



Including structural changes into IAM : some ideas and possible implications

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Outline

1. Emission abatement measures versus policy instruments to implement these measures and reasons for including 'non-technical' measures into IAM
2. Some questions and points for discussion
 - 1) Different types of costs involved in reducing emissions
 - 2) To what extent are price effects and their impacts taken into consideration?
 - 3) How to deal with transport emissions?



1. Emission abatement measures versus policy instruments and reasons for including 'non-technical' measures into IAM

Emission abatement measures

a) 'Technical' measures: mainly end-of-pipe (EOP)

- Filters, flue gas desulphurisation, selective catalytic reduction, etc. but also low-sulphur fuel

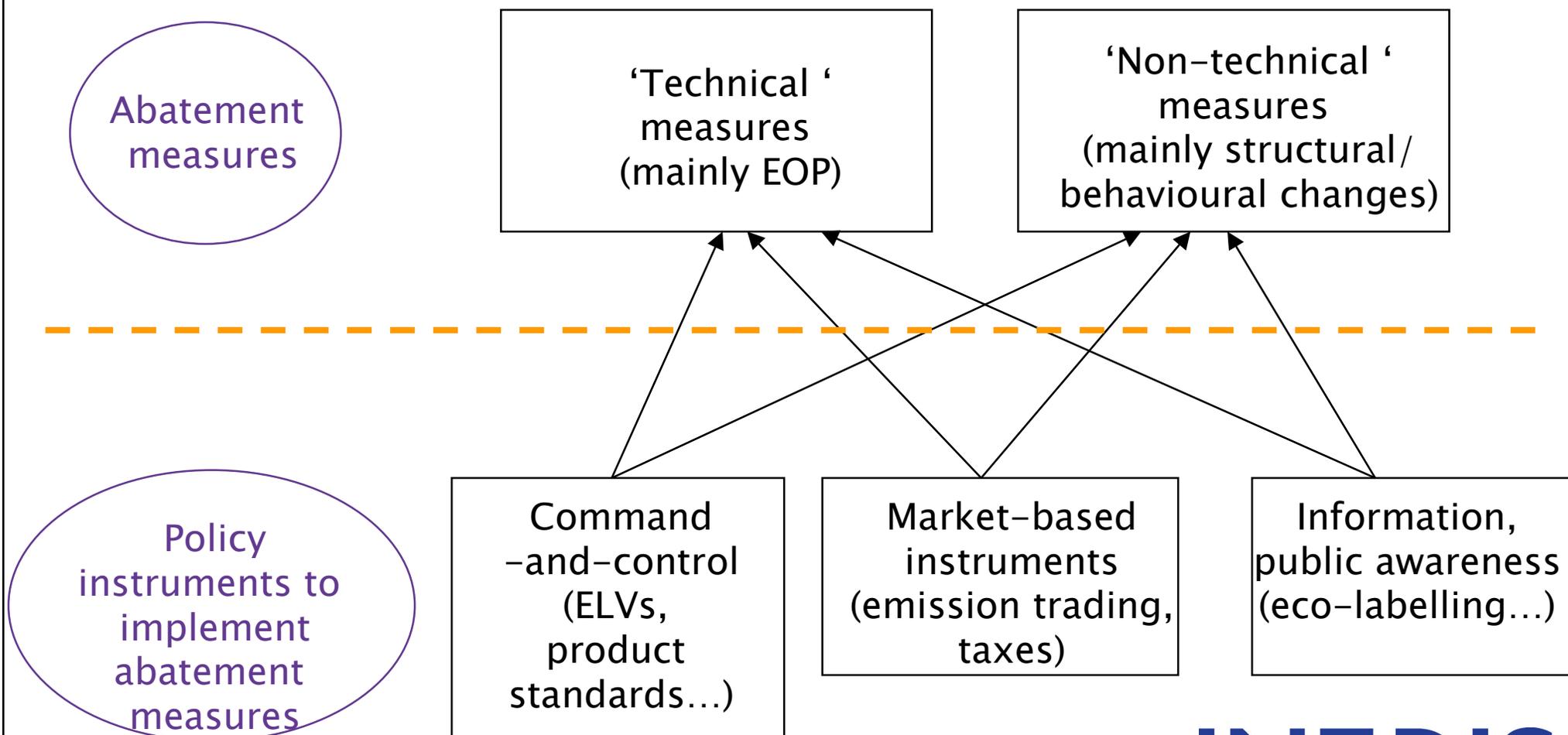
=> endogenous variables in RAINS

b) 'Non-technical' measures \approx structural & behavioural changes

- Changes in production and consumption modes, e.g. modal change (such as use of rail instead of road transport)
 - Reduced transport or energy demand
 - More efficient production techniques, e.g. energy efficiency measures
 - Fuel switch
- } non-technical?

=> exogenous variables for the RAINS model

Policy instruments and abatement measures: two different levels



Policy instruments versus 'non-technical' measures

Policy instruments are not explicitly modelled in RAINS:

- RAINS identifies the ('technical') measures to be implemented to reduce emissions in a cost-effective way
- RAINS leaves open with which policy instruments to implement these measures
 - e.g. sector-differentiated command-and-control policy (CAC), market-based instruments (MBIs)

