

# Competitiveness and integration of air quality and climate change policy

Jirina Jilkova in collaboration with Vladislav Bizek  
IEEP – University of Economics Prague

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# Outline

- **Background and motivation**
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  - ↗ **Integrated strategies promoting innovation and improving competitiveness**
- **What policy makers need from the modelling community?**



# Background

## ■ Climate change

- ↗ Major environmental problem worldwide
- ↗ GHGs: CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, F-gases

## ■ Air pollution

- ↗ Pollutants
- ↗ Serious environmental problem in majority of countries
- ↗ Health impacts: PM, ozone = VOC + NO<sub>x</sub>
- ↗ Ecosystem impact: ozone
- ↗ Acidification: SO<sub>2</sub>, NO<sub>x</sub>, NH<sub>3</sub>
- ↗ Eutrophication: NO<sub>x</sub>, NH<sub>3</sub>



# Air Pollution and Climate Change

- Strong and complex interaction among air pollutants and greenhouse gases
  - High overlap of driving forces (sources of pollution)
  - Synergies (energy savings)
  - Trade-offs (combustion of biomass)
- ↗ The problems often share similar drivers.
- ↗ The policies often share similar instruments.
- Policies on EU and national level develop independently

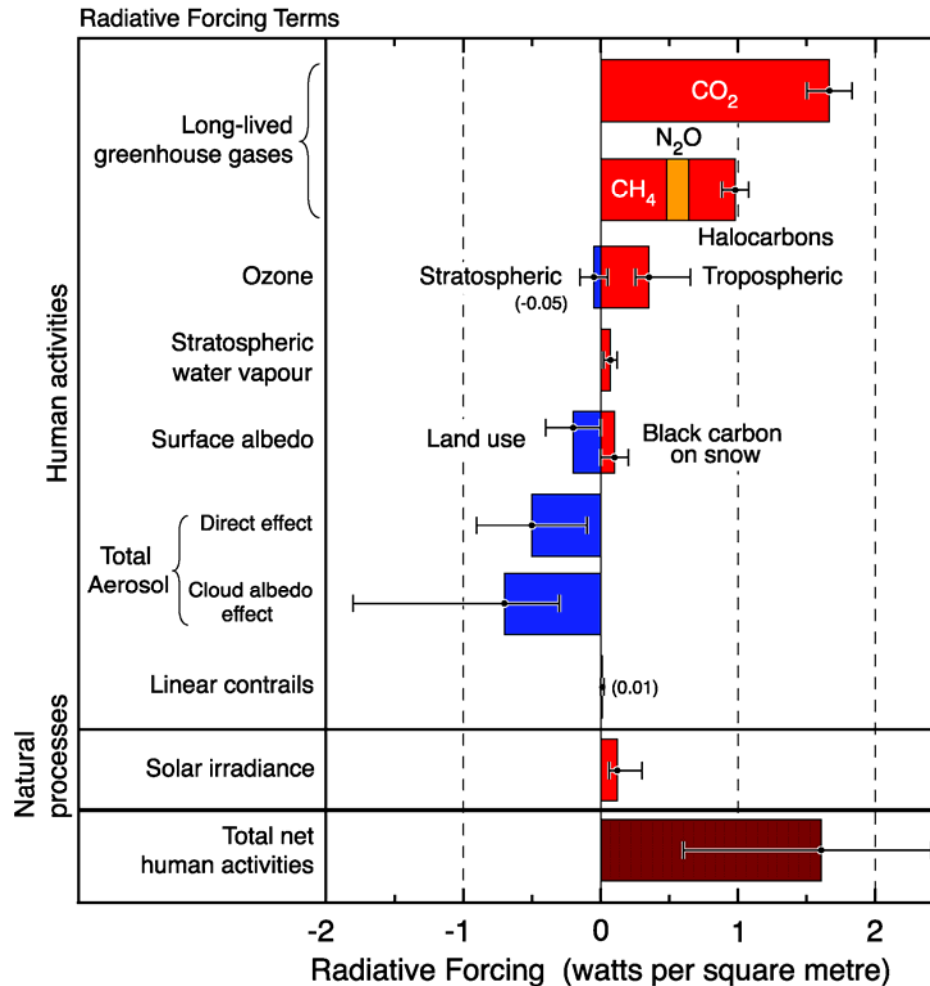


# Motivation

- **Climate change and air quality**
  - Key environmental concerns for the Government
  - Both concerns can be addressed using a **COMBINATION** of technological improvements and behavioural change
- **Integration of climate and air protection policy**
  - ancillary benefits: cost savings and health effects
  - trade-offs
- **Financial and economic crisis: global policy needs national legitimacy**
  - Can models provide insight for policy makers?
  - Can models contribute to set-up of effective instruments promoting innovation and improving competitiveness?



