IMPACTS OF CZECH BROWN COAL MINES ENLARGEMENT: ASSESSMENT BY ENERGY MODEL TIMES-CZ

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Overview
After years of deliberations, the Czech government revoked its past binding decision about the territorial ecological limits for brown coal mining from 1991 and voted in favour of lifting brown coal mining limits in the Bílina pit in northern Bohemia in October 2015. We analysis the impacts of Czech brown coal mines enlargement and possible ban on new nuclear power plants on the Czech energy system. We use localized TIMES model with individual plants included in the EU ETS. The effect of the potential enlargement of brown coal mines is highly dependent on future development of fuel and EUA prices. In scenarios with high EUA price the enlargement of brown coal mines does not bring any additional brown coal consumption in the energy system and the use of the addition brown coal is questionable.

Methods
Czech localization of partial equilibrium model TIMES is used to analyse four options of the revoking of the territorial ecological limits for brown coal mining in the Czech Republic. This policy decisions is further investigated in sensitivity analysis under various developments of fuel and EUA allowance prices and under 3 possible policy decisions about the future of nuclear energy at the Czech Republic.

Results
Revoking of the territorial ecological limits for brown mining increases the brown coal consumption in Czech energy sector only in limited way. The brown coal consumption does not increase with higher brown coal availability than set by the government in October 2015. The decision about the future development of nuclear energy in the Czech Republic does not have significant effect on the share of brown coal on electricity production because the nuclear energy is replaced by natural gas or hard coal depending on the fuel prices assumptions.

Conclusions
The sensitivity analysis shows that the global fuel prices and price of the EU ETS allowance have much higher influence of the Czech energy system than the availability of the brown coal in the Czech Republic. Considering the environmental effects of brown coal mining and burning together with the international efforts to reduce the greenhouse gases, further enlargement of brown coal availability by revoking of the territorial ecological limits is not desirable.

References
Capros, P., Paroussos, L., Fragkos, P., Tsani, S., Boitier, B., Wagner, F., Busch, S., Resch, G., Blesl, M., Bollen, J., (2014) " *Description of models and scenarios used to assess European decarbonisation pathways*", Energy Strateg. Rev. 2, 220–230. doi:10.1016/j.esr.2013.12.008
Timmerman, J., Vandevelde, L., Van Eetvelde, G., (2014) "*Towards low carbon business park energy systems: Classification of techno-economic energy models*", Energy 75, 68–80. doi:10.1016/j.energy.2014.05.092