=> introducing MBIs in RAINS does not reduce the costs resulting from the optimisation

=> costs could be reduced by introducing 'non-technical' measures, thus increasing the range of possible emission reduction measures

Further reasons for including 'non-technical' measures in IAM

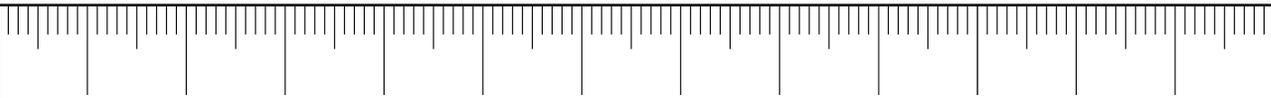
1 Scenario CLE is close to scenario MTR

- We are reaching the limits of what is technically feasible
=> the scope of possible further environmental improvements can be enlarged by studying 'non-technical' measures

2 Short-term versus long-term changes

- When studying short-term issues (2010, 2015) and only air pollution
=> taking into account only 'technical' measures may be sufficient
- When studying longer-term (2030, 2050) and more global issues (links with climate change)
=> necessity to take into account structural changes (modifications of activity scenarios)

<=> GAINS



2. Some questions and points for discussion

1a) IAM and cost types involved in reducing emission

1) Costs related to the pollution abatement measure

borne by the regulated actor (industry, agriculture, etc.)

- e.g. cost for applying the 'technical' measure SCR (investment + fixed and variable O&M) => currently included in RAINS
- e.g. cost for the 'non-technical' measure modal change from road to rail (train fare - cost of car travel) => not currently covered by RAINS

2) Costs related to the policy instrument

a) to the regulated actor

- managing permits, monitoring emissions, etc. => not currently included in RAINS

b) to the regulator

- policy making & implementation costs (design & negotiation of policy and of pollution reduction programmes, monitoring & enforcement)
=> not currently included in RAINS

1b) Include costs related to the policy instrument into the models?

