

Outlook for Energy Consumption in the Czech Republic in the Context of the Convergence Process

Emerging Energy Markets

Tallin, August 21, 2008

Jan Kubíček

Advisor to the Board

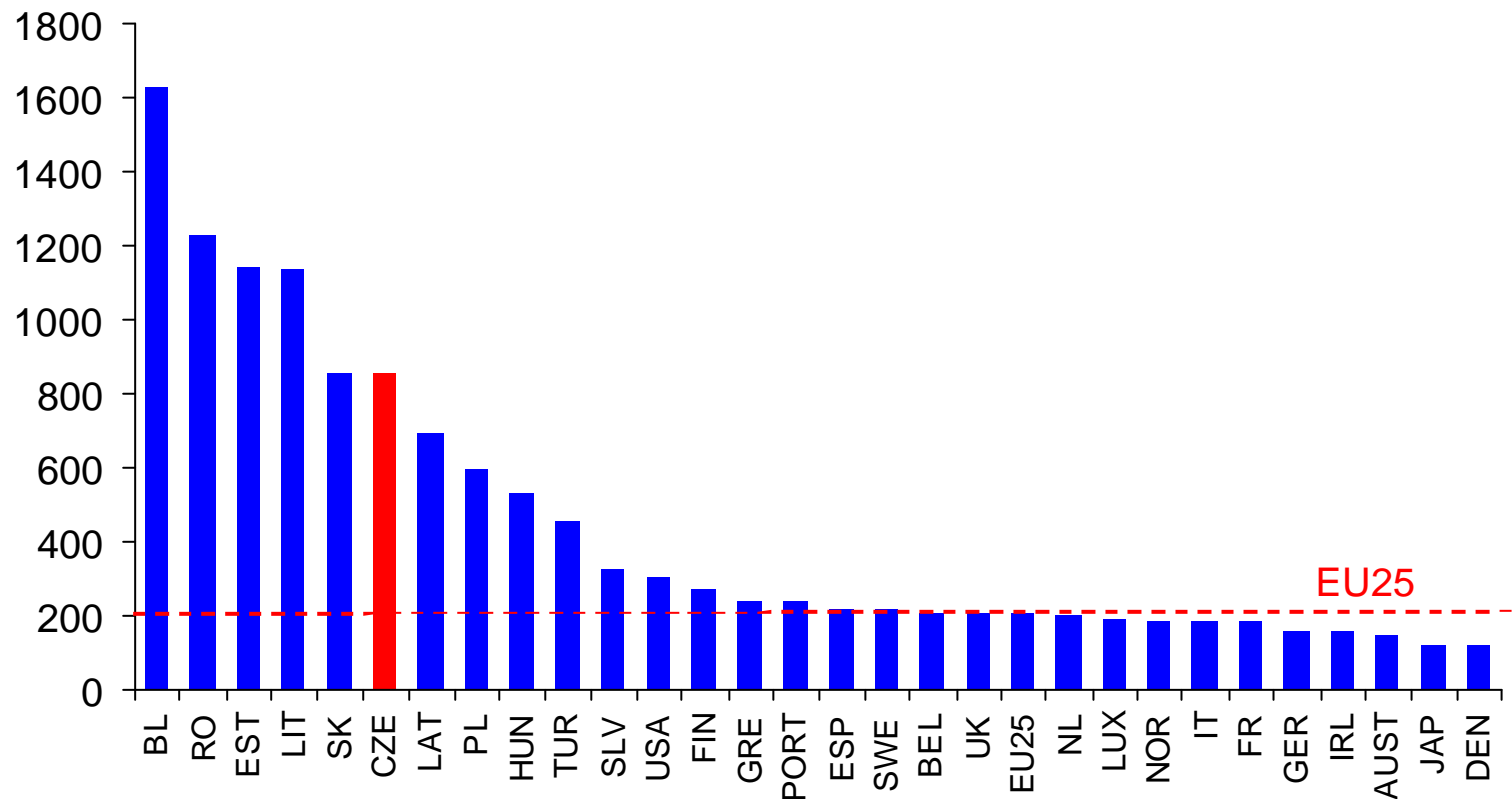
Czech National Bank

ČESKÁ **ČNB** NÁRODNÍ BANKA

