



# Swedish Road Transport Fossil-free in 2030?

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# CO2 from European road transport

	Mton 2011	% change 1990-2011	Ton per capita 2011
EU 27	859.0	21.5	1.7
<b>Sweden</b>	<b>18.4</b>	<b>6.4</b>	<b>1.9</b>
Norway	10.0	31.6	2.0
Germany	147.9	-1.7	1.8
UK	108.3	-0.4	1.7



# The road map scenario

- The Swedish Transport Administration says in a 2012 policy report that emissions can be **cut by 80 % by 2030** provided that the **cost of driving is made to increase by 50 %**
- This would **cut both car fleet and road traffic by 40 %** (2 million fewer cars) compared to trend
- However, in the agency's long-term investment plan, **traffic is forecasted to rise by 34 %** between 2013 and 2030



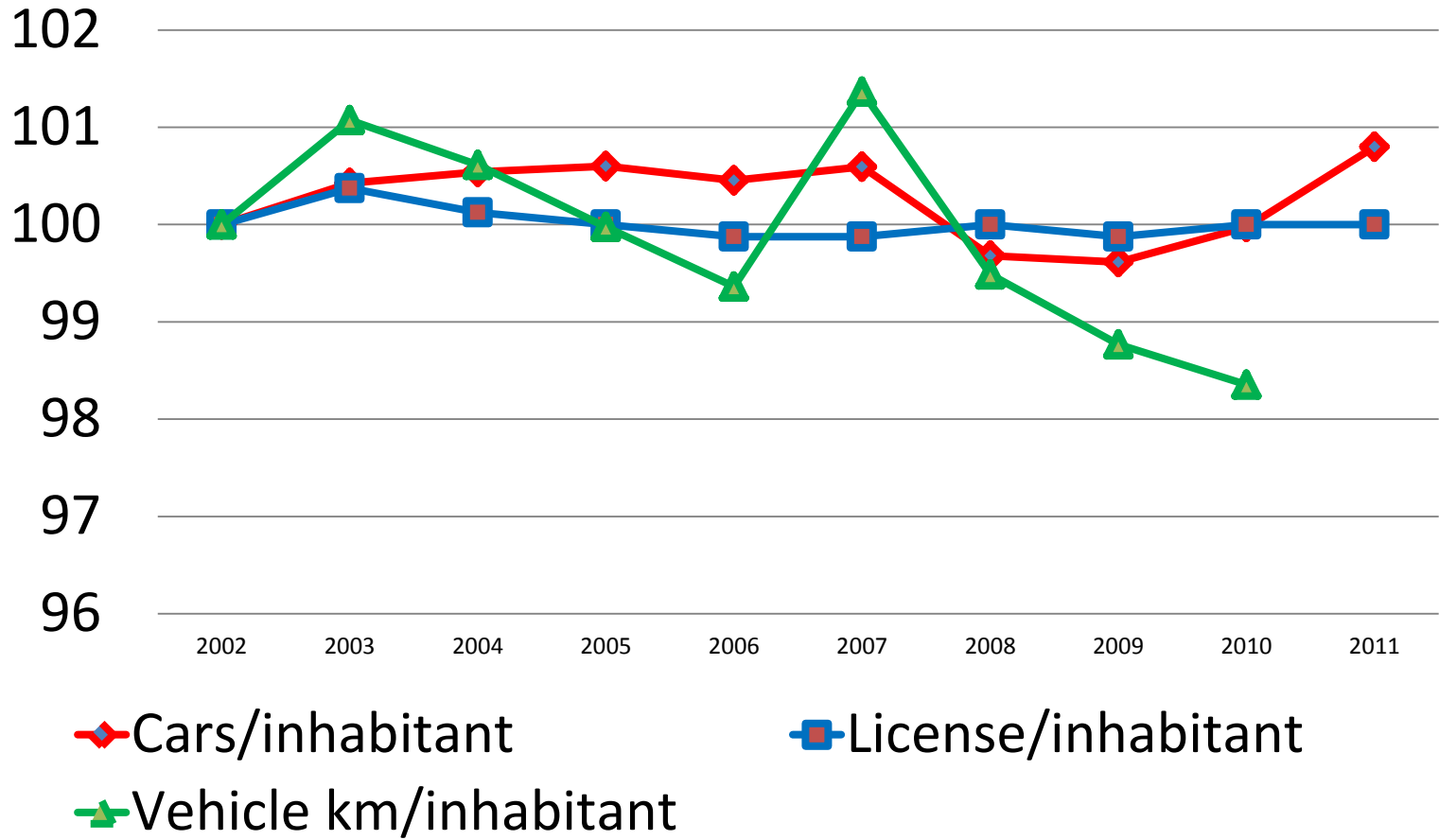
# Abatement targets

- The official position is that Sweden should have **zero net emissions by 2050** (possibly offsetting some by reductions abroad)
- Based mainly on wishful thinking, the Commission on fossil free road transport says Sweden can and should cut its CO2 emissions by **80-90 % by 2030**
- The Commission believes EU road transport GHG emissions could be reduced by **20 % in 2030 and 60% in 2050**



