

Preliminary results from CGE model

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Agenda

1. Scenarios description
2. Important assumptions
3. Results for scenario proposed by the Czech MoE
4. Comparison with ETR results
5. Results for alternative scenarios
6. Conclusion

Policy scenarios

- Scenario 1: the increase in emission charges as proposed by the Czech MoE in Air Quality Act
- Scenario 1a: scenario 1 + ETR via payroll tax for employers
- Scenario 2: scenario 1 with constant rates for 2010 and on
- Scenario 3: abolishment of emission charges

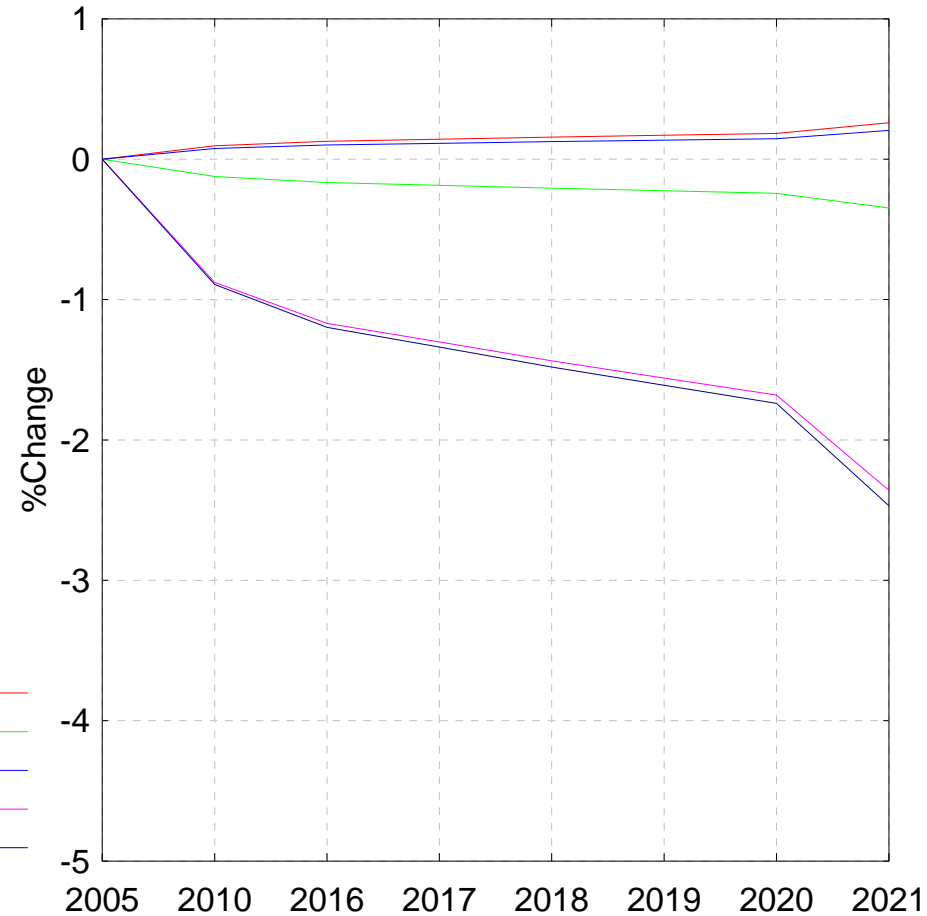
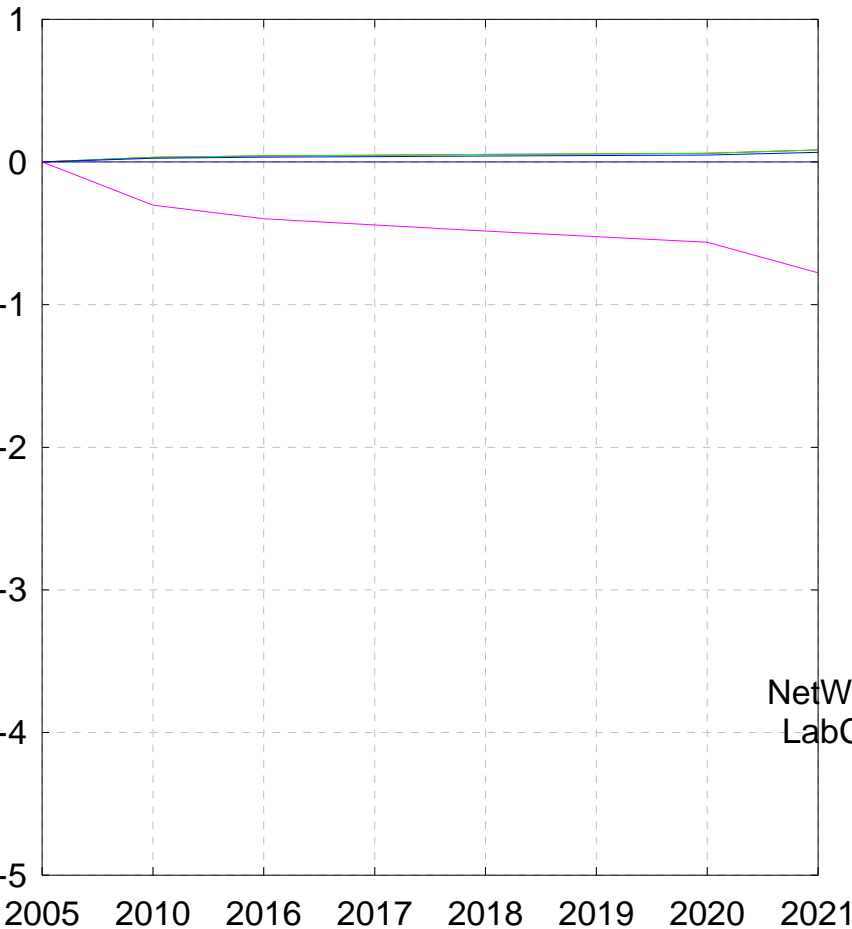
Table 1: Emission charge rates [nominal Kc per t] & [%change in real term] for stationary (except households) and process related (except for CO₂) sources

	2005-2009		2010-2015		2016		2017		2018		2019		2020		2021 and on	
PM	3 000	0%	4 200	19%	6 300	91%	8 400	153%	10 500	214%	12 600	272%	14 700	329%	29 400	746%
SO₂	1 000	0%	1 400	19%	2 100	91%	2 800	153%	3 500	214%	4 200	272%	4 900	329%	9 800	746%
NOx	800	0%	1 100	17%	1 700	94%	2 200	149%	2 800	214%	3 300	265%	3 900	326%	7 800	742%
VOC	2 000	0%	2 800	19%	4 200	91%	5 600	153%	7 000	214%	8 400	272%	9 800	329%	19 600	746%
CO	600	0%	0	-100%	0	-100%	0	-100%	0	-100%	0	-100%	0	-100%	0	-100%
CO₂	0	0%	587	500%	662	662%	684	684%	706	706%	727	727%	749	749%	775	775%

Important assumptions

- Static model of the small-open economy (based on 2005 data)
- 19 sectors, 7 production factors, 1 household, government
- Combustion- & process-related emission of 6 pollution
- 10 types of taxes and quasi-taxes
- Net export = const (exchange rate is a numéraire)
- Capital supply = const
- Labor force = const, but endogenous unemployment
- No inflation, but we measure a price change within the model
- No technological progress
- No abatement possibility (to be add)
- External environmental benefits

Results for scenarios 1 & 1a: Labour market



How to interpret results properly

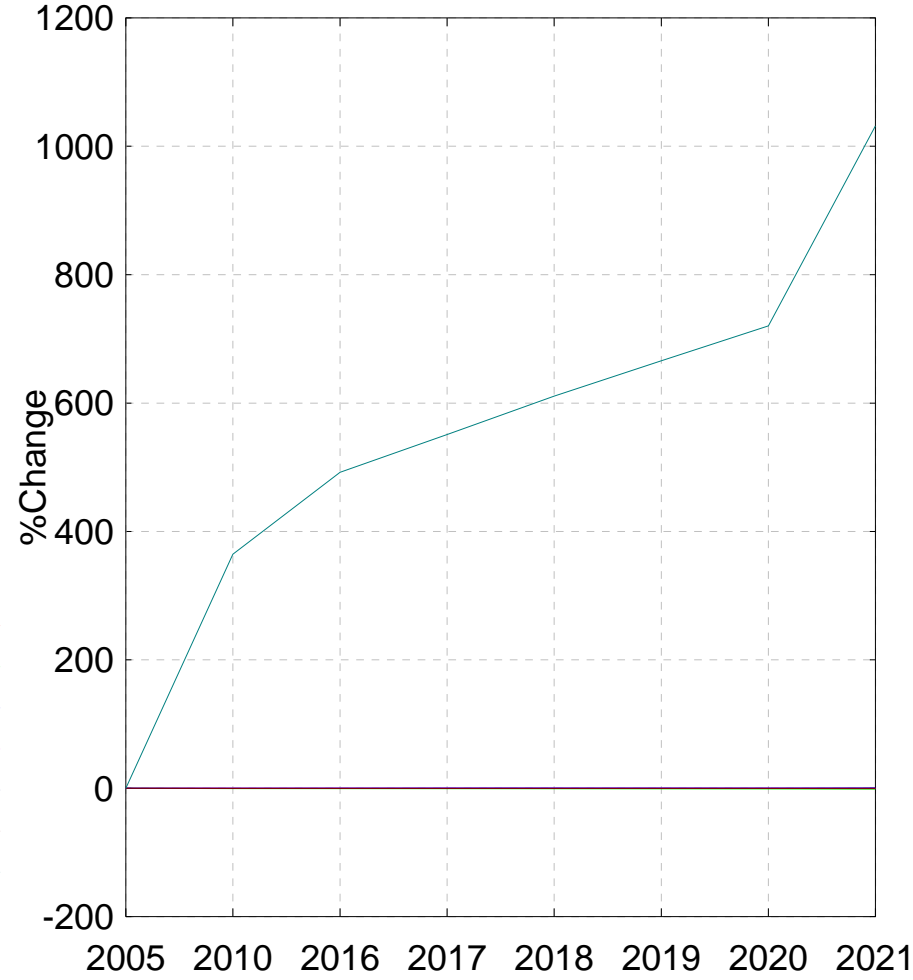
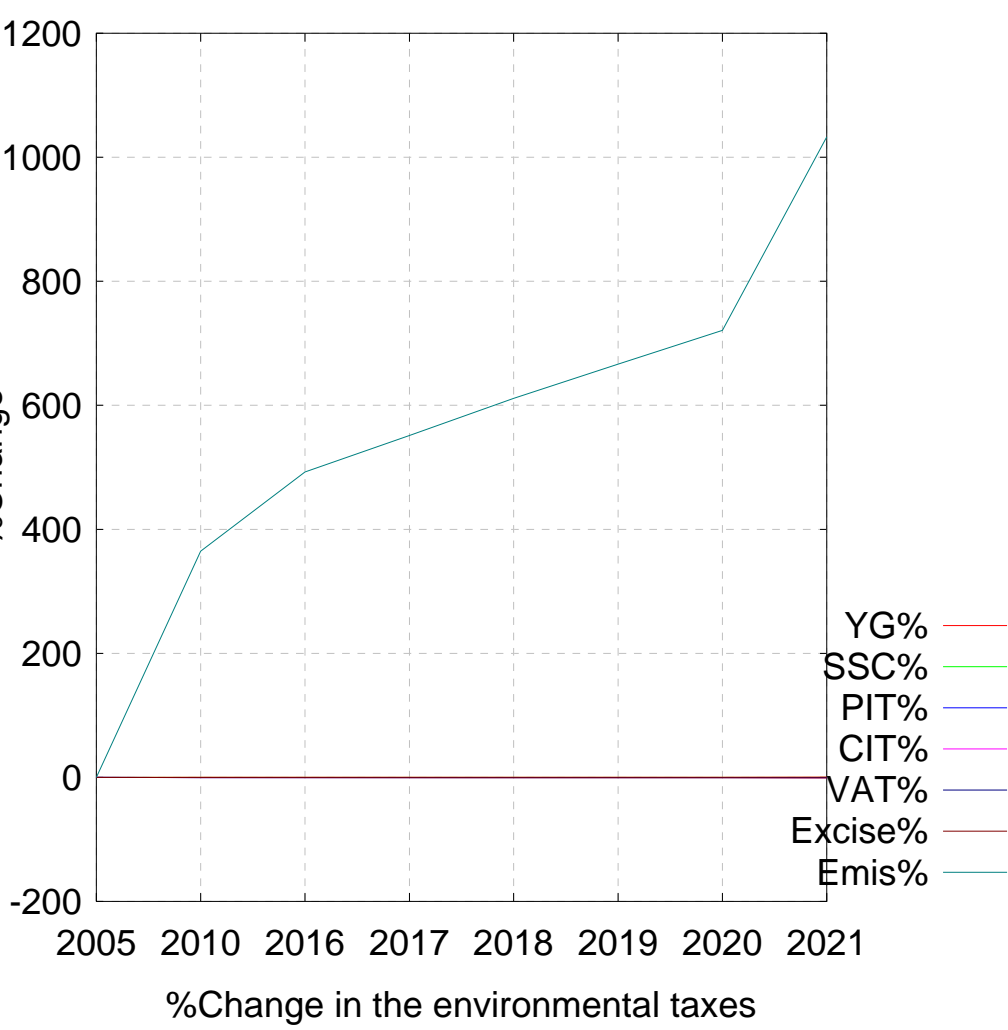
The results of CGE simulation do not imply that the implementation of the ETR will decrease unemployment by 0.9% in 2005-2010.

