

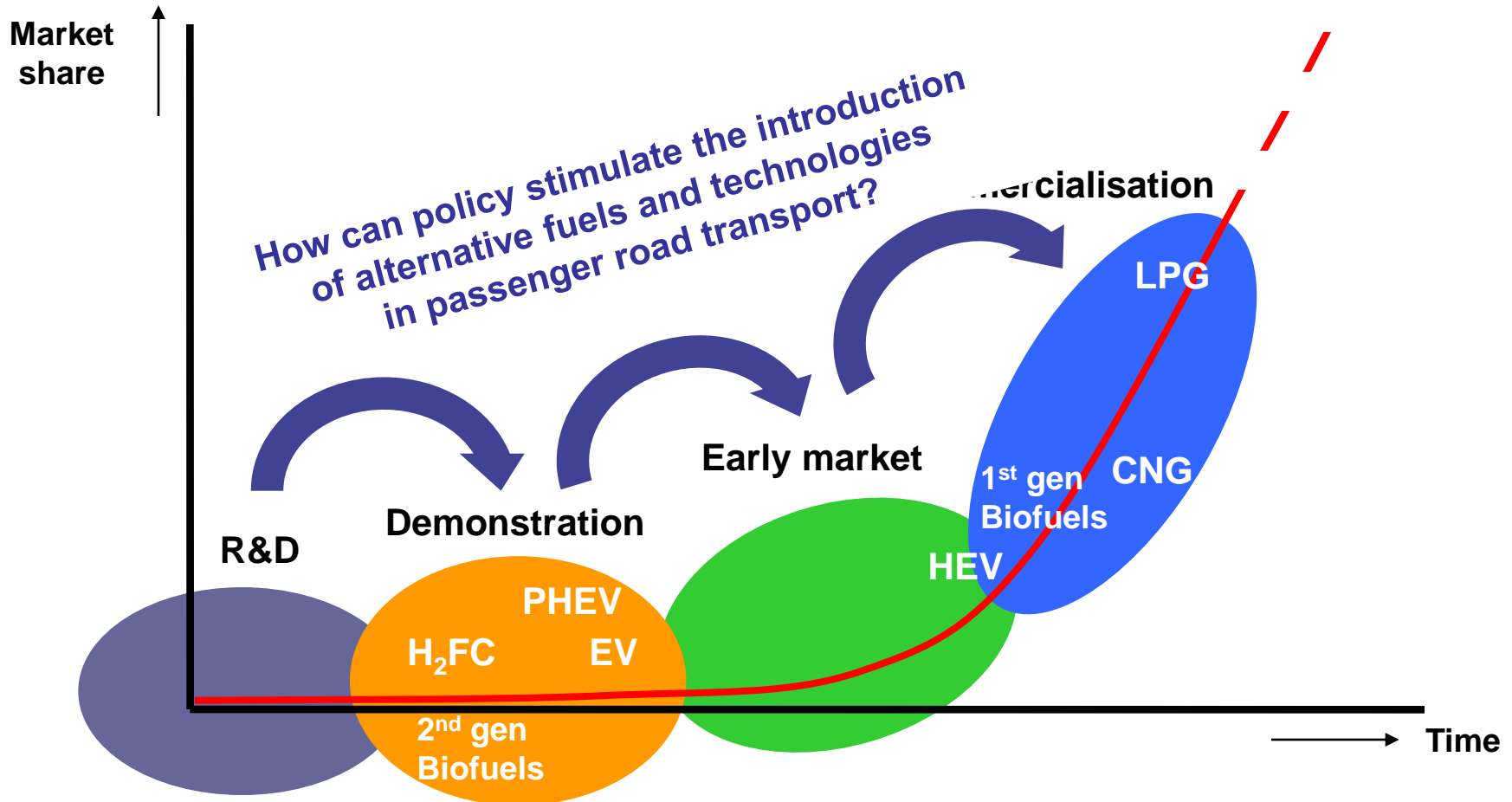
Alternative fuels and technologies

Policies for successful introduction

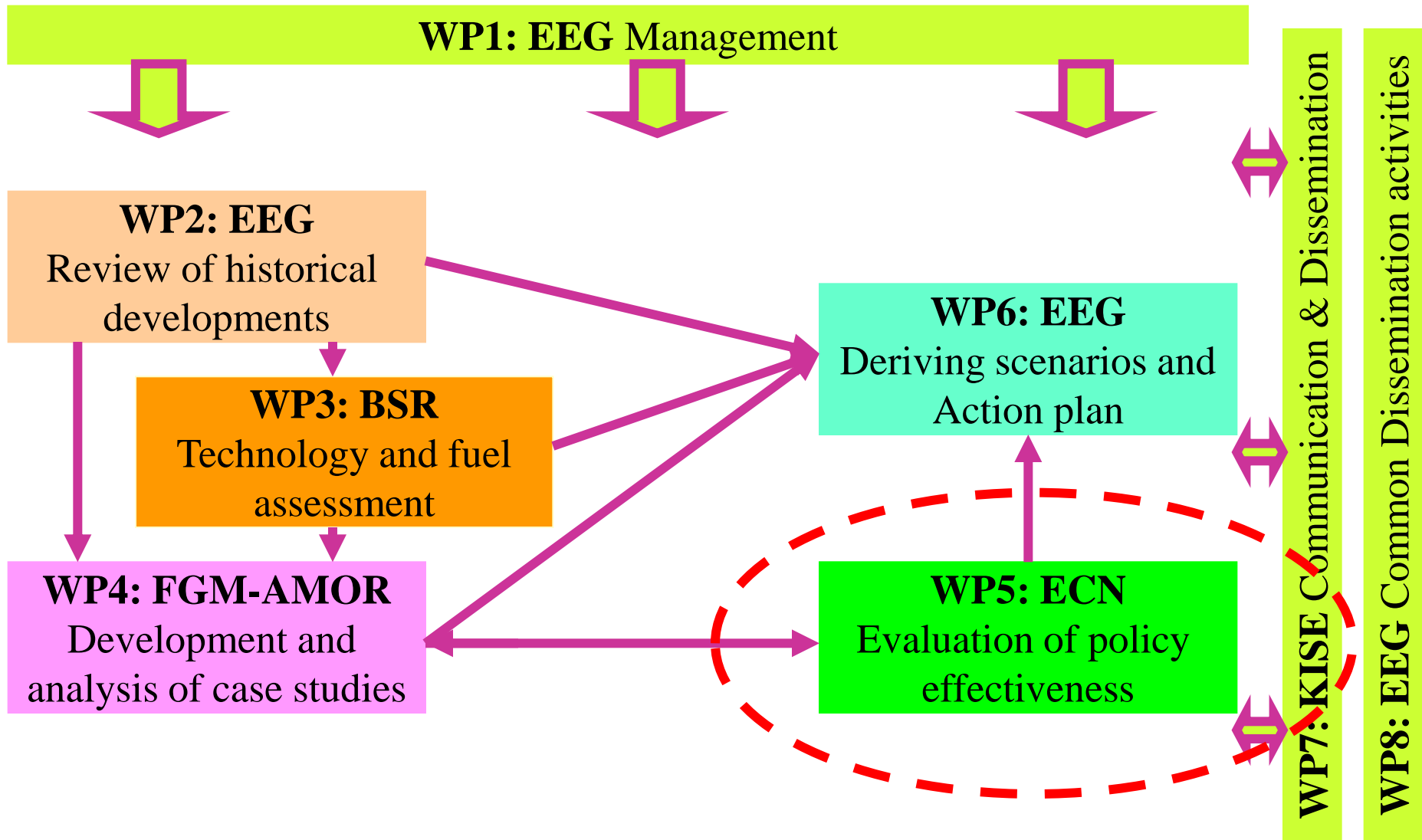
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Unit Policy Studies