# Are we approaching Peak Car?

2002 = 100



◆ Cars/inhabitant

■ License/inhabitant

▲ Vehicle km/inhabitant



# However, fast population growth

	Statistics Sweden's main forecast	Net immigration	
2010	<b>9 416 000</b>	Low	High
2020	10 200 000	9 911 000	10 284 000
2030	10 660 000	10 159 000	<b>11 002 000</b>
2040	10 945 000	10 248 000	11 560 000
2050	11 288 000	10 362 000	12 795 000



# Public transport

- Stakeholders **hope to double** travel by local and regional **public transport by 2020** compared to 2006
- Relatively fast increase since 2000 but **costs are rising faster** than traffic and passenger kilometers – half is paid by local tax money
- Improved rail transit services, BRT and enlarging the metro of Stockholm are important measures but equally important are policies that make car use less attractive



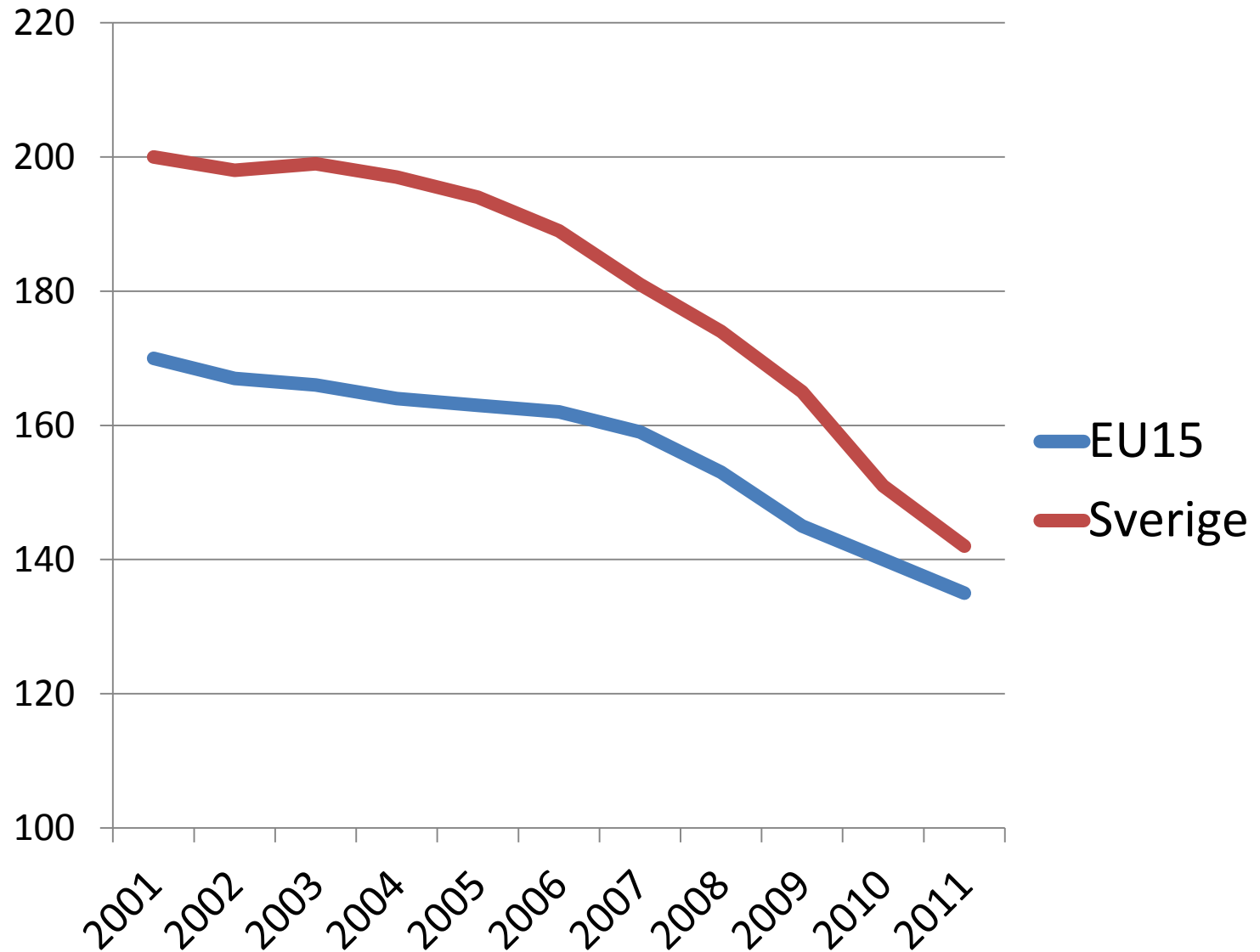
# Heavy goods transport

- High share of railway and shipping
- Modal split has not changed much in recent decades
- 60 ton trucks and heavier allowed
- Km-taxation is a sensitive issue
- Track fees among the lowest in Europe
- Short sea shipping may lose market shares after 2015 (the sulphur directive)





# Average CO2/km of new cars

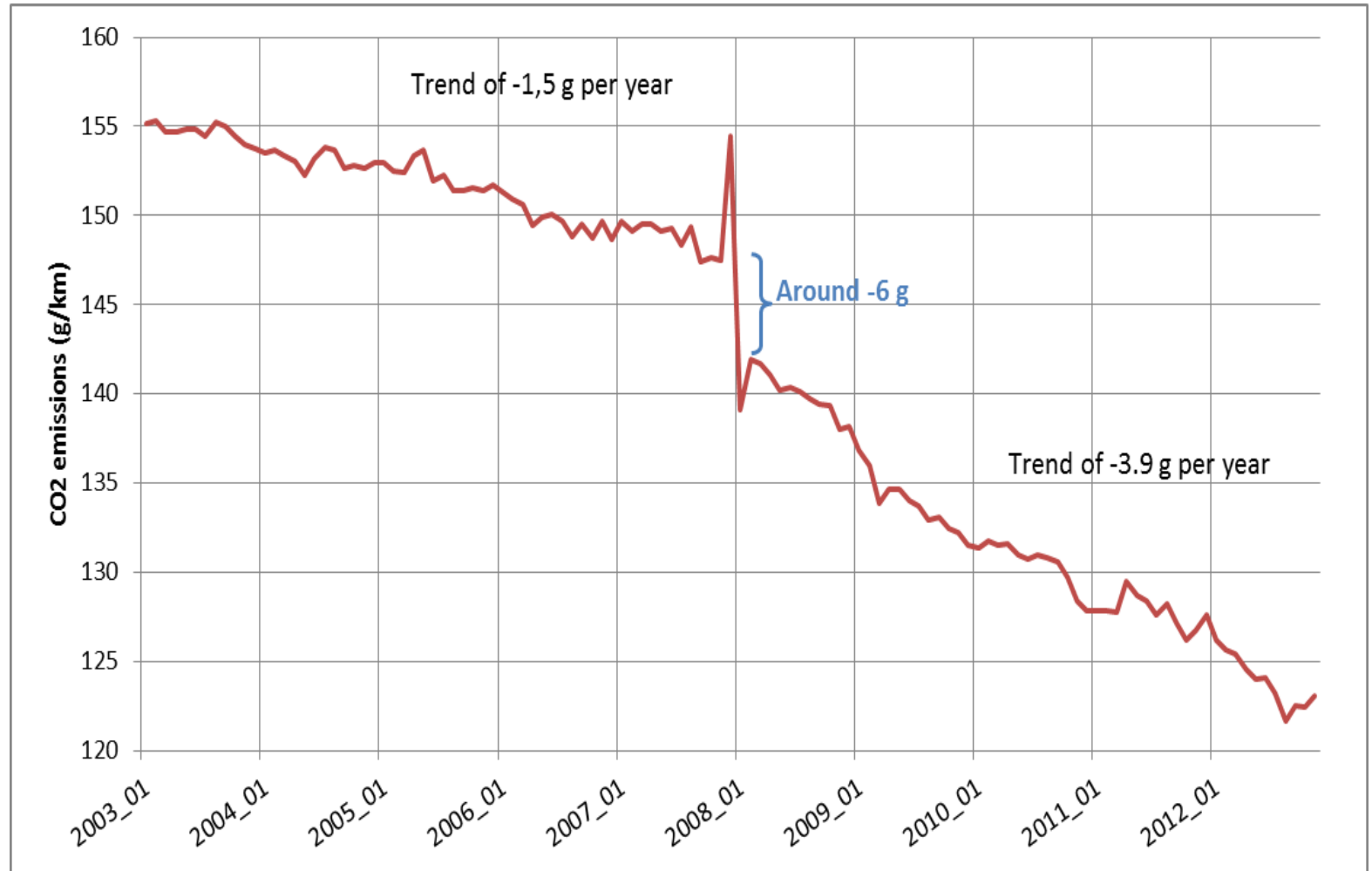


# New car sales in 2012 by segment and 4WD. Per cent.

	Small	Lower medium	Upper medium	Executive	4WD
Sverige	17	26	28	29	23
Frankrike	49	31	14	6	7
Finland	21	31	33	15	13
Tyskland	29	33	20	18	15
EU 15	39	32	17	13	11



