Choice-editing the car market: radical reductions without reinventing the wheel

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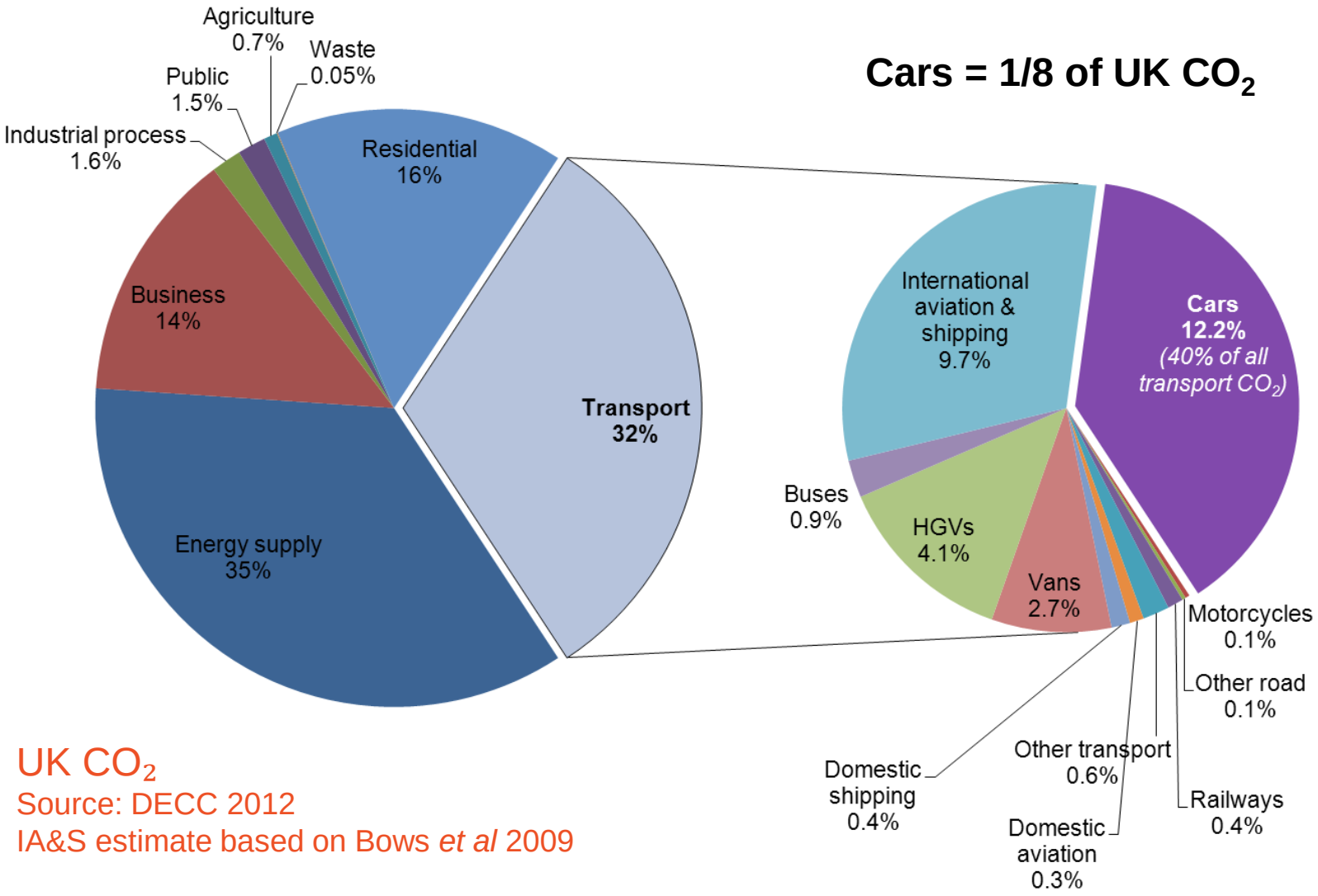
Outline