Brussels, 1 March 2011

Alternative technologies and fuels face barriers on their way to the market



Alter-Motive Work packages



Fiscal policy is the main policy instrument creating a playing field

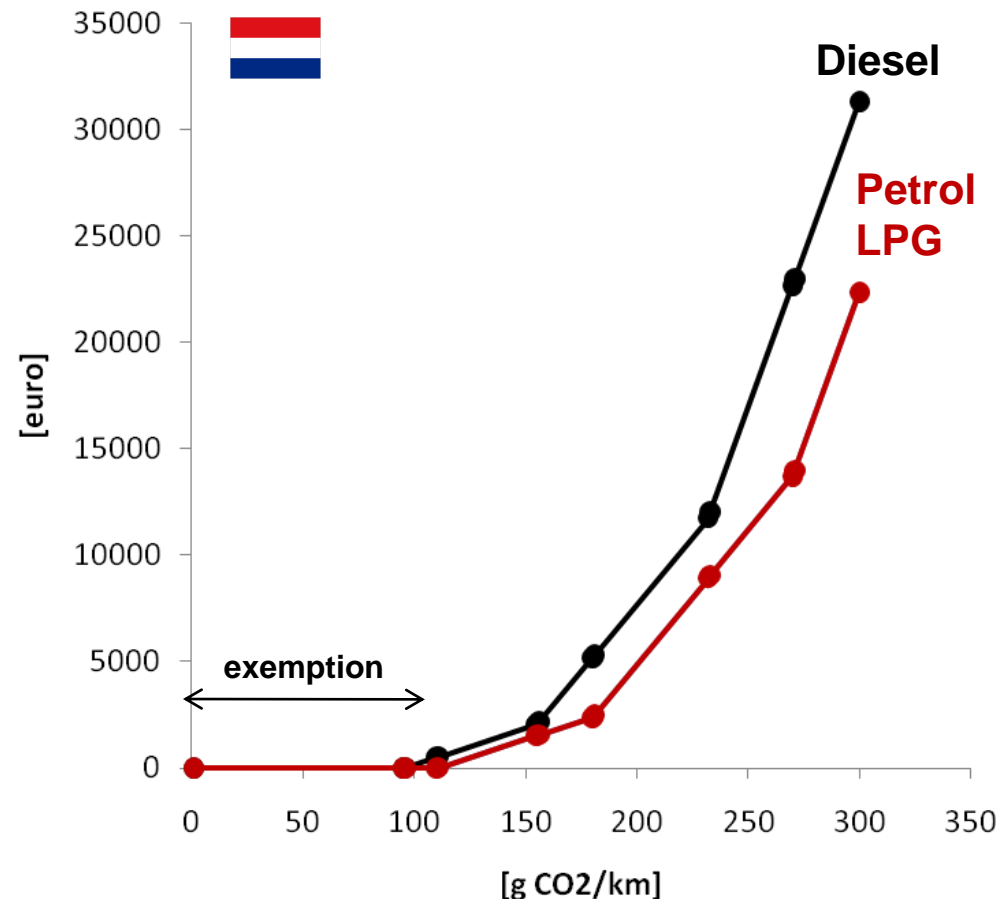
- 17 EU countries have implemented CO₂ differentiation in taxation
 - There is evidence that fiscal policy affects:
 - Car ownership
 - Car use
 - CO₂ emissions
- [Nordisk Ministerråd, 2008]



