

Croatian experience in calculation of energy savings with TD indicators

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Energy Saving calculation in the 2nd NEEAP (1/2)

- The calculation of the energy savings for Croatia was done with a set of energy efficiency indicators in the households, services, transport and industrial sectors recommended by the EC for measuring top-down energy savings, according to the “Recommendations on M&V Methods in the Framework of Directive 2006/32/EC on Energy End-Use Efficiency and Energy Services” manual
- Data quality is very high, based on national statistical data, energy balance, ODYSSEE database and additional assumptions

Energy Saving calculation in the 2nd NEEAP (2/2)

- The calculation of indicators and the savings was done with all indicators (Preferred and Minimum) according to the Methodology, except for the services
- The planning period was 2007 to 2020, the last year with known data is 2010
- The data source for inputs in 2011 to 2020 period in all sectors was MAED model

Households

- Lack of stock data for appliances

	Energy savings in 2010 [PJ]	
	P indicators	M indicators
M1		2,24
M2		2,50
P1	4,30	
P2	-0,06	
P3	-0,62	
P4	/	
P5	0,13	
Total	4,43	4,74

Households – TD indicator vs. MAED model

		2007	2020
Item	Unit		
Dwellings	[million]	1,583	1,662
Degree-days	[days°C]	2051	2300
Dw. size.	[sqm]	78,2	80,2
Area really heated	[sqm]	47,6	62,7
Total area	10 ⁶ [sqm]	124	133

MAED		2007	2020
Scenario with beter thermal isolation			
Heat losses	[Wh/sqm/°C/h]	2,97	2,19
Useful Space heating	PJ	39,6	45,3
Final energy for Space heating	PJ	48,8	53,3
Efficiency	%	81,1	84,9

Frozen scenario(frozen only thermal isolation, not appliances efficiency)			
Heat losses	[Wh/sqm/°C/h]	2,97	2,97
Useful Space heating	PJ	39,6	61,5
Final energy for Space heating	PJ	48,8	72,4
Efficiency	%	81,1	84,9
Final energy savings	PJ	0,0	19,1

Energy consumption of households for space heating in GJ per floor area in m2 adjusted for climatic conditions

$$\frac{E^{HSH}}{F} * \frac{MDD_{25}^{heating}}{ADD^{heating}}$$

2007	2020
0,443	0,400

Final energy savings		PJ
2007	2020	With heated area
	5,7	22,4 PJ

Services

- Data source problem – there are no data for subsectors (electricity and non-electricity)
- Only total electricity and non-electricity consumption – calculation of the Minimum indicators only
- The indicator of activity

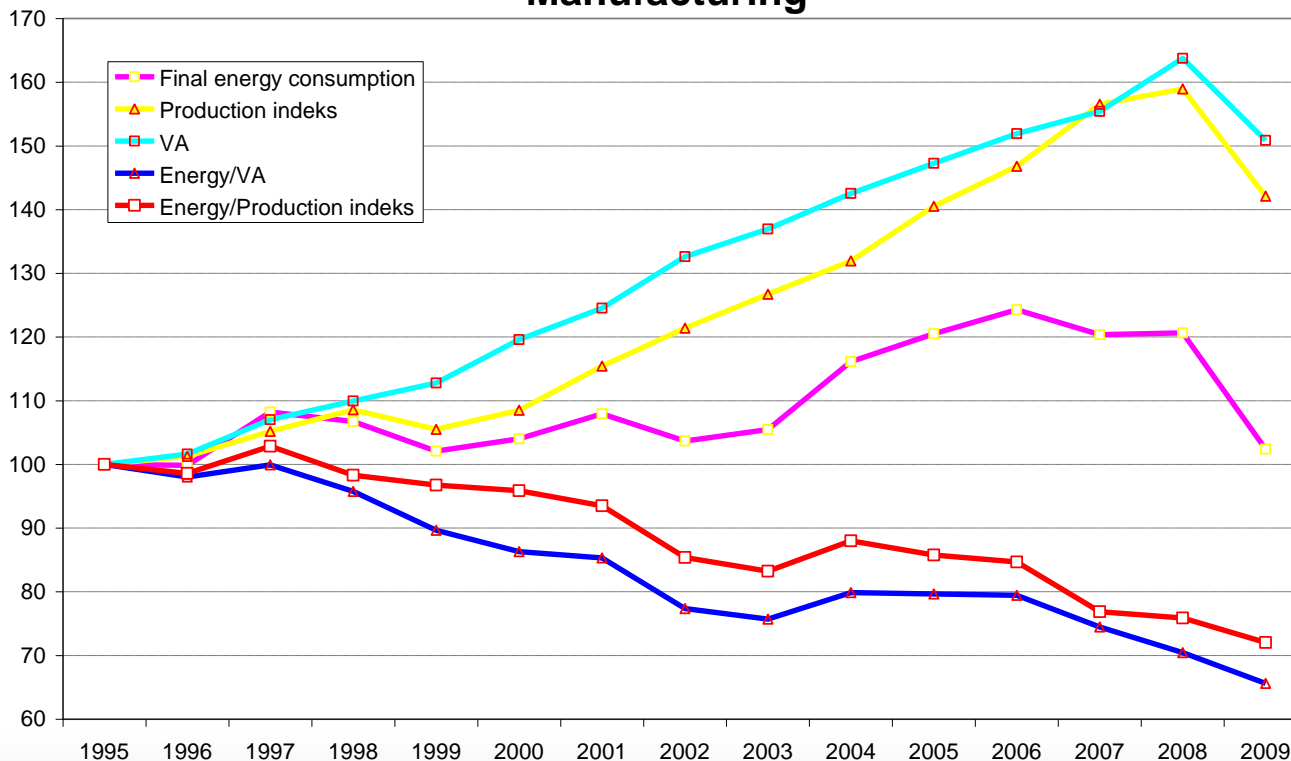
	Energy savings in 2010 [PJ]	
	Number of employees	Floor area (m2)
M3	- 0,18	0,33
M4	-2,02	-0,23

