

**GFEI GLOBAL NETWORKING
MEETING 2016**

Introduction to FEPIT

9-10 JUNE 2016 - PARIS

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France**

Purpose of FEPIT

- Simple tool to estimate the impact of selected policy measures on the average fuel economy of newly registered cars in a given year in the future
- Support for decision makers to implement policy schemes to achieve region specific fuel economy targets in the light of the GFEI target
- Light application running in MS EXCEL with limited data requirements and with a simple and user-friendly interface
- Does not replace in-depth policy study: magnitude of the impact of the policy measures rather than exact forecast

Data requirement – FE baseline & additional info

- New registrations by fuel economy segment for at least one past year
- Average fuel economy by fuel economy segment of all newly registered cars for at least one past year
- **Additional Information on:**
 - Vehicle taxation (registration and circulation tax/feebate)
 - Fuel price and fuel taxation
 - Fuel composition of newly registered cars (gasoline/diesel)

Policy measures in FEPIT

- Fuel economy regulation/standard
- CO₂-Based Vehicle registration tax/feebate scheme
- CO₂-Based Vehicle circulation tax
- Fuel taxation

Eco-labelling not explicitly considered: it is assumed to be a pre-requisite for the application for all other policies

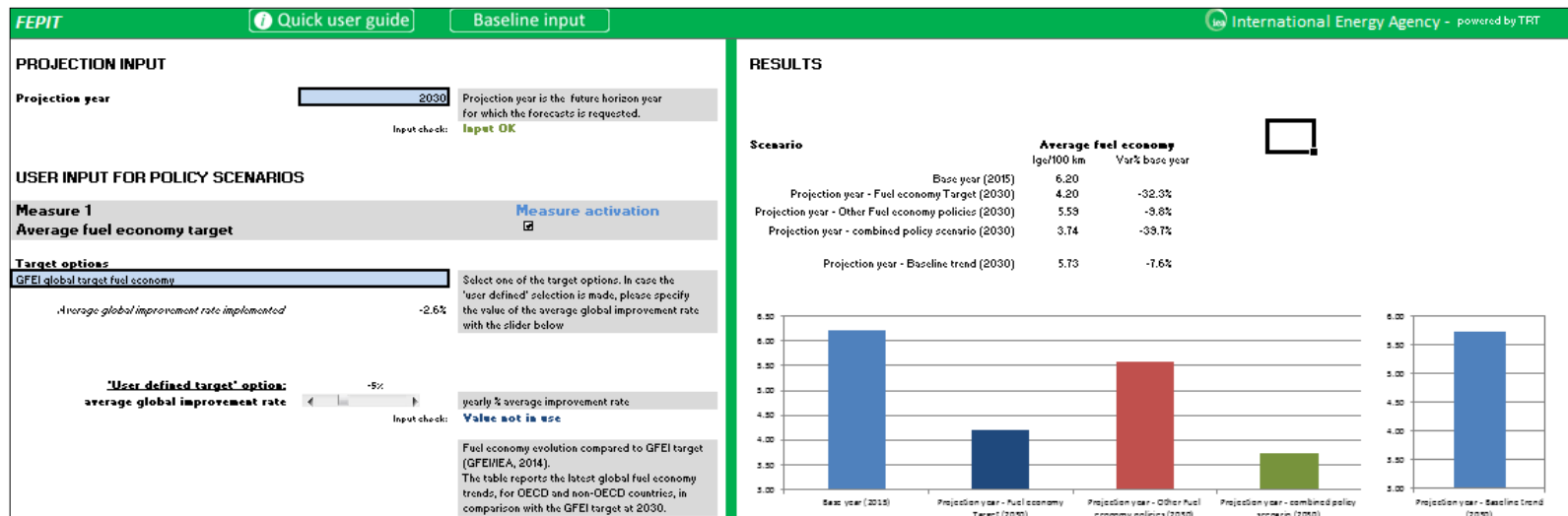
Use of FEPIT

1.) Baseline input

- Filling the baseline input fields

2.) Projection input and results worksheet:

- Setting the assumptions for the policy scenarios
- Reading the results of the calculations