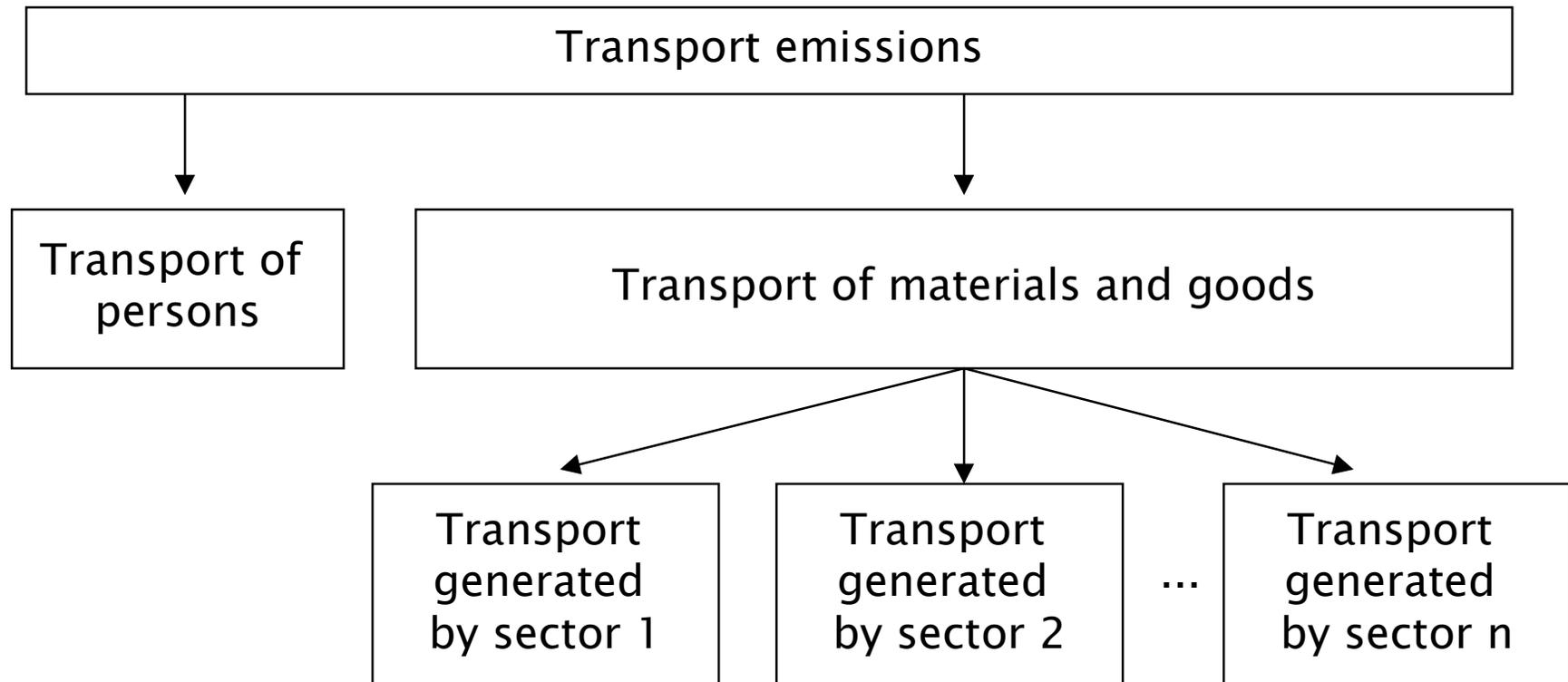
- Policy instrument costs borne by the regulated actor: monitoring & reporting costs
 - Costs for continuous monitoring equipment: partly country dependent
 - Additional monitoring and reporting costs: case and country dependent
 - => could probably be included in the model
- Policy instrument costs borne by the regulator: policy making & implementation costs
 - => fit rather into the impact assessment (c/b analysis)
 - => costs are case and country dependent (e.g. dependent on the sector concerned and on regulatory enforcement procedures)
 - => data is scarce (CAC and MBIs)

2) To what extent are price effects and their impacts taken into consideration?

- Price effects can result from market based instruments (MBIs) and command-and-control (CAC) policy
 - A direct effect of a policies based on MBIs
 - An indirect effect of CAC policies (costs of abatement techniques may increase the production costs, industry may try to pass on the costs to the purchaser)
- => price effects can induce behavioural and structural changes
- => they are not treated by RAINS
- => they are the issue of macro-economic models (GEM-E3)
- => no link back from structural effects resulting from price effects to calculate impact on emissions

3a) How to deal with transport emissions?

- Vary the sector frontiers - allocate transport emissions to the sectors generating the transport



3b) Allocate transport emissions to the sectors generating them

- Why?

- => to go beyond the artificial opposition of transport and industry

- => to introduce measures to reduce emissions that are not yet taken into account (e.g. optimisation of logistics)

- => to induce industry to improve logistics (e.g. modal change, increase in rates of load capacity utilisation)

- Open questions

- => possible with inventory format SECTEN?

- => how to define emission ceilings - by country, industrial sectors across countries, or by sectors and countries?



Thank you for your attention

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