They imply that, *ceteris paribus*, unemployment would be 0.9%-0.3%=0.6% lower if ETR was implemented in 2005 together with new tax rates than if only new tax rates were implemented in 2005.

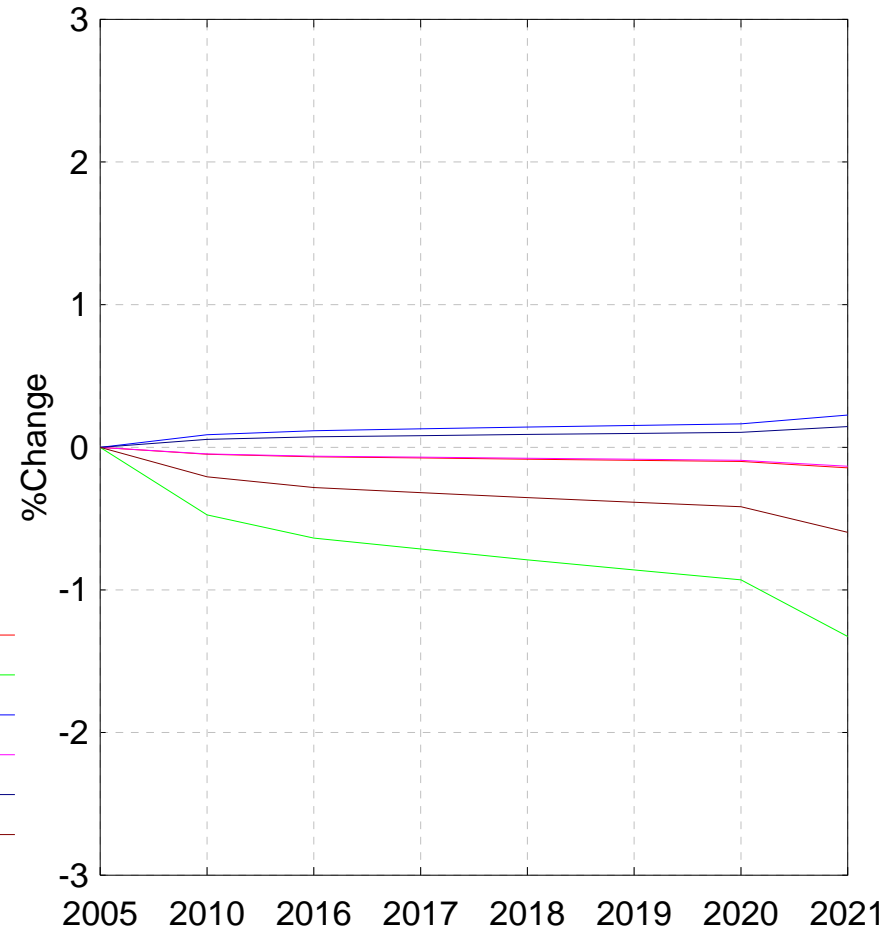
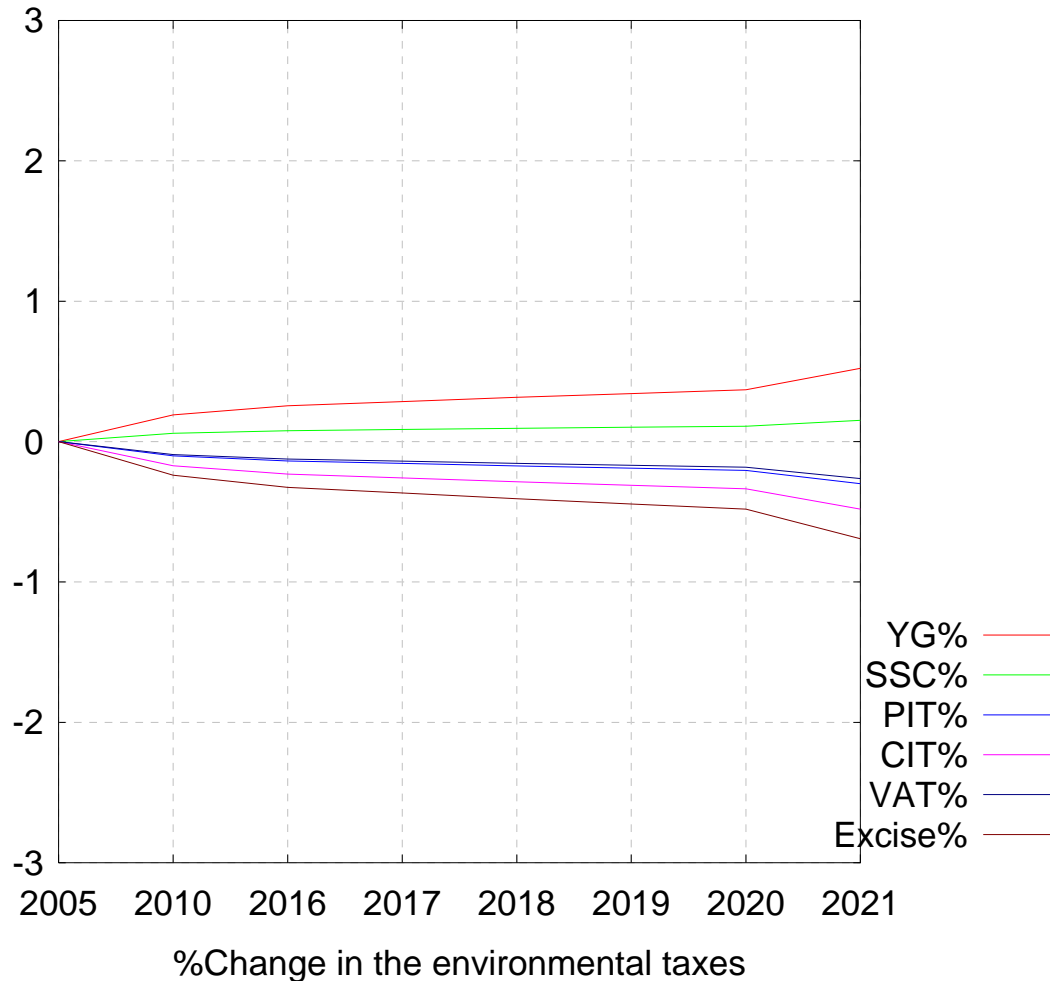
Also results may change if ETR was implemented in a different way (eg. via income tax instead of payroll tax).

Finally, CGE models do not provide precise results, because a numeric tolerance should be considered (at least $\pm 0.5\%$)

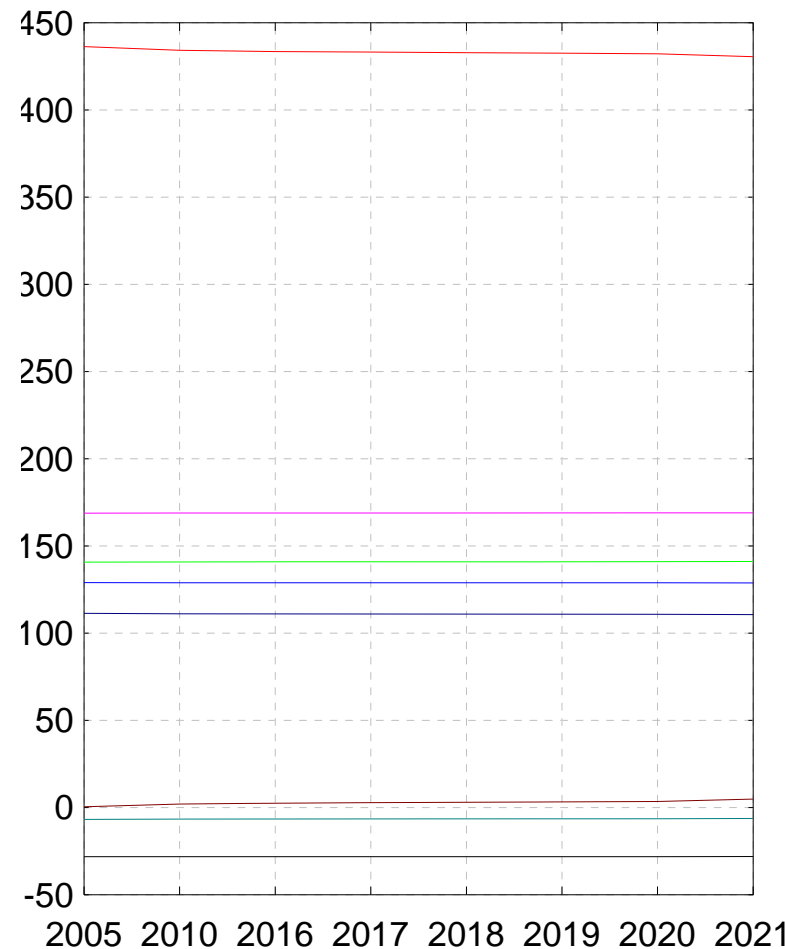
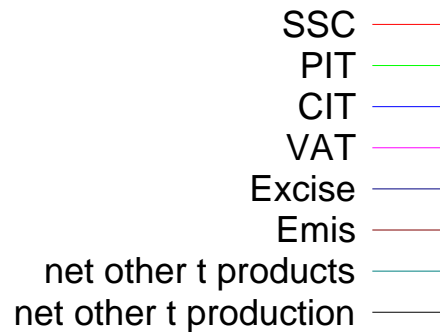
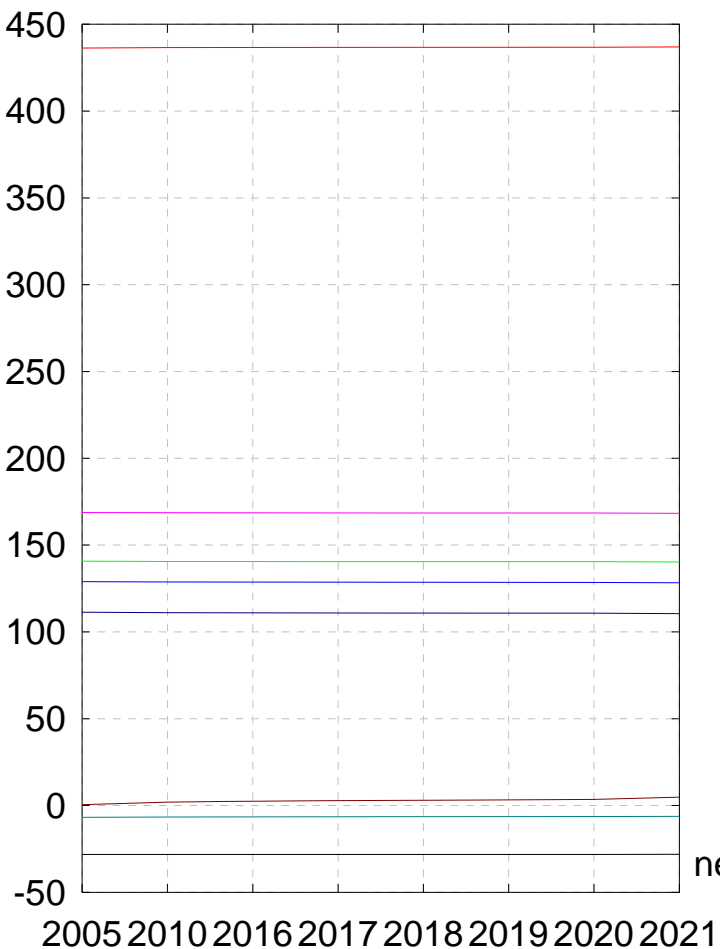
Results for scenarios 1 & 1a: Tax revenue per source



Results for scenarios 1 & 1a: Tax revenue streams (except emission charges)

