

Green Jobs for Sustainable Development: Myth or Reality?

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Green Jobs assessments in OECD countries

Case study of Germany

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Definition of environmental goods and services

BESCHÄFTIGUNG IM
UMWELTSCHUTZ

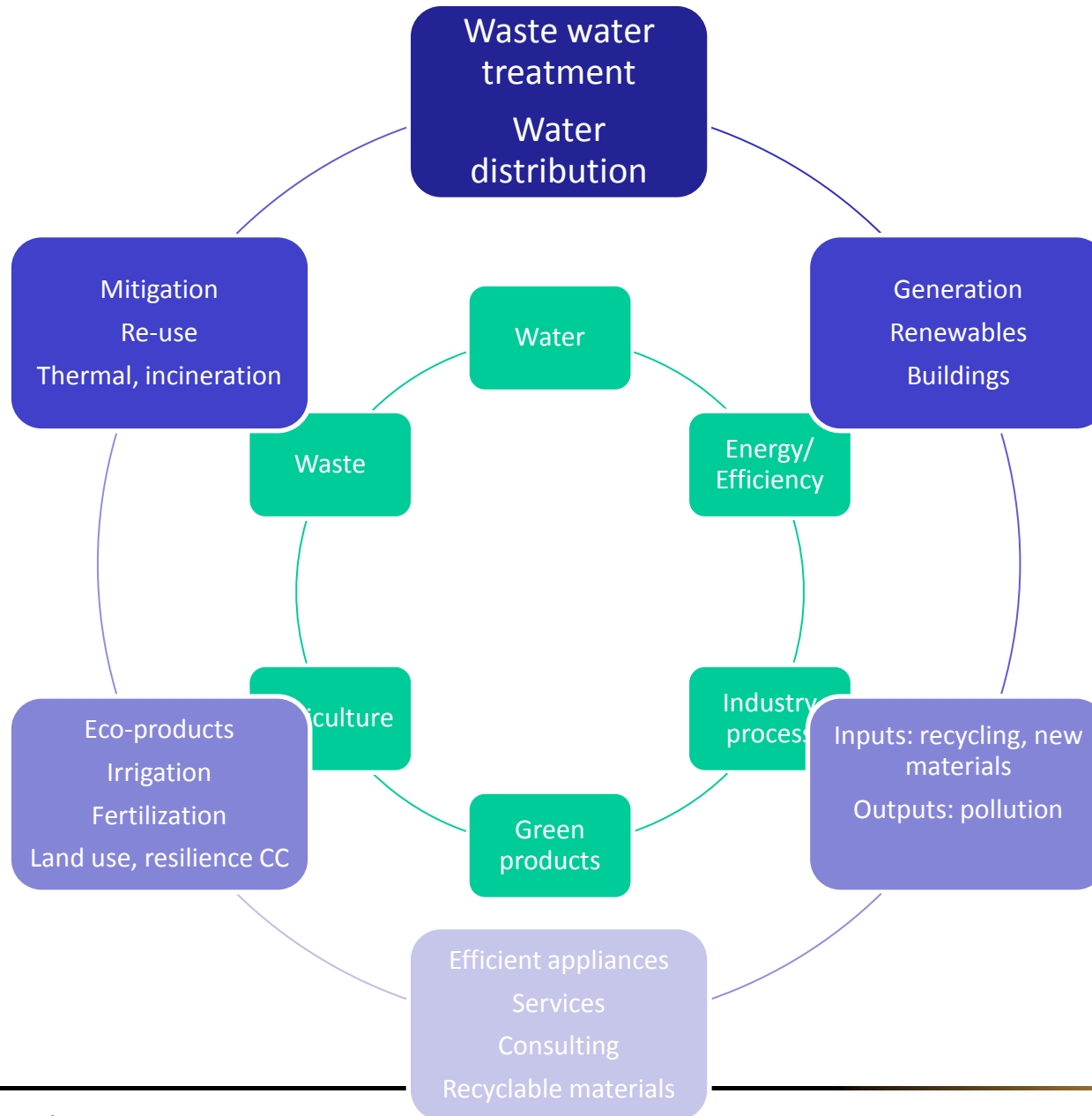


Umwelt
Bundes
Amt
Für Mensch und Umwelt

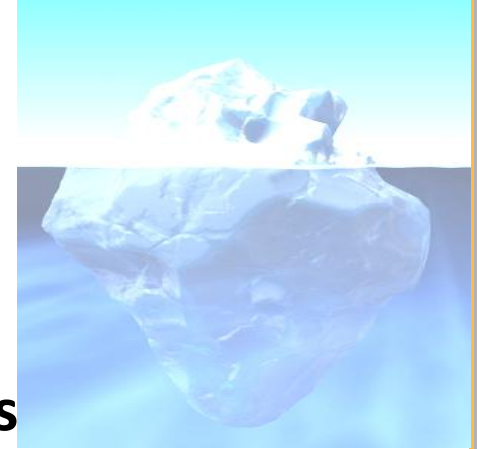
Definition follows the OECD/Eurostat/ ILO definitions

- ◆ “Environmental sole-purpose products are goods (durable or non-durable goods) or services whose use directly serves an environmental protection or resource management purpose and that have no use except for environmental protection or resource management. Examples of these products include catalytic converters, septic tanks (including maintenance services), and the installation of renewable energy production technologies (e.g. installation of solar panels).
- ◆ Adapted goods are goods that have been specifically modified to be more “environmentally friendly” or “cleaner” and whose use is therefore beneficial for environmental protection or resource management.”

Environmental sectors



How many jobs? What type of jobs?



Direct jobs

- ⇒ **Production of green products**
- ⇒ **Services (waste, water, trade, administration, education etc.)**
- ⇒ **Agriculture**

Indirect jobs

- ⇒ **Inputs for production**
- ⇒ **Inputs for agriculture**
- ⇒ **Inputs for services**

Calculation and estimation – ex post analysis

Direct jobs

⇒ Demand oriented approach:

- Data on investment and expenses available from German Statistical Office

⇒ Supply oriented approach:

- Sectoral data (waste, recycling)
- Data from Trade Associations

Indirect jobs

⇒ Input-Output-Analysis

⇒ Consistent framework

⇒ Individual application to RE

- Development of 10 additional IO vectors

Current expenses for environmental protection in industry 2010 (enterprises with more than 50 employees)
1000 €

