Assumptions

Baseline - 120km/h

Private car fleet	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
CO_2 emissions (tonnes)	1,178,591	1,251,205	1,300,465	1,331,490	1,363,852	1,380,820	1,397,787	1,414,754	1,431,722	1,448,689	1,426,038	1,403,387	1,380,735	1,358,084	1,335,433	1,347,319	1,341,755	1,336,190	1,330,626	1,394,862
Total petrol CO_2 emissions (tonnes)	472,850	484,016	503,340	514,972	533,635	543,747	553,858	563,970	574,081	584,193	572,544	560,895	549,245	537,596	525,947	531,748	520,099	508,450	496,800	554,951
Total diesel CO_2 emissions (tonnes)	705,741	767,189	797,125	816,517	830,217	837,073	843,929	850,785	857,640	864,496	853,494	842,492	831,490	820,488	809,486	815,571	821,656	827,741	833,826	839,911
PM emissions (tonnes)	261	283	294	302	307	310	312	315	318	320	316	312	308	304	299	302	303	305	307	311
Total petrol PM emissions (tonnes)	12	12	13	13	14	14	14	14	15	15	15	14	14	14	13	14	13	13	13	14
Total diesel PM emissions (tonnes)	249	271	282	288	293	296	298	300	303	305	301	298	294	290	286	288	290	292	294	297
NOx emissions (tonnes)	3,579	3,857	4,008	4,105	4,185	4,226	4,267	4,308	4,349	4,389	4,329	4,268	4,208	4,147	4,087	4,120	4,133	4,147	4,160	4,251
Total petrol NOx emissions (tonnes)	522	534	555	568	589	600	611	622	633	644	631	619	606	593	580	586	574	561	548	612
Total diesel NOx emissions (tonnes)	3,057	3,324	3,453	3,537	3,597	3,626	3,656	3,686	3,715	3,745	3,697	3,650	3,602	3,554	3,507	3,533	3,559	3,586	3,612	3,639

Car fuel consumption (litres)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Petrol	205,586,744	210,441,536	218,843,480	223,901,063	232,015,192	236,411,540	240,807,887	245,204,235	249,600,582	253,996,930	248,932,075	243,867,221	238,802,366	233,737,512	228,672,657	231,194,753	226,129,898	221,065,044	216,000,189	241,283,135
Diesel	268,342,650	291,707,026	303,089,278	310,462,923	315,671,991	318,278,750	320,885,509	323,492,268	326,099,027	328,705,786	324,522,491	320,339,196	316,155,901	311,972,606	307,789,311	310,102,998	312,416,685	314,730,372	317,044,059	319,357,746

LGV fleet	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
CO_2 emissions (tonnes)	348,151	395,055	430,398	448,991	482,585	493,072	503,558	514,045	524,532	535,019	535,739	536,458	537,178	537,898	538,618	537,743	536,868	535,993	535,119	534,244
PM emissions (tonnes)	61	69	76	79	85	87	88	90	92	94	94	94	94	95	95	95	94	94	94	94
NOx emissions (tonnes)	970	1,101	1,200	1,251	1,345	1,374	1,403	1,433	1,462	1,491	1,493	1,495	1,497	1,499	1,501	1,499	1,496	1,494	1,491	1,489

LGV fuel consumption (litres)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Diesel	132,376,855	150,211,142	163,649,332	170,719,175	183,492,396	187,479,750	191,467,103	195,454,456	199,441,809	203,429,162	203,702,882	203,976,602	204,250,322	204,524,043	204,797,763	204,465,111	204,132,460	203,799,809	203,467,157	203,134,506

HGV fleet	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
CO_2 emissions (tonnes)	306,589	347,894	379,017	395,391	424,974	434,209	443,444	452,678	461,913	471,148	471,782	472,416	473,050	473,684	474,318	473,547	472,777	472,007	471,236	470,466
PM emissions (tonnes)	48	54	59	61	66	67	69	70	72	73	73	73	73	73	74	73	73	73	73	73
NOx emissions (tonnes)	2,427	2,754	3,000	3,130	3,364	3,437	3,510	3,583	3,656	3,729	3,734	3,739	3,744	3,749	3,754	3,748	3,742	3,736	3,730	3,724

