

The vulnerability and social injustice of coal energy policy in the Czech Republic

Does the coal energy prevent or contribute to (energy) poverty?



Bohumil Frantál – Stanislav Martinát – Eva Nováková

Institute of Geonics , Academy of Sciences of the Czech Republic
Department of Environmental Geography, Brno



Energy policy of the Czech Republic – general facts

The overall electricity generation is produced by

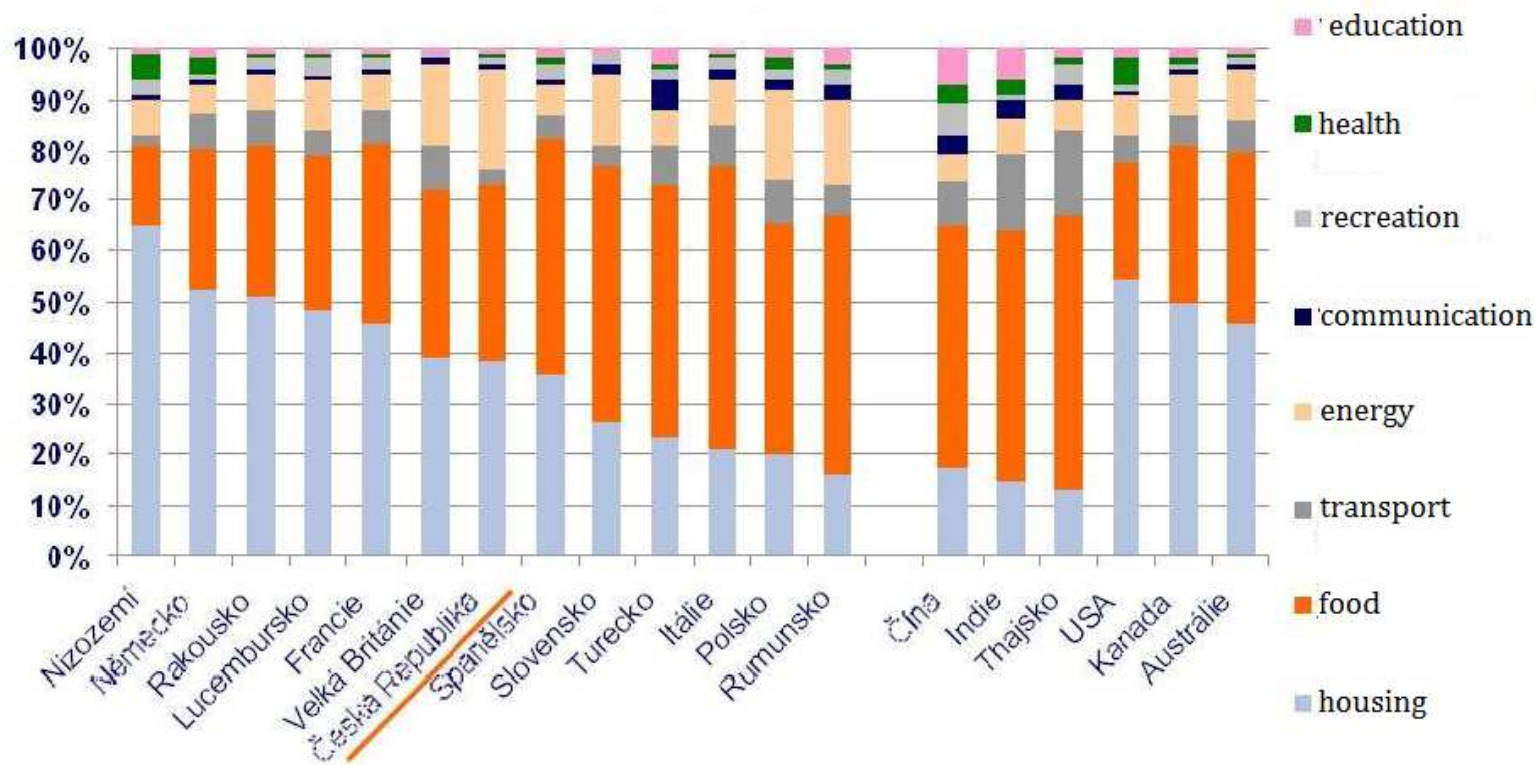
- thermal power plants (57%)
(burning primarily brown coal (46%), black coal (5,5%), gas (4%) and other fuels)
- nuclear power plants (33%),
- renewable energy sources (10 %) (Source: ERU, 2013)