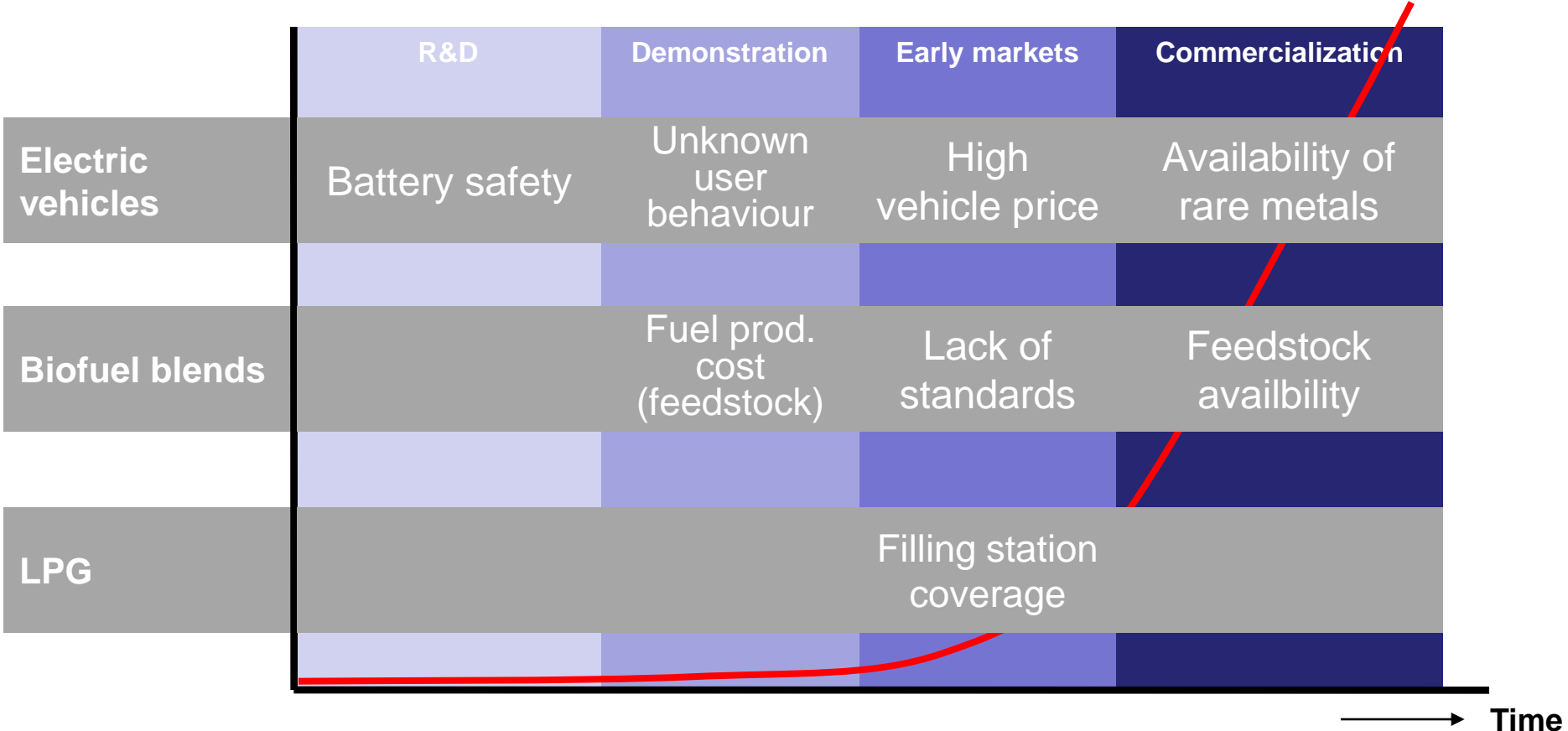
Alternative fiscal policies could possibly help to provide a more level playing field

- In current fiscal policy (in NL), tariffs differ per fuel
- A more level playing field is possible, e.g. by using WTW emissions as a basis
- This does not ensure competitiveness of alternative fuels

Dutch registration tax as function of CO₂ emissions

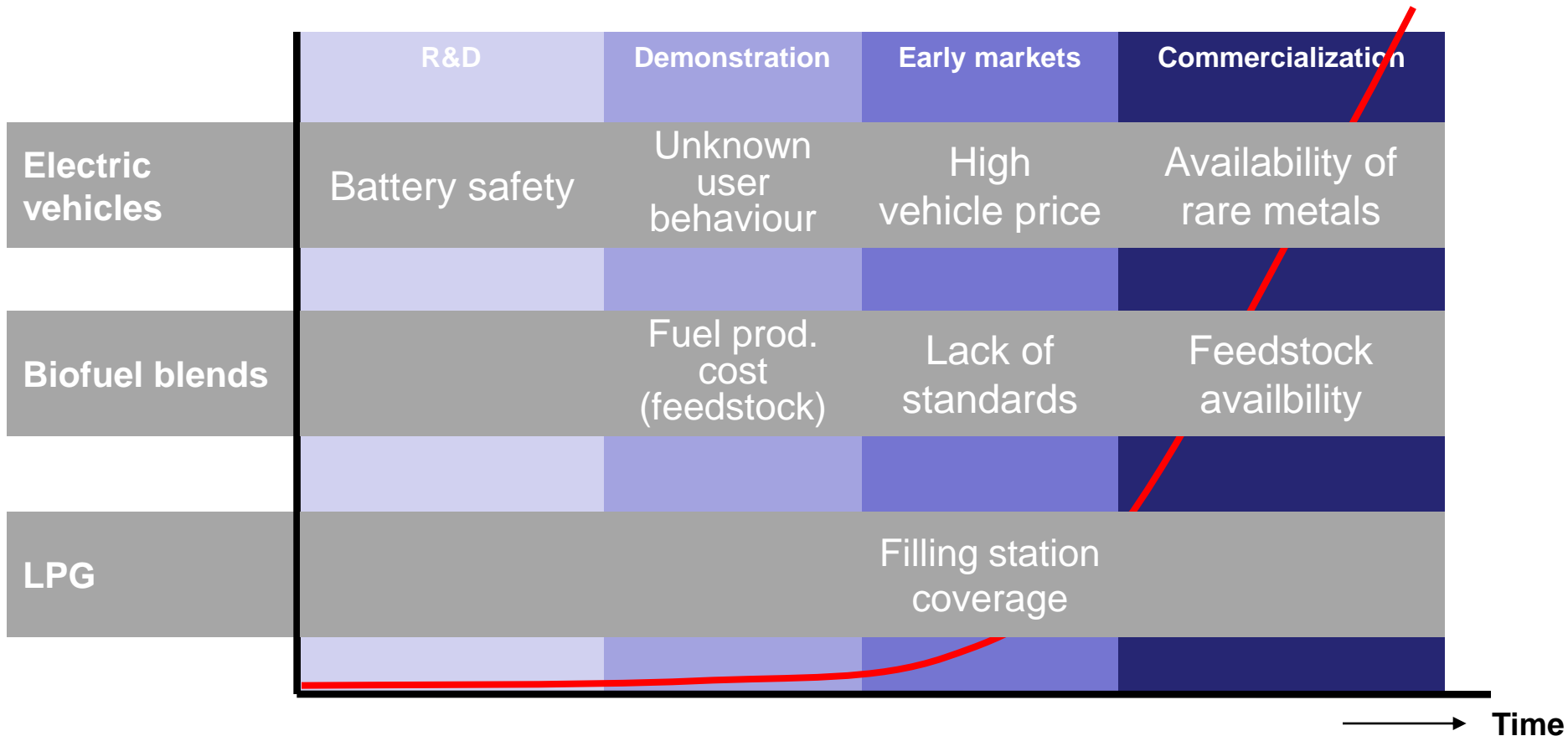


Barriers are technology-specific and phase-dependent



» Specific policy package per fuel required «

Barriers are technology-specific and phase-dependent



» Policy package needs to be adapted over time «























Policy objectives, success factors, effectiveness measures depend on innovation phase