FEPIT input – New car registrations

Baseline input worksheet

■ New cars registrations

NEW CARS REGISTRATIONS

New registrations classes

Fuel consumption thresholds

ICE <	4.0	(lge/100km)
ICE 4-	5.0	
ICE 5-	6.0	
ICE 6-	7.0	
ICE >	7.0	

These values define the segments used by the tool to represent the registration mix of conventional Internal Combustion Engine cars. CO2 based vehicle taxation policies are described in the tool by applying taxes differentiated according to these segments. See the user guide for more details on the choice of the thresholds

Input check: Input OK

New registrations composition

Composition for Base year (2015)

Battery electric	0.0%
Hybrid Plug-in electric	0.0%
Hybrid electric	0.3%
ICE <4 lge/100km	0.5%
ICE 4-5 lge/100km	9.0%
ICE 5-6 lge/100km	44.4%
ICE 6-7 lge/100km	28.8%
ICE >7 lge/100km	17.1%

The composition of new registrations is defined in terms of share of cars registered in each segment (according to the classes defined above). Hybrid (electric and plug-in) and battery electric cars are kept separated. The sum of the shares has to be 100%.

Input check: Input OK

FEPIT input – FE by segment

Baseline input worksheet – fuel economy

NEW CARS FUEL ECONOMY		
Average fuel consumption		
<u>Fuel consumption by segment for Base year (2015)</u>	(lge/100km)	The average fuel consumption has to be defined according to the new registrations classes defined above. It is expressed in terms of lge/100 km (litre-gasoline-equivalent per 100 kilometre).
Battery electric	1.50	
Hybrid Plug-in electric	3.00	
Hybrid electric	4.50	
ICE <4 lge/100km	3.86	
ICE 4-5 lge/100km	4.71	
ICE 5-6 lge/100km	5.54	
ICE >7 lge/100km	8.35	
	Input check:	Input OK
<u>Past year</u>	<input type="text"/>	This is a past year for which data on fuel consumption by car segment is available.
	Input check:	Past year not in use
<u>Fuel consumption by segment for Past year ()</u>	(lge/100km)	Data related to past year is used to estimate the endogenous changing fuel consumption of new registrations according to past trend. If past year data is not available cells should be <u>empty</u>
Battery electric	<input type="text"/>	
Hybrid Plug-in electric	<input type="text"/>	
Hybrid electric	<input type="text"/>	
ICE <4 lge/100km	<input type="text"/>	
ICE 4-5 lge/100km	<input type="text"/>	
ICE 5-6 lge/100km	<input type="text"/>	
ICE >7 lge/100km	<input type="text"/>	
	Input check:	Input OK

FEPIT input – Vehicle taxation

Baseline input worksheet

- Vehicle taxation in the base year
 - Level of registration tax for each car segment, net of any value added tax
 - level of circulation tax for each car segment

VEHICLE TAXATION	
Average REGISTRATION tax in the base year	
<i>Tax level by segment for Base year (2015)</i>	<i>(\$)</i>
Battery electric	0.00
Hybrid Plug-in electric	0.00
Hybrid electric	0.00
ICE <4 lge/100km	150.00
ICE 4-5 lge/100km	500.00
ICE 5-6 lge/100km	1000.00
ICE 6-7 lge/100km	2000.00
ICE >7 lge/100km	3000.00

Input check: **Input OK**

The **REGISTRATION tax** is a tax paid only once when the vehicle is purchased and registered. It does NOT include any VAT or similar tax applied to the purchase price

The tax/rebate level has to be defined according to the registration classes defined above.

Taxes should be coded as positive values, rebates should be coded as negative values.

