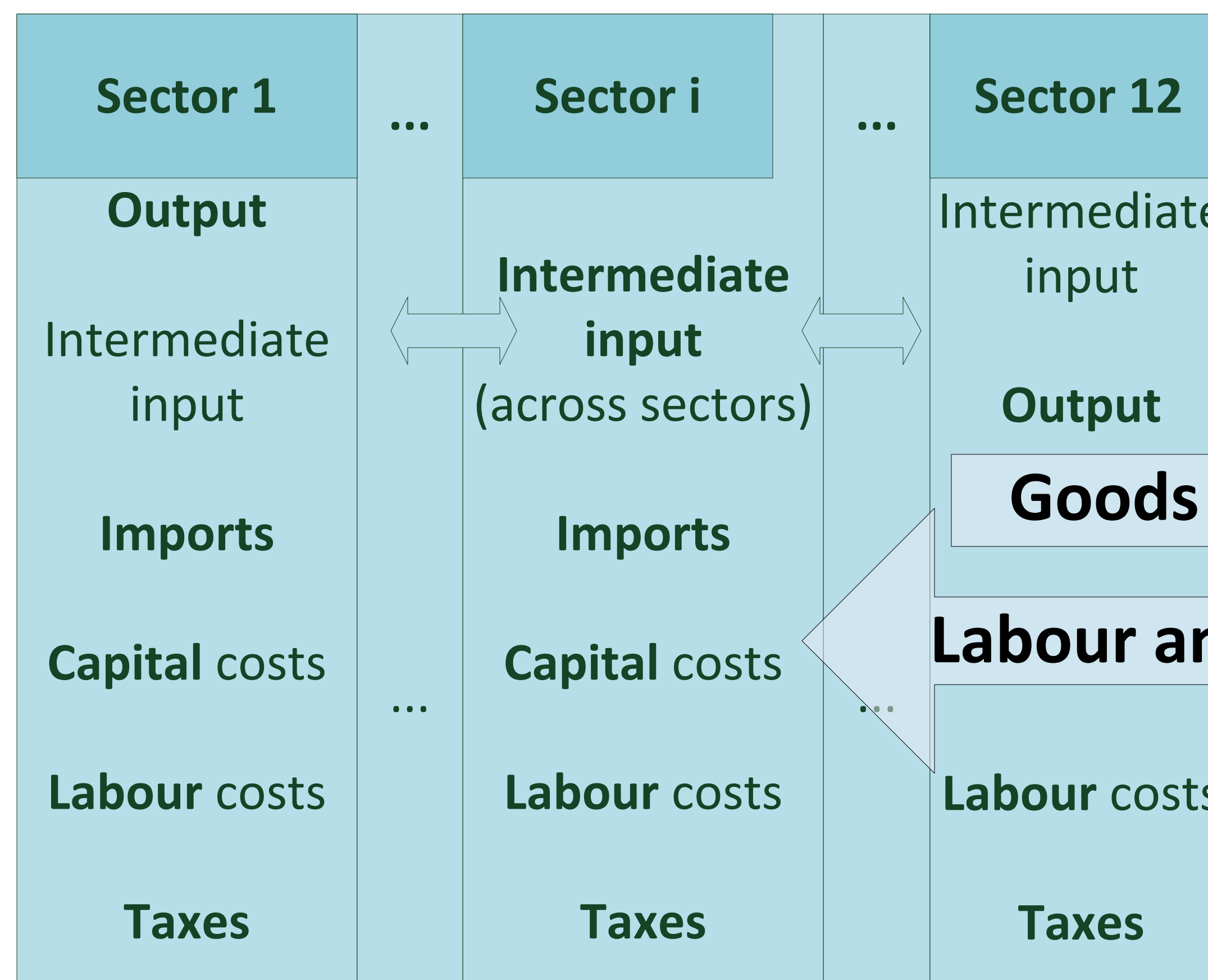
Technologies:

- **Renewables:** (subsidised)
Hydro, Biomass, Wind, Solar/Photovoltaic
- **Fossil:** Gas, Coal, Oil



Cheaper technologies are used first; when the price rises, more expensive technologies enter the market.