Czech Republic has been regularly among the biggest net exporters of electricity worldwide (net export in 2013 exceeded 17 TWh - a historical maximum)

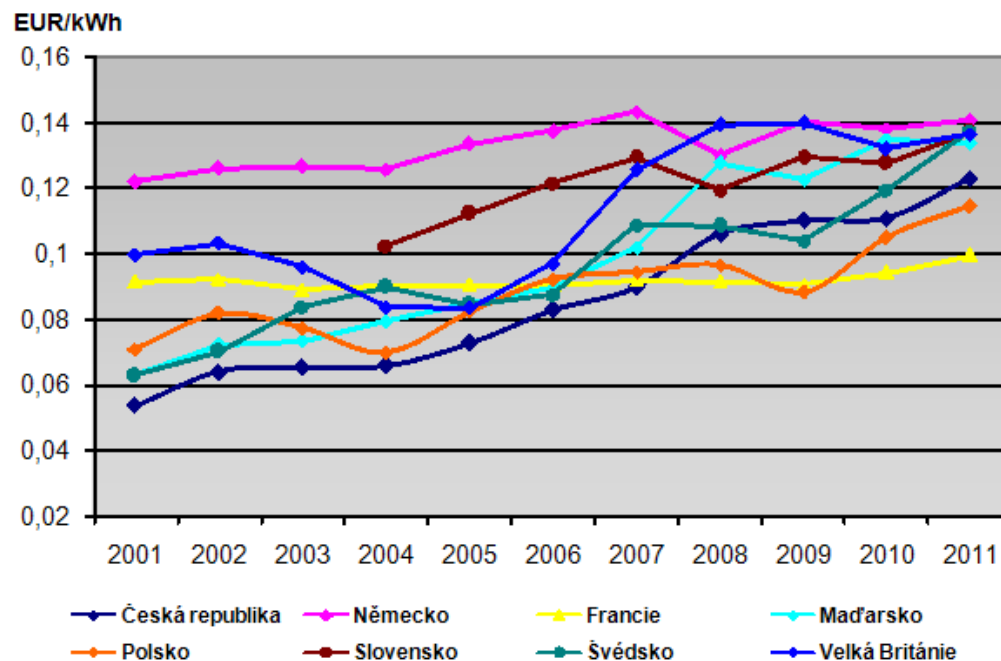
This export represents approximately 5 million tons of brown coal burnt in Czech thermal power plants of low energy efficiency (Polanecký et al., 2010).

It can be considered a form of landscape commodification and exportation which raises questions of environmental injustice or the uneven spatial and social distribution of benefits (economic profits for energy producers and stakeholders, possible cheaper electricity for general public) and costs (in the form of environmental, health, economic and social impacts) of electricity from coal.

