

Transport

In the July 2010 *2050 Pathways Analysis* report we set out choices of trajectories for domestic passenger transport, freight transport, international aviation and international shipping (see Section 2B, page 58 to 75 of the July report¹). In response to the Summer 2010 Call for Evidence, changes were implemented in March 2011 to bus technologies, transport activity and international shipping scenarios (see *2050 Pathways Analysis: Response to Call for Evidence Part 2*², Section 2A.I, page 93 to 99).

Updates to the Calculator

In response to evidence received since March 2011, we have implemented the following further changes to the 2050 Calculator:

- The domestic transport electrification slider has been renamed ‘shift to zero emission transport’. Zero emission transport includes battery electric or hydrogen fuel cell cars and buses, and electrified domestic rail, all of which have zero emissions at the tailpipe. Hybrid or plug in hybrid vehicles have both petrol/diesel engines and electric motors and are therefore not zero emission. Amendments have also been made to the level 4 trajectory to remove unnecessary early scrapping of conventional cars;
- An additional slider ‘Choice of fuel cells or batteries’ has been incorporated into the Calculator to allow the user to choose which zero emission car and van technology (battery electric or hydrogen fuel cell) is prevalent in 2050;
- The previous international aviation and international shipping trajectories have been updated to reflect new evidence.

Levels for the shift to zero emission transport

This slider, originally called ‘Domestic transport electrification’, has been renamed to account for the inclusion of a new slider, entitled ‘Choice of electric or hydrogen car and van technology’. This reflects Government’s technology-neutral approach to the type of zero emission vehicles that are anticipated to come onto the mass market.

Level 4

The previous level 4 domestic transport electrification led to an implausible situation where vehicles were being scrapped early in the calculator in the period leading up to 2050, due to the speed of uptake of zero emission vehicles required to fully decarbonise cars by 2050.

To reduce this effect we have modified the trajectory to decrease the number of vehicles being scrapped unnecessarily early, while keeping the 2050 end point the same. This is illustrated in Table 1 and Figures 1 and 2.

¹ <http://www.decc.gov.uk/assets/decc/What%20we%20do/A%20low%20carbon%20UK/2050/216-2050-pathways-analysis-report.pdf>

² <http://www.decc.gov.uk/assets/decc/Consultations/2050/1344-2050-pathways-analysis-response-pt2.pdf>

Table 1. Amended shift to zero emission transport level 4 trajectory

Previous shift to zero emission transport trajectory

	2007	2010	2015	2020	2025	2030	2035	2040	2045	2050
Internal Combustion Engine	100%	100%	99%	97%	66%	34%	26%	18%	9%	
Plug-in Hybrid Vehicle			1%	1%	23%	45%	38%	32%	16%	
Electric Vehicle			1%	2%	10%	18%	29%	40%	60%	80%
Fuel Cell Vehicle					2%	4%	7%	10%	15%	20%

Updated shift to zero emission transport trajectory

	2007	2010	2015	2020	2025	2030	2035	2040	2045	2050
Internal Combustion Engine	100%	100%	99%	97%	66%	43%	28%	19%	12%	
Plug-in Hybrid Vehicle			1%	1%	23%	36%	37%	28%	17%	
Electric Vehicle			1%	2%	10%	16%	28%	44%	57%	80%
Fuel Cell Vehicle					2%	5%	7%	9%	14%	20%

