



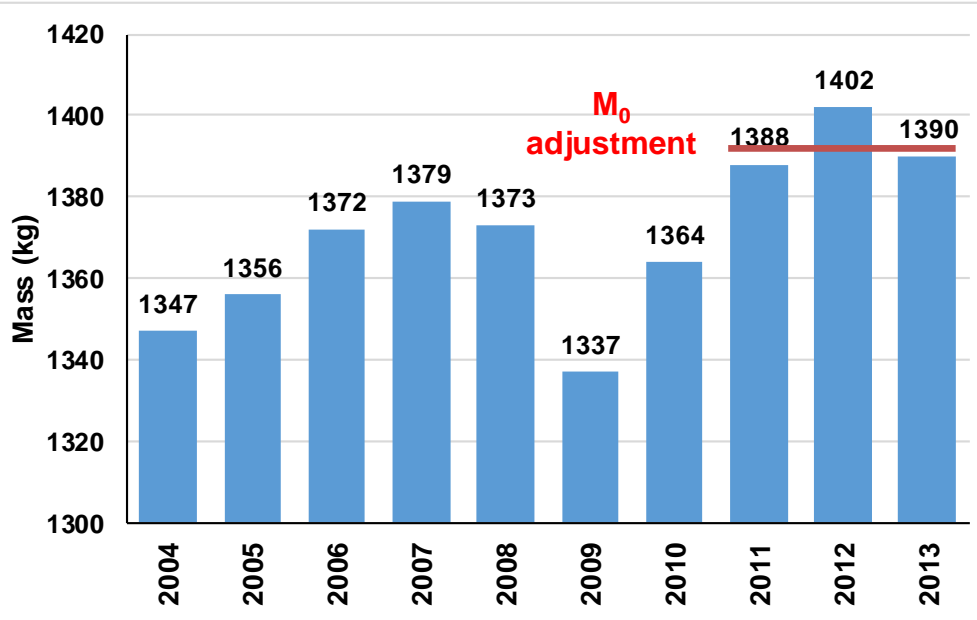
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Improving the understanding of the potential for weight reduction in cars and vans

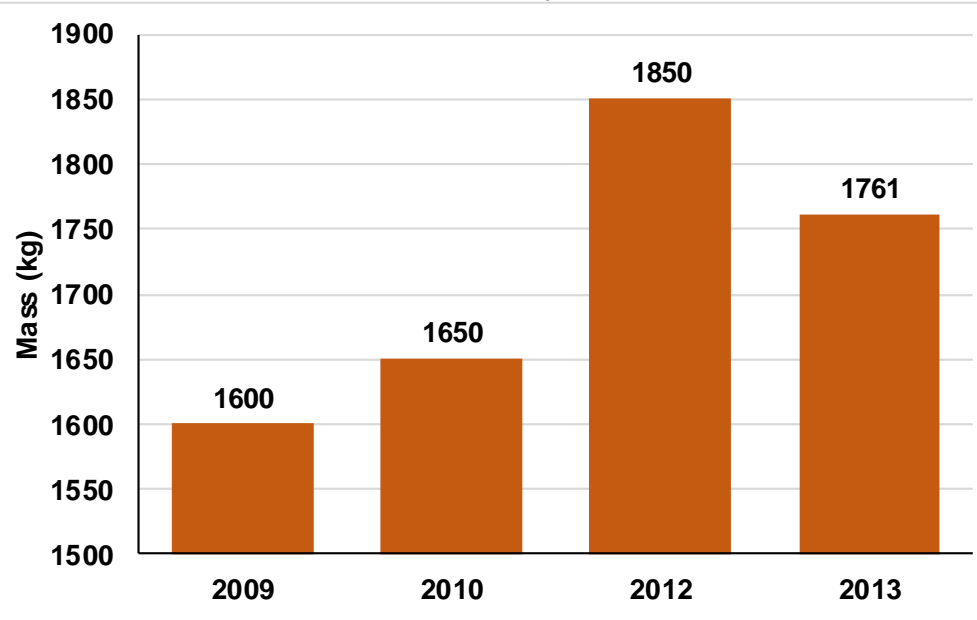
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Brussels, 9th December 2014