Energy costs and share of household expenditures

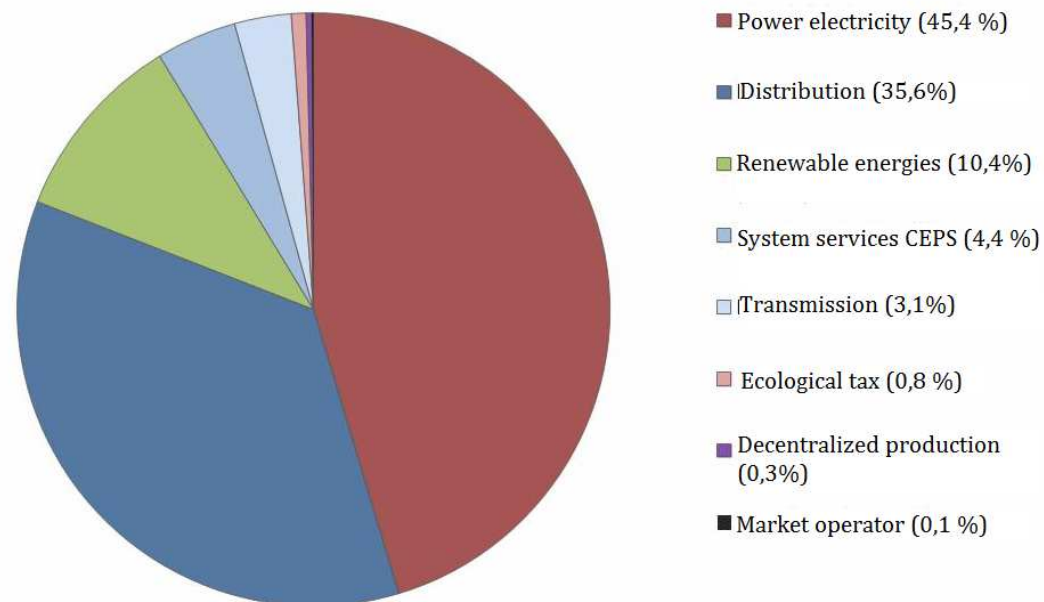


About 20% of monthly expenditures goes to energy costs (ING Bank survey, 2012)



Electricity costs

What does constitute the cost of electricity for end users ?





Conflict issues

- Should the Czech Republic continue in coal mining and coal combustion or support further renewable energy development ?
- Should the government apply a carbon tax for electricity produced from fossil fuels and/or special taxes for electricity producers whose power plants do not achieve a set minimum energy efficiency?
- A conventional public perception being supported by the coal industry lobby prevails of that renewable energy is expensive and needs to be subsidized while fossil fuels are cheap... But what is the real social cost of coal energy?
- Who will benefit from a possible breaking of the territorial ecological limits of brown coal mining in North Bohemian coal basin?
- Does coal energy industry prevent or contribute to increasing energy poverty?

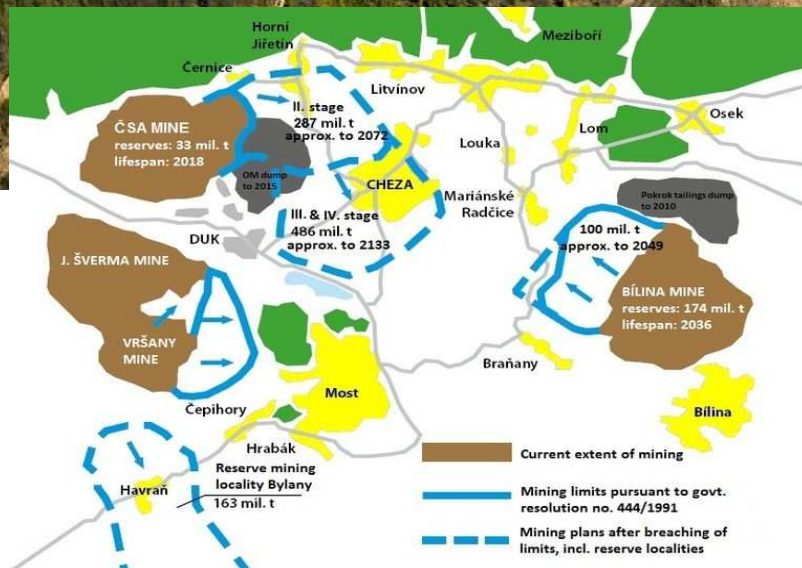
Competing discourses of coal energy



- It is necessary to prevent rapid increase of electricity and district heating prices and prevent energy poverty! (subventions for renewable energy and lack of coal and its substitution by natural gas in the central heating plants)
- It is necessary to maintain employment in coal mining regions! (*a social mining?*)
- We should keep the traditional Czech branch running and to contribute to the state budget !