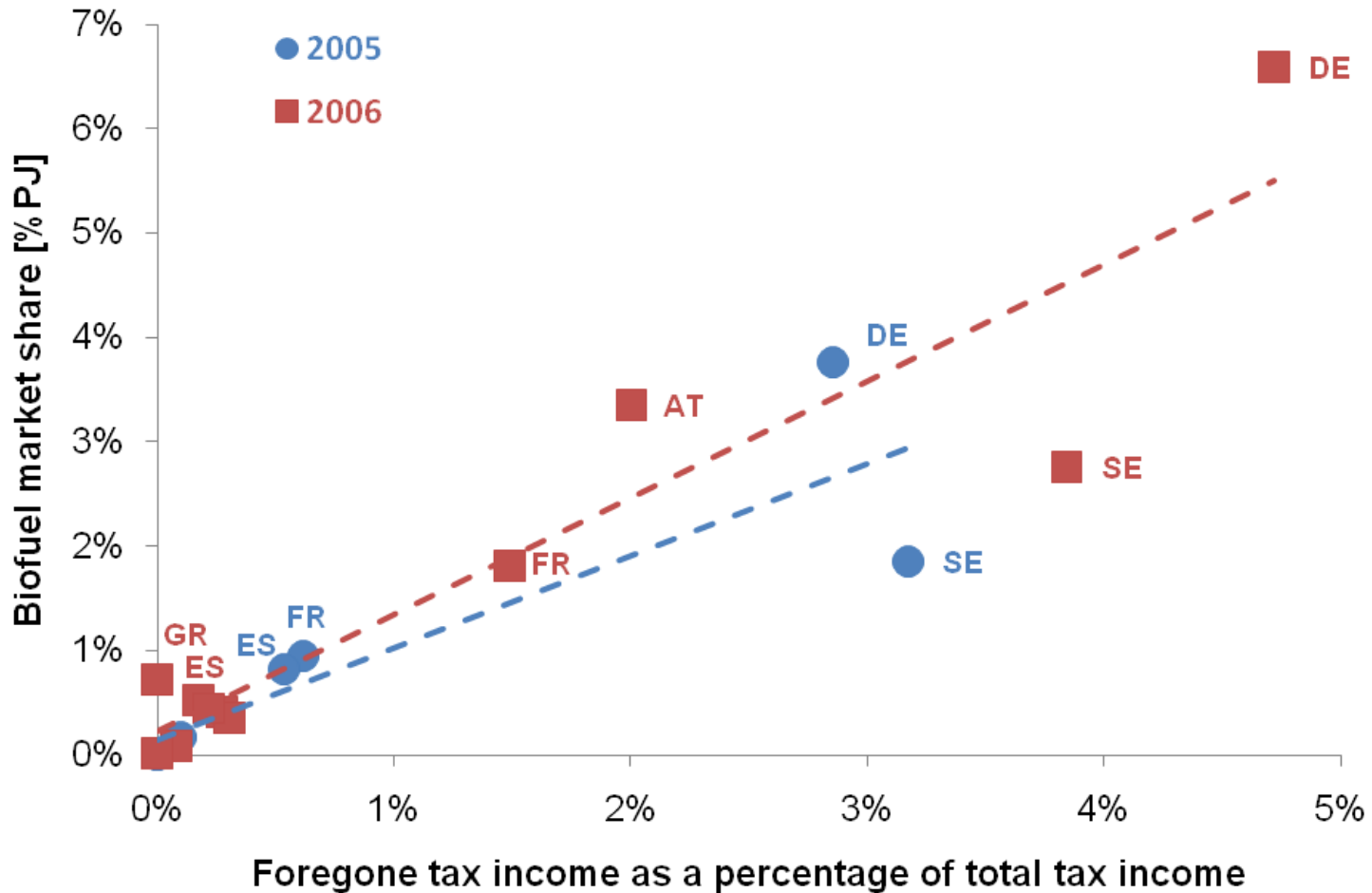
	R&D	Demo	Early market	Mass market
POLICY OBJECTIVE	<ul style="list-style-type: none"> • Address technological issues 	<ul style="list-style-type: none"> • Address technological issues 	<ul style="list-style-type: none"> • Increase market share 	<ul style="list-style-type: none"> • Competitiveness
KEY SUCCESS FACTORS	<ul style="list-style-type: none"> • Focus • Mass 	<ul style="list-style-type: none"> • Involvement key players • Coordination 	<ul style="list-style-type: none"> • Strong incentives • Removal other barriers 	<ul style="list-style-type: none"> • Competitive price • Enforceable obligations
EFFECTIVENESS MEASURE	<ul style="list-style-type: none"> • Investment • # completed projects 	<ul style="list-style-type: none"> • Investment • # completed projects 	<ul style="list-style-type: none"> • Market share 	<ul style="list-style-type: none"> • No more (costly) support

Biofuels are in the early market phase

Key policies are tax reductions and obligations

	Market share	Tax reduction	Obligation	Vehicle Subsidies	Public Procurement	Production support	Support for 2nd gen.	Other support policies
Germany	 7.7%	X	X				X	
Sweden	 3.8%	X	X	X	X	X	X	X
France	 3.4%	X		X				
Austria	 3.1%	X	X					
Netherlands	 2.6%		X				X	
Lithuania	 2.6%	X	X					
Luxembourg	 1.6%	X	X					
Greece	 1.2%		X					
Spain	 1.1%	X	X			X	X	
Belgium	 1.0%	X						
United Kingdom	 0.8%	X	X					
Slovenia	 0.8%	X	X					
Poland	 0.8%	X	X					
Hungary	 0.7%	X						
Czech Republic	 0.5%	X	X			X		
Ireland	 0.5%	X						
Italy	 0.4%		X					
Bulgaria	 0.1%	X	X					
Latvia	 0.1%	X						
Denmark	 0.1%	X					X	
Cyprus	 0.1%	X						
Finland	 0.0%		X					

Tax exemptions have not been equally effective in all countries



Main issue for biofuels is who should bear costs in anticipation of the (cheaper) 2nd generation