- Different views are held on the optimal utility parameter
- Previous work has shown that mass and footprint are the most credible options
- However, critics argue that mass disincentivises vehicle weight reduction
- For post-2020/21 time period, important to understand the relative attractiveness of weight reduction
- Will help inform discussions on the stringency of future CO₂ targets and choice of utility parameter
- Main topics covered by the study
 - Analysis of recent EU trends in the mass of cars and vans
 - Impacts of weight reduction on manufacturer targets under the current Regulations
 - Potential for applying weight reduction measures to light duty vehicles
 - Review of key US studies on vehicle weight reduction
 - Exploring the impact of footprint versus mass-based utility parameters



Cars



LCVs

- Long term increase in average sales weighted mass for cars
- For cars, trend is observed across all brands, all segments and for individual models
- However, 2013 EEA monitoring data indicates reduction in average mass (to 2011 levels)
- Data for LCVs is less robust - and there have been shifts in sales between LCV classes over time
- 2013 data indicates shift in sales towards Class I LCVs, although Class III vehicles still dominate sales (57% of the total)

Scenario analysis: impacts of weight reduction on manufacturer targets under the current Regulations

Scenario	Utility parameter	Weight reduction of “Manufacturer A”	Average weight change of other manufacturers	Subsequent change in average weight of market
BAU	Mass	0%	None	0%
1	Mass	10%	None	Down by 1%
2	Mass	10%	Up by 10%	Up by 8%
3	Mass	10%	Down by 10%	Down by 10%
4	Mass	0%	Down by 10%	Down by 9%
5	Footprint	10%	Not relevant for target of Manufacturer A	Not relevant for target of Manufacturer A

- For all scenarios, three versions were explored, where “Manufacturer A” (i.e. the one taking the action to reduce the weight of its cars in most scenarios) was:
 - an ‘average’ manufacturer
 - a ‘heavier’ manufacturer; and
 - a ‘lighter’ manufacturer.

Impacts of mass reduction on manufacturer targets under the current Regulations

- Where 'mass' is the utility parameter, distance to target for any manufacturer will depend to some extent on the action of its competitors, as a result of potential M_0 adjustment

