Shift to zero emission transport

In 2013, almost all of Ireland's domestic passenger transport was powered by diesel or petrol. By 2020, revised government targets aim for 50,000 electric vehicles (around 3% of private cars) on the road. 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. However as plug-in hybrids receive most of their energy from the electricity socket, they can produce 45% less CO_2 from their tail pipe compared to conventional internal combustion engine vehicles.

Trajectory 1

Trajectory 1 assumes that by 2020, 1% of cars and 6% of buses are hybrids. Trajectory 1 assumes that by 2050, 20% of passenger kilometres are in plug-in hybrid electric cars, with batteries that can be charged from the mains, and 2.5% are in zero emission cars. The use of hybrid buses reaches 40%; trains are largely unchanged.

Trajectory 2

Trajectory 2 assumes that 2% of private cars are zero emission and that 1% are hybrids in 2020. By 2050 about 35% of passenger-km are travelled in conventional petrol or diesel engine cars, 54% of cars are plug-in hybrids and 11% are zero emission. Some 60% of buses are hybrids of electric motors and diesel engines. The electrification of passenger rail travel increases from 20% to 35%.

Trajectory 3

Trajectory 3 assumes that by 2050, 20% of passenger-km journeys are in conventional internal combustion engine cars, with 32% in plug-in hybrid vehicles and 48% in zero emission vehicles. About 20% of bus travel is in fully electric or fuel cell electric buses, with 60% of buses powered by hybrid diesel-electric engines. 65% of passenger rail travel is electrified.

Trajectory 4

Trajectory 4 assumes that by 2050 all car travel is either powered by an electric motor or by hydrogen fuel cells. Some 85% of passenger trains are electrified and 50% of bus travel is fully electrified (25% from batteries and 25% via fuel cells), with the remainder being diesel-electric hybrids.

Interaction with other choices

Users can specify the type of zero emission car technology to come onto the market by selecting any one of the choices A to D of the 'choice of fuel cells or batteries slider.
The 'domestic transport behaviour' lever influences how much people travel and by what mode.

Where vehicles are not electrified (and even in Trajectory 4, buses are expected to be at least partially powered by liquid fuel) they can run on biofuel rather than diesel or petrol. This option can be selected in the 2050 Calculator by choosing bioenergy imports, or choosing to dedicate land to biomass and to turn that biomass into liquid biofuel.

% of car travel by:	2013	2050 T.1	2050 T.3	2050 T.2	2050 T.1
Conventional car	~100	77.5	35	20	0
Plug-in hybrid	0	20	54	32	0
Zero emission car	0	2.5	11	48	100

Figure 2: Energy requirement in TWh/y assuming Trajectory 1 on 'domestic transport behaviour' and Trajectory B on 'Choice of electric or hydrogen car technology'