Major barriers

- Fuel cost relative to conventional

Minor barriers

- Vehicle cost premium
 - Dedicated infrastructure
- } only for high blends

Policy recommendations

- Tax break (or subsidy)
- Obligation

Government (i.e. all taxpayers) pays

Motorists pay

To overcome the 'blend wall' additional measures are required

Major barriers

- Fuel cost relative to conventional

Minor barriers

- Vehicle cost premium
 - Dedicated infrastructure
- } only for high blends

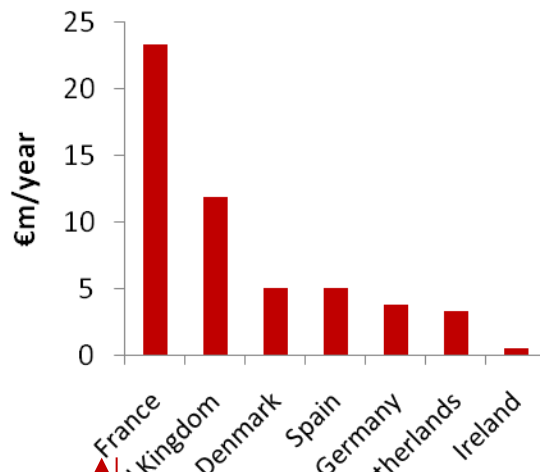
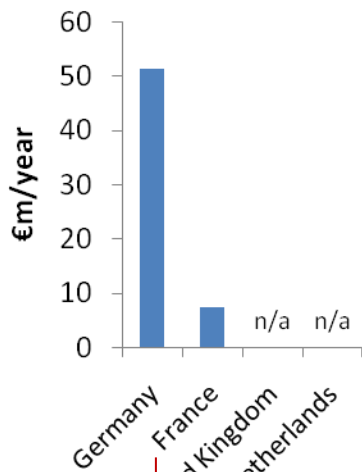
Need to anticipate future developments

Policy recommendations

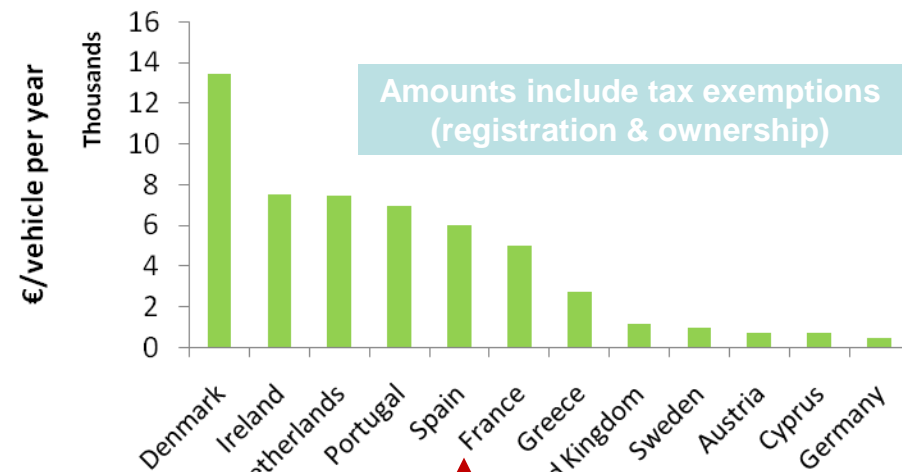
- Tax break (or subsidy)
- Obligation

Electric vehicles are in the demonstration phase Countries are taking strategic positions

R&D expenditures (2009) Demo expenditures (2009)



Early market expenditures (2009)



Note: The expenditures of the British and Dutch R&D programmes are unknown.
Note: Different scales on the vertical axes.

The relative importance of the various barriers for EVs is unclear, but costs will be (very) important

Barriers

- Battery capacity
- Unknown user behaviour
- Vehicle cost
- Lack of charging infrastructure
- Vehicle model availability

Policy recommendations

- Measures to address barriers in all phases
- Appropriate mix depends on local circumstances & on insights from ongoing research

Different barriers become important in different phases of the innovation process

Barriers

- Battery capacity
- Unknown user behaviour
- Vehicle cost
- Lack of charging infrastructure
- Vehicle model availability

R&D

Demo

Early market

Policy recommendations

- Measures to address barriers in all phases
- Appropriate mix depends on local circumstances & on insights from ongoing research

Different barriers can be solved in different phases in the innovation process

Barriers

- Battery capacity
- Unknown user behaviour
- Vehicle cost
- Lack of charging infrastructure
- Vehicle model availability

R&D: Techn. development
Demo: Fast charging, battery swapping
EM: User behaviour

R&D: Techn. development
EM: Battery leasing

Policy recommendations

- Measures to address barriers in all phases
- Appropriate mix depends on local circumstances & on insights from ongoing research

Conclusions

- Technology-specific measures are needed to address technology-specific barriers
- Policy packages need to ‘follow’ the development of a technology over time
- Policy measures can serve to...
 - ...trigger ‘learning-by-doing’
 - ...‘kick start’ a market
(which does not ensure a lasting market)
- Effectiveness depends on providing a good incentive, including the creation of a solid investment perspective

Thank you for your attention!



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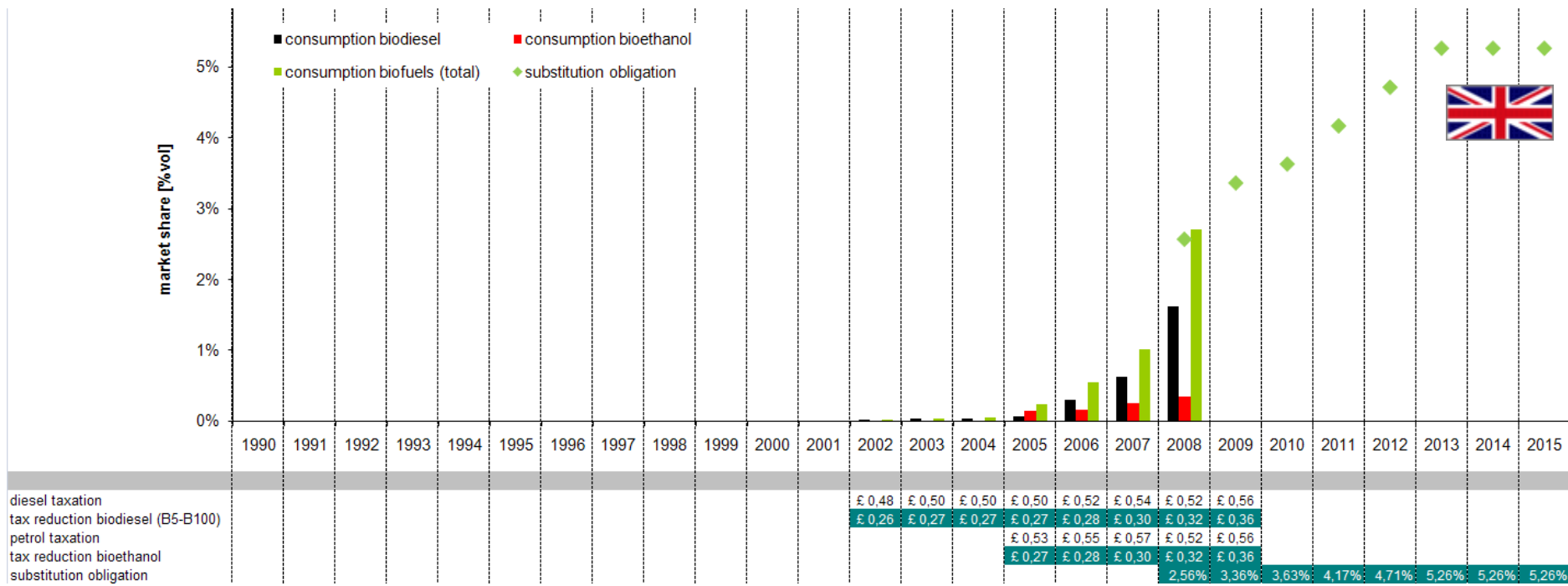
Acknowledgment