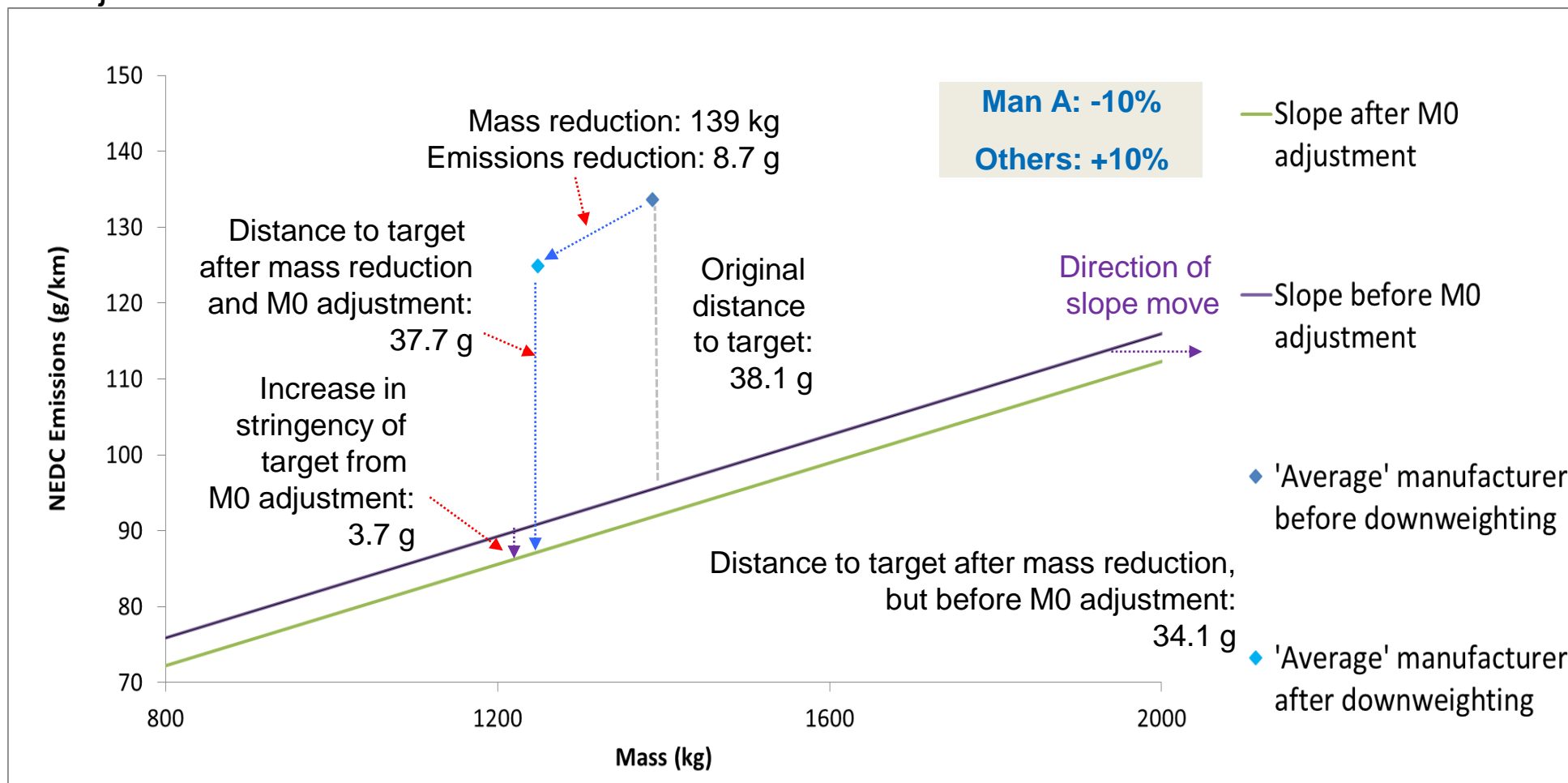


Figure: Representation of results for an 'average' manufacturer in Scenario 2

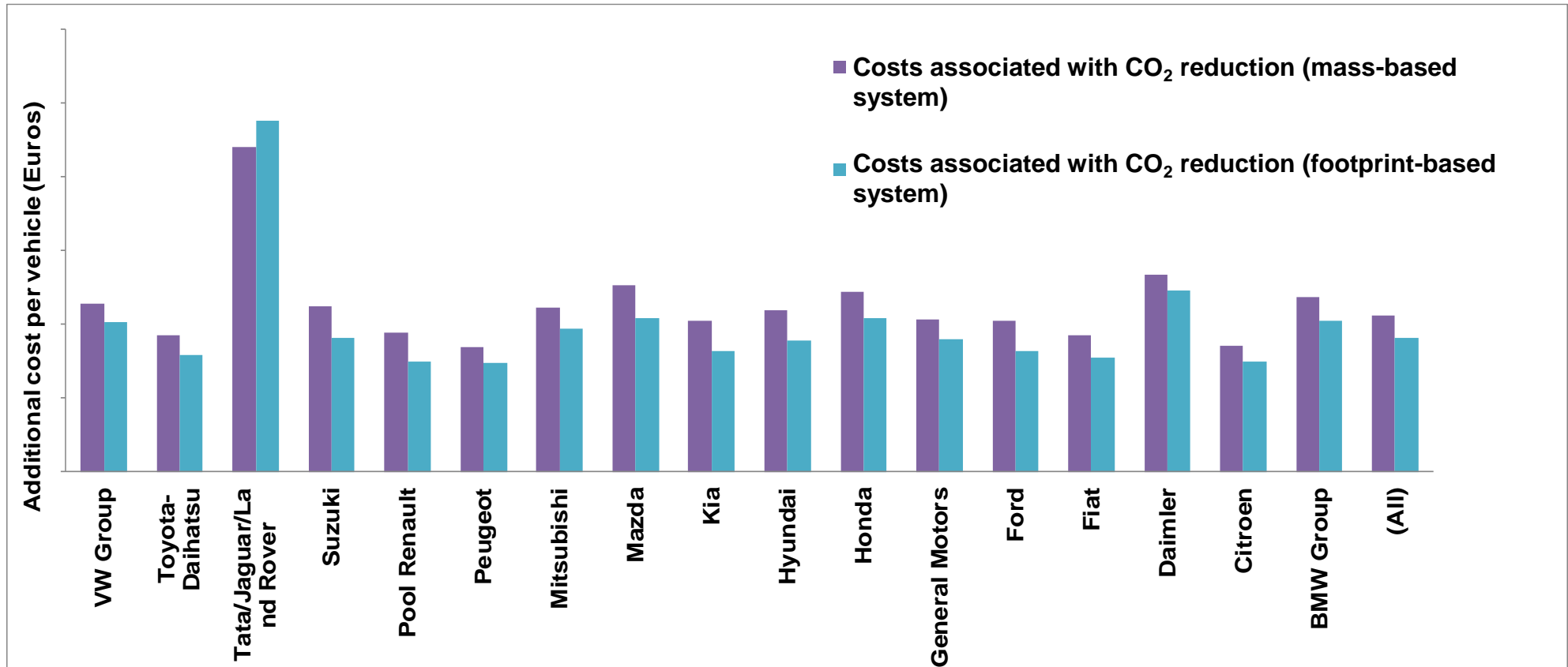
- **Scenarios illustrate that:**

- Weight reduction always brings a manufacturer closer to its target – but M_0 adjustment **may** reduce the benefit of cutting mass
- Example from previous slide indicates that 10% reduction in mass would mean that a manufacturer is only 1% closer to its target after the M_0 adjustment
- Using mass as utility parameter increases the cost and risk for first movers
- Mass as utility parameter increases the likelihood that a manufacturer benefits from reductions in weight made by rival manufacturers
- Mass reduction is more attractive for OEMs that sell heavier vehicles when the average mass of the market is increasing

Aim: To assess the impact of footprint versus mass based utility parameters for a hypothetical 2025 target value under the WLTP

- Existing 2012 EC Car CO₂ monitoring database was 'translated' to WLTP figures.
- Results were compared to a hypothetical 2025 mass-based target with the target slope line adjusted using the same 'equal effort' approach as has been applied between 2015 and 2020.
- Results were also compared to a footprint based target for 2025 calculated to achieve the same overall CO₂ reduction.
- The effort required by each manufacturer to reach the two alternative target lines was calculated.

Exploring the impact of footprint versus mass-based utility parameters for passenger cars



- Using footprint as the utility parameter:
 - Overall effort is identical – but distribution amongst OEM poolings changes
 - Total costs for meeting the target are **more than 16% lower**
 - Only one manufacturer would incur higher costs