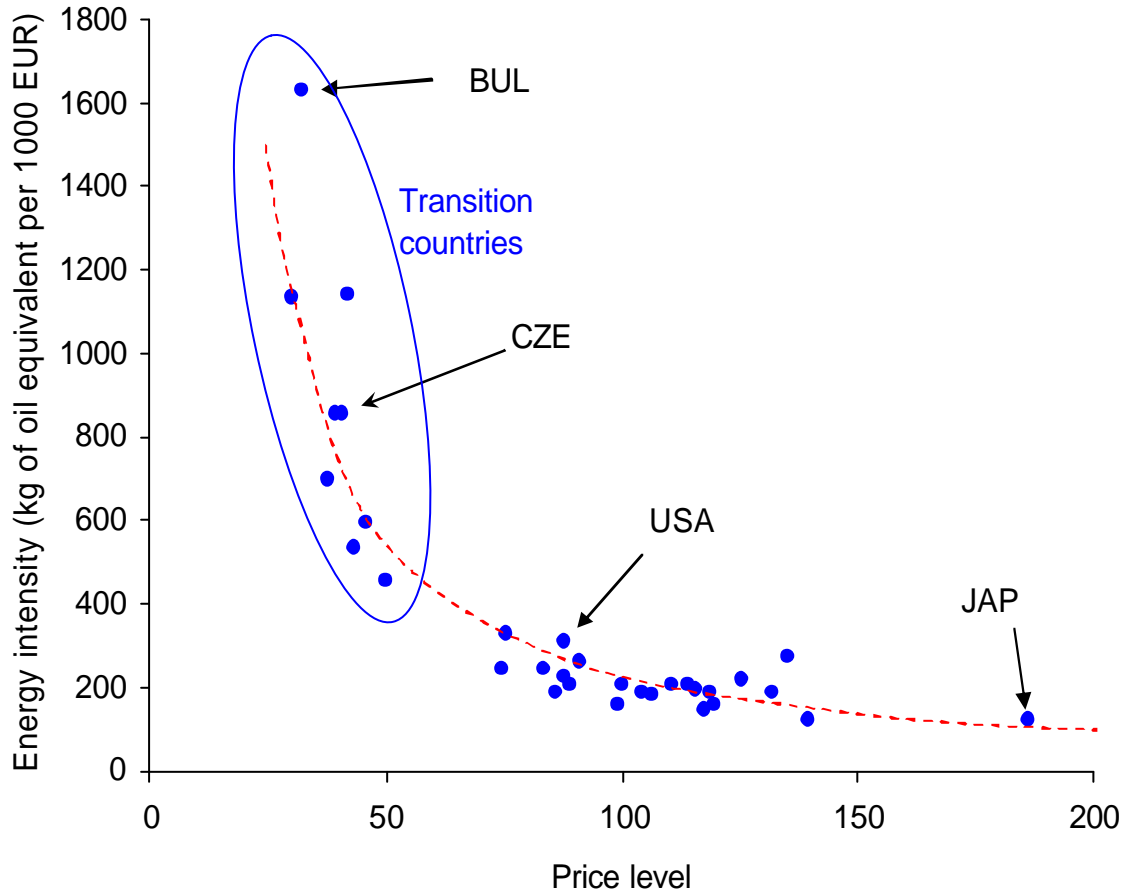
- Indicator of Energy Intensity of the Economy
- Electricity Consumption and GDP
- Prediction of Future Electricity Consumption
- Energy Savings as a New „Source of Energy“ (or Is It?)

Energy Intensity of the Economy I.