	Waste management	Water protection	Air quality control	Climate protection
Industry	6189	7272	3079	686
Mining and quarrying		68	35	5
Manufacturing	2612	2880	2114	258
food products		305	30	24
paper and paper products	18	208	41	29
coke and refined petroleum products	42	226	555	12
chemicals and chemical products	529	847	335	34
basic pharmaceutical products and pharmaceutical preparations	70	98	19	
other non-metallic mineral products	97	58	12	
basic metals	312	422	592	4
machinery and equipment	124	9	73	14
motor vehicles, trailers and semi-trailers	264	25	194	41
Electricity, gas, steam and air conditioning supply	601	61	822	389
Water supply, sewerage, waste management and remedation activities	2935	3712		
Water collection, treatment and supply	23	412		
Sewerage	201	3109	5	

Goods and services for environmental protection, by economic activities and types of services 2009

Economic activities	Units with environmental turnover	Turnover of goods, construction work and services for environmental protection	Employees for the environmental protection
	number	EUR mn	number
Industry	6,031	58,184	202,215
Manufacturing	2,248	50,979	154,645
machinery and equipment	618	16,566	57,634
Repair and installation of machinery and equipment	1,118	6,382	7,412
computer, electronic and optical products	153	6,343	18,102
electrical products	174	4,712	17,543
Construction	3,681	6,824	45,829
other branches of economic activity ¹	2,937	8,718	34,187
Service industries	2,753	5,069	30,533
Total	8,968	66,901	236,402

Beyond direct jobs

Indirect Jobs

- ◆ **Indirect jobs contribute more than half to total employment from production: 51% are indirect jobs**
- ◆ **=> approx. 580.000 people work in green production in total**
- ◆ **Additionally approx. 380.000 people work in renewable energy**

Services

- ◆ **1.2 million people work in environmental services**
 - ⇒ 44.000 in organic farming
 - ⇒ 42.900 in gardening
 - ⇒ Industry and mining 100.200 people in environmental services
 - ⇒ Recycling 45.000
 - ⇒ Trade, repair, maintenance 216.000