Industry

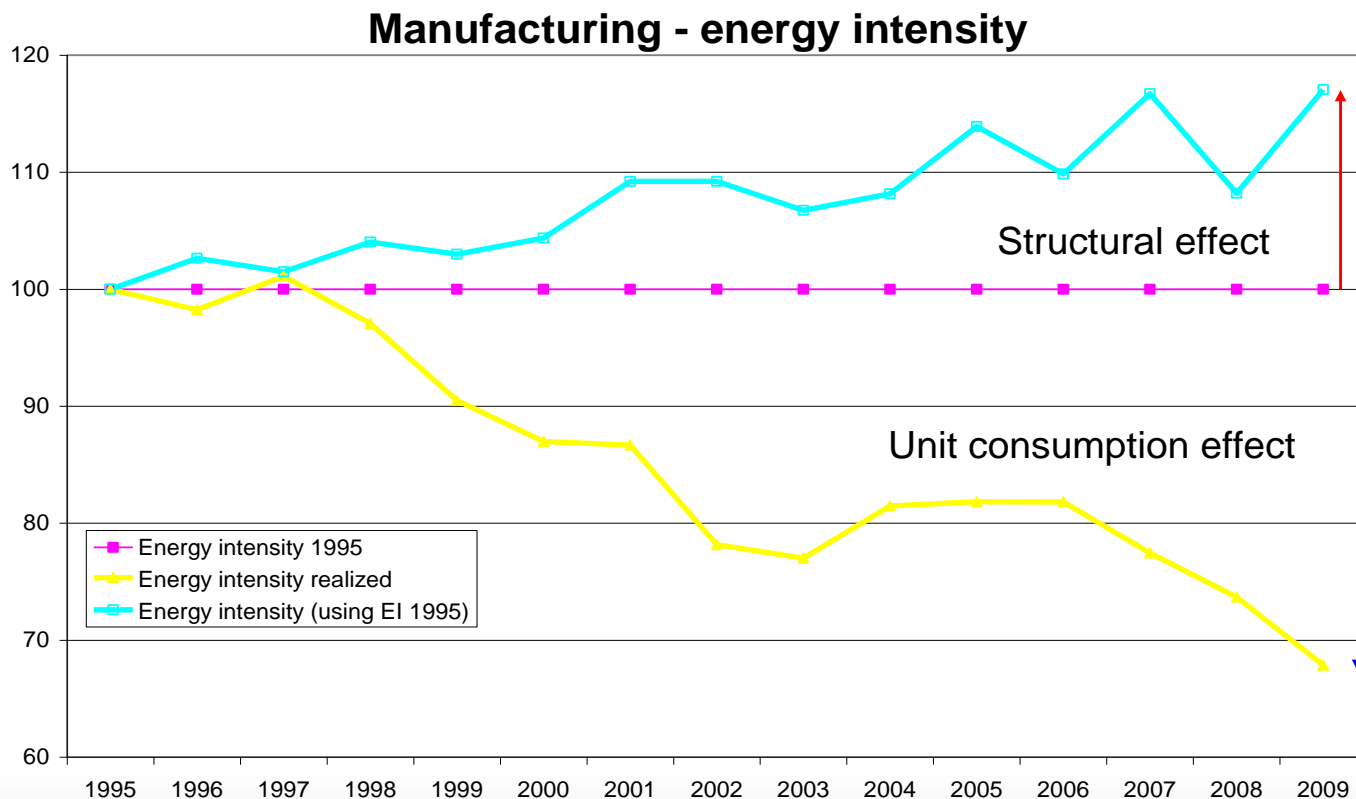
- All data were available for indicators in industry (in all subsectors) for 2007 to 2010 period – energy, Consumption Index and Value Added
- Source of the Production Index and the Value Added for 2007 to 2010 period was ODYSSEE database (with 2005=100)
- For the period 2011 – 2020 the Production Index and the Value Added are calculated based on the assumption that they have equal gradient and that the Production Index is about 20% lower than the Value Added
- The share of energy consumption covered by ETS (K factor) is calculated for 2007 based on energy balance