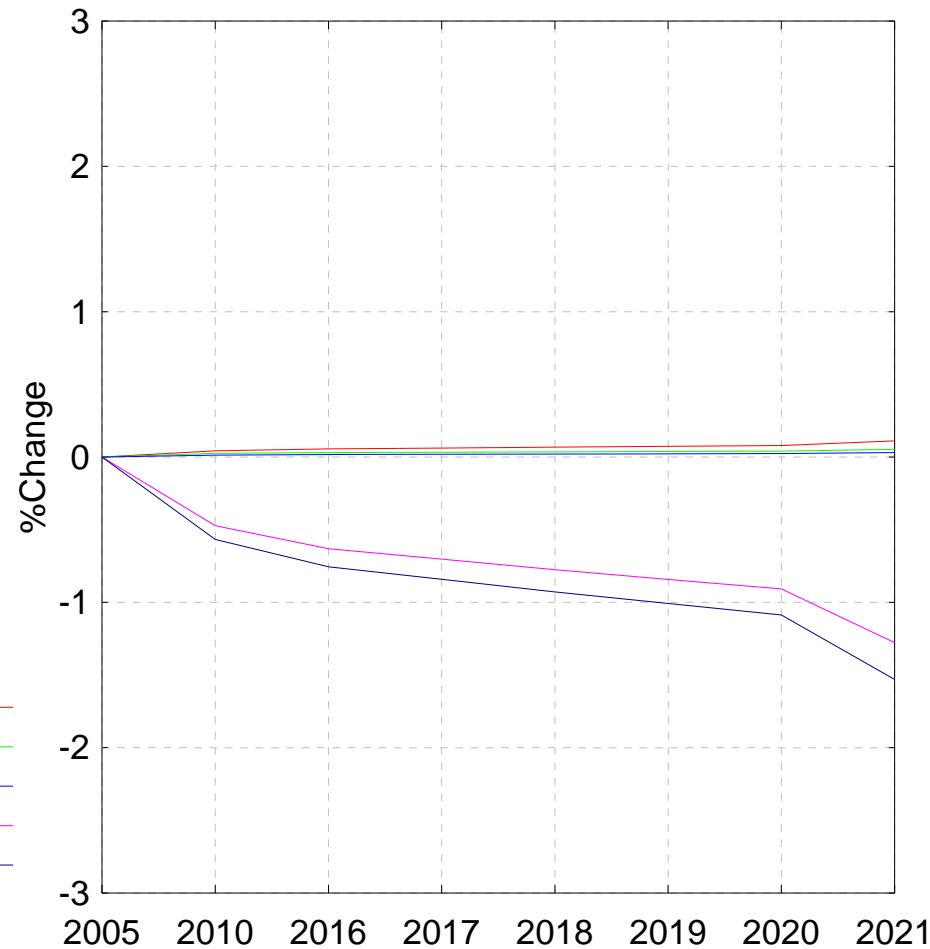
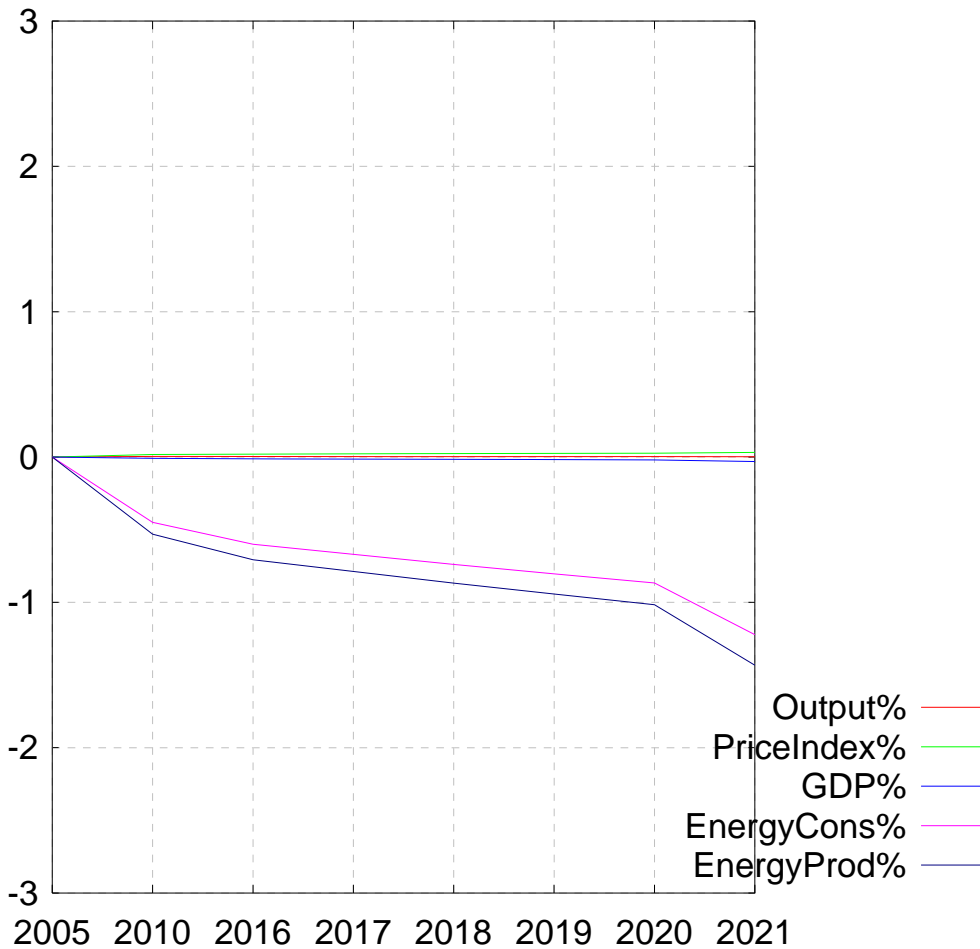


Results for scenarios 1 & 1a: Tax revenue [bln Kc 2005]

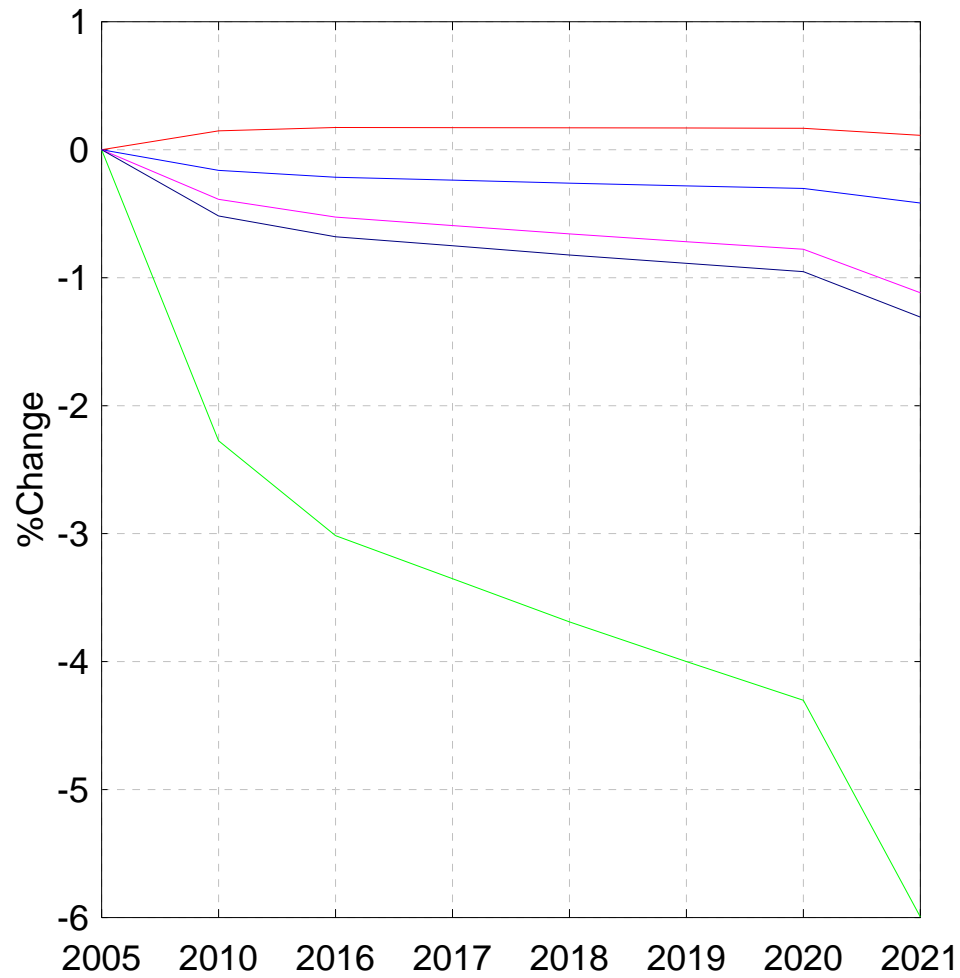
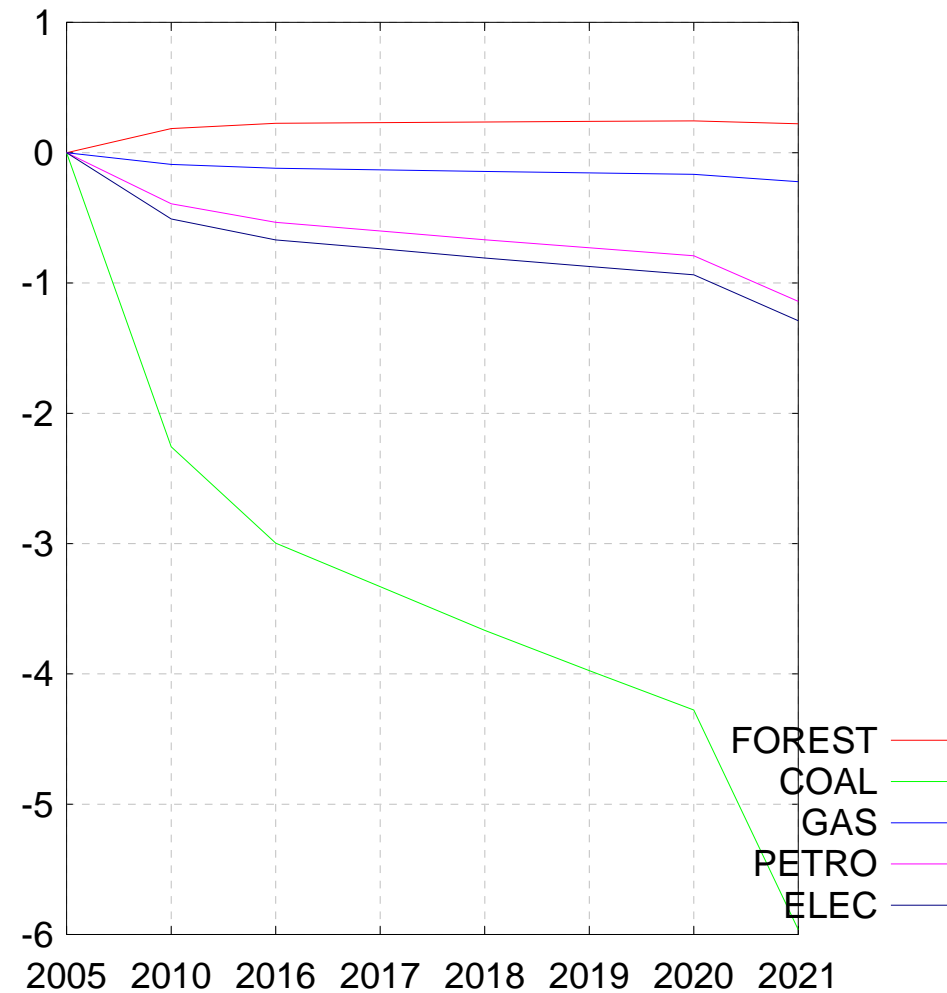