Environmental Services

Primary	Industrial	Business services
Consulting in all environmental fields	R&D	Finance
Energy	Technical consulting and controls	Banks
Water/waste water	Logistics	Private equity
Waste	Trade	Insurances
Environment	Operation and maintenance	Consulting(Human Resources/ IT/Organization
Project development	Recycling	Legal services
Contracting	Tax consultants	
Innovative business models	Education	
Trade with green electricity		
Car-Sharing		
Eco-Tourism		
E-charging stations		

Employment effects of Renewable Energy Increase in Germany

Investment in Renewable Energy
(RE), O&M
Export of RE facilities
Import of RE facilities

Base year 2012: statistical data,
survey (first survey 2005, second
2008)

Future: Scenarios

=> **Resulting gross employment**

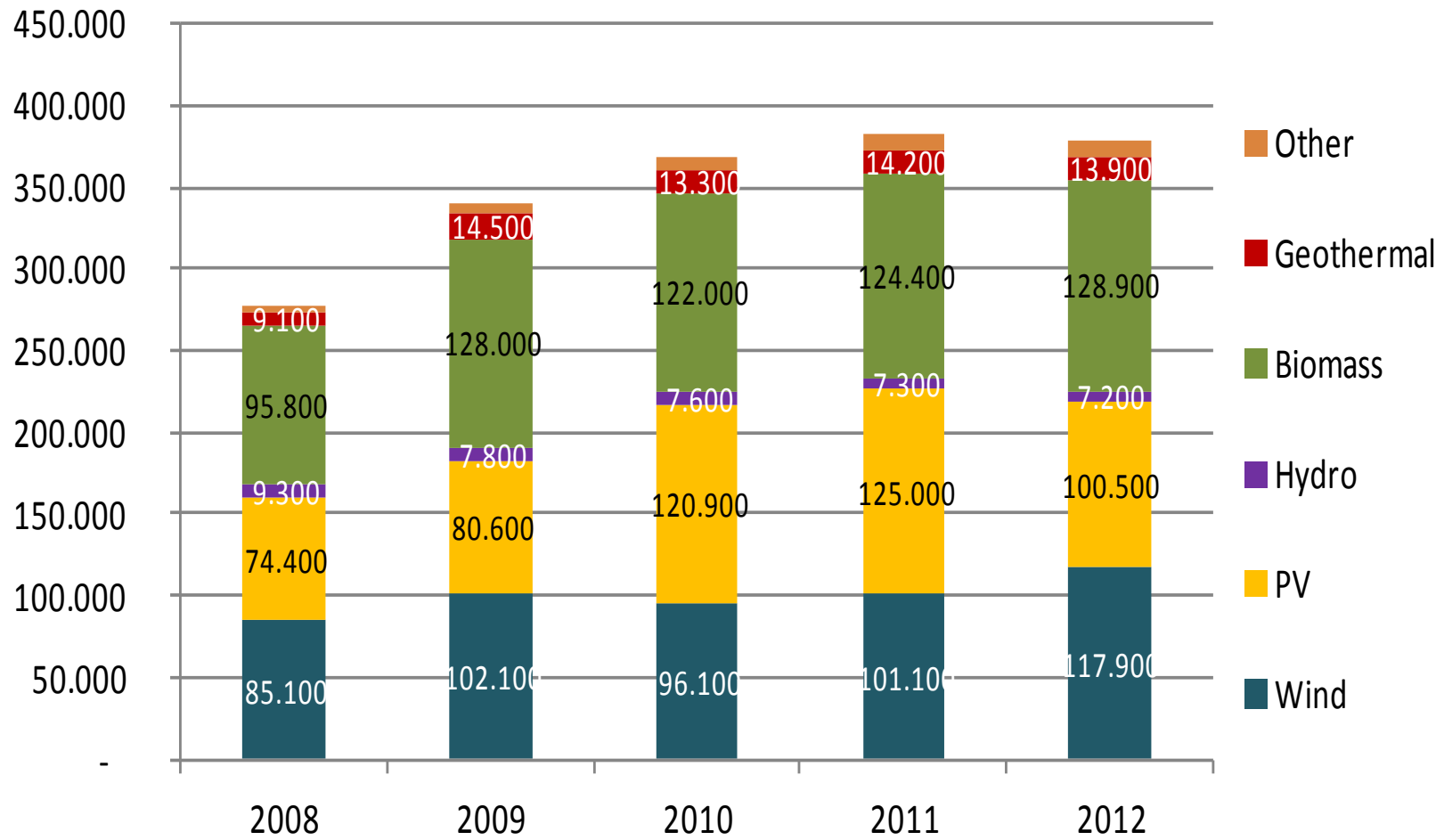
Input-Output-Tables (extended
with vectors for RE) , survey
based, input structures for 10
technology sectors