 - Costs for all other manufacturers would be between **8% and 20% lower**

Estimated costs for mass reduction

- Wide range of mass reduction options available or coming to market
- Analysis carried out for this study indicates that costs are lower than previously anticipated for the EU market
- Based on the analysis carried out in this study, the following new cost estimates have been developed for mass reduction

	Small cars	Medium cars	Large cars
10% reduction in vehicle mass	€30	€40	€50
20% reduction in vehicle mass	€200	€250	€300
30% reduction in vehicle mass	€740	€925	€1,110

	Small LCVs	Medium LCVs	Large LCVs
10% reduction in vehicle mass	€40	€45	€85
20% reduction in vehicle mass	€410	€475	€810
30% reduction in vehicle mass	€2,045	€2,385	€4,430

- Long term increase in average sales-weighted mass for cars
- Less data available on LCVs and trends are less clear – although available data indicate mass increased between 2009 and 2012
- For passenger cars, using mass as the utility **parameter increases the cost and risk for first movers and increases the likelihood that a manufacturer benefits from reductions in weight made by rival manufacturers**
- For passenger cars, using footprint as the utility parameter would **reduce the total costs for meeting possible future targets by more than 16%**
- Wide range of mass reduction measures available or coming to market
- Costs of applying mass reduction measures are lower than previously anticipated – although very high percentage reductions in mass may be costly to achieve
- Mass reduction has become a key CO₂ reduction strategy for many OEMs and greater focus on this area expected in future

QUESTIONS?

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