%Change in the environmental taxes

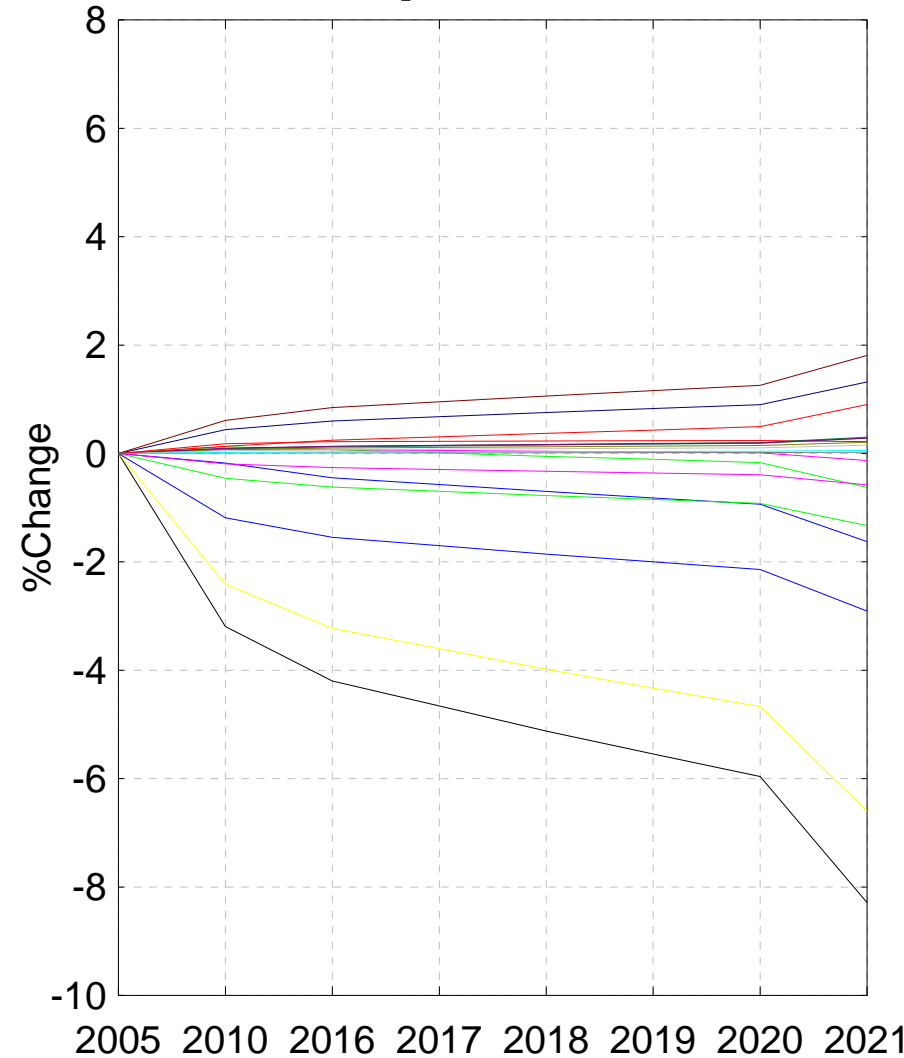
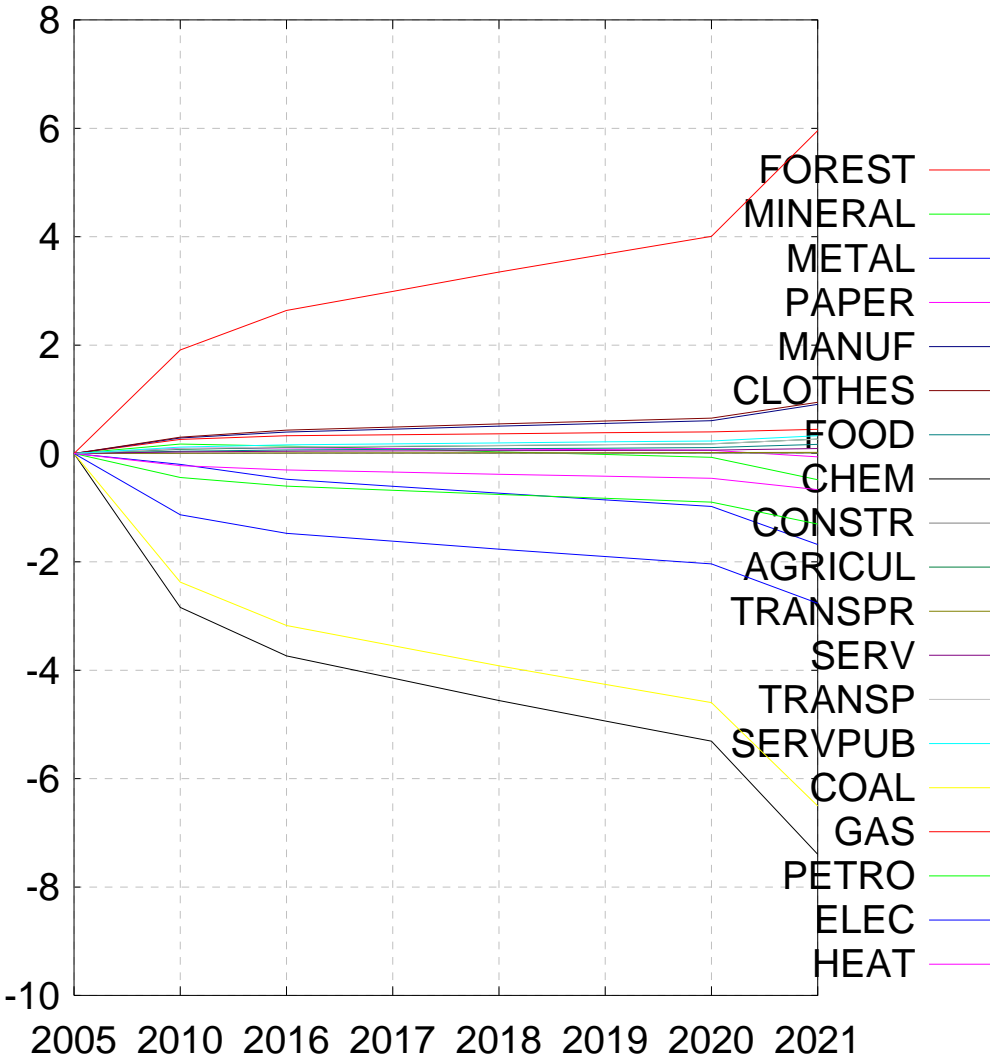
Results for scenarios 1 & 1a: Macro indicators



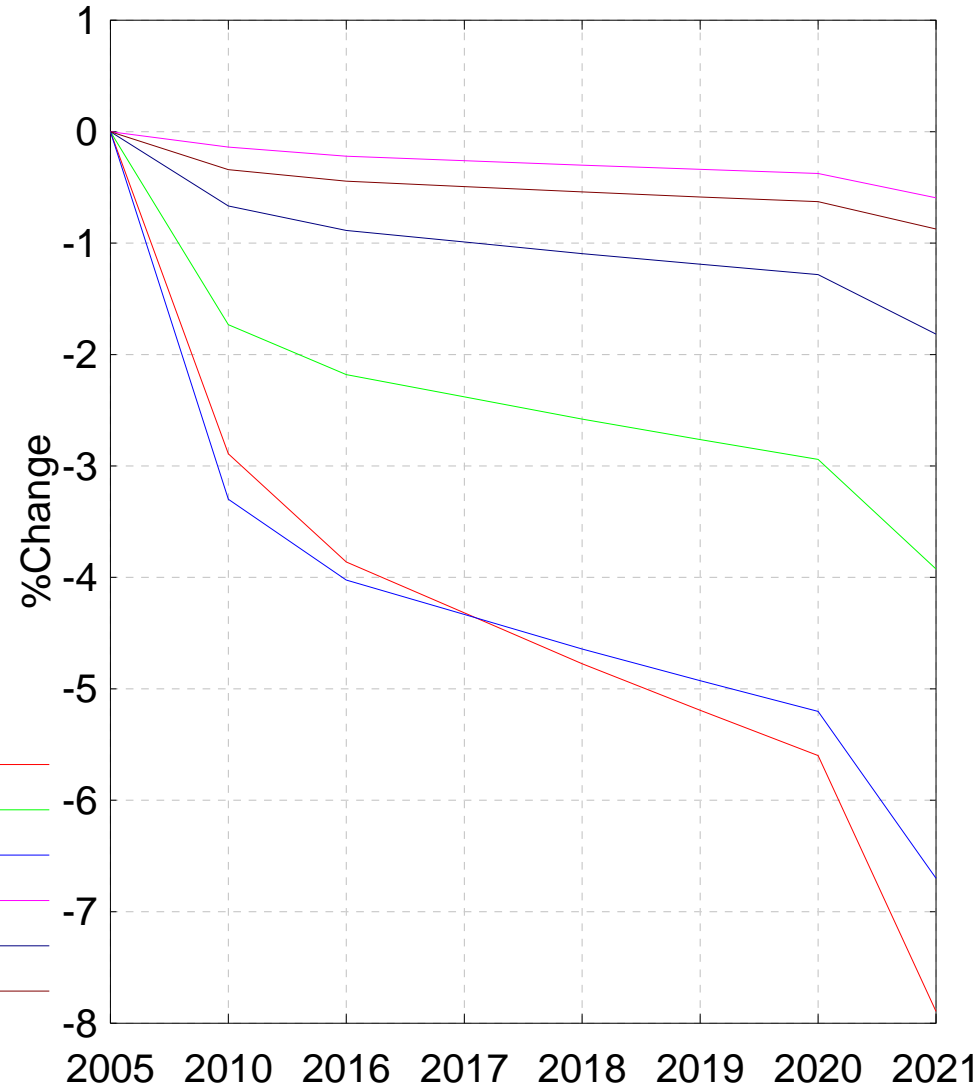
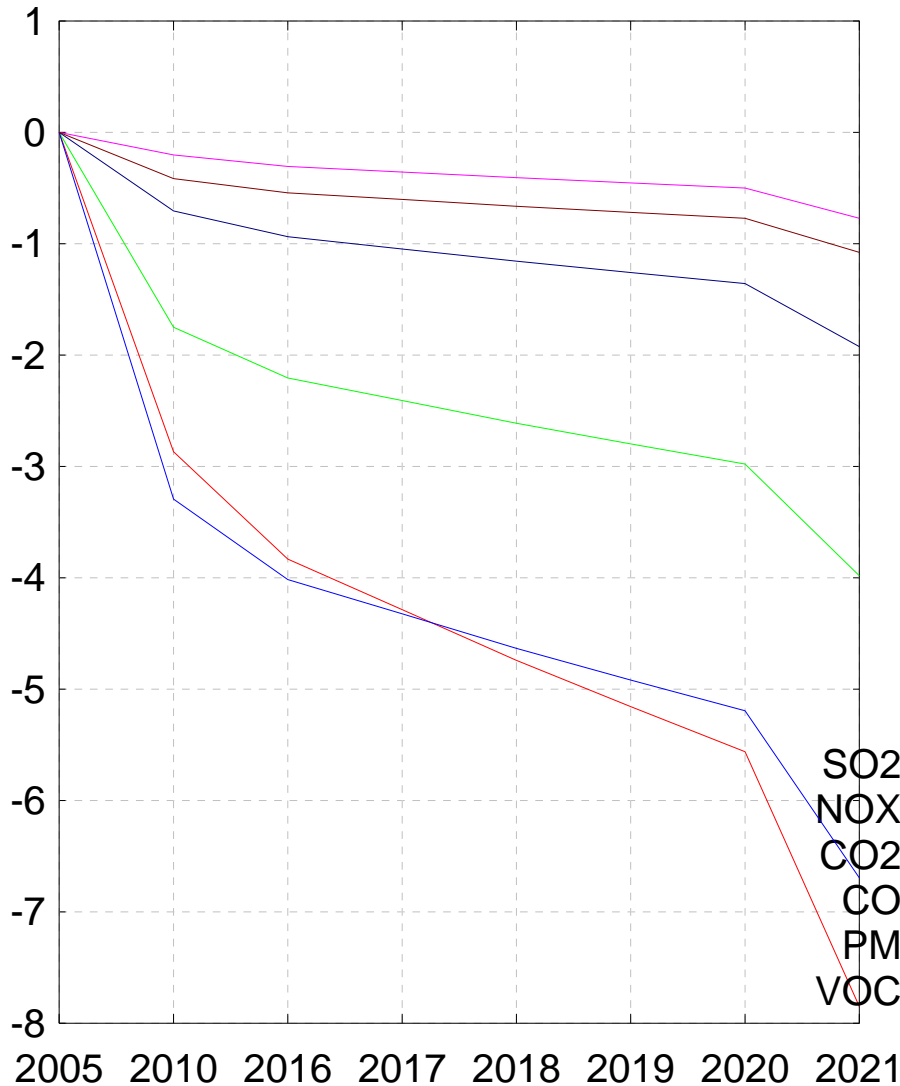
Results for scenarios 1 & 1a: Energy consumption



