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Session 2: Renewal of the Vehicle Park
Car Scrappage Schemes - Good Design

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Car scrappage schemes: good design

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Where and how scrappage schemes have been used first

• Created to reduce HC and NOx emissions in urban areas

• Used to create a market of tradable permits (emission reduction credits) across different economic sectors:
  - e.g. oil companies may compare costs of achieving pollution reduction targets in their plants or by scrappage schemes.

• to date, never used for CO2
Why scrapping vehicles?

Distribution of US fleet's emissions

% of tot. fleet's emissions

Scrappage s.  Replacement s.

HC  CO
How to identify “gross emitters”?

Look at the vehicles’ environmental performance (average emissions $g/km$)

Look at the average annual use ($km/year$)

Look at the expected remaining life

(Don’t forget the emissions’ location: priority to urban areas)
What experience has shown: scrappage schemes

IF proper selection is made to identify gross emitters

scrappage schemes can achieve HC and CO emission reductions at a reasonable cost per tonne

(cost-effectiveness ratio seems less favourable for NOx and PM reduction)
What experience has shown: *replacement* schemes

Crucial to select scrapping cars with high emission factor *and* high VkmT

Old vehicles used as a main means of transport ⇒ *lower-income owners*

Difficult to persuade low-income owners to buy a *new* car

Replacement schemes will *not* get gross emitters
What about CO$_2$ emissions?

1. What vehicles may be efficiently targeted?
2. What could be the replacement car?

Average fuel consumption - CO2 em. of new vehicles
Can we reduce CO2 by scrapping?

Possibilities:

1. Target pre-1982-84 vehicles with *scrappage* schemes (replacement with average-age cars)

2. Wait for “120 g/km-car” and implement a *replacement* scheme (efficiency problems)

All in all: apart from possible “niches”, better to use scrappage schemes to reduce “traditional” pollutants (HC, CO). CO2 reductions would be a (limited) side-effect
Suggestions for good design: 1. Defining environmental costs

*Permanent/Repeated scrappage schemes make average car life shorter → increase of fixed costs*
Suggestions for good design:

2. Cost-effectiveness ratio

Limited number of properly selected vehicles

$/tonne of avoided em.

Total Avoided emissions (t/y)
Suggestions for good design: 3. *Possible market perturbations*

When scrappage schemes eliminate a large number of vehicles:

- Local stock of used, “cheap” vehicles is reduced. Their demand is not
- Price of used cars is likely to increase substantially
- Import of used cars from outside
- Lower scrappage rate for targeted vehicles
Suggestions for good design:  
4. Cost-benefit ratio

Reducing 1 kg of “traditional” pollutant in urban, densely populated areas may give higher benefits for the population (reduction of human health risk) compared to non-urban zones

Where possible, target urban public/private vehicles
To sum up

• *If well designed*, scrappage schemes may achieve emission reduction of given pollutants (HC, CO) at a reasonable cost: *useful tool!*

• Other positive side-effects (safety, other pollutants)

• *Presumably not* cost-effective to reduce CO2

• Careful selection of targeted vehicles is fundamental for effectiveness and efficiency

• Beyond a given number of vehicles:
  - scheme not efficient (high cost per tonne)
  - there may be significant market perturbations

• Schemes particularly efficient in *urban areas*