The values of the registration tax should be provided in US Dollars

If registration tax does not exist in the base year all values should be set to zero

FEPIT input – Fuel price

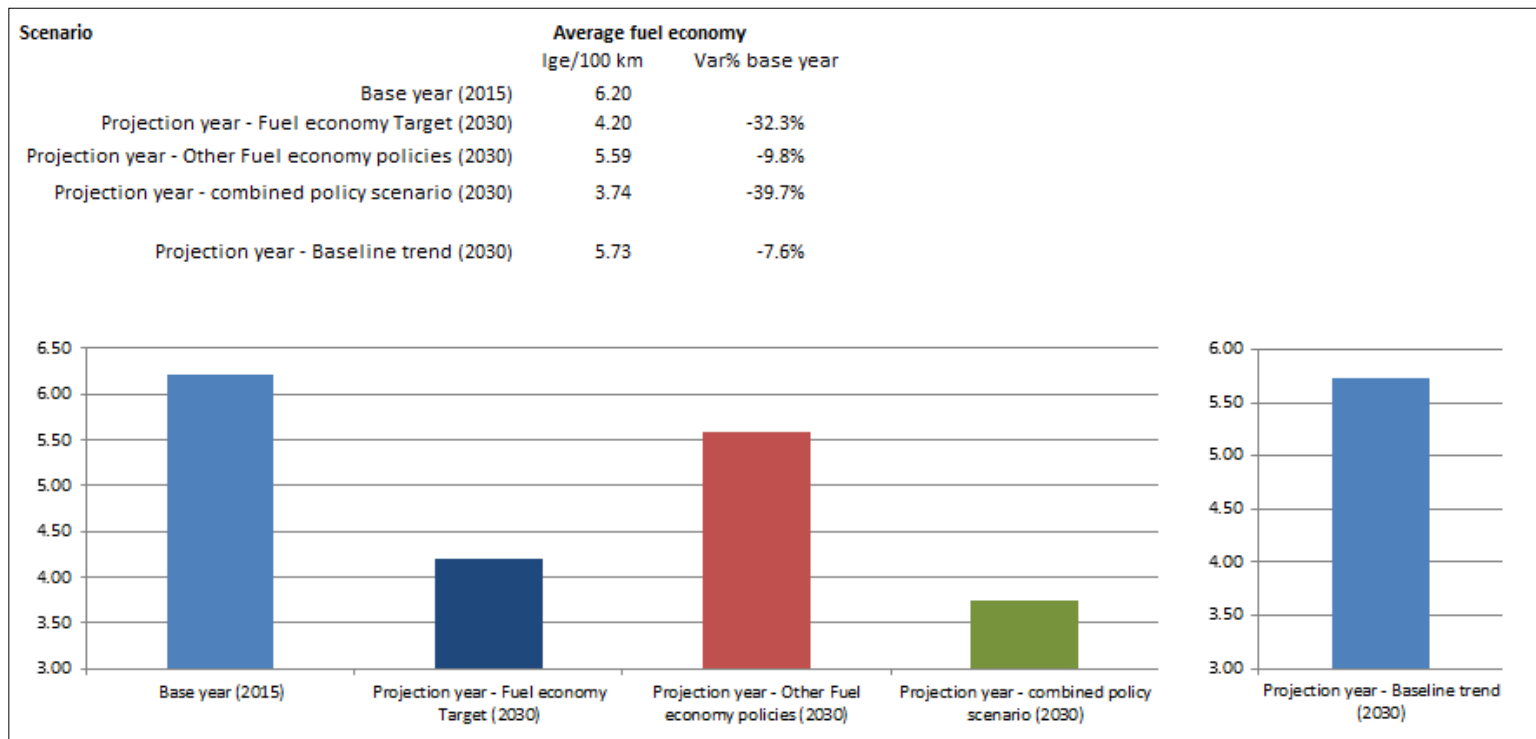
Baseline input worksheet

- Fuel price in the base year
 - Average fuel price at the pump (pump price), in \$/liter
 - Average share of fuel taxes on pump price
 - Split of newly registered cars between gasoline and diesel

FUEL PRICE		
Average fuel price		
<i>Average pump price</i>	(\$/litre) <input type="text" value="2.00"/>	This is an average price across all fuels sold in the country. Preferably a weighted average where weight is the share of each fuel on total transport fuel consumption
	Input check: Input OK	
<i>Fuel taxes (% of pump price)</i>	<input type="text" value="50%"/>	This is an average across all fuels sold in the country. Preferably a weighted average where weight is the share of each fuel on total transport fuel consumption
	Input check: Input OK	
Average fuel composition of new registrations		
gasoline	<input type="text" value="57%"/>	Share of gasoline and diesel cars in new registration. cars otherwise fuelled should not be considered
diesel	<input type="text" value="43%"/>	
	Input check: Input OK	