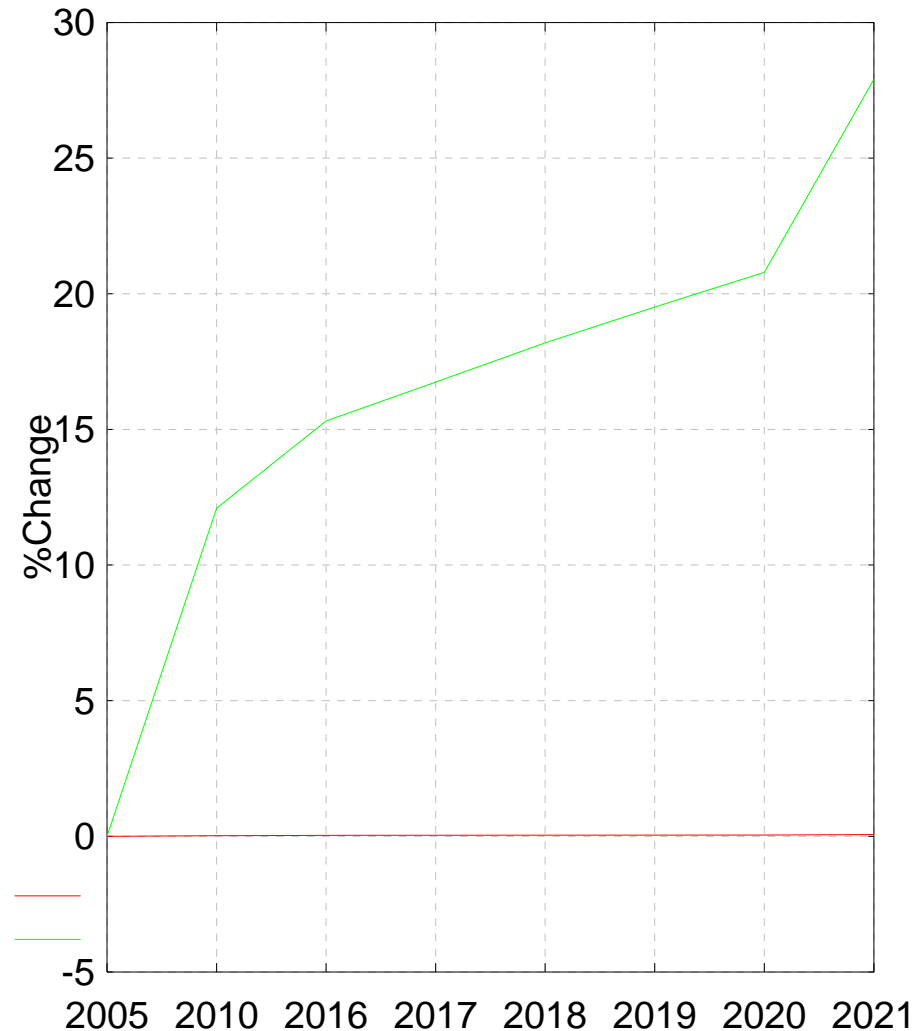
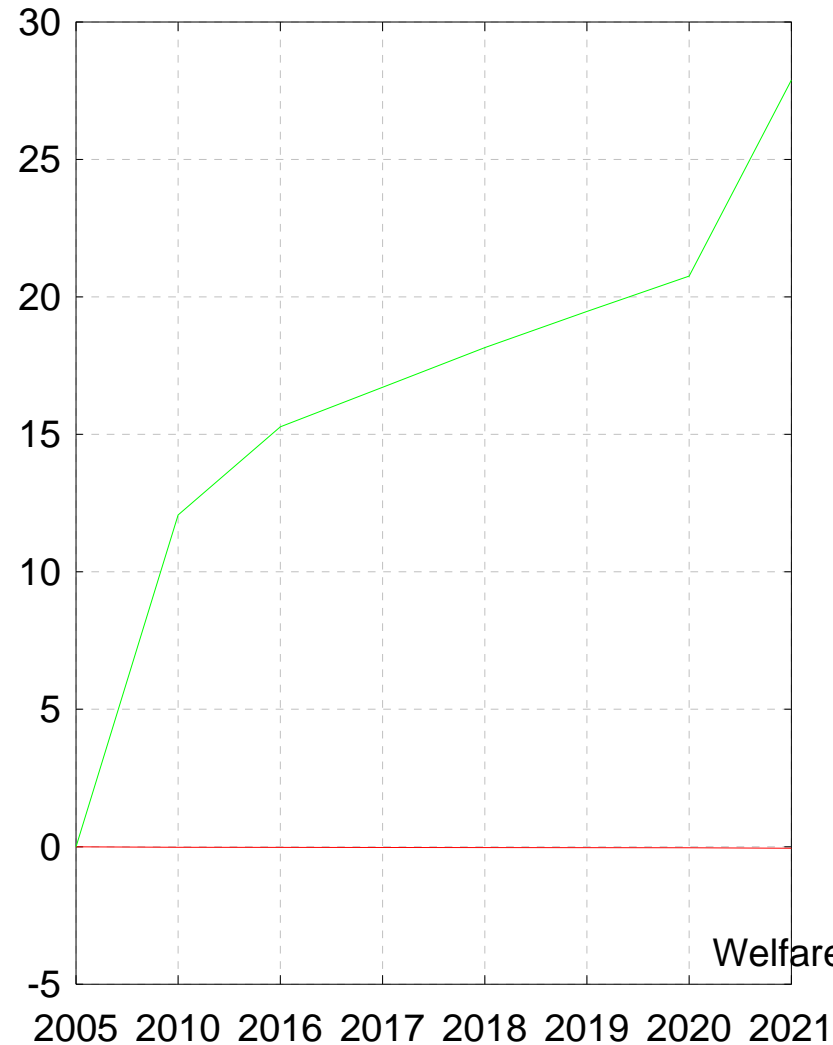
Results for scenarios 1 & 1a: Output



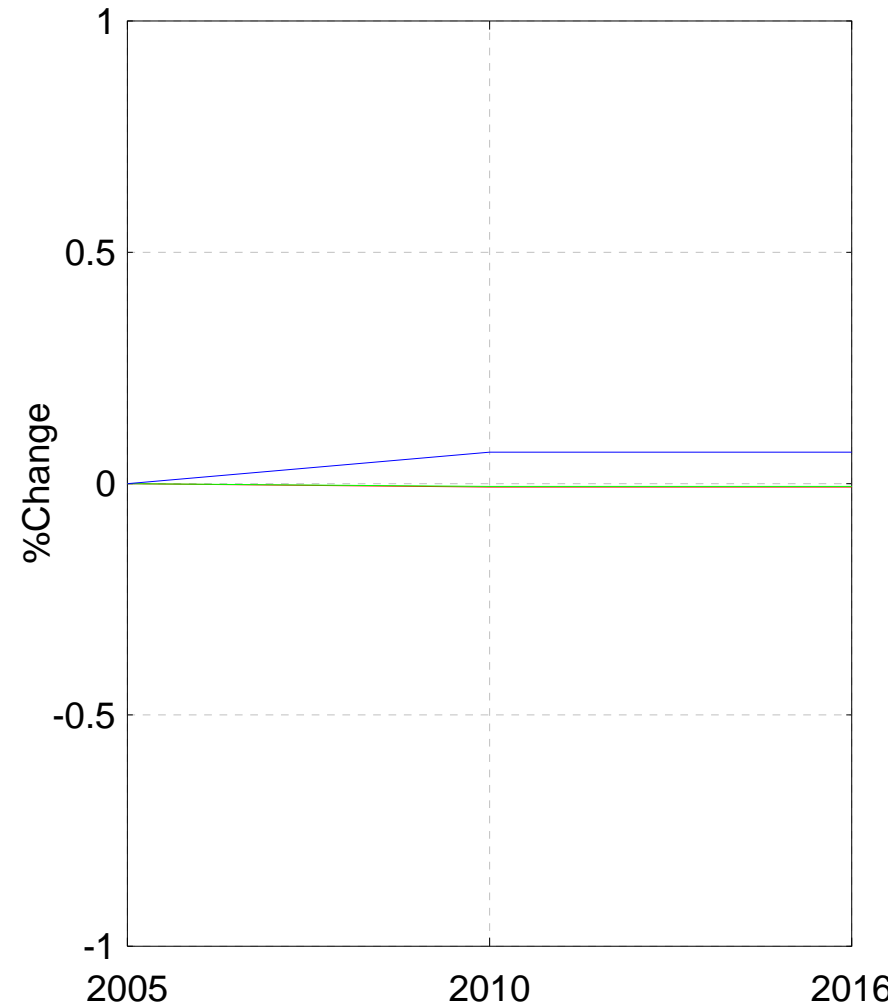
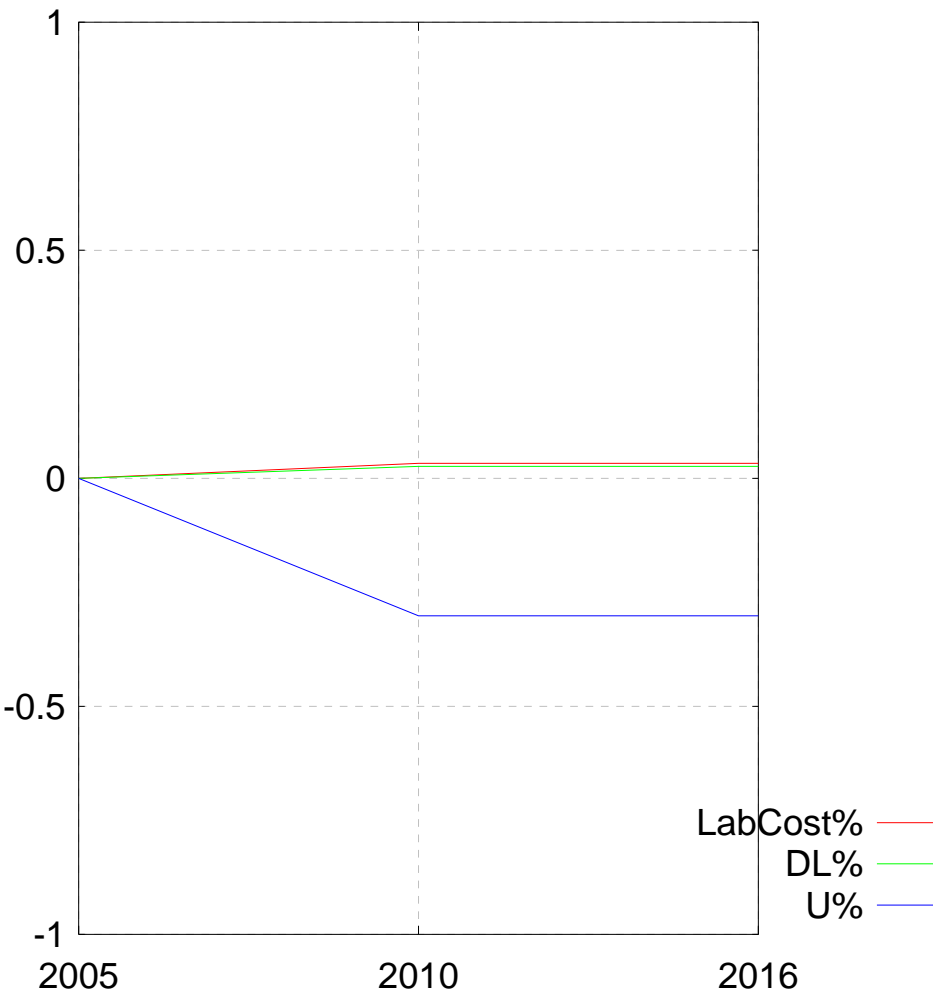
Results for scenarios 1 & 1a: Pollution emission



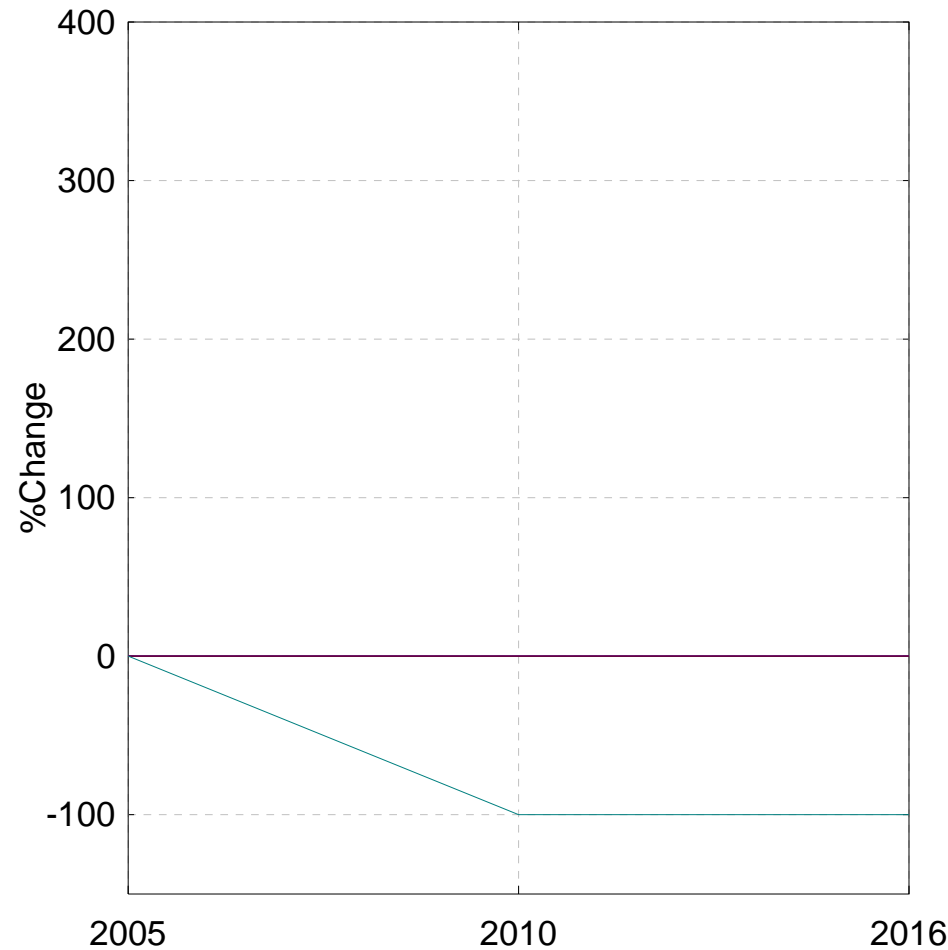
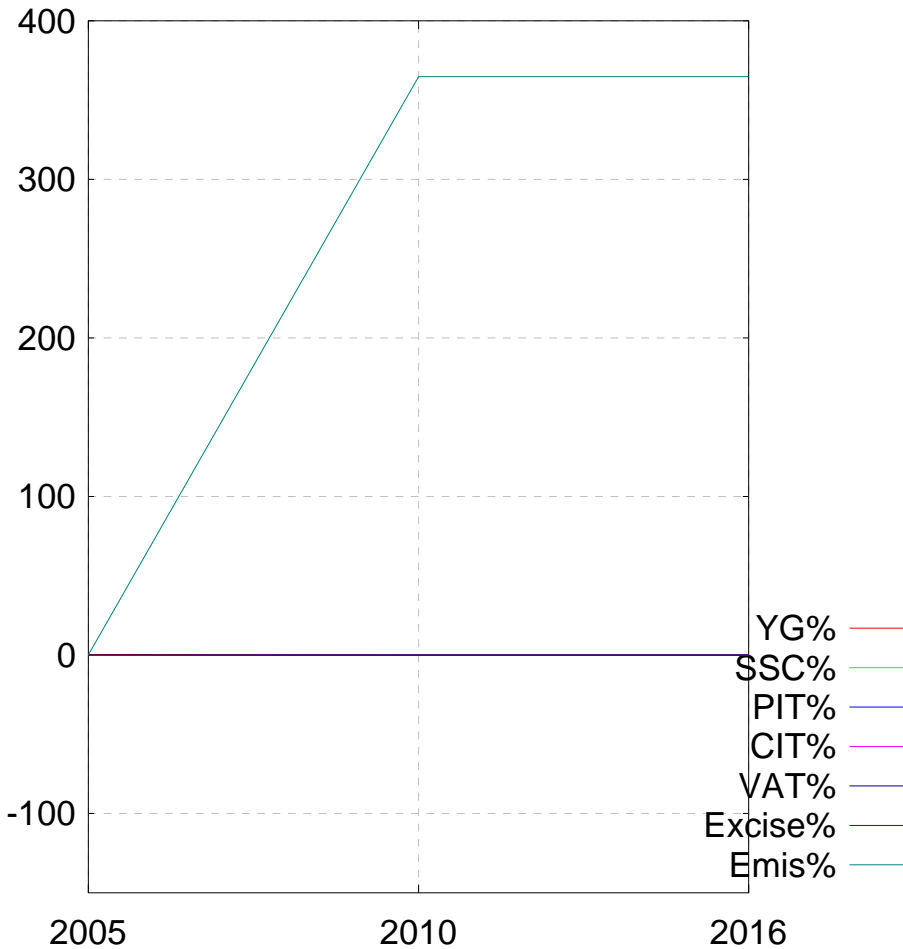
Results for scenarios 1 & 1a: Welfare (EV)



