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SMART TRANSPORT

The Cost of Achieving Net Zero

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Agenda

1. Total cost
2. Fiscal cost transport
3. Cost of global heating
4. Effects on Value for Money
5. Base-Line?
6. Timing
7. Road Pricing
8. Behaviour change
9. Road programme , carbon costs
10. Two futures

1. How much will it cost the UK to reach net zero?

FINANCIAL TIMES

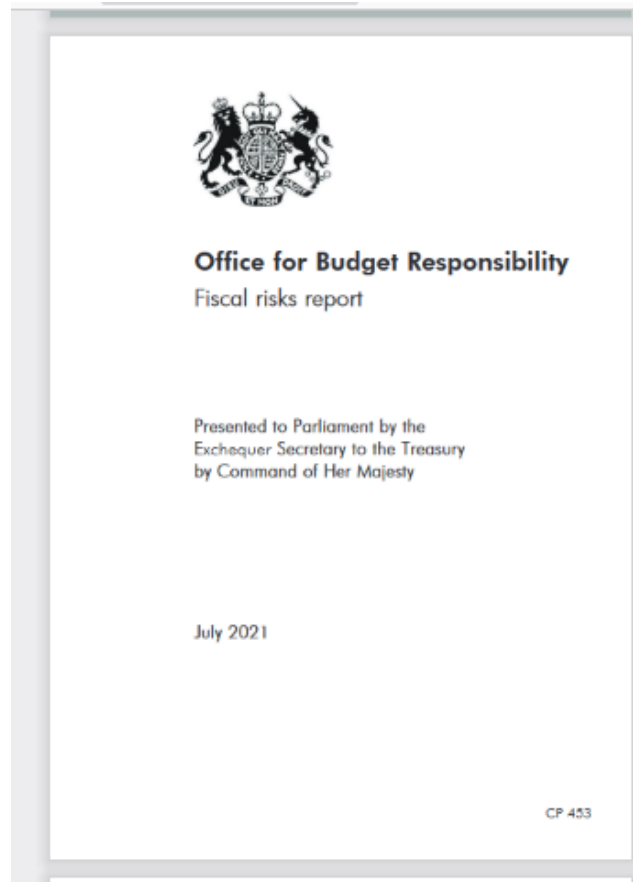
FT summary, 3.11.2021, **from** Office for Budget Responsibility OBR, **from** Committee on Climate Change CCC.

£1.4tn 2020-2050 ‘green investment’

(£50bn per year, 2% of GDP, but this brings savings of £1tn, so net cost **£12b a year or £400 per household per year**)

(Dieter Helm “disingenuous and dangerous” as ignores embedded carbon in imports).

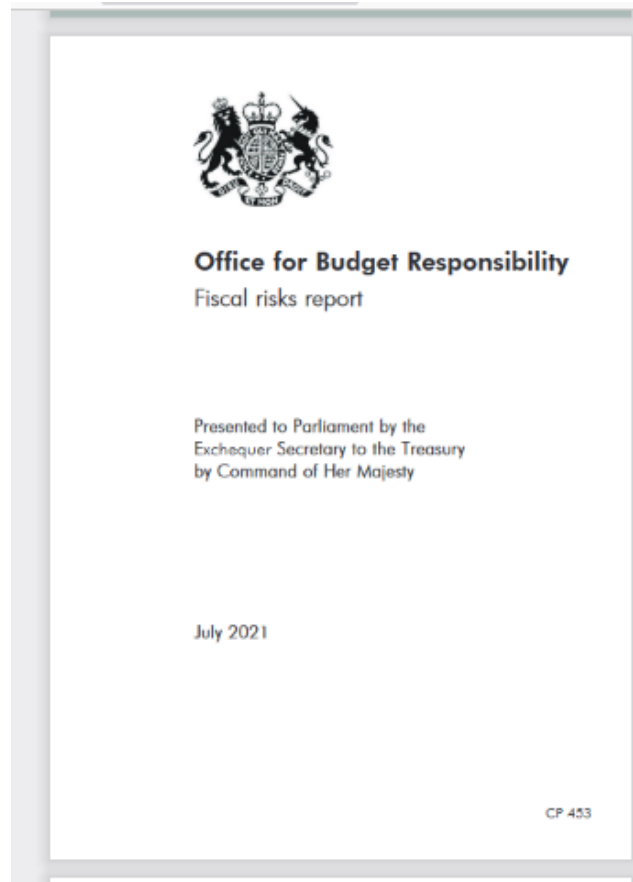
2. Fiscal cost of climate policies - transport



“On unchanged fuel duty and VED policies, once the entire vehicle stock has turned over, that will result in a revenue loss of 1.5 per cent of GDP (equivalent to £31 billion in today’s terms).