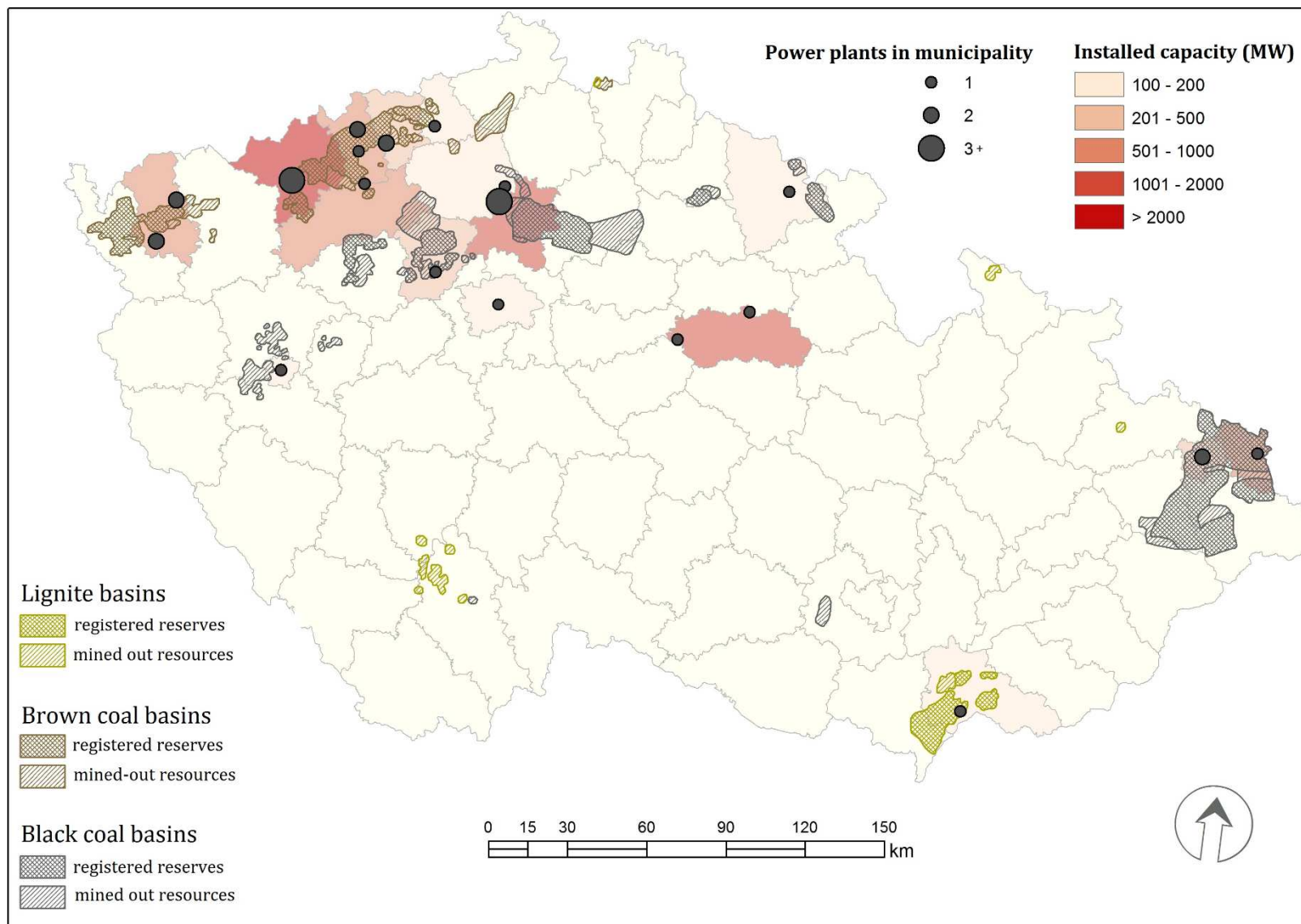


- The coal energy comes at a tremendous environmental and social cost!
- Effects of coal industry on regional employment rates are negligible, the economic benefits are unevenly distributed, and continues in regional resource-dependency.
- Low energy efficiency of coal combustion in thermal power plants (let's save the coal for future when economically and technologically more effective processing will be possible).



Ecological limits of mining in the Most region, Northern Bohemia

Spatial distribution of coal mining and coal combustion



The resource curse and environmental injustice of coal energy

Relationship between distribution of power plants and mean values of selected indicators