Energy intensity in terms of kilograms of oil equivalent per 1000 euro of GDP

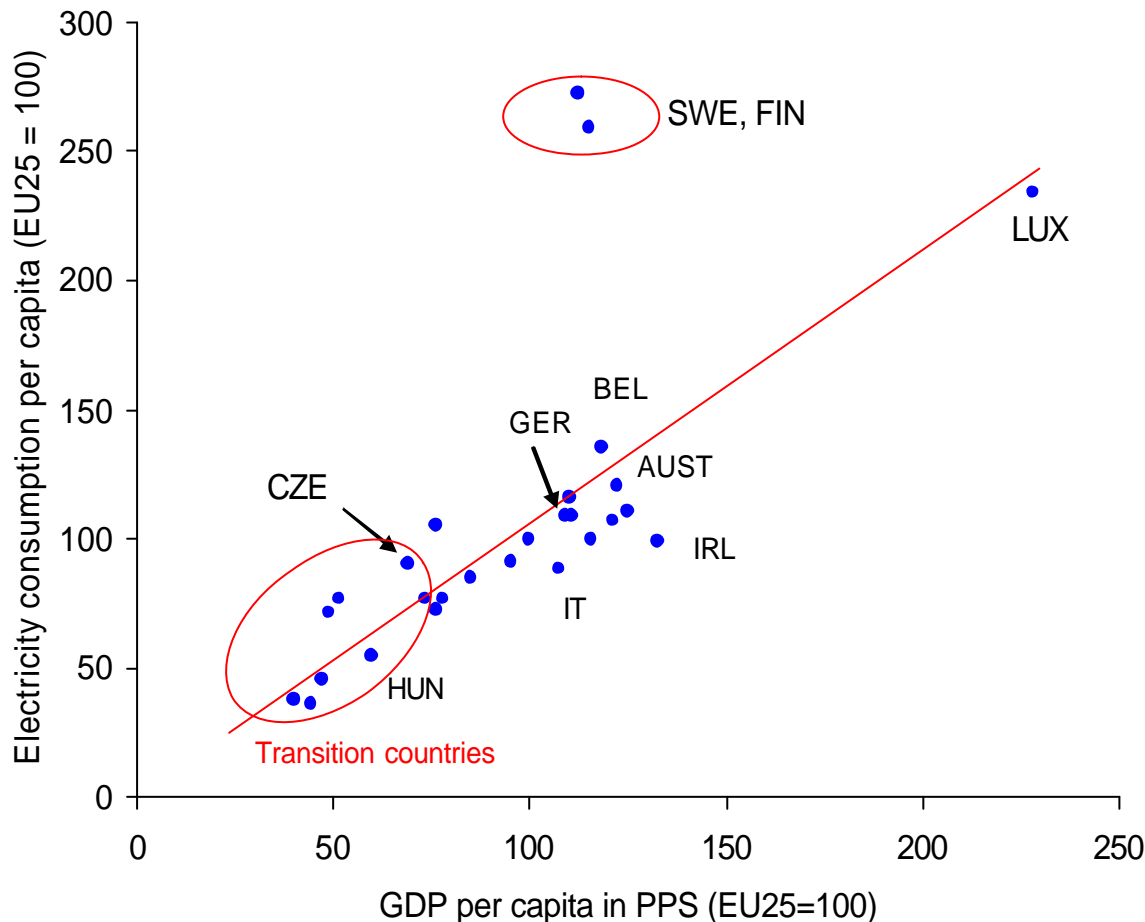


Energy Intensity II.