HGV fuel consumption (litres)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Diesel	116,573,688	132,278,916	144,112,853	150,338,697	161,587,050	165,098,392	168,609,734	172,121,077	175,632,419	179,143,761	179,384,805	179,625,848	179,866,892	180,107,935	180,348,979	180,056,039	179,763,100	179,470,160	179,177,221	178,884,281

Scenario - 110km/h

Private car fleet	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
CO_2 emissions (tonnes)	1,106,711	1,174,508	1,220,754	1,249,870	1,280,381	1,296,385	1,312,390	1,328,394	1,344,398	1,360,402	1,339,077	1,317,751	1,296,426	1,275,101	1,253,776	1,264,959	1,259,530	1,254,102	1,248,673	1,309,692
Total petrol CO_2 emissions (tonnes)	450,141	460,771	479,167	490,241	508,007	517,633	527,259	536,885	546,511	556,137	545,048	533,958	522,868	511,778	500,689	506,211	495,121	484,032	472,942	528,300
Total diesel CO_2 emissions (tonnes)	656,570	713,737	741,587	759,629	772,374	778,752	785,130	791,508	797,886	804,264	794,029	783,793	773,558	763,322	753,087	758,748	764,409	770,070	775,731	781,392
PM emissions (tonnes)	232	251	261	267	272	274	277	279	281	284	280	276	273	269	265	267	269	271	272	275
Total petrol PM emissions (tonnes)	10	11	11	11	12	12	12	12	12	13	12	12	12	12	11	12	11	11	11	12
Total diesel PM emissions (tonnes)	221	241	250	256	260	262	265	267	269	271	268	264	261	257	254	256	258	260	261	263
NOx emissions (tonnes)	3,199	3,447	3,582	3,668	3,740	3,777	3,813	3,850	3,887	3,924	3,869	3,815	3,761	3,707	3,652	3,682	3,693	3,705	3,716	3,799
Total petrol NOx emissions (tonnes)	485	497	517	528	548	558	568	579	589	599	588	576	564	552	540	546	534	522	510	569
Total diesel NOx emissions (tonnes)	2,714	2,950	3,065	3,140	3,192	3,219	3,245	3,271	3,298	3,324	3,282	3,240	3,197	3,155	3,113	3,136	3,159	3,183	3,206	3,230

Fuel consumption (litres)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Petrol	195,713,546	200,335,189	208,333,635	213,148,330	220,872,782	225,057,997	229,243,212	233,428,428	237,613,643	241,798,858	236,977,241	232,155,623	227,334,006	222,512,388	217,690,771	220,091,744	215,270,126	210,448,509	205,626,891	229,695,636
Diesel	249,646,514	271,383,033	281,972,253	288,832,157	293,678,296	296,103,435	298,528,574	300,953,714	303,378,853	305,803,992	301,912,158	298,020,324	294,128,490	290,236,656	286,344,822	288,497,309	290,649,795	292,802,282	294,954,768	297,107,255
Total	445,360,060	471,718,222	490,305,888	501,980,487	514,551,078	521,161,432	527,771,787	534,382,141	540,992,496	547,602,850	538,889,399	530,175,947	521,462,496	512,749,044	504,035,593	508,589,052	505,919,921	503,250,790	500,581,659	526,802,891

LGV fleet	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
CO_2 emissions (tonnes)	300,240	340,689	371,168	387,203	416,174	425,217	434,261	443,304	452,348	461,391	462,012	462,633	463,254	463,875	464,496	463,741	462,987	462,232	461,478	460,723
PM emissions (tonnes)	55	63	68	71	77	78	80	82	83	85	85	85	85	86	86	86	85	85	85	85
NOx emissions (tonnes)	834	946	1,031	1,075	1,156	1,181	1,206	1,231	1,256	1,281	1,283	1,285	1,286	1,288	1,290	1,288	1,286	1,283	1,281	1,279

LGV fuel consumption (litres)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Diesel	114,159,666	129,539,668	141,128,546	147,225,464	158,240,885	161,679,514	165,118,143	168,556,772	171,995,401	175,434,030	175,670,082	175,906,134	176,142,186	176,378,238	176,614,290	176,327,416	176,040,543	175,753,670	175,466,797	175,179,923