Figure 1. Previous shift to zero emission transport trajectory³

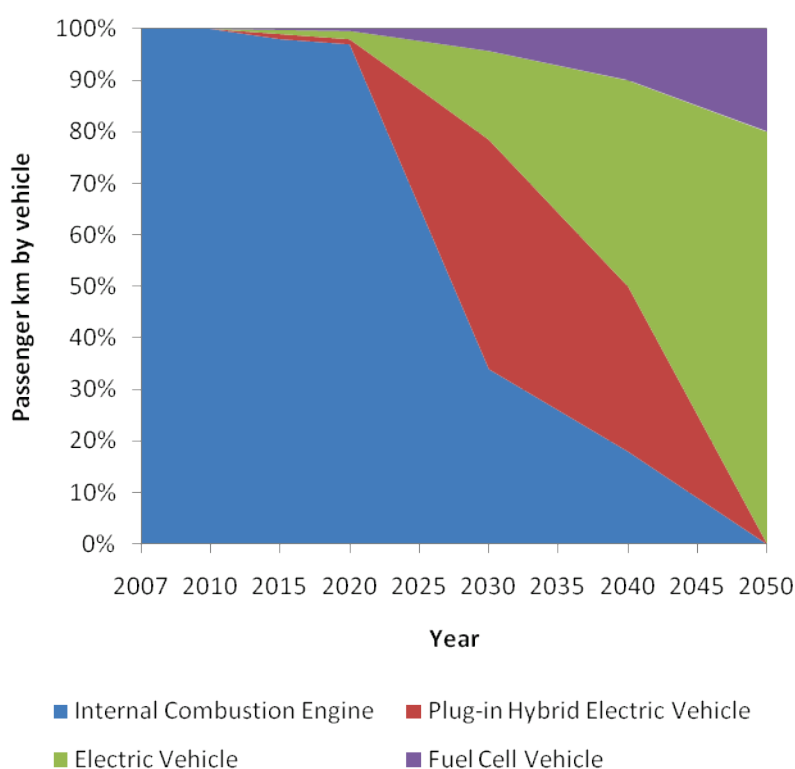
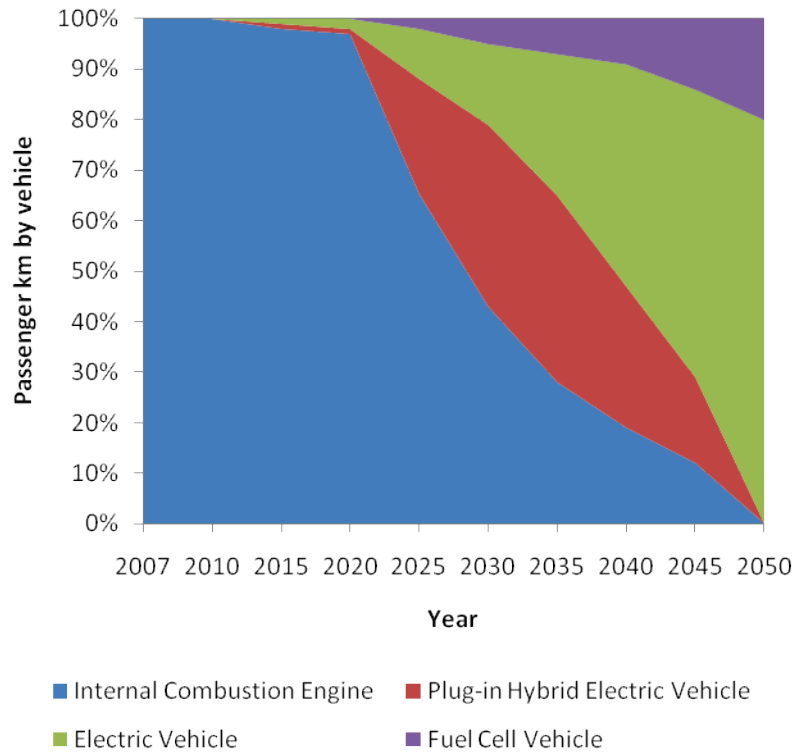


Figure 2. Updated shift to zero emission transport trajectory⁴

³ Figure 1 assumes level 4 for shift to zero emission transport and option B for choice of electric or hydrogen car technology (80% of cars will be powered by electric batteries; 20% of cars will be hydrogen fuel cell vehicles).

⁴ Figure 2 assumes level 4 for shift to zero emission vehicles and option B for choice of electric or hydrogen car technology.



Level 4 shift to zero emission transport has also been updated to remove the predetermined split of electric and hydrogen fuel cell vehicles in 2050 (previously 80% electric; 20% fuel cell). Users of the Calculator are now able to choose for themselves the type of zero emission car and van technology that they expect to see in 2050 by the inclusion of a new slider.

Choice of fuel cells or batteries

Users of the 2050 Calculator could previously choose the proportion of distance travelled by zero emission cars and vans in 2050. However the percentage split between electric and hydrogen fuel cell vehicle technology was predetermined. The addition of the new 'Choice of electric and hydrogen car and van technology' slider allows users to choose for each level of shift to zero emission transport whether fully electric cars and vans or hydrogen fuel cell cars and vans are prevalent in 2050. The new slider does not impact on other technologies included in the shift to zero emission transport scenarios, including buses, trains and domestic aviation.

We have applied the following percentages to the new slider as options A to D to illustrate that a broad range of technologies could be technically feasible by 2050:

Option A

Option A assumes by 2050, 100% of domestic zero emission vehicles will be fully electric and there will be no hydrogen fuel cell vehicles.

Option B

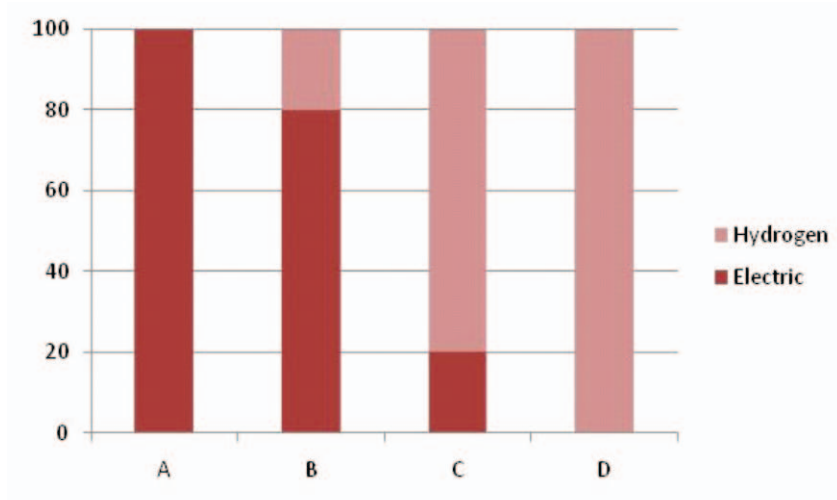
Option B assumes by 2050, 80% of zero emission vehicles will be fully electric, and 20% will be hydrogen fuel cell vehicles.

Option C

Option C assumes by 2050, 20% of zero emission vehicles will be fully electric and 80% will be hydrogen fuel cell vehicles.

Option D

Option D assumes in 2050, all zero emission vehicles will be powered by hydrogen fuel cells.



Scenarios for international aviation and international shipping

Text to follow.