Impact on economic indicators,
balance

= > **net effect**

Macro-econometric model:
PANTA RHEI

Employment from RE in Germany by technology



Modeling approach for « Green Economy » in Germany

✓ **German discussion focuses on political instruments**

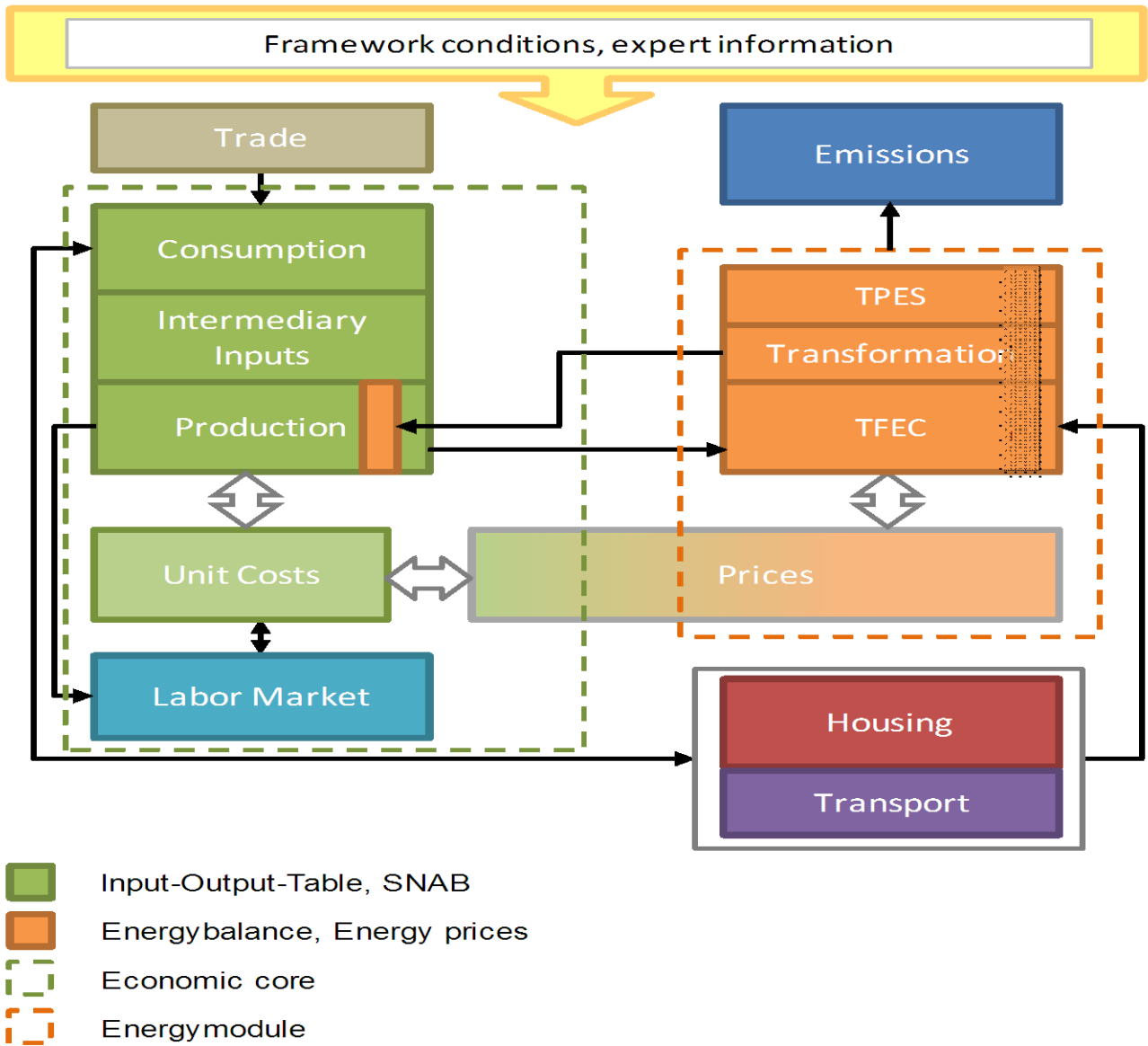
✓ **PANTA RHEI is a full economic model for Germany**