- Introduction
  - » *Why are we interested in passenger car sector emissions?*
- Current and planned sectoral mitigation
  - » *Why the EU new car emissions targets will not deliver radical reductions*
- Introducing tighter emissions legislation
  - » *40% emissions reduction by 2022 by choice-editing the new car market*
- What does a 2°C-constrained budget mean for the sector?
  - » *Implications for managing demand*

UK passenger car sector emissions

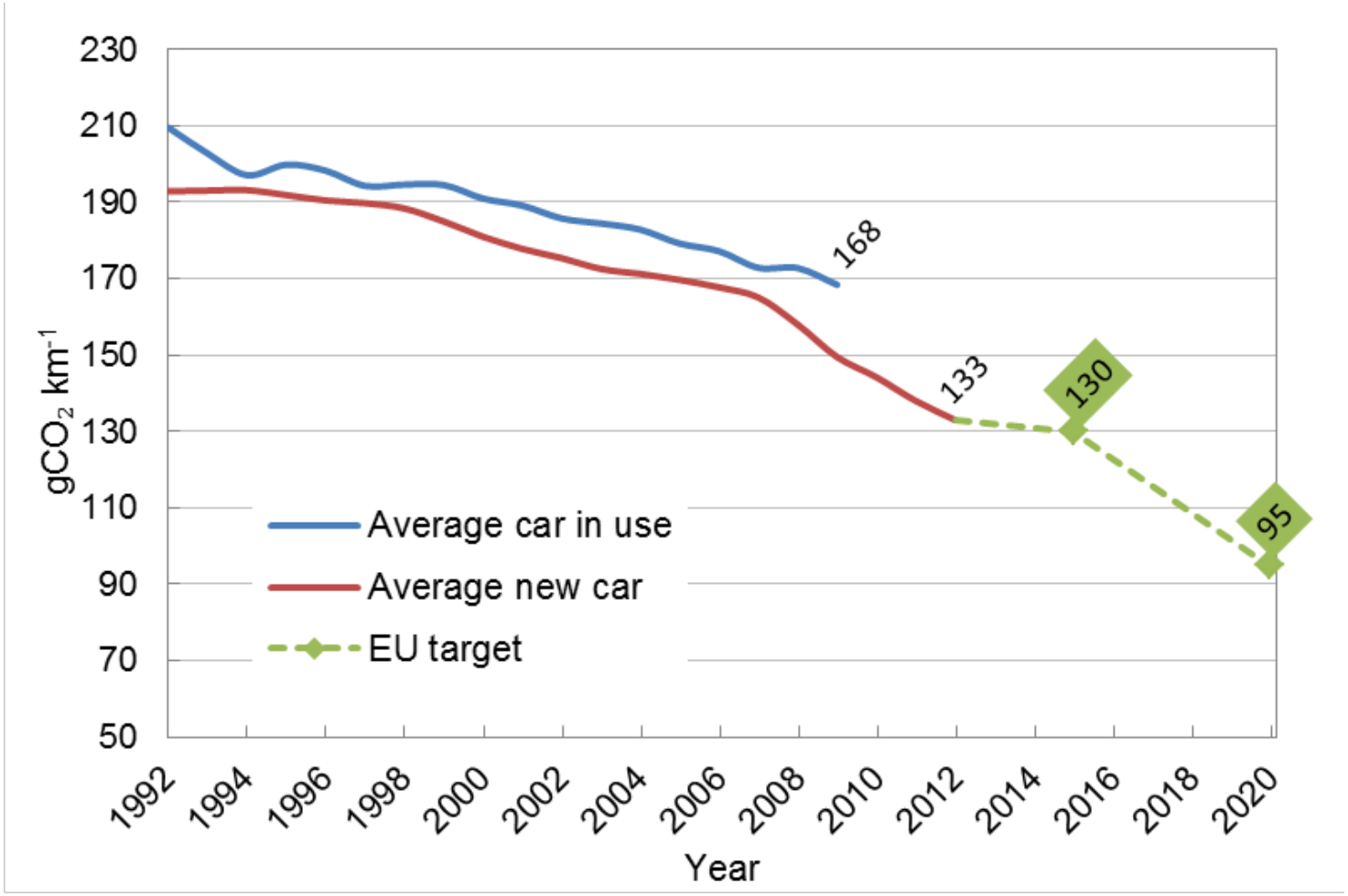


UK CO_2

Source: DECC 2012

IA&S estimate based on Bows *et al* 2009

CO_2 per kilometre



Effect of current policies in UK

- EU new car regulations
  (130gkm by 2015 → 90 gkm by 2020)
- More biofuel (10% by 2020)

- Expected to reduce annual emissions by 14% in 2020 (cf.2008)
- Or… reduction in cumulative emissions 2008–22
  from 1100 $MtCO_2$
  to 1000 $MtCO_2$

EU targets: lots of loopholes…

- EU new car emissions regulations:
  - » Based on test-cycle values
  - » Mass-weighted, not absolute
  - » Derogations for niche manufacturers
  - » Manufacturers can group together to form pools
  - » ‘Super credits’: allowances for ‘ultra-low-emissions vehicles’