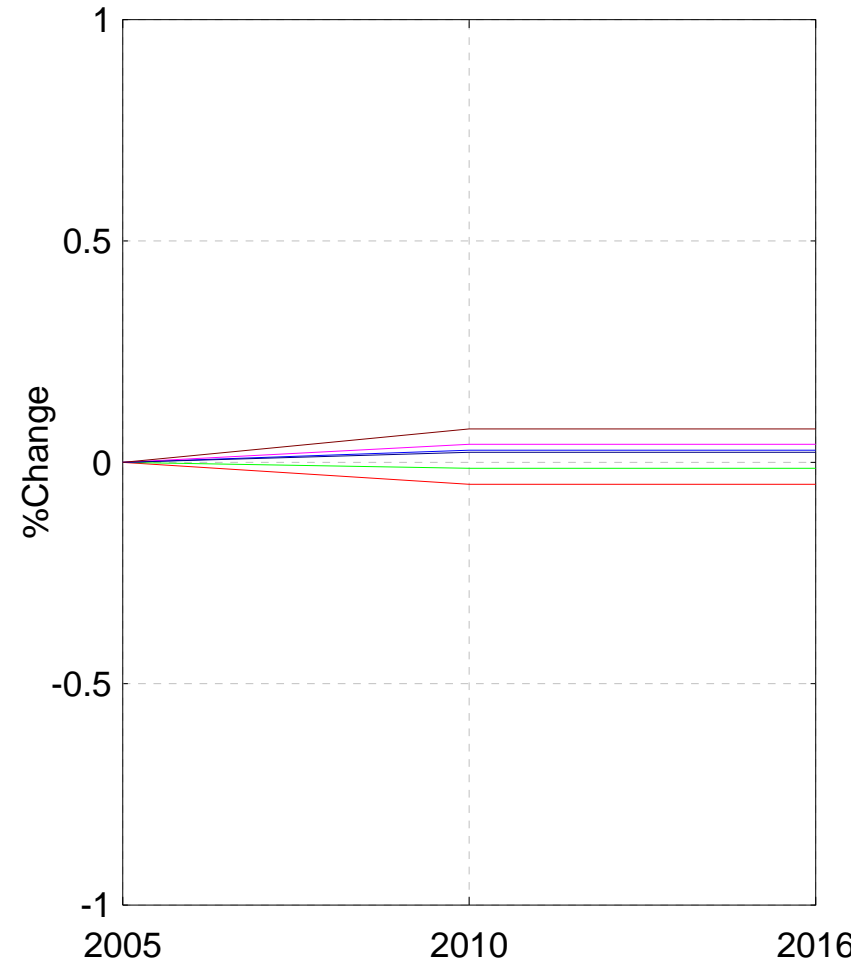
Results for scenarios 2 & 3: Labour market



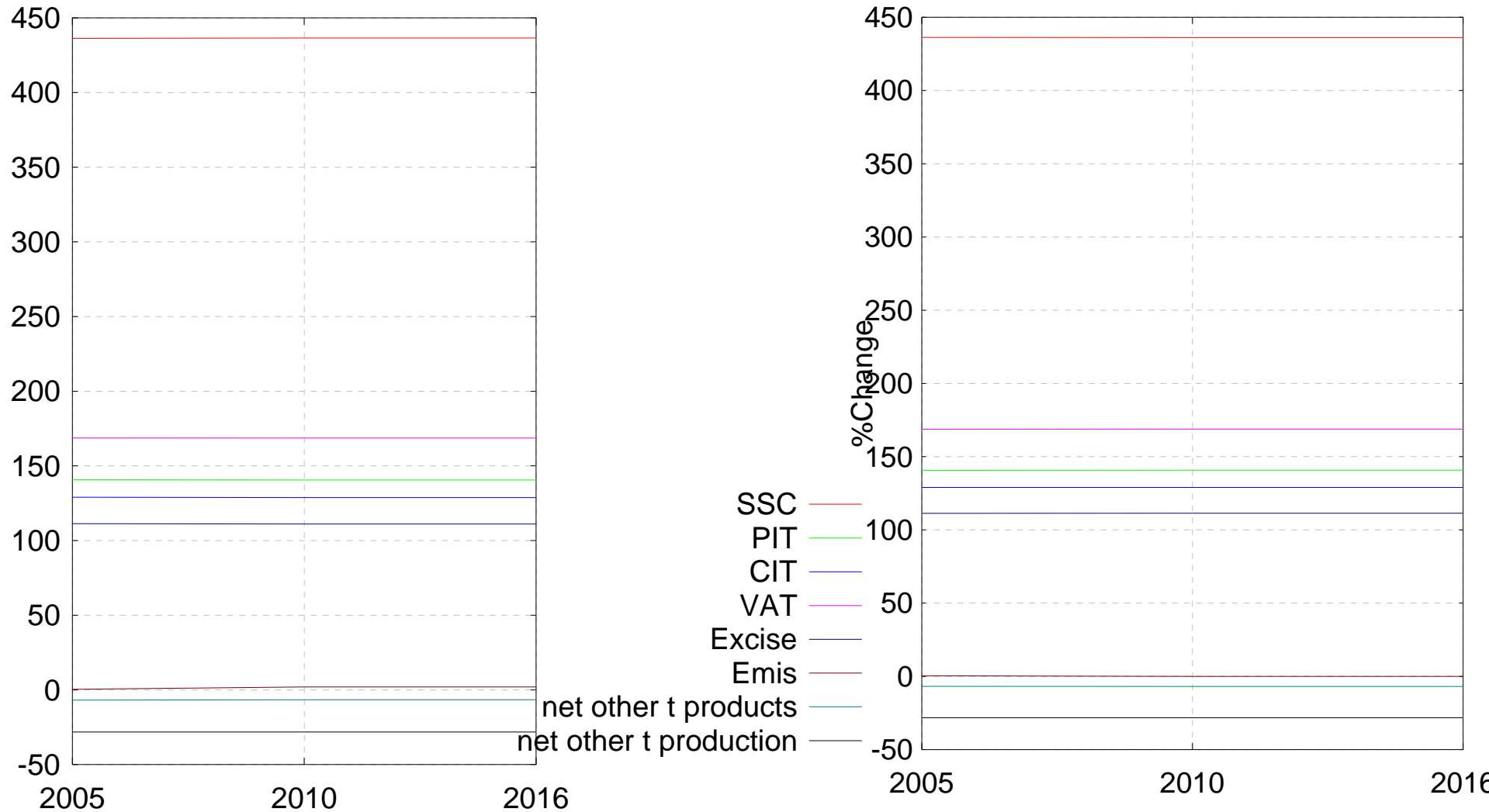
Results for scenarios 2 & 3: Tax revenue per source



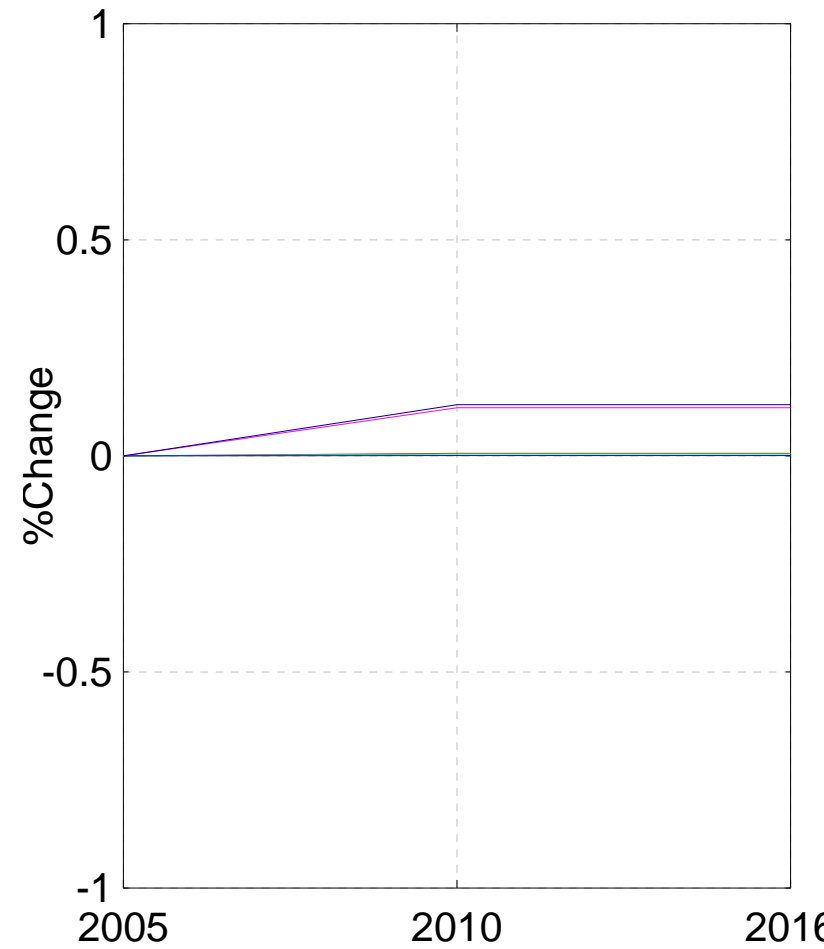
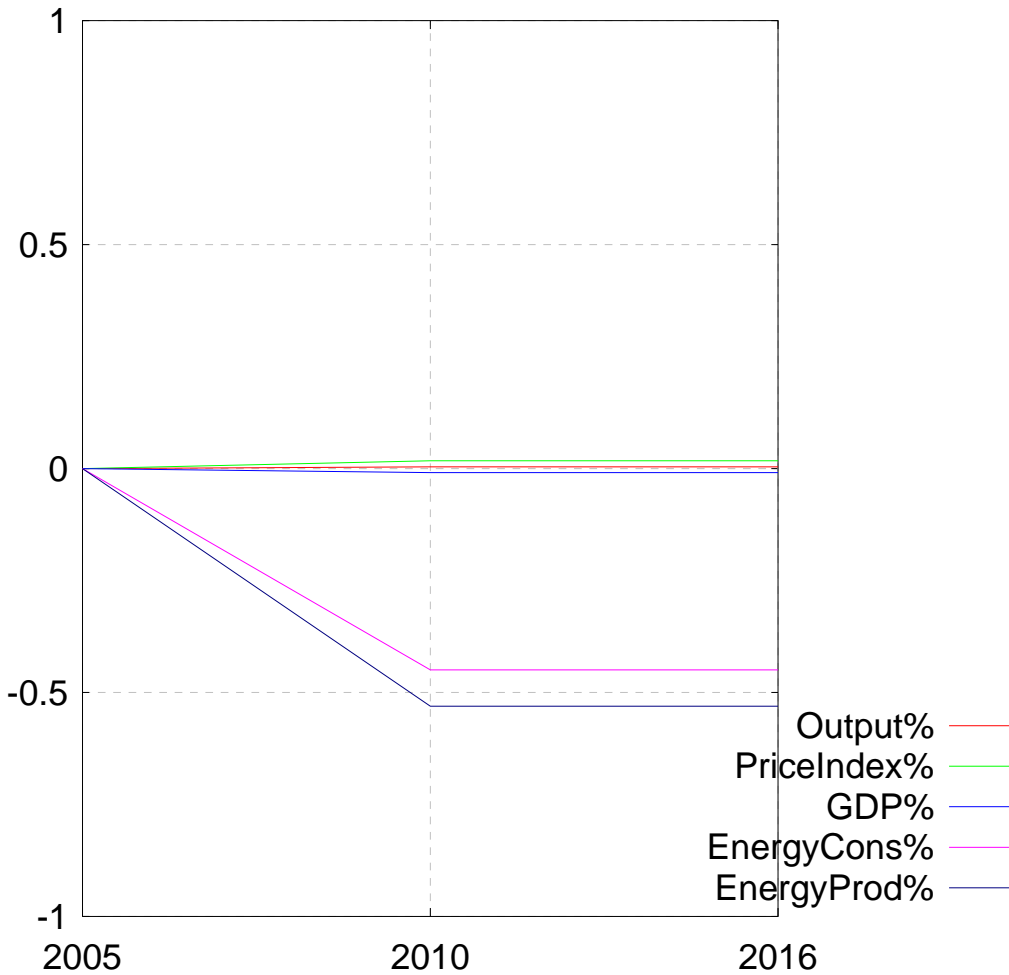
Results for scenarios 2 & 3: Tax revenue streams (except emission charges)