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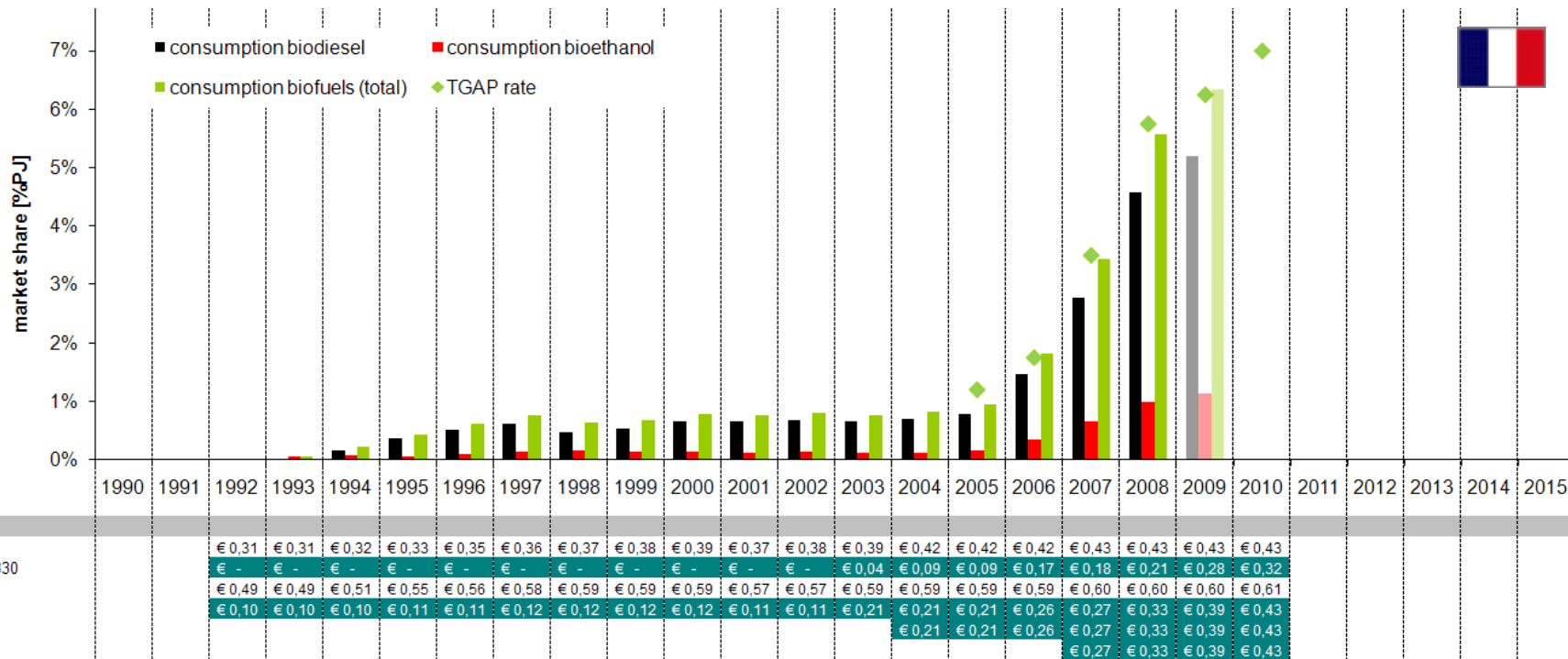
ALTER-MOTIVE: Has the wheel already been invented?

BACKUP SLIDES

Biofuel policy in the UK did initially not provide a sufficiently strong incentive










French biofuel policy limits budget impact, but also market shares










CNG is on the brink of commercialization

Low taxation is combined with additional measures

	Market share	Low taxation	Acquisition tax reduction	Vehicle Subsidies	Filling Station Subsidy	Other support policies
Bulgaria	 1,7%	?	?	?	?	?
Italy	 1,4%	?		X		X
Sweden	 0,3%	X			X	X
Greece	 0,2%	X			X	
Germany	 0,2%	X	X			
France	 0,2%	X		X		X
Czech Republic	 0,1%	X				
Austria	0,0%	X				
Netherlands	0,0%	X	X		X	X
Belgium	0,0%	X				
Poland	0,0%	X				