FEPIT results

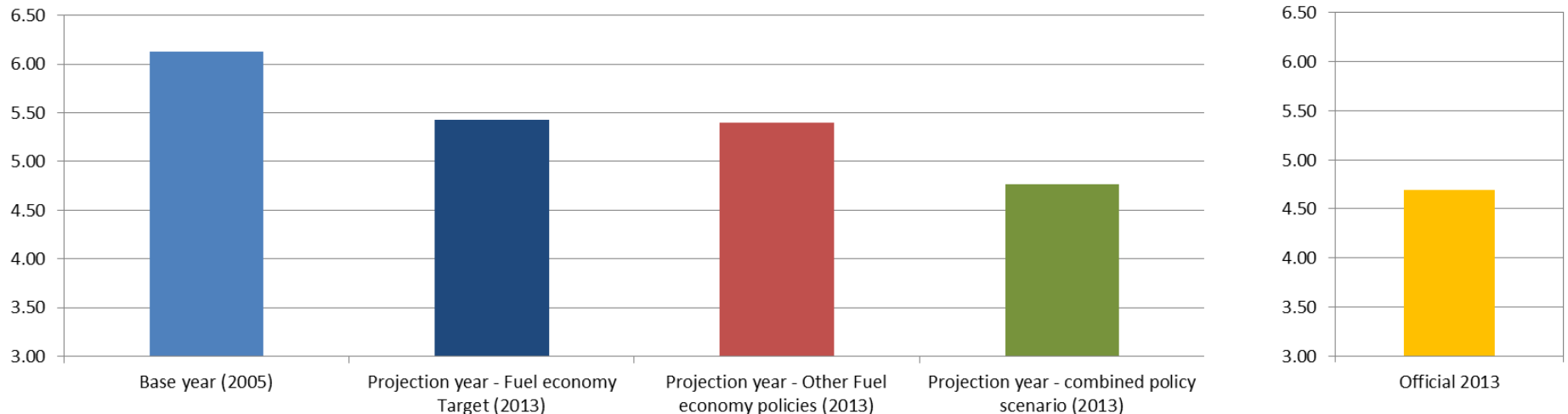
Projection input and results worksheet



FEPIT validation

France: back-casting exercise 2005 to 2013

- GFEI data for 2005 as baseline
- Projection year: 2013
- Comparison of results: 2% deviation projection vs. 2013 data



FEPIT download

- The tool is available for download here:
<http://www.iea.org/gfei/FEPIT2015.xlsb>
- FEPIT - User guide:
<http://www.iea.org/gfei/FEPITUserGuide.pdf>
- FEPIT – Methodology report:
<http://www.iea.org/gfei/FEPITMethodologyReport.pdf>

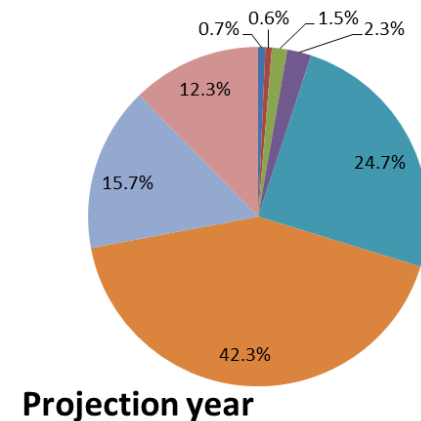
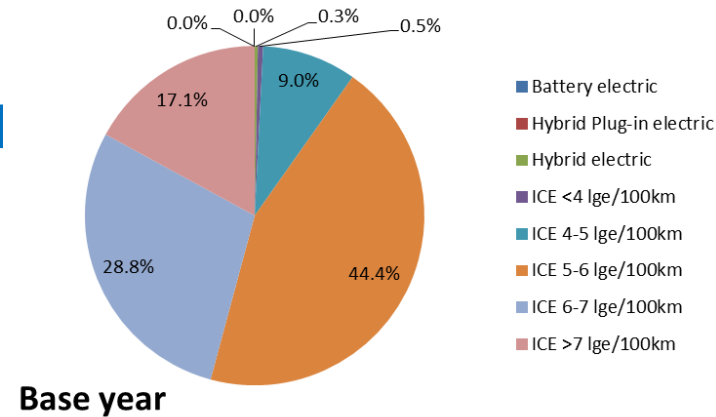
Thanks!