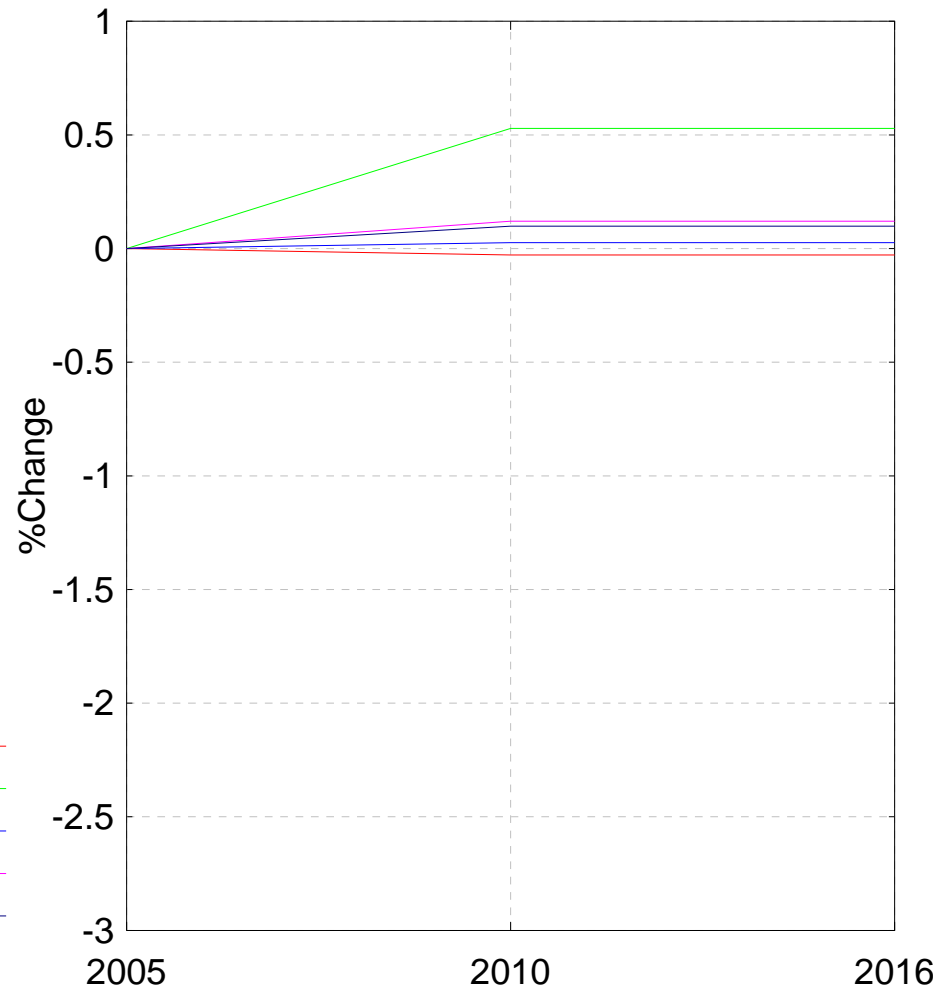
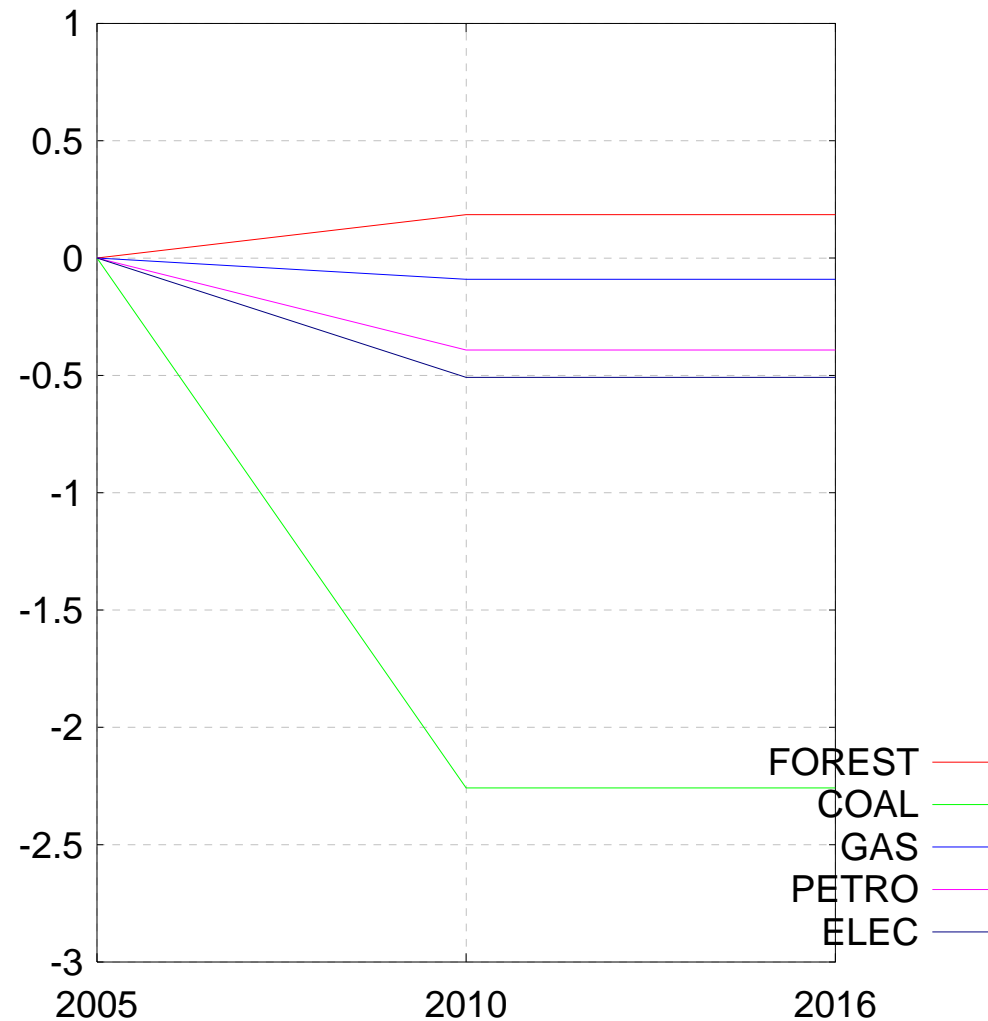
Results for scenarios 2 & 3: Tax revenue [bln Kc 2005]



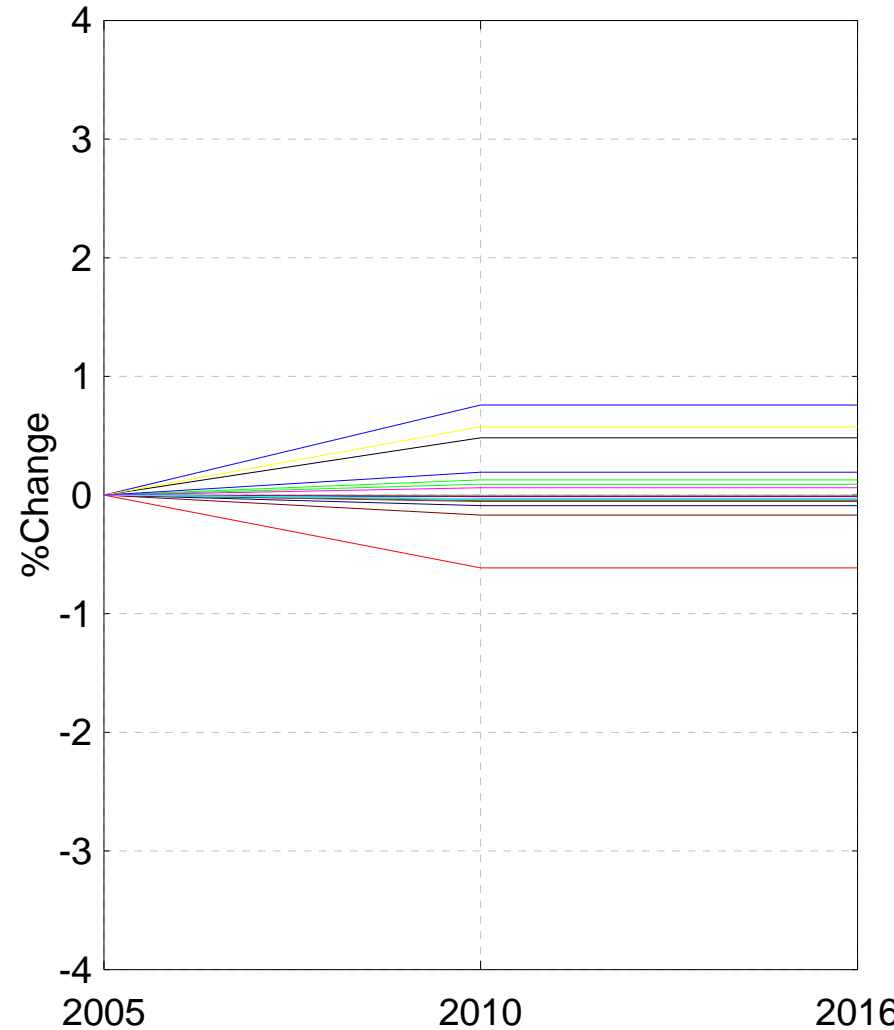
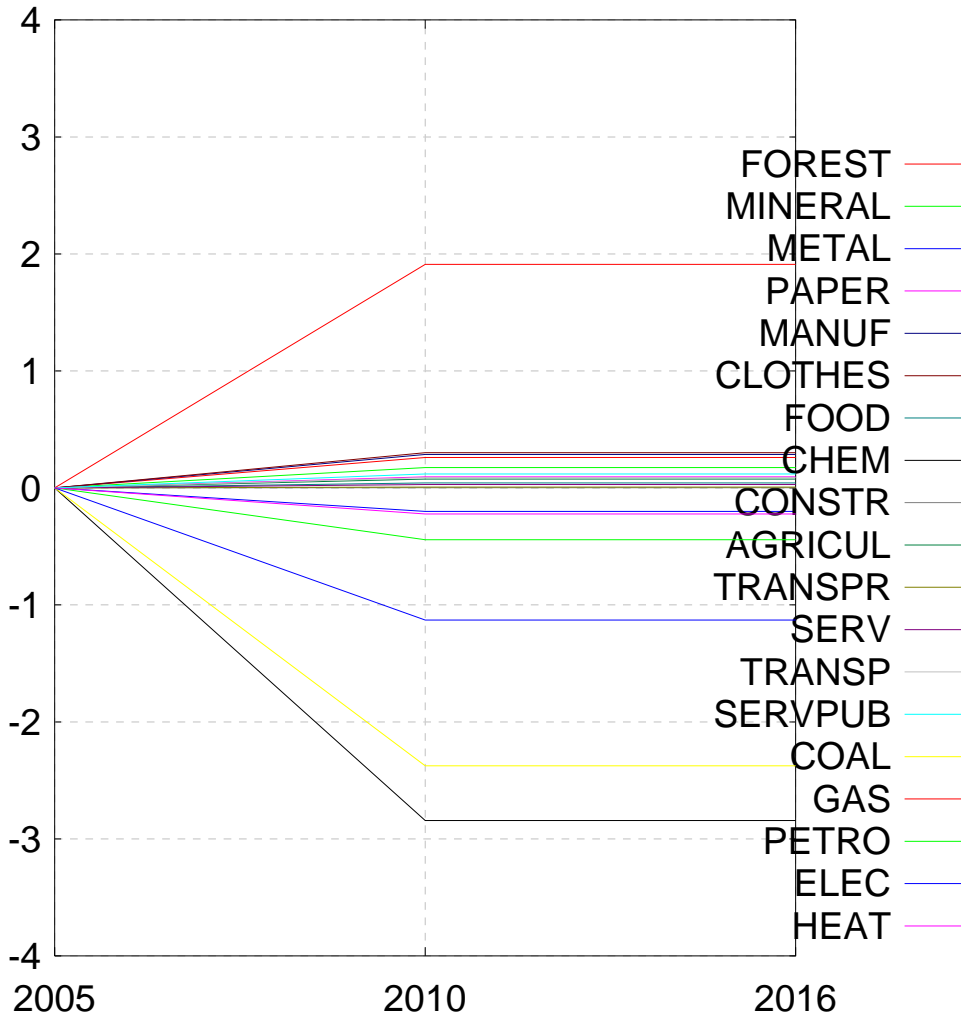
Results for scenarios 2 & 3: Macro indicators