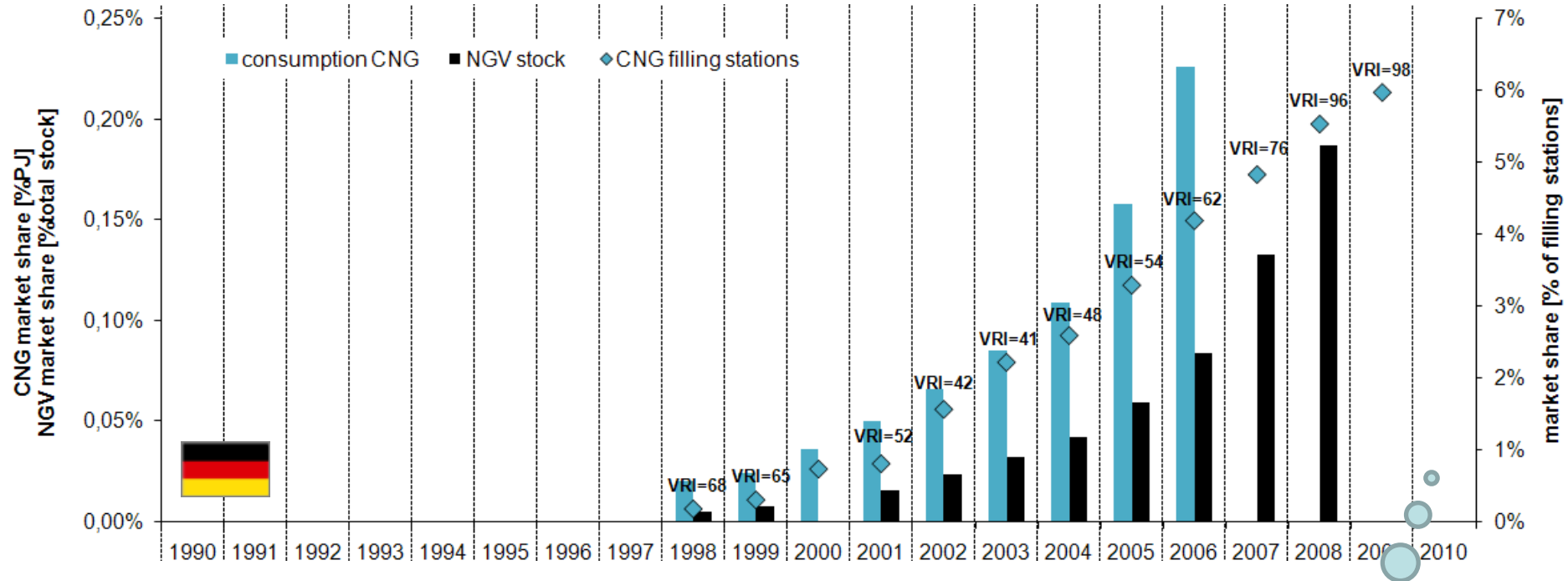
CNG is on the brink of commercialization

Low taxation is combined with additional measures

	Market share	Low taxation	Acquisition tax	Production tax	Filling Station subsidy	Other support policies
Bulgaria		1,7%			?	?
Italy		1,4%				X
Sweden		0,3%	X		X	X
Greece		0,2%	X		X	
Germany		0,2%	X	X		
France		0,2%	X		X	X
Czech Republic		0,1%	X			
Austria		0,0%	X			
Netherlands		0,0%	X	X	X	X
Belgium		0,0%	X			
Poland		0,0%	X			

Mainly biogas

Example: Germany slowly but steadily increases CNG market share



- Main instruments: low taxation & vehicle subsidies
- Some incentives to stimulate infrastructure buildup
- New vehicle model introductions have significant impact

Cost advantage:
 €0,57/lit petrol-equiv
 €0,23/lit diesel-equiv

Low taxation is a key policy, but needs to be complemented by other measures

Major barriers

- Fuel costs relative to conventional fuels
- Vehicle model availability
- Dedicated infrastructure

All major barriers:
chicken-egg
dynamic

Minor barriers



















- (none)

Policy recommendations

- Tax break
- Investment subsidy
- Covenants with industry

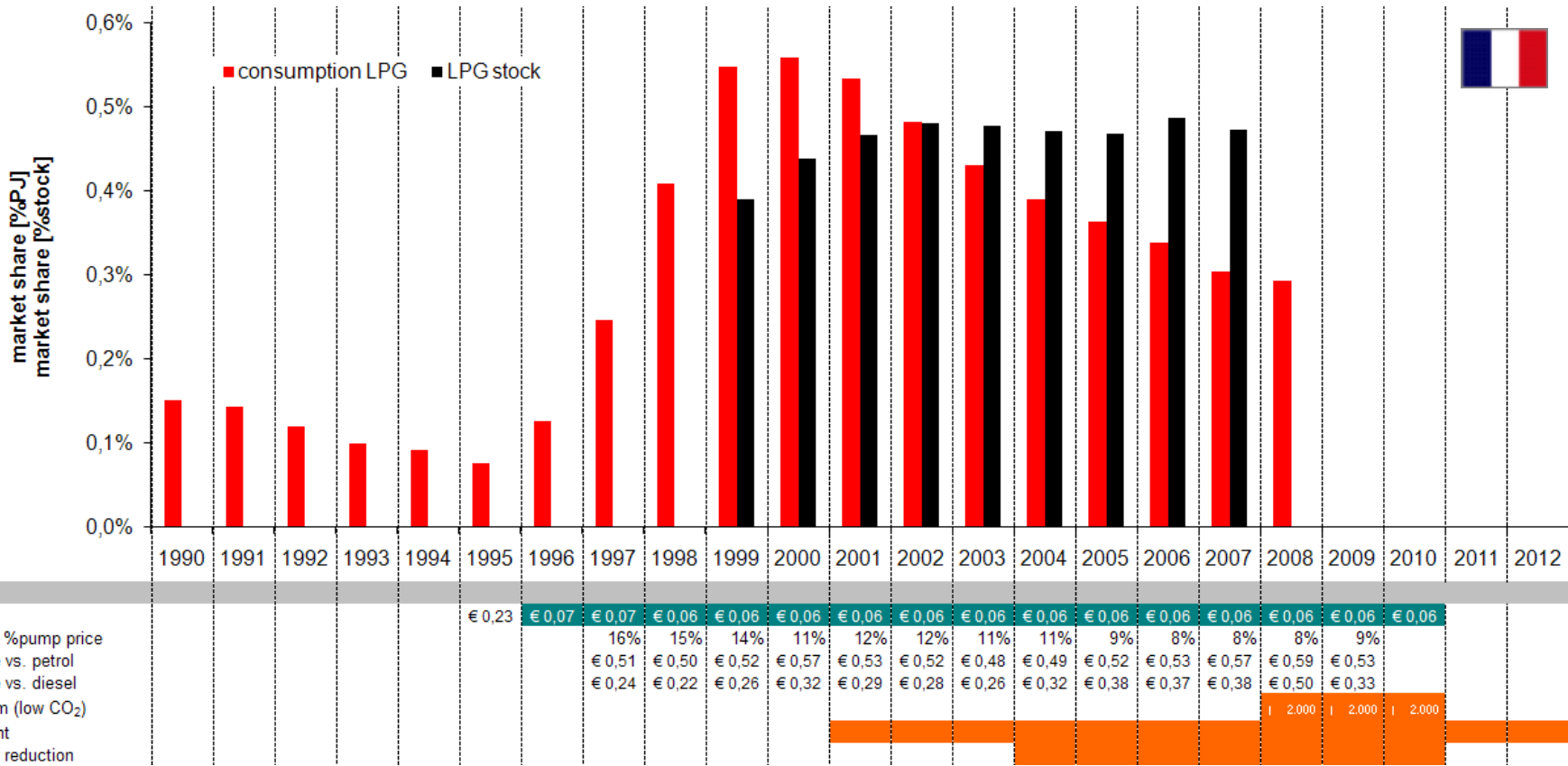
Provide favourable
investment perspective