FEPIT – Methodology

Methodological approach

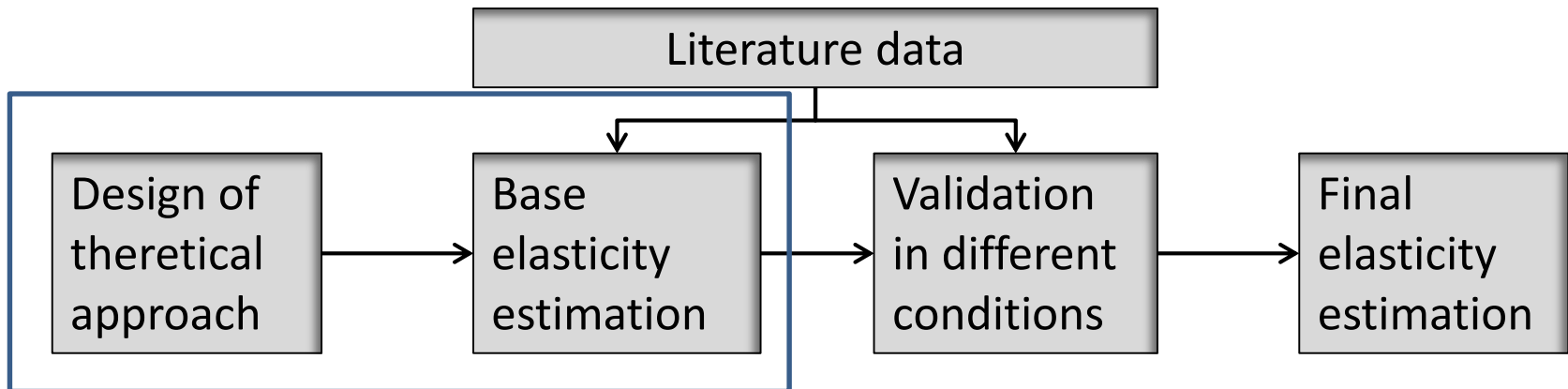
Theoretical approach

- New vehicles registrations segmented into fuel consumption classes
- Each segment represented by the related average fuel consumption
- Policies affect both
 - the new registration composition, and
 - the average fuel consumption by segment
- Context factors and interaction between policies affect the size of final impacts



Methodological approach

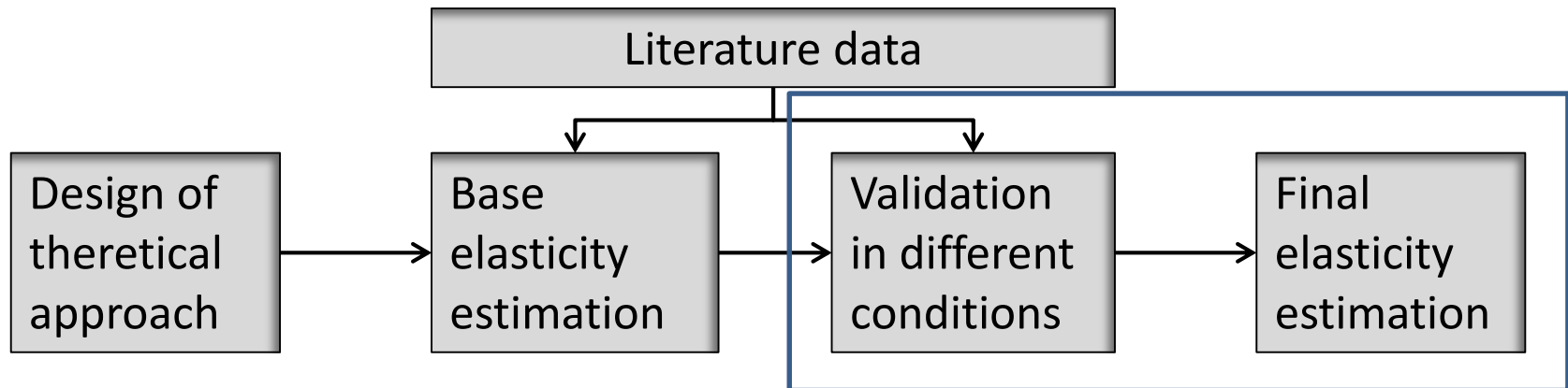
- Elasticity parameters estimated on the basis of literature data to provide realistic responses in different conditions