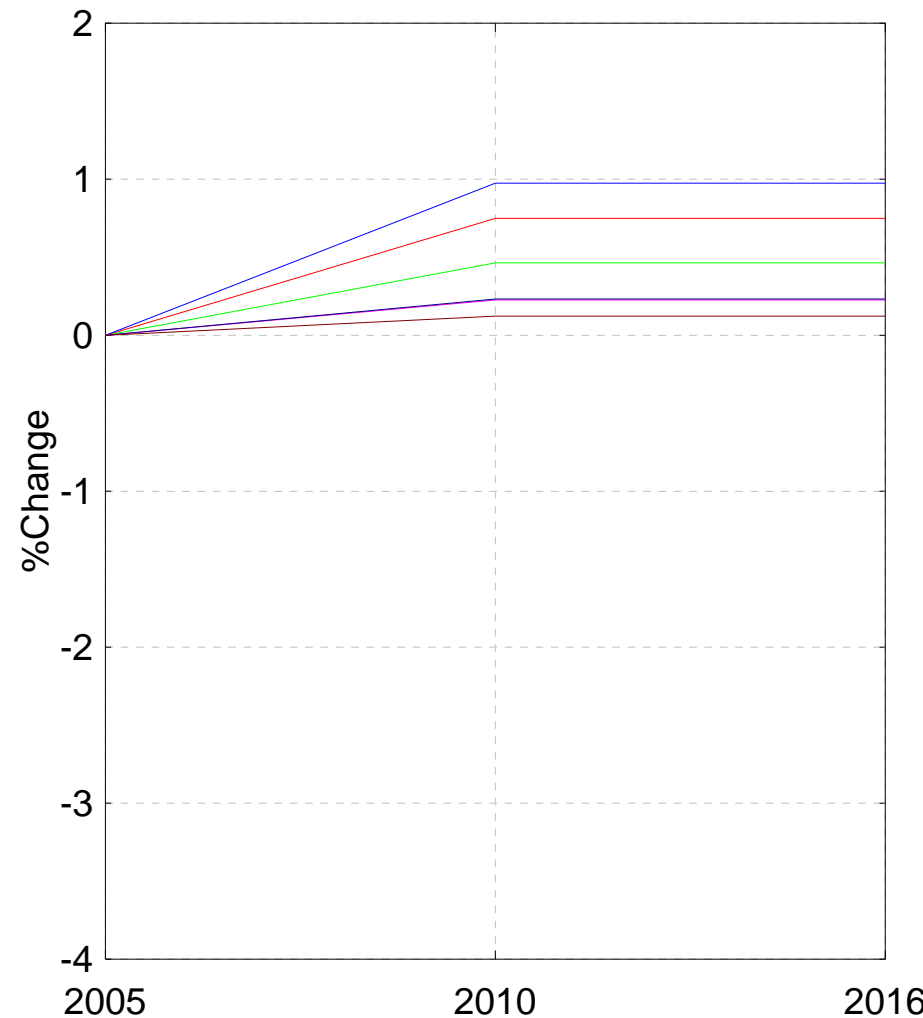
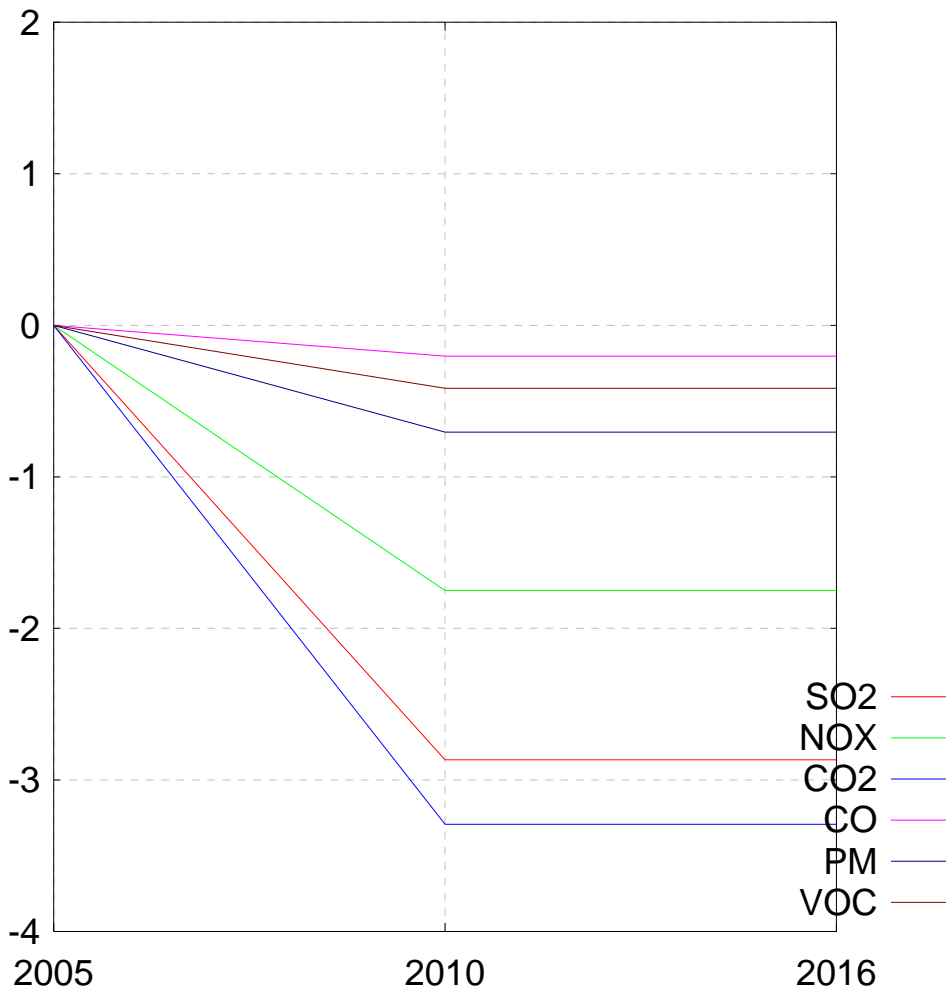
Results for scenarios 2 & 3: Energy consumption



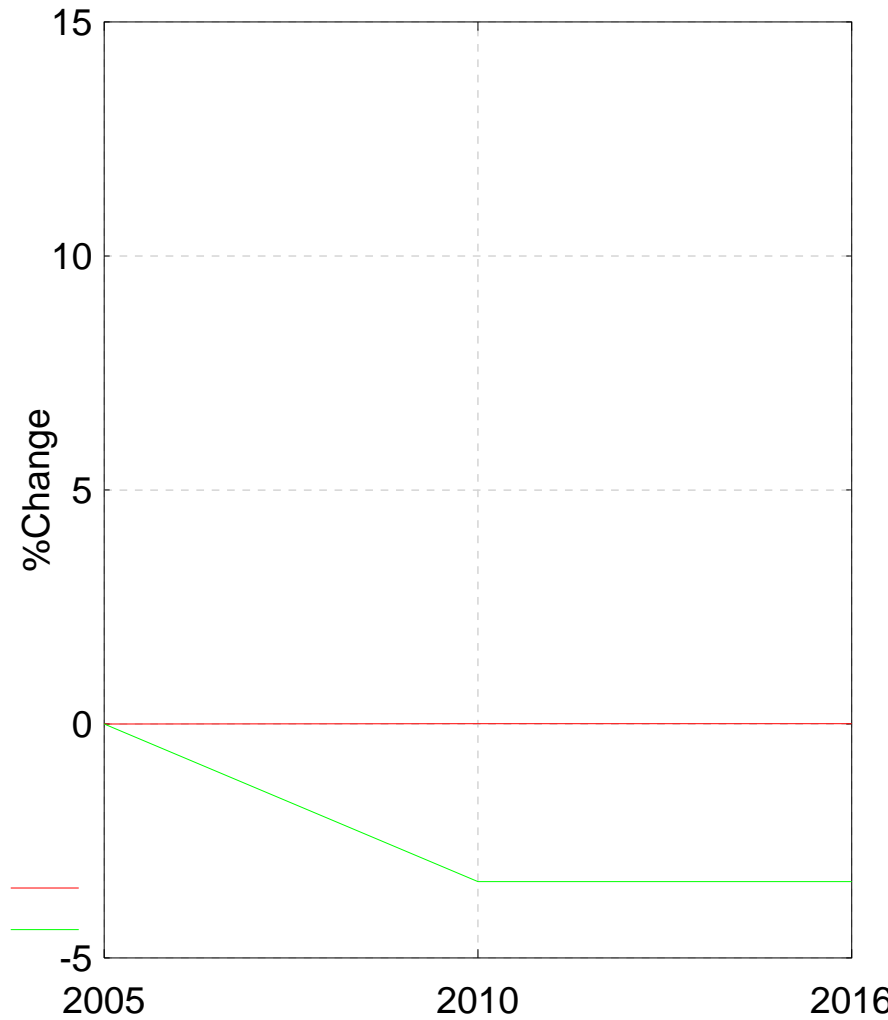
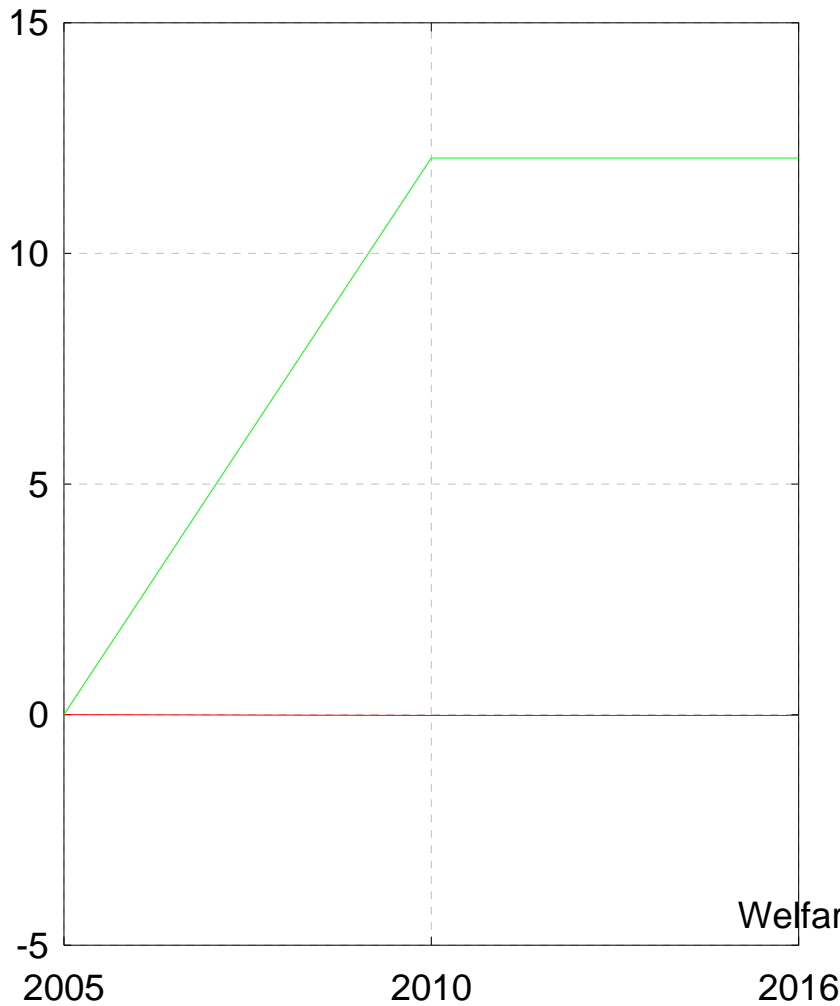
Results for scenarios 2 & 3: Output



Results for scenarios 2 & 3: Pollution emission



Results for scenarios 2 & 3: Welfare (EV)



Conclusion

1. We found a double dividend with ETR
2. The increase in emission charges should not slow down economic growth of the Czech Republic
3. Policy makers should consider a transitional support for selected sectors (chemical, coal, electricity)
4. Abatement possibility should be considered in the model
5. Data consistency should be verified