  - » Further leeway for off-cycle ‘eco-innovations’
  - » Seriously weakened targets arising from powerful industry lobbying

SMMT (2013) data: number of new car variants by selected CO_2 bands

CO_2/g/km	0	<=75	<=95	<=100	<=130	Over 200	Total
2007	4	4	6	7	482	2,420	7,208
2011	10	12	85	172	1,848	797	7,610
2012	15	19	151	322	2,425	683	7,899

82% ICE vehicles

Easy wins…

- Model-related factors
  - vehicle lightweighting – reduce mass (kerb weight)
  - engine downsizing + turbo charging
  - retuning of powertrain performance characteristics
  - idle shut-off (start-stop ignition)
  - diesel (UK has one of the lowest penetrations of diesels in EU)
  - non-powertrain measures (aero/ rolling resistance / feedback)
- Hybrid technology & regenerative braking
  - electric motors for low speed, stop-start journeys

The car of 2020… available since 2001 !

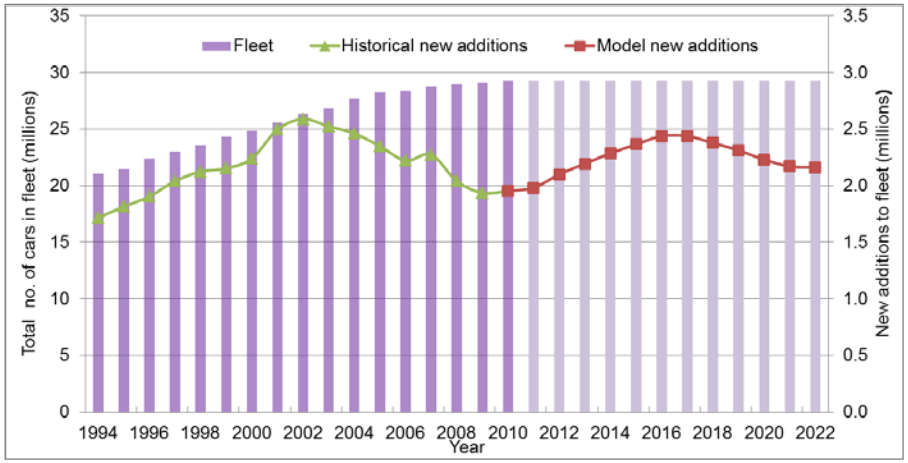
- 2001 model ‘Audi A2 1.2 TDI 3L’
- 86 gCO_2/km, equivalent to 3.2l diesel / 100km
- 5-door, multi-person vehicle
- Turbo gives 61 bhp, max. speed 104 mph
- Relatively lightweight construction
- Limited production run, quickly withdrawn from sale