Energy consumption in industry

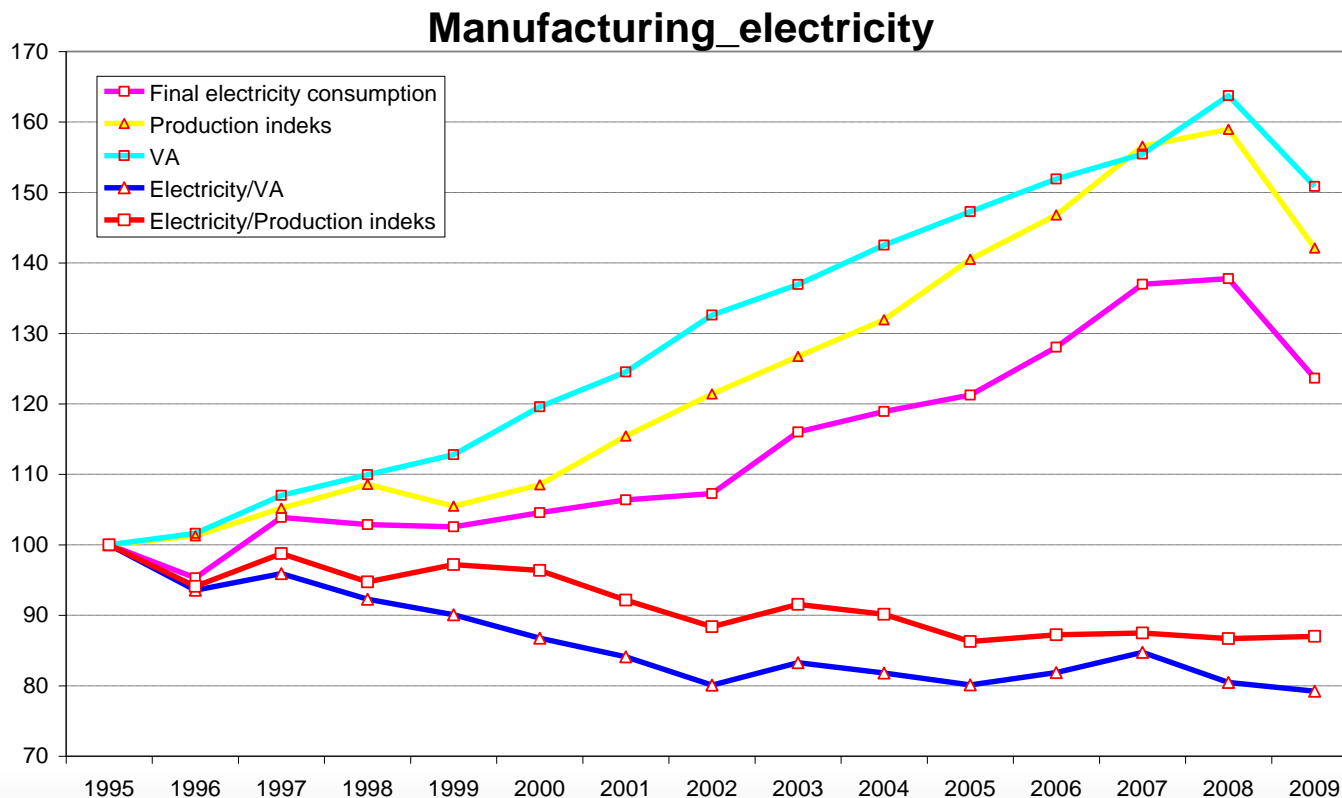
Manufacturing



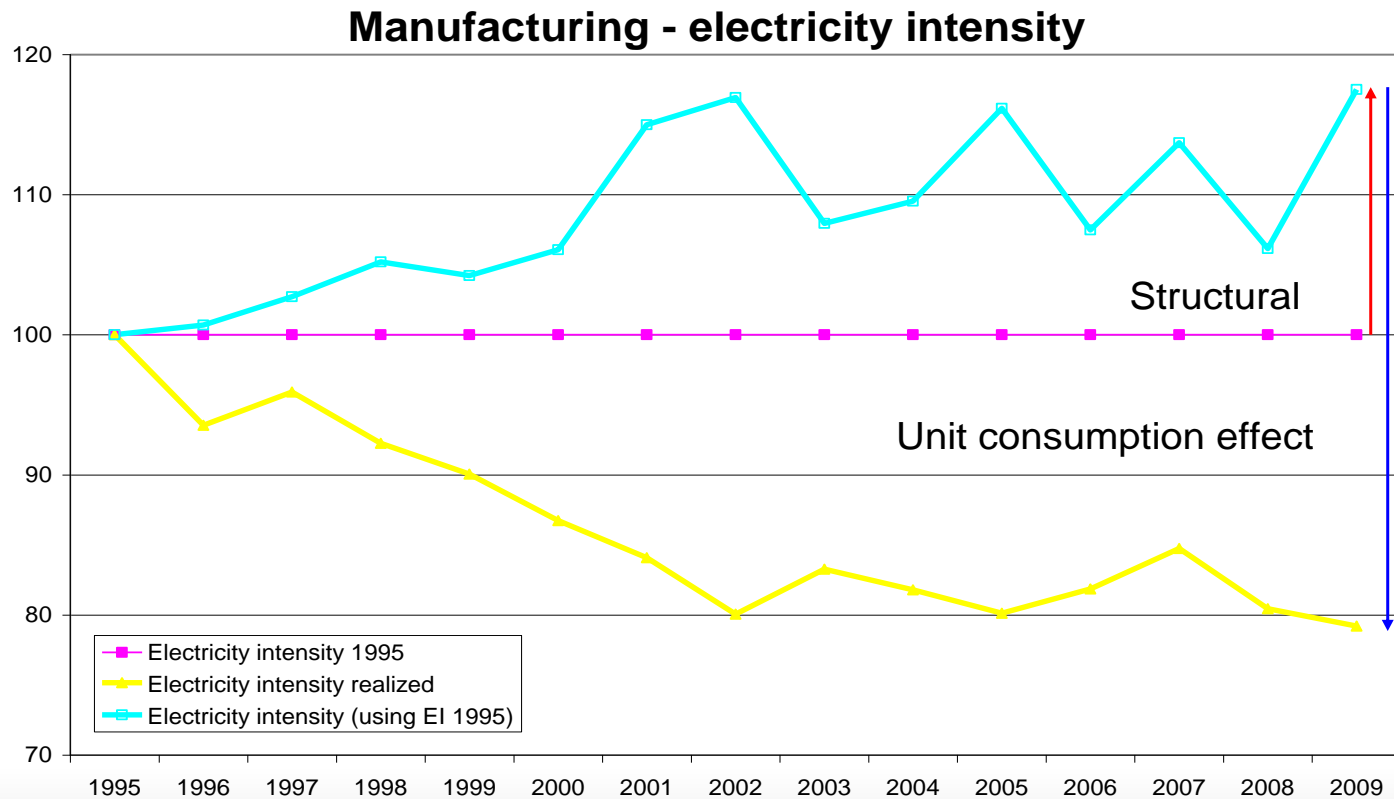
Energy savings in industry



Electricity consumption in industry



Electricity savings in industry



Main points

1. Existing stock data crucial for energy efficiency and energy saving monitoring
2. TD indicators work well for industry
 - In SEE the effect of new technologies diffusion surpasses structural effect -> BAU situation (no actual measures from the State level)
 - 1% annual improvement possible
- TD indicators not suitable for households' future energy savings estimations
 - Huge differences between MAED and TD?

THANK YOU FOR YOUR ATTENTION!