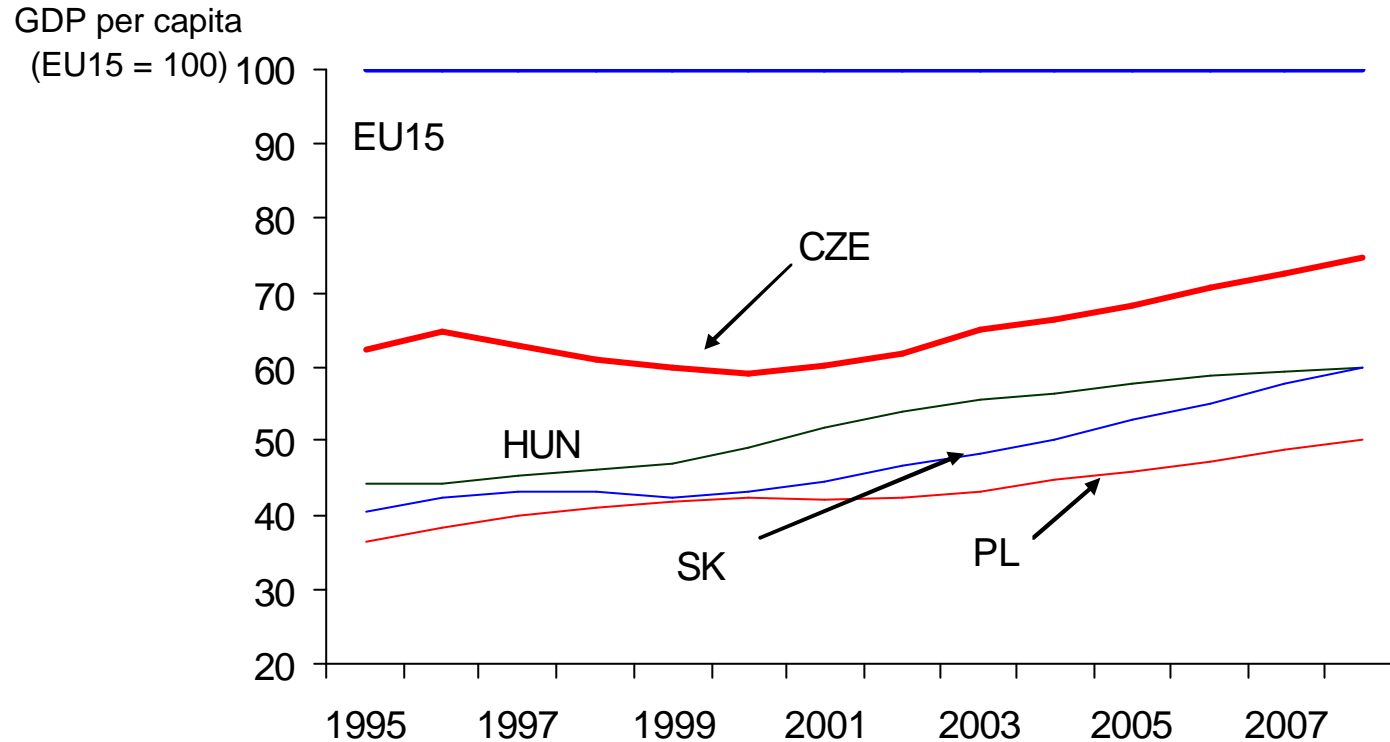
- Energy intensity in transition countries is many times higher than in developed countries
- The indicator of energy intensity as it is computed is **misleading** due to different price levels.

Consumption of Electricity and GDP in PPS



- Relatively strong relationship between GDP in PPS and electricity consumption
- Other factors: geographical position, industrial structure
- Some countries above the fittedline, e.g. Czech Republic – is it a symptom of energy inefficiencies?

Convergence Process



- Estimates of future GDP growth as a starting point for estimating future electricity demand
- Growth of electricity demand (long term) = EU15 growth + convergence + population development

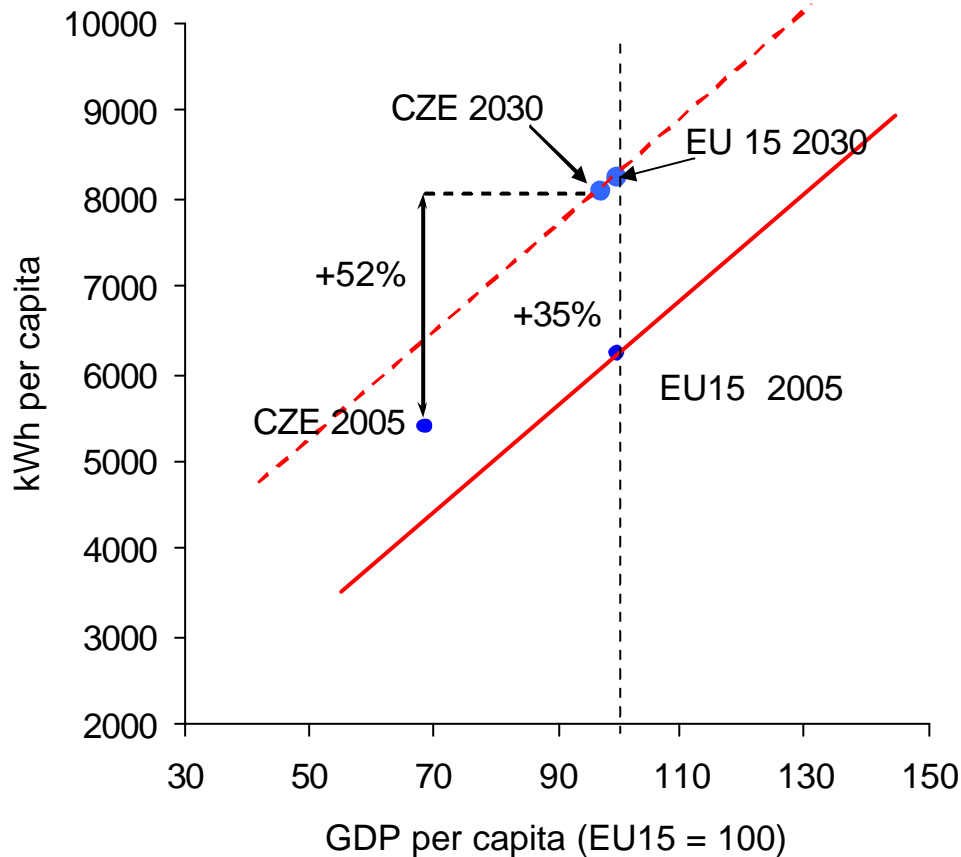
Prediction I.