This is a key component of the fiscal cost of getting to net zero emissions”. OBR

3. And the cost of **not** halting global heating?



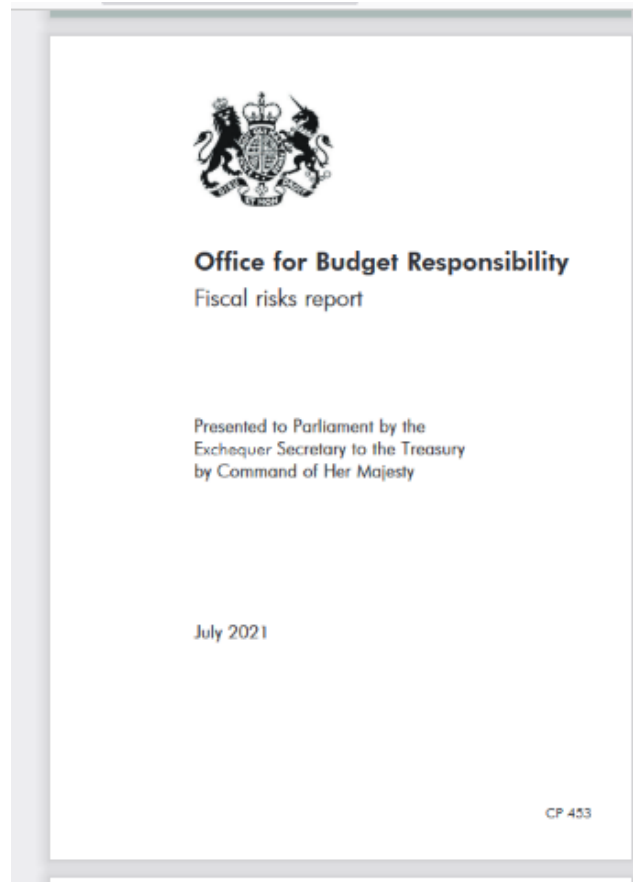
Studies calculating that

“where average temperatures rise by 4°C by 2100) the average level of per capita global GDP in 2100 would fall by 23 per cent”

(or maybe ‘only’ 7%)

But this does **not** include...

Non-Linear effects – ‘tipping points’ (like Antarctic ice cover)



3.27 ...extreme events...
conflict... war... mass
migration... disease
patterns... civil unrest...
governance breakdown...
insurance failures...
systemic financial crises...
economic instability...

4. Climate change crucial to transport appraisal in **two** ways

Effects **of** climate change **on** transport – economic, social and operating conditions, needs, constraints and demand

Changes the **baseline** forecasts which underpin all CBA-like appraisal...

...and the **outcomes** of projects, programmes and policies

Effects **of** transport **on** climate change – mostly by CO2 production

Includes embedded carbon in manufacture of vehicles and construction of roads, tail-pipe emissions in use, and carbon from maintenance, scrapping;

& any land use, life-style and activity results of transport decisions.

5. DEFRA 2020: TWO BASELINE SCENARIOS



Department
for Environment
Food & Rural Affairs

Accounting for the Effects of
Climate Change

Supplementary Green Book
Guidance

November 2020

“Where longer time horizons are needed (i.e. beyond 2035)... It is ...necessary to appraise using at least two climate scenarios...

in appraisal; one baseline should be consistent with a ‘2°C’ scenario...and the other appraisal baseline should be consistent with a global temperature rise of 4°C.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/934339/Accounting_for_the_Effects_Of_Climate_Change_-_Supplementary_Green_Book_-_pdf

Until now, all transport project appraisals have used a **base-line**..

...which assumes road traffic increases with smooth economic growth,

national and international economies are **unaffected** by either climate change or policies to counter it.

‘Business as usual’ means no radical changes in weather, no radical shifts in the location of population or activities, no shortages of food, no structural changes in employment.