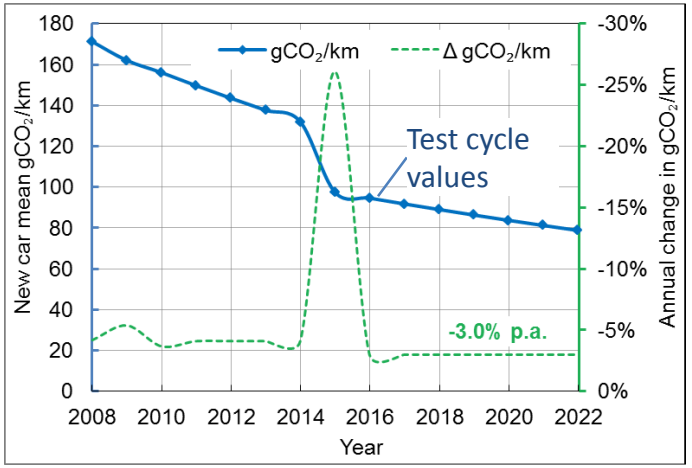
"The critical issue is not technology"

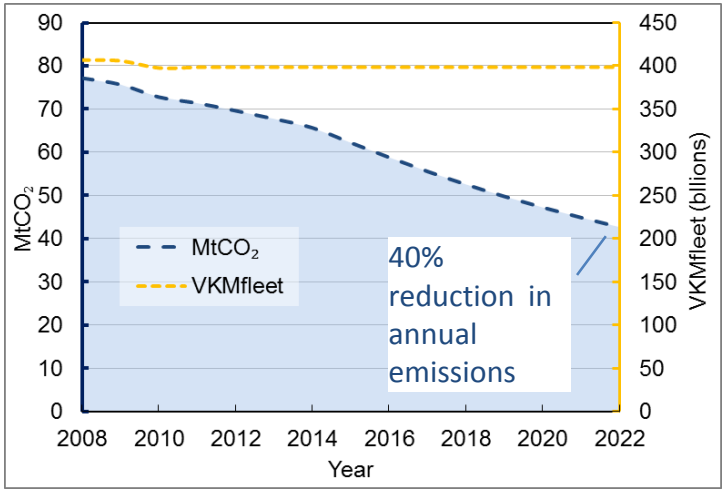
"*The critical issue is a … technology neutral, innovation and competition driving policy,* ***built around stepwise tightening of emissions*** *and incentive levels*"

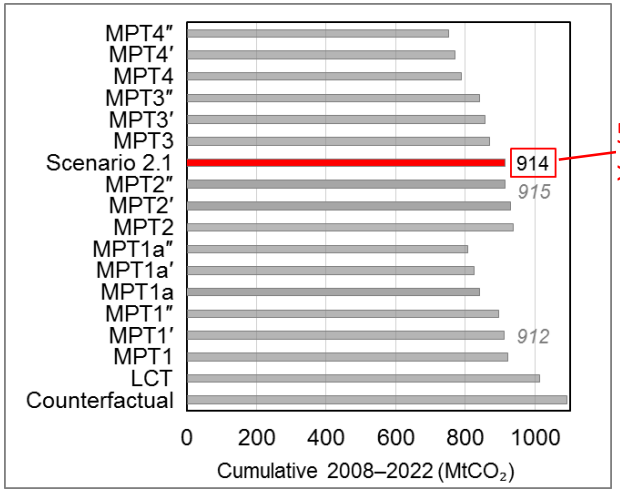
(Berggren and Magnusson, 2012)