Czech GDP growth rate (average 2005-2030)	EU 15 GDP growth rate (per capita, average, 2005-2030)	Czech GDP per capita in 2030 (EU15=100)	Czech electricity demand per capita (index 2030/2005)
3.5	1.5	110.7	172
3.0	1.5	98.1	152
2.5	1.5	86.9	134

Source: author's calculations

- Assumptions: GDP growth 3%, income elasticity of electricity demand 0.8, elimination of current deviation of the Czech Rep. from the regression line

Prediction II.



- Result: **+52 %** compared to present demand
- Strong growth despite conservative assumptions

A Note on Industry and Electricity Demand

Weight of industry in GDP has been decreasing. **Will it reduce electricity demand?**

	Share of industry in GDP in current prices	
	1970	2002
Belgium	35%	19%
France	28%	17%
Italy	29%	20%
Netherlands	27%	17%
Austria	32%	22%
Spain	30%	17%
Sweden	27%	20%
Great Britain	34%	20%

NO. The weight of industry is reduced because of declining relative prices of industrial production. Real growth rates of industry are similar to GDP growth rates.

	Growth of industry	GDP growth
Belgium	2,4%	2,4%
France	2,4%	2,5%
Italy	1,9%	2,3%
Netherlands	2,0%	2,5%
Austria	2,7%	2,6%
Spain	2,9%	3,0%
Sweden	2,6%	2,0%
Great Britain	1,2%	2,3%

Energy Savings as A New Source of Energy I.

- Position of environmentalists: better technologies will lead to savings in energy, future energy demand will not grow so fast, it may even decline, i.e. energy savings as a new source of energy
- What is quantitative size of energy savings?
- Methodology:

$$E = u \cdot X / A$$

E ... electricity demand

u ... rate of use of electrical equipment

X ... stock of electrical equipment used in industry and services

A ... energy saving technology

Energy Savings as A New Source of Energy II.

$$E = u \cdot X / A$$

	1985 - 2004		1990 - 2004	
	Electricity demand	Stock of equipment (proxy)	Electricity demand	Stock of equipment (proxy)
Austria	n.a.	n.a.	2.0	3.0
Denmark	1.5	6.7	0.8	5.5
Finland	n.a.	n.a.	2.5	0.8
France	n.a.	n.a.	2.0	3.5
Italy	3.0	3.1	2.5	2.9
Netherlands	3.0	6.8	2.4	6.6
Norway	1.1	4.2	1.1	4.5
Spain	n.a.	n.a.	4.3	4.3
UK	2.5	5.0	2.2	5.3
Average	2.2	5.2	2.2	4.0

Energy Savings as A New Source of Energy III.

- Energy savings were substantial and they will probably continue to be important
- BUT (!): the stock of equipment grows fast, usually faster than real GDP (this is in line with diminishing marginal returns)
- Therefore despite energy savings, demand for electricity will continue to grow

Thank you for your attention

Jan Kubicek

Jan.kubicek@cnb.cz