# Evidence: GHGs and Air Pollutants – Radiative Forcing



# Evidence: Results of modelling exercises

## ■ Studies (some examples):

- Barker et Rosendahl (2000)
- Vuuren et al. (2006)
- EEA (2006)

## ■ Findings

- An integrated approach can harvest considerable ancillary benefits in terms of environmental impacts and costs
- Substantial ancillary benefits identified for regional air pollution of implementing the Kyoto protocol



# Political reality

## ■ EU

- Climate package
- Air protection policy

*Apart from fighting the greenhouse gases that cause climate change, a **key objective of environmental legislation** is to improve the quality of our air, the pollution of which has repercussions in particular on people's health and, in the form of phenomena such as acidification and eutrophication, on the environment.*

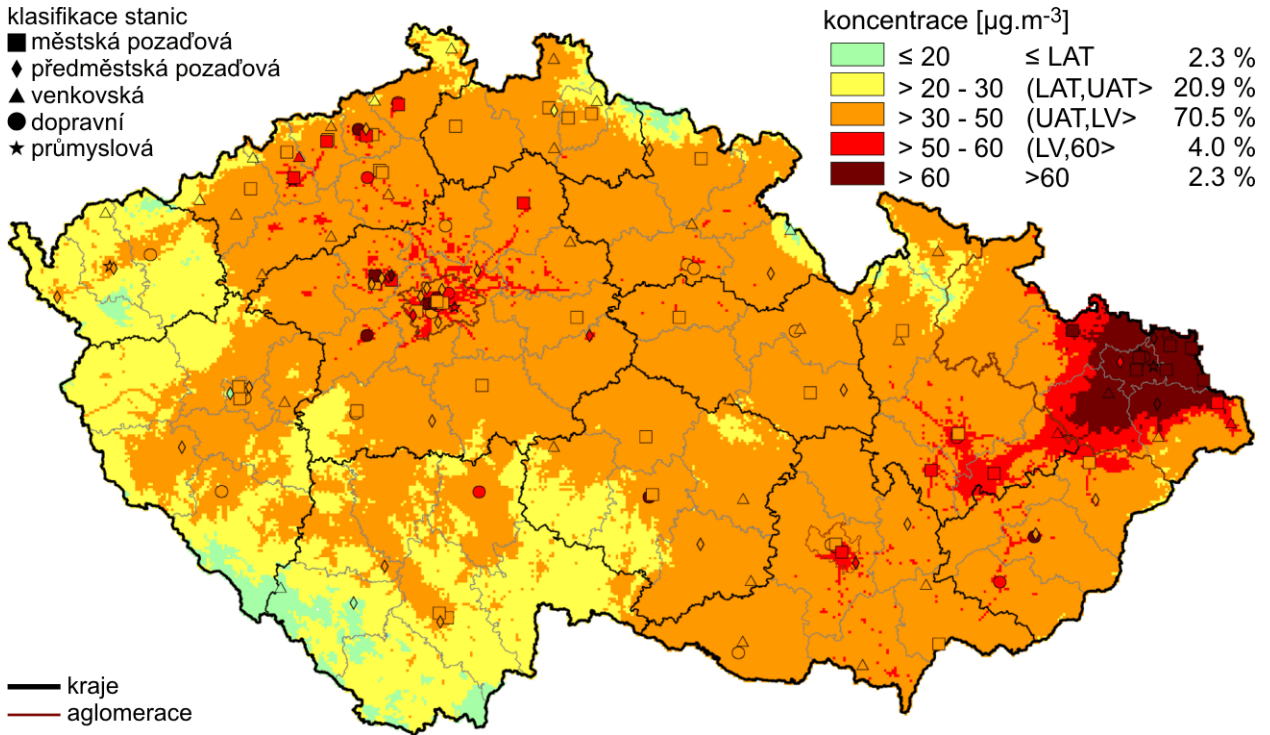
## ■ Czech Republic

- **Climate protection policy**
- **National program for emission reduction**

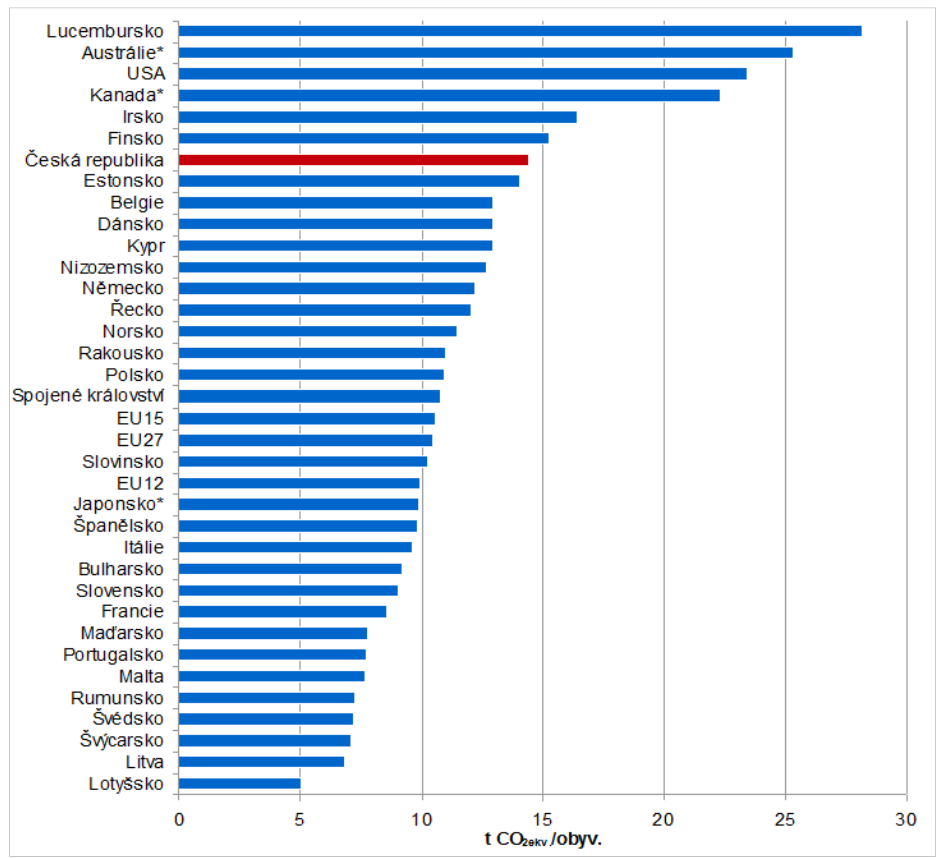




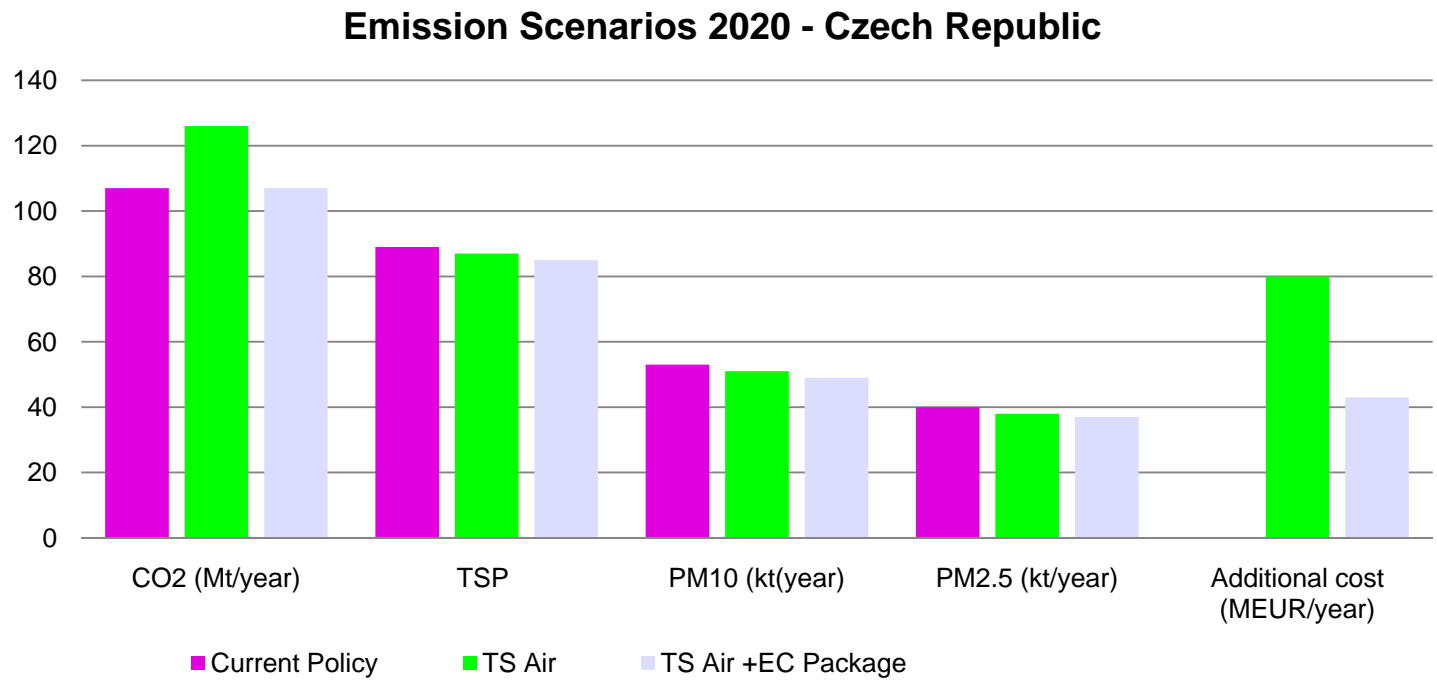
# Czech Republic: PM<sub>10</sub> Exceedance (2007)