‘Choice-edited’ scenario









56% probability >2°C

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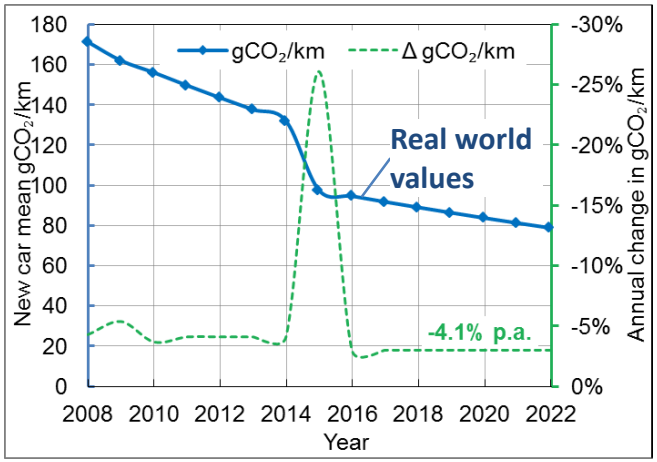
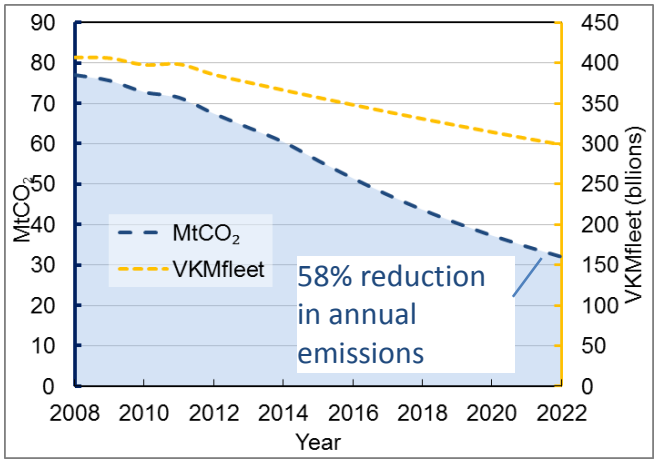
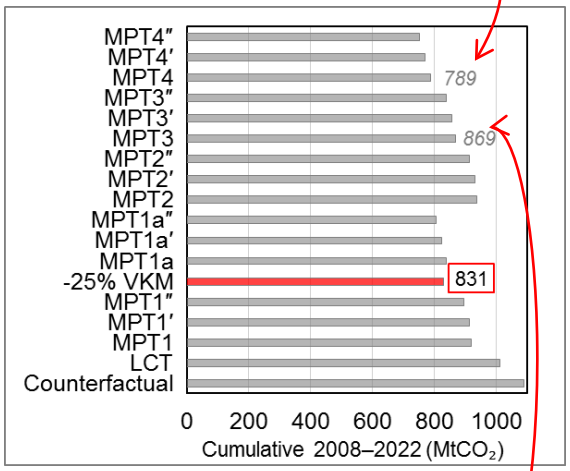
For <50% chance of exceeding 2°C

- Reduction in total vehicle kilometres from fleet
- In parallel with the technology roll-out, choice-edited scenario





36% probability >2°C



52% probability >2°C

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Demand reduction

- Recent trends show decline in annual per capita driving distances (so-called ‘peak car’)
- Cancelled out at fleet level by increase in number of car drivers
- ‘Peak car’ will not deliver the reductions in fleet aggregate VKM needed to follow a 2°C-constrained sectoral budget
- Evidence is very thin for effectiveness of voluntary measures
- ‘Coercive’ demand-side measures needed to deliver large cuts
  - » Road user charging
  - » Minimum occupancy lanes on motorways and major routes into cities
  - » Quantity constraint such as a price escalator or personal carbon allowances

In summary…

- With existing cars
  - » with IC engines
  - » without any significant price premium
  - » at current uptake rates
  - » by restricting mean new car emissions to 90g km from 2015

40% reduction in annual emissions by 2022

- For cumulative emissions reductions in line with 2°C, significant levels of demand reduction still required

Thanks for listening

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