LPG is a mature technology and can be stimulated by tax reductions only

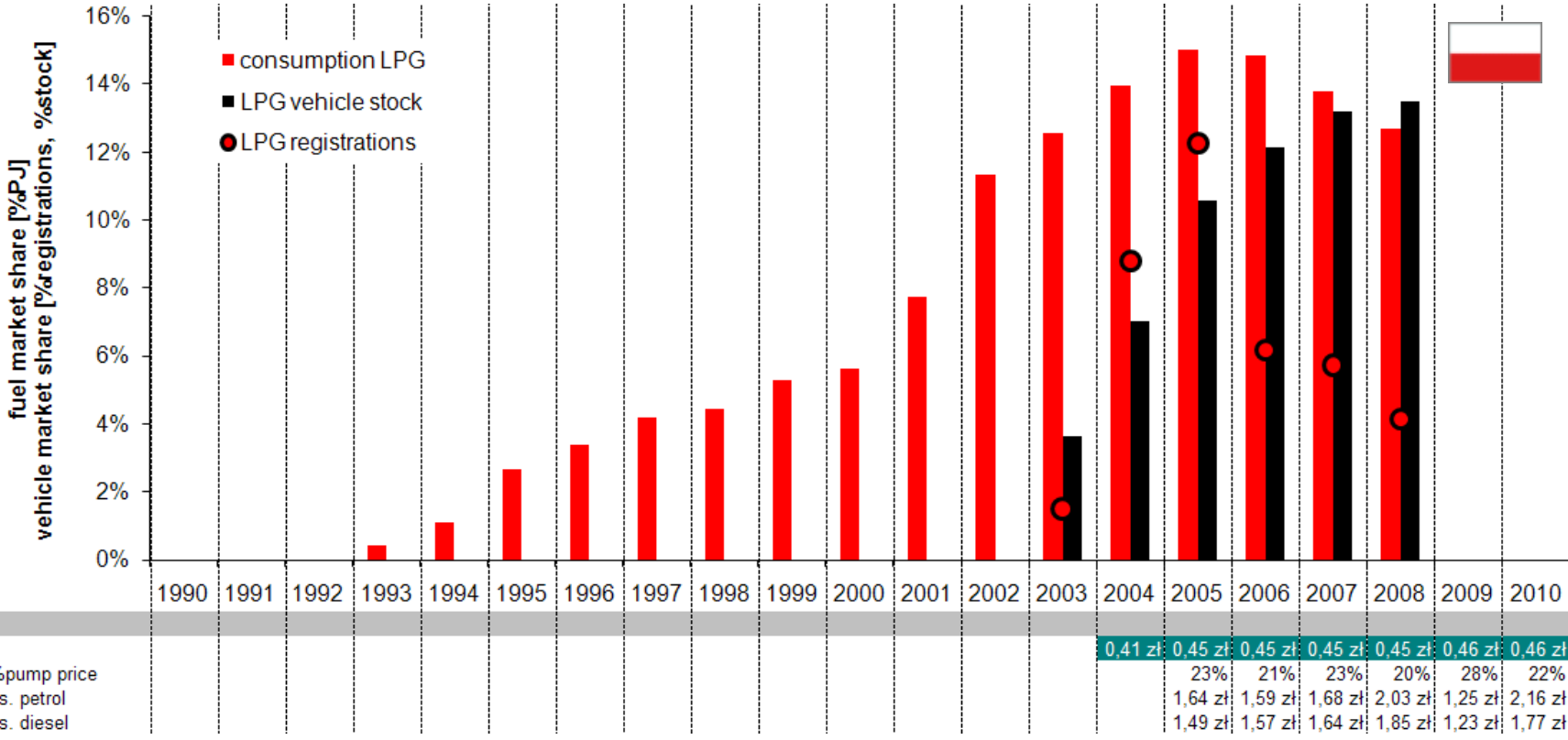
	Market share	Low excise tax	Vehicle tax reduction	Vehicle Subsidies	Other support policies
Bulgaria	 15,8%	X			
Lithuania	 15,3%	X			
Poland	 13,8%	X			
Netherlands	 3,3%	X	X		
Italy	 2,6%	X		X	
Latvia	 2,5%	X			
Czech Republic	 1,4%	X			
Belgium	 0,8%	X			
Hungary	 0,7%	X			
Germany	 0,5%	X			
Portugal	 0,4%	X			
United Kingdom	 0,3%	X			
France	 0,3%	X	X	X	X
Austria	 0,2%	X			
Greece	 0,2%	X			
Spain	 0,1%	X			
Denmark	 0,1%	X			
Luxembourg	 0,1%	X			

Eastern Europe:
cheap conversion

LPG market share increase in France was triggered by tax measures



LPG market share in Poland has been in decline in recent years



LPG requires a significant discount over conventional fuels

Major barrier

- Fuel costs relative to conventional fuels

Minor barriers

- Vehicle conversion costs
- Dedicated infrastructure

Policy recommendations

- Tax break (or subsidy)

LPG does not require specific policies for infrastructure buildup

Major barrier

- Fuel costs relative to conventional fuels

Minor barriers

- Vehicle conversion costs
- Dedicated infrastructure

If fuel costs are sufficiently low, the market will take care of infrastructure buildup.

Policy recommendations

- Tax break (or subsidy)

Hydrogen faces major barriers that relate to a chicken-egg dynamic

Barriers

- Vehicle cost
- Infrastructure
- Vehicle model availability

Policy recommendations

- Cooperation with industry (PPP, covenants)
- Tax breaks & subsidies (vehicles & fuel)
- Investment subsidy & accelerated depreciation

National policies are likely required to help hydrogen in the early market phase

Barriers

- Vehicle cost
- Infrastructure
- Vehicle model availability

EU unlikely to fund early market

Policy recommendations

- Cooperation with industry (PPP, covenants)
- Tax breaks & subsidies (vehicles & fuel)
- Investment subsidy & accelerated depreciation