# CR: CO2 emission per capita (2006)

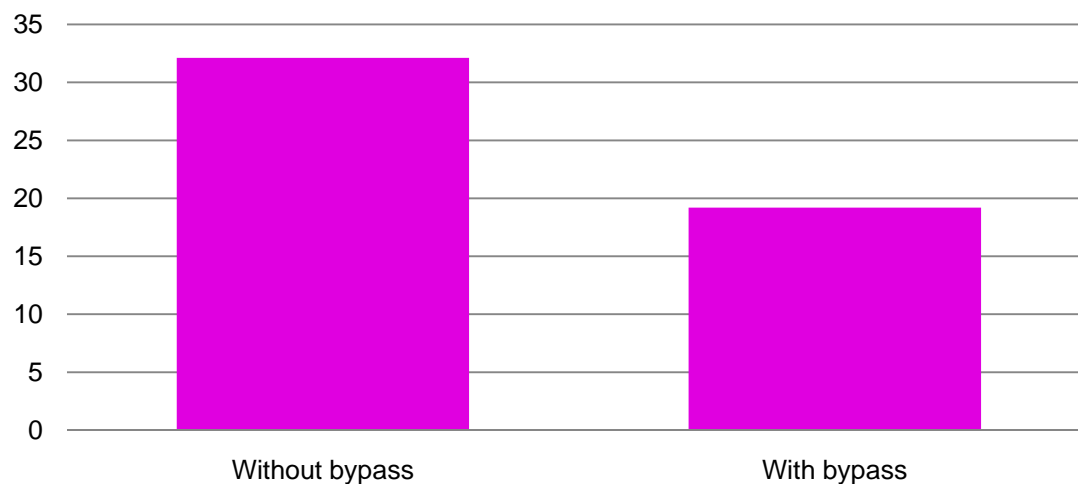


# CR: Benefits from integrated approach



# Prague: Effects of city bypass on CO2 emissions

**Emise CO<sub>2</sub> Emissions from the whole transport network - city area + bypass (t/24 hours)**

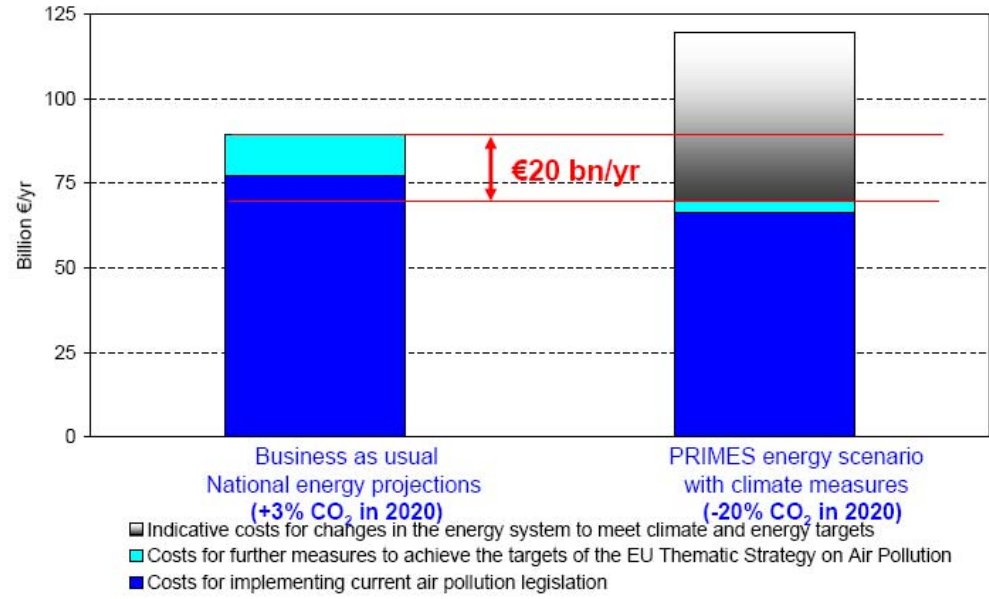


# EU: Benefits from integrated approach



Emission control costs to meet the EU targets for the Air Thematic Strategy and Climate

EU-27, 2020 (Source: IIASA's GAINS model)



# Normative concept

## ■ Integrated strategy can

- Prevent inefficient use of resources and implementation of suboptimal solutions
- Promote innovation
- Deliver positive effects for ambient air quality and health
- Achieve better political acceptance

## ■ Good practice examples

- US EPA concept of integrated environmental strategies
- Germany: from Ecological Tax Reform to Sustainable Industry Policy / but no coordinated CC and AP policy



# Integrated concept for the Czech Rep. (1)

- Which policy mix is likely to best deliver the positive synergies between climate change and air quality improvement?
- **Challenges**
  - Ambitious climate policy targets
  - Air quality problems
- **Instrument mix**
  - EU conform system – preference for administrative instruments
  - Shift from climate to air protection
  - Economic instruments for fiscal purposes and emergency situation
  - **New concept: more flexibility and economic instruments**



# Integrated concept for the Czech Rep. (2)

## ■ Large stationary sources

- EU ETS as pillar
- Air pollution charges (SO<sub>2</sub>, NO<sub>x</sub>, PM, VOC)
- Tax exemption/credits promoting innovation