6. Urgency: Timing is not neutral

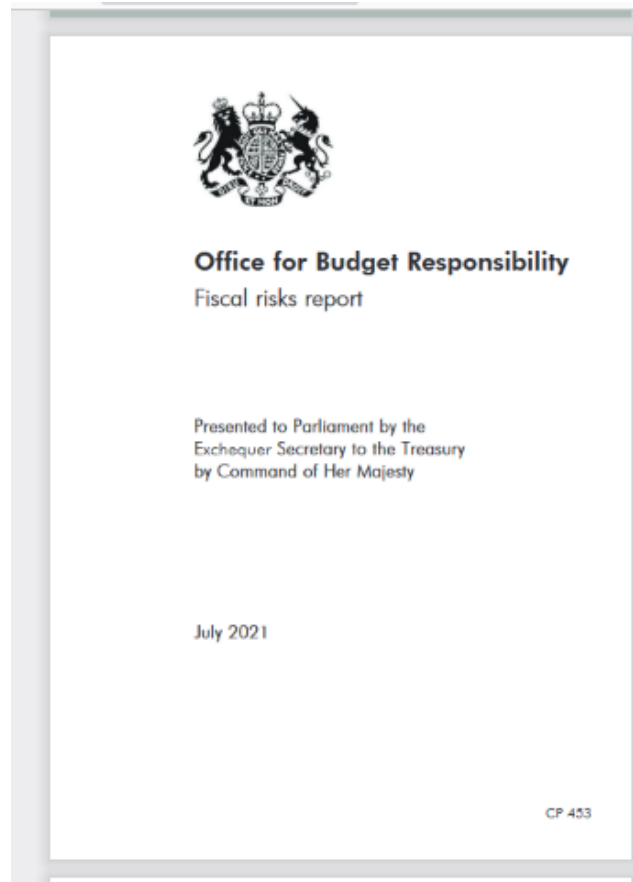
It is the **stock** of greenhouse gases in the atmosphere, not the annual **flow** of new emissions, that determines the average temperature. Their atmospheric lifetime is very long,

Therefore each tonne of carbon emitted this year does 29 years of damage by 2050. Making early reductions is **much better** than making late reductions.

Electrification of vehicles does not have quick effects, because the average vehicle life is now (14) years.

(and what happens to displaced petrol cars – sold to developing countries?)

Charging for uncharged external costs

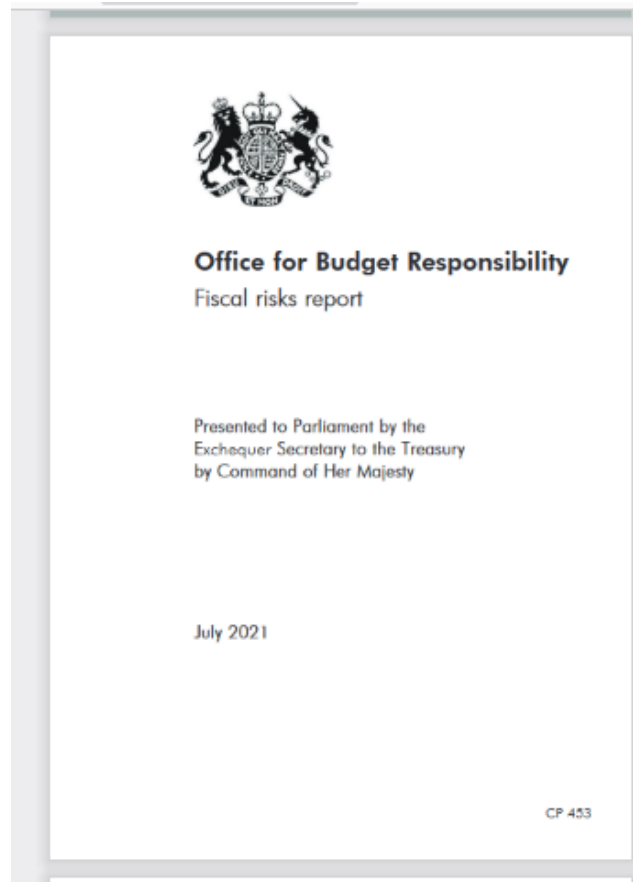


19. “Climate change results from several market failures – most importantly that *the costs of emissions to current and future generations are not borne by those who produce them today.*

This can be addressed by applying an appropriate price on carbon”

(Not only carbon)