Methodological approach

Validation in different conditions:

- Simulating various case studies
- Revision of the elasticity parameters



Methodological approach

Theoretical approach

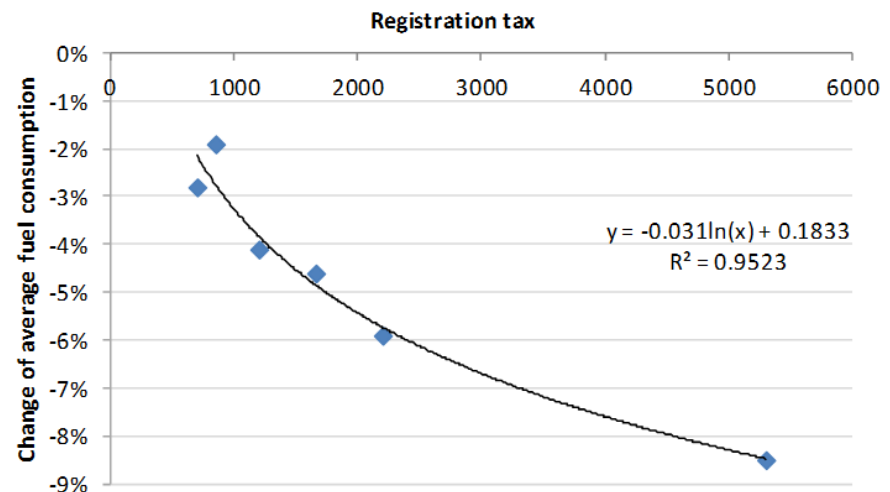
- Impact on new registrations composition by segment
 - Direct change of the natural logarithm in car registrations in a given segment in response to a 1000 Euro tax/rebate (registration share of segment s change by $x\%$)
[D'Haultfœuille et al. (2012), Klier and Linn (2012)]
 - Compensation of direct change by changes in the other segments (for instance, if the most energy intensive class loses 2% of share, this 2% is gained by less energy intensive segments, proportionally to the relative shares they had in the base year)

Methodological approach

Theoretical approach

■ Impact on the average fuel consumption by segment

- Due to changes of the distribution of the registrations within the segments and the deployment of technical improvements
[COWI (2002), Bunch, Greene et al. (2011)]
- Function estimated on COWI (2002) data, generated by registration tax under a fleet neutrality assumption



Methodological approach

Theoretical approach

- Base elasticities drawn from studies based on the experience of vehicle taxation in Europe.
- The effect of vehicle taxation may potentially be quite different in other contexts
- Taking into account context factors influencing the base elasticities: effect of the baseline fuel price
 - Comparing the effect of feebate scheme related to registration tax in US [Bunch, Greene et al. (2011)] and France [Klier and Linn (2012)]
 - reduction of the elasticity parameters to simulate lower responsiveness in US with respect to the EU reference case (assumed to be related to baseline fuel price differences)

Methodological approach

Theoretical approach

- Interaction between measures:
 - Circulation and registration taxes: the effect is larger when combined [*COWI (2002)*]
 - Fuel consumption target and other policies: responsiveness to other measures is reduced assuming that, as vehicle efficiency gradually improves, the incentive to choose a more fuel efficient car also gradually declines
- Electric vehicles segments
 - Comparing the effect of incentives [*Mock, P. and Yang, Z. (2014)*]
 - Smoothing the elasticities
 - Estimating shares at projection year based also on an exogenous increasing trend from 2012 onward