Top down: Production sectors:



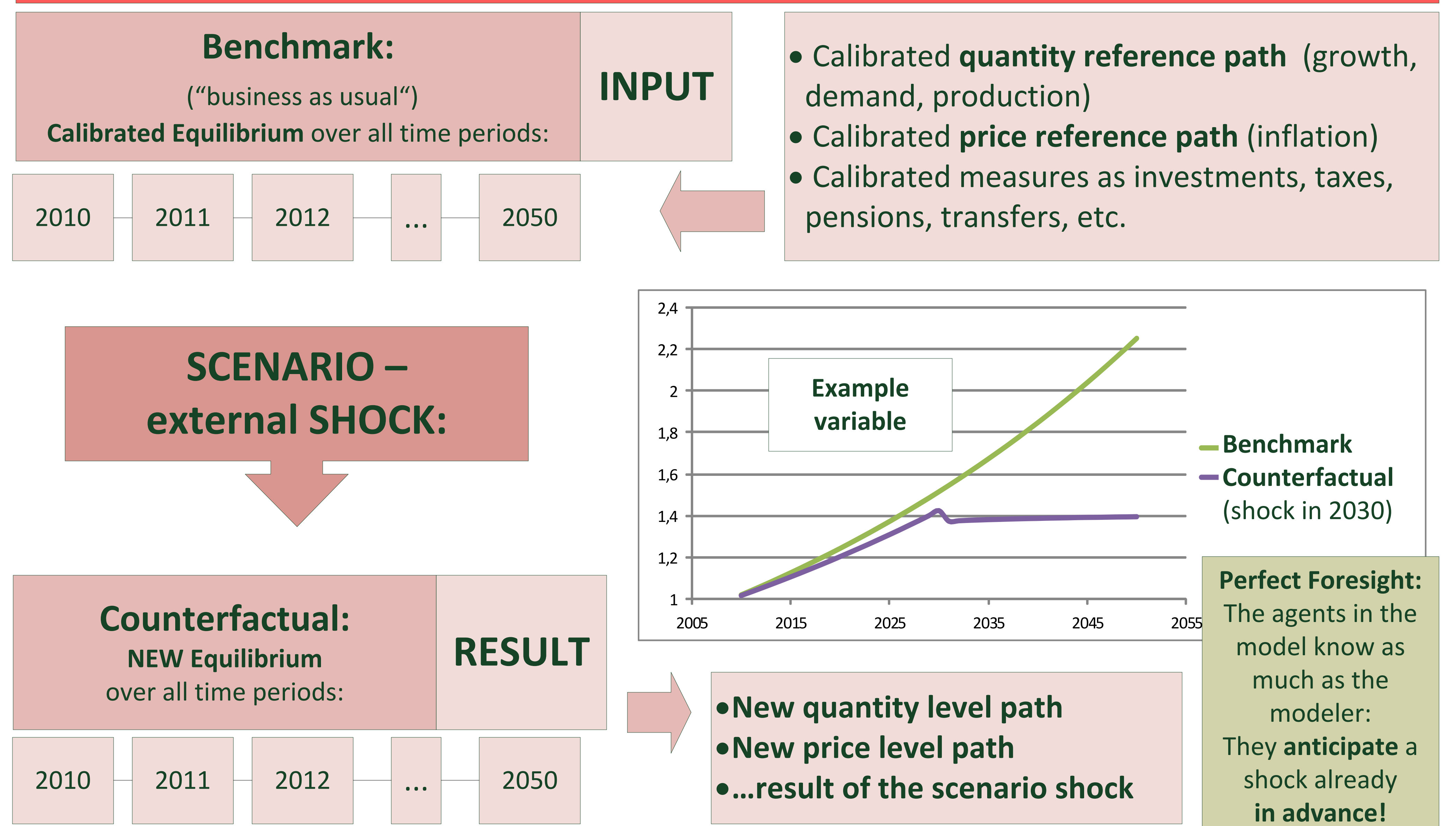
Agents in the model:

Government Agent	Representative Agent (Household)	Rest of World Agent
Public consumption	Private consumption	Exports
Collects taxes	Pays taxes	Imports
Pays transfers	Receives Transfers	

Mechanics in each period:

- Representative Agent **maximizes utility** from consumption and leisure. He **offers capital and labour** to the production sectors (labour + leisure = total time endowment) in return for income to buy products.
- Production sectors produce **as much as demanded** and as can be sold **at current prices**.
- **Prices** are determined by input costs and **may change** along a model run due to **substitution possibilities** of firms and agents.
- In each period, all markets are cleared.
- No production activity makes a positive profit.
- **Taxes** included: Labour tax, mineral oil tax, value added tax, various taxes on production, capital tax.

Intertemporal model mechanics (over many periods):



Typical model SCENARIOS:

- **Political:** tax reforms, subsidies
- **Environmental:** change in resource capacities
- **Economic:** rise of oil price, decrease in investments

Typical model RESULTS:

- Sectoral **output** levels, GDP
- Public and private **consumption** levels
- Foreign trade
- Set of relative **price** levels for all goods
- Mix of used **technologies** and their market prices

Extensions planned:

- A detailed **traffic sector:** household mobility behaviour
- More detail in the **electricity sector**
- **Households** decomposition regarding urban, rural and income differences

- ?) **Decomposition** of top-down and bottom-up
- ?) **Framework** for an iterative **micro-macro** link