Dependent variables	Category of district according to number of plants (number of districts within category)				Pearson's ρ
	0 (N = 61)	1 (N = 8)	2 (N = 3)	3+ (N = 4)	
Air quality (SO ₂ + NO _x + CO tones/km ²)	4,2	12,6	92,1	36,2	0,52**
Roma minority per 1000 population	0,4	0,5	0,8	2,0	0,51**
Life expectancy (years)	74,2	73,3	73,0	72,3	- 0,45**
Regional election turn-out [%]	38	35	34	31	- 0,44**
Crime offences per 1000 population	23	29	39	33	0,43**
Flats with central heating [%]	70	73	75	81	0,42**
Abortion rate	3,6	4,1	4,1	4,9	0,41**
Installed capacity of wind energy [MW]	2,1	1,3	2,7	18,8	0,38**
Infant mortality	2,6	4,0	3,4	4,9	0,33**
Average price of flats [mil. CZK]	1,303	1,138	0,995	0,780	- 0,32**
Basic education [%]	19	20	19	23	0,31**
Unemployment rate [%]	8,9	10,9	10,0	12,2	0,30**
Average monthly wage [CZK]	16 372	16 926	16 996	17 954	0,29*
Average monthly pension [CZK]	10 134	10 259	10 294	10 320	0,29*
Divorce rate	2,6	2,8	2,8	3,0	0,27*
Homeless people per 1000 population	0,9	1,6	1,8	1,1	0,25*
Environment protection [mil. CZK]	1,968	1,801	3,365	2,959	0,26*
Population per km ²	131	300	486	163	0,22*
Net migration	1,75	-0,23	-0,37	-0,33	- 0,21*

¹ Dependent variables are listed according to descending correlation value ² Correlations are significant at the level of **0,01; *0,05). Data source: Czech Statistical Office, Institute of Regional Information. Own calculations.

The resource curse and environmental injustice of coal energy

Table 3: Relationship between mining activity and selected indicators (Mean values and measures of association).

Indicators	District category ¹			Eta ²
	Non-mining districts	Mining districts	Most district	
Air quality (SO ₂ + NO _x + CO tones/km ²)	4,5	66,8	48,2	0,69**
Life expectancy (years)	74,1	72,1	72,1	0,56**
Abortion rate (abortions per 100 births)	34	42	49	0,41**
Basic or lower education [%]	19	22	24	0,41**
Unemployment rate [%]	9,1	12,3	15,6	0,40**
Business activity (business units per 1000 population)	236	199	199	0,35**
Population change (2005-2009 per 1000)	+ 20,7	- 10,9	- 16,1	0,28*
Roma minority per 1000 population	0,4	1,5	5,0	0,76**

¹ The 'mining districts' category includes all districts where coal mining is still active, the 'non-mining' category includes all other regions of the Czech Republic. ² Measures of association (Eta), Significance ** $p < 0,01$; * $p < 0,05$. Data source: Czech Statistical Office, Institute of Regional Information. Own calculations.



Conclusions

- Our data analysis support the hypotheses of the resource curse and environmental injustice of coal energy.
- Although coal energy contributed to a slightly above the average incomes and pensions (which are actually significant statistically but not practically), and provided households with some technical services (central heating), these positives have come at high environmental and health costs paid by local population, such as significantly worse air quality, lower life expectancy, higher rate of infant mortality, etc.
- Above the average rates of unemployment, homelessness and crime also indicate the economic benefits have been unevenly distributed (e.g. in 2012, the yearly income of the Czech Coal company was 3,3 billions CZK, from which 1,1 billions were payed out in dividends just to two majority owners!)
- A higher proportion of uneducated people and ethnic minorities detected in affected districts suggests the coal energy is environmentally unjust.
- There is no direct or even undirect contribution of coal energy to preventing general energy poverty! (actual annual revenues are only 1,5% (240 millions CZK) from brown coal and 0,5% (150 millions CZK) from black coal mining), with no contribution to cheaper energy (just regional reinvestments)



Policy recommendations

- The coal mining and coal combustion should be much more charged (mining revenues up to 30%, carbon tax, etc.)
- Actual energy expenditures of households include approx.: heating costs (56%), water heating (24%), and electricity (20%).
- In 2013, 77% of all permanently occupied dwellings were not insulated, about 55% will not be insulated even in 2020.
- Government should support energetic renovation of houses, replacement of boilers, implementation of solar systems, etc.
--- proposed 13 billions CZK invested into the implementation of „green technologies“ within 2013-2020 could generate additional GDP of 253 billions CZK and about 30 thousands of stable jobs
(source: *Hnutí Duha*, 2013)

Thank you for your attention !
Any questiones ?



RNDr. Bohumil Frantal, Mgr. Stanislav Martinat, Mgr. Eva Novakova

Institute of Geonics, Academy of Sciences of the Czech Republic

Department of Environmental Geography, Brno

E-mail: frantal@geonika.cz