# The effect of bonus-malus in France



# A possible Swedish Bonus-Malus

**Alternative 1)** SEK 400/g and km (€ 44) with the balance point at 120 g in 2015, gradually reduced to 90 g in 2020

Results in **SEK 48,000 for zero emission car in 2015 (€5,300)** and SEK 36,000 (€4,000) in 2020

**Alternative 2)** Raising the annual circulation tax, differentiated for CO<sub>2</sub>/km (SEK 50/g) and using the revenues for grants to new low-consuming cars and BEV



# Effects of subsidizing “environmental cars”

- Environmental cars enjoy different types of tax breaks
- Cars that can use E85 or biogas are allowed to emit **150 g/km** compared to **95 g** for other cars (between 2006 and 2012 the limits where **218 g/km vs 120 g**)
- This has resulted in **E85 and biogas cars consuming more fuel/km** compared to gasoline cars of the same size



# The rise and fall of E85

- The “pump law” made E85 mandatory at all major service stations – **1,832 pumps**
- The market share of E85 cars was **23% in 2008** falling to 2% in 2012 and **1% in 2013**
- Very few E85 models have been certified against Euro 6 exhaust standards
- Reduction in company tax for E85 cars ended in 2012
- **229 000 E85 cars (=5% of total fleet)**
- **Sales of E85 fuel fell by 22%** in 2013



# The biogas case

- The gas consumed by road vehicles is on average **60% biogas and 40% fossil gas**
- The fossil gas is **taxed far below gasoline** both in terms of tax per kg CO<sub>2</sub> and tax per unit of energy
- > 99% of these cars are bought by companies or government bodies + local bus fleets
- 40 % reduction of the company car tax



# Supporting biofuels

- All biofuels are exempt of fuel tax but this possibility will expire in 2019
- The government proposed the introduction of a biofuel low blend obligation from 1 May 2014 in combination with scrapping the energy tax exemption but continuing the exemption of CO<sub>2</sub> tax (SEK 1.08/kg)
- Not accepted by the Commission





# A feed-in tariff for new biofuels?

- The Commission on fossil free transport proposes that 2<sup>nd</sup> generation biofuels should receive **a feed-in premium** equal to the difference between SEK 12/liter and the production cost of diesel fuel
- All distributors would have to share the cost but only for biofuel sales in Sweden
- The proposed model violates EU state aid rules and international trade agreements



# A more realistic approach

- Equal taxation of all road fuels (per MJ)
- A **common biofuel obligation** equal to a certain percentage of all fuel sales - rising over time
- Possibility to **trade with biofuel certificates** – perhaps jointly with neighboring countries
- **Allow double-counting of certain biofuels** as long as it is EU policy



## *Drop-in vs high blends*

- Strong lobbyists want to favor pure biofuels or biofuels in high blends
- This has so far resulted in huge costs, a lasting dependence on subsidies and lock-in effects
- Better with equal treatment of high and low blends which will probably result in more drop-in than pure biofuel
- HVO can be **blended with fossil diesel up to 60 or 70%**



# *Distribution in different markets*

- Volumes diminishing over time

	Diesel	Gasoline	Biogas /LNG	Ethanol	Hydrogen	Electricity
Local niches	X	X	X	X		X
Along major E-routes	X	X	X	X	(X)	X
Rest of country	<b>X</b>	<b>X</b>				<b>X</b>



# *Electrification*

- Means CO2 emissions move from the non-trading sector to EU ETS
- Plug-in hybrid cars and light trucks
- BEV will remain a niche vehicle
- Electric buses or PHEV buses in cities
- Electric or PHEV distribution trucks
- Electrification of parts of the EU-motorway system to accommodate long-distance HDVs



# Conclusions

- Taking a route that deviates greatly from main stream EU policy is difficult
- The **cost** has so far on average been **above €350/ton CO2** – very inefficient
- Cutting emissions by 80% in 15 years would require a combination of very high taxation and prohibition of certain types of vehicles and traffic
- **A reduction by about 50% is feasible but challenging**





# Thanks for listening!

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