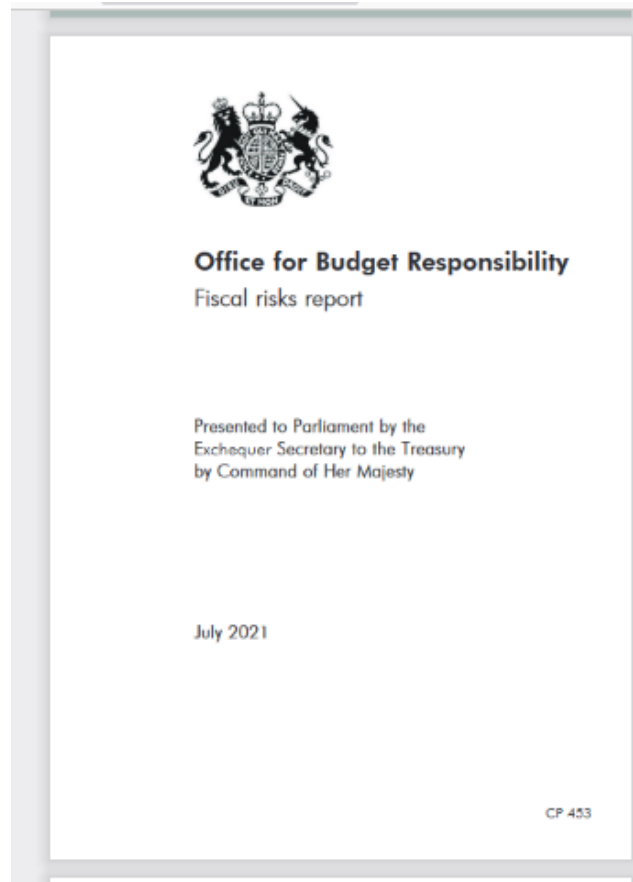
7. Road pricing – a cost or a benefit?



20....”rather than allow existing taxes on motoring to fall to zero, the Government could maintain the tax burden on motoring by levying other taxes such as a road-user charge”.

Charging for external costs is not a burden, it is avoiding a burden

8. Behaviour change – but will be more.



3.61 Around a fifth of the required reduction in emissions in 2050 is assumed to stem from *behavioural changes reducing transport demand.*

This is despite rising car ownership and a falling cost of driving, so it is possible other sources of abatement could need to be greater if mileage continues on the upward trend of recent years

What Sort of Behaviour Changes? - the Weft



- A very substantial **mode shift** to walking, cycling and PT in towns
- Increasing **car occupancy** overall
- Improved and more attractive **long distance rail** services integrated with bus-walk-cycle access
- Improved **intercity express coach** services
- **Shift of road freight** onto rail, shipping & cargo bikes
- Embedding transport decarbonisation principles in **spatial planning** to ensure that new development promotes sustainable travel choices

9. The Warp

- *“ambitious roads programme reflects – and will continue to reflect – that in any imaginable circumstances the clear majority of longer journeys, passenger, and freight, will be made by road; and that rural, remote areas will always depend more heavily on roads”*

But ‘majority’ is not the point. every scheme to increase road capacity in the current DfT road programme has been appraised with forecasts of *increasing* road traffic: continuing well past 2050

Are carbon costs from the road programme significant?