- Trading with pollutants (offset solutions) for emission ceilings and IPPC have huge cost savings potential

## ■ Medium stationary sources

- Air pollution charges (historical) – lump sum solutions aiming reduction of transaction cost
- CO<sub>2</sub> charge to get small source out of EU ETS

## ■ Small stationary and mobile sources





# Market for modelling studies

## ■ Demand: Policy makers perspective

- The policy makers need to sell more than global effects
- Identification of cost savings and positive health effects: demonstration of ancillary benefits
- Health effects? - Cost savings? - Innovation and competitiveness?
- Need for integrated models
- Political feasibility

## ■ Supply: Modelling exercises

- Strong assumptions, but often reflection of specific reality needed
- Specific models, but assessment of complex relations needed
- Theoretical concepts, but detailed insider knowledge useful
- Descriptive message, but proposal for solutions needed (no regret / win win]
- Limited reflection of specific targeted instruments, but they are under design to resolve specific problems



# What policy makers need from the modelling community?

- **Assessment of ancillary benefits/ air protection and climate policy**
  - **Cost savings**
  - **Ambient air quality and health effects**
- **Assessment of trade-offs**
  - **Negative effects on air quality development**
- **Advice on the design of specific instruments**
  - **From Pigouvian tax to targeted instruments promoting innovation and competitiveness, not just reduction of emissions**
  - **What is the optimal policy mix most likely to yield objectives at minimum cost?**