✓ **Fiscal instruments can be simulated**

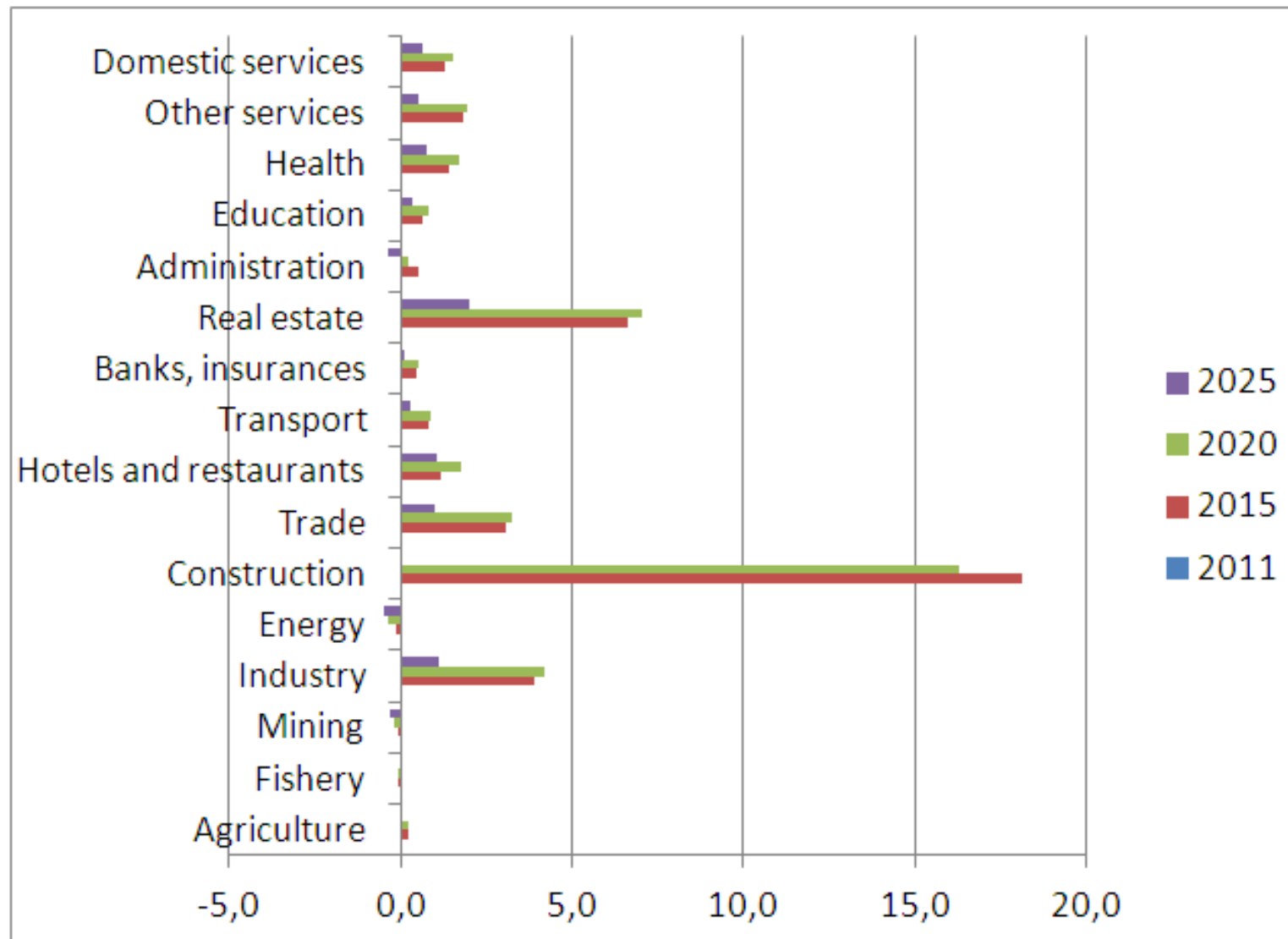
✓ **Relative price changes can be simulated**