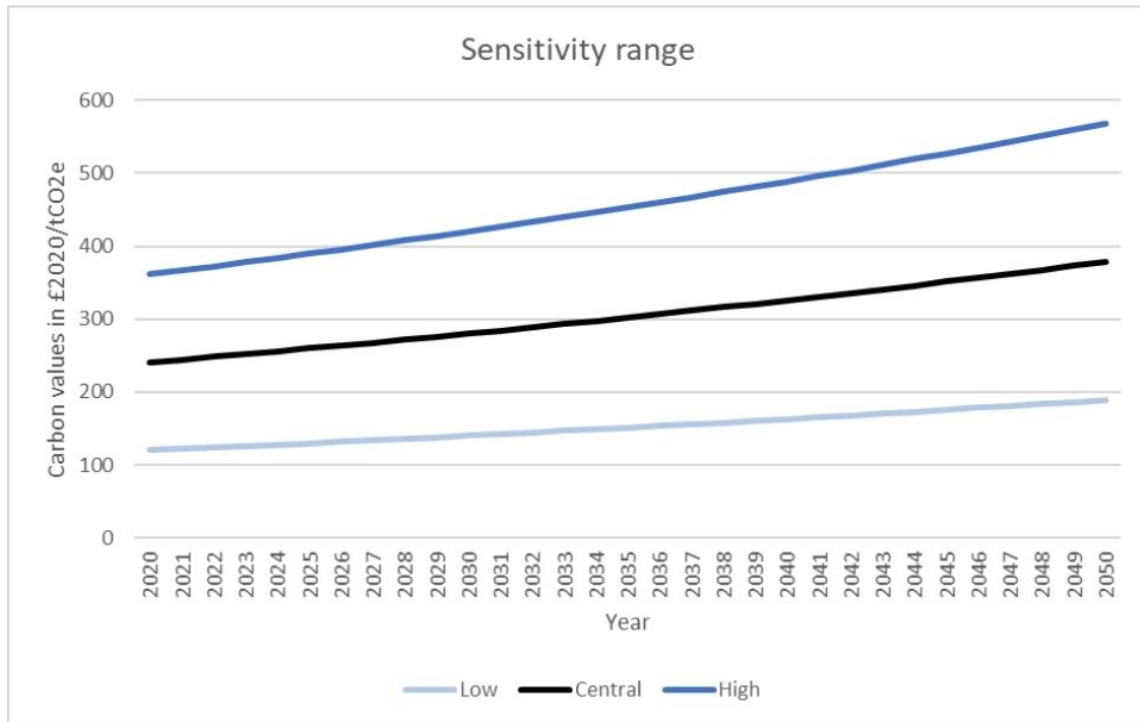
DfT and Highways England: CO2 due to road schemes 'insignificant', 'immaterial', 'negligible', even legally 'de minimis' ... **BUT only because of**

- a unique definition of 'insignificant'... carbon emissions as a percentage of all the carbon emitted from all activities in the whole economy. (only applied to roads – all other activities aggregate or offset)
- And with very low 'carbon values'



Valuation of greenhouse gas emissions: for policy appraisal and evaluation

Published 2 September 2021



- BEIS issued revised values of carbon for appraisal. The figures for 2021 are in the order of **ten times higher** than the previous figures for 2021 issued in 2018, and **3-4 times higher** for 2030.
- An implicit statement that carbon has been **substantially undervalued in all appraisals** until now.

Do the new carbon values make a difference?

Stonehenge-A303

Old Values: carbon output 2mt,
discounted average £44/tonne.

total cost of carbon £87m

NPV £101 BCR 1.08

New values (approx.)

NPV -£400m, BCR 0.7

A428 Black Cat-Caxton Gibbet

Old values: carbon output 3.3m tonnes,
discounted £38 per tonne,

total cost of carbon £127m

NPV £420m, BCR 1.9

New values (approx.)

NPV -£300m, BCR 0.6

10. What next? Many scenarios, but dominated by **TWO Futures**

1. Runaway Climate Change

Progressively more serious effects on climate, weather, sea levels, flooding, heat waves, mass population displacement, production chains, Greater incidence of 'Unpredicted' emergencies affecting Coasts, rivers, flood plains, Water drainage and sewage security, medical services, Food supply and distribution

Reduced standards of living and available income. This will transform economic geography, consequent travel patterns.

This is not a future of traffic growth

2. Successful Limits to Climate Change

- Deep reduction in fossil fuelled road traffic, Halt to policies and infrastructure which embed car dependence, Reinforce the advantages of active travel, and localism, Enabled by non-climate economic advantages of this approach – reduced congestion, better health:

Not necessarily reduce quality of life and effective incomes, but will require, and assist, a redefinition of national income. This will transform economic geography, consequent travel patterns, This is not a future of traffic growth

Where are we now?

Ambitious sensible aspirations for electrification, and big shift from cars to public transport, walking cycling; land use planning, instruments still to be decided, but with collateral benefits for congestion, health, safety and local communities and

‘Biggest road programme ever’ – appraised with no climate change, forecasts from another era, and carbon ‘insignificant’

Agenda and Conclusions

1. Total cost
 - Manageable
2. Fiscal cost transport
 - Solvable
3. Cost of global heating
 - Disastrous
4. Effects on Value for Money
 - Big, not yet allowed for
5. Base-Line?
 - Must change
6. Timing
 - Urgency – 2030 not 2050
7. Road Pricing
 - Sensible
8. Behaviour change
 - Essential
9. Roads carbon costs
 - NOT insignificant
10. Two futures
 - Neither support traffic assumptions