NET Effects

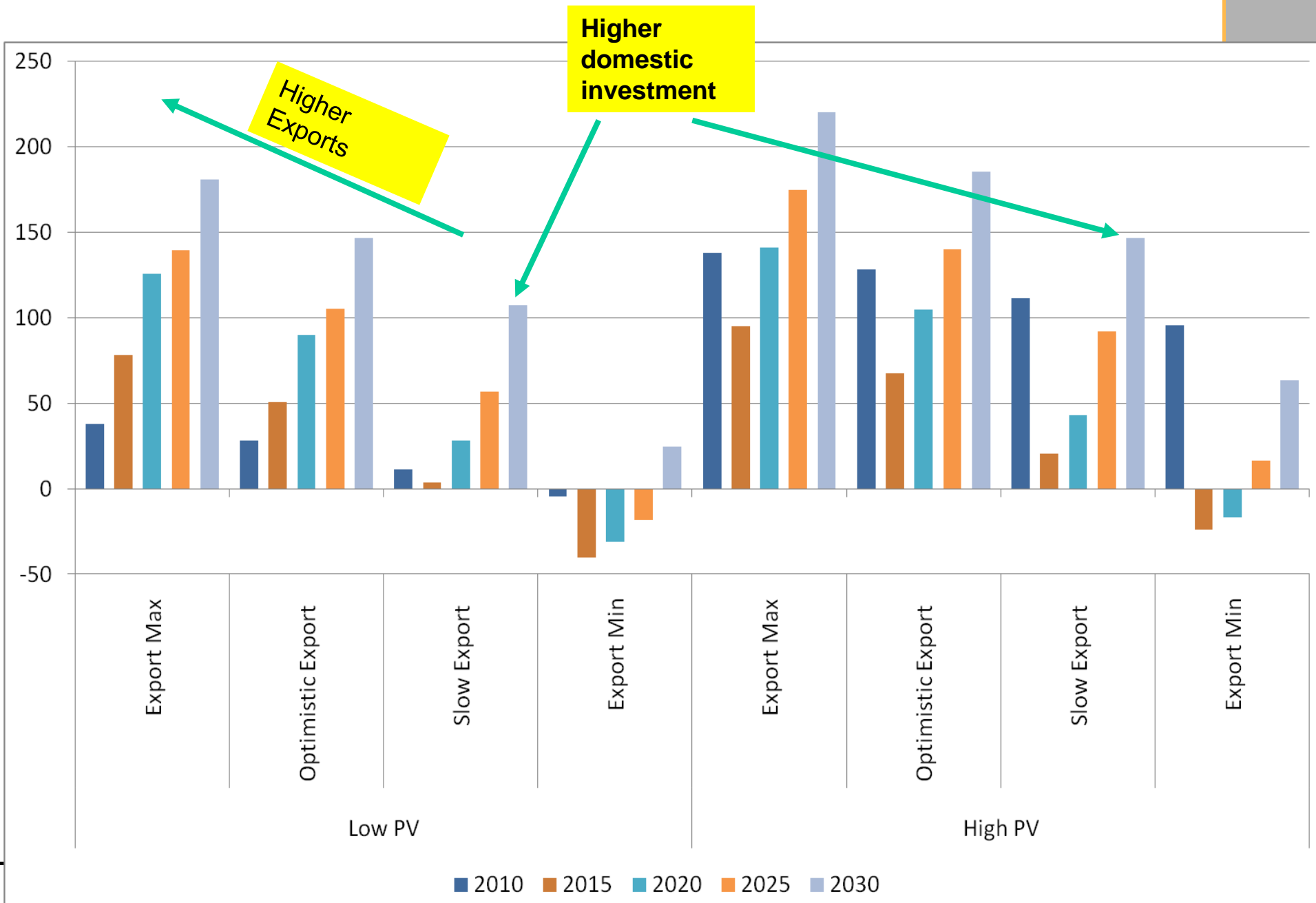
- ◆ Macroeconomic energy and environmental model
 - Based on official statistics (SNA, time series of IOT)
 - Bottom-up (59 sectors)
 - Fully interdependent
 - Energy balance systematic
 - Parameters econometrically derived from historical time series, no neoclassical general equilibrium
 - Open for expert information
- ◆ Suitable for simulation of direct and indirect effects
 - Esp. counterbalancing effects
 - Results are net after all adaption processes
- ◆ Reference:
Socio-economic and economic-environmental relations of the past will continue in the future



Examples of results – increased efficiency in building stock (2% rehab rate)



Jobs in RE (1000), Differences to Reference



Thank you for your attention!