HGV fleet	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
CO_2 emissions (tonnes)	281,260	319,153	347,705	362,726	389,865	398,337	406,809	415,281	423,753	432,225	432,806	433,388	433,970	434,551	435,133	434,426	433,719	433,012	432,306	431,599
PM emissions (tonnes)	45	51	55	58	62	63	65	66	67	69	69	69	69	69	69	69	69	69	69	69
NOx emissions (tonnes)	2,316	2,628	2,863	2,987	3,210	3,280	3,350	3,419	3,489	3,559	3,564	3,569	3,573	3,578	3,583	3,577	3,571	3,565	3,560	3,554

HGV fuel consumption (litres)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Diesel	106,943,119	121,350,881	132,207,174	137,918,679	148,237,766	151,459,023	154,680,281	157,901,539	161,122,797	164,344,054	164,565,184	164,786,314	165,007,445	165,228,575	165,449,705	165,180,966	164,912,227	164,643,488	164,374,750	164,106,011

Costs

	NORA levy (€/litre fuel)				Carbon Tax (€/tonne CO2)				Excise duty petrol/ethanol (€/litre)				Excise duty diesel/biodiesel (€/litre)				Better Energy Levy (€/litre)				VAT (%)			
Fuel Price Breakdown	2017	2020	2025	2030	2017	2020	2025	2030	2017	2020	2025	2030	2017	2020	2025	2030	2017	2020	2025	2030	2017	2020	2025	2030
Baseline	€0.02	€0.02	€0.02	€0.02	€20	€20	€20	€20	€0.54	€0.54	€0.54	€0.54	€0.43	€0.43	€0.43	€0.43	€0.001	€0.001	€0.001	€0.001	23%	23%	23%	23%
Scenario	€0.02	€0.02	€0.02	€0.02	€20	€20	€20	€20	€0.54	€0.54	€0.54	€0.54	€0.43	€0.43	€0.43	€0.43	€0.001	€0.001	€0.001	€0.001	23%	23%	23%	23%

Carbon tax	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Carbon tax (€/tonneCO2) (excl. VAT)	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Petrol carbon tax (€/litre) (excl. VAT)	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.052	0.059	0.066	0.073	0.079
Diesel carbon tax (€/litre) (excl. VAT)	0.053	0.053	0.053	0.053	0.053	0.053	**0.053**	0.053	0.053	0.053	0.061	0.069	0.077	0.085	0.093

Emissions savings

Private cars (kilotonnes)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
CO_2	48.9	52.2	54.2	55.5	56.8	57.4	58.1	58.7	59.4	60.0	59.1	58.2	57.3	56.4	55.5	56.0	55.9	55.8	55.7	57.9
Petrol	15.4	15.8	16.4	16.8	17.4	17.8	18.1	18.4	18.7	19.1	18.7	18.3	17.9	17.6	17.2	17.4	17.0	16.6	16.2	18.1
Diesel	33.4	36.3	37.8	38.7	39.3	39.7	40.0	40.3	40.6	41.0	40.4	39.9	39.4	38.9	38.4	38.6	38.9	39.2	39.5	39.8
PM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NOx	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

LGVs (kilotonnes)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
CO_2	32.6	37.0	40.3	42.0	45.2	46.1	47.1	48.1	49.1	50.1	50.1	50.2	50.3	50.3	50.4	50.3	50.2	50.2	50.1	50.0
PM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NOx	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

HGVs (kilotonnes)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
CO_2	21.5	24.4	26.6	27.8	29.8	30.5	31.1	31.8	32.4	33.1	33.1	33.2	33.2	33.3	33.3	33.3	33.2	33.1	33.1	33.0
PM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NOx	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Overall emissions savings (kilotonnes)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Petrol	15	16	16	17	17	18	18	18	19	19	19	18	18	18	17	17	17	17	16	18
Diesel	88	98	105	108	114	116	118	120	122	124	124	123	123	122	122	122	122	123	123	123
Total	103	114	121	125	132	134	136	139	141	143	142	142	141	140	139	140	139	139	139	141

Car fleet

Parameter	Value	Units	Notes
Total car vehicle kilometres in 2014 (million)	34,609,000,000	vkm	CSO - http://www.cso.ie/en/releasesandpublications/ep/p-tranom/to2015/rt/rt/
Per cent of vehicle kilometres on motorway	20%		TII Data on Motorway Travel in Ireland
Total motorway vehicle kilometres (million)	6,921,800,000		
Total petrol motorway vehicle kilometres (million)	3,246,356,641		Assume fuel demand as a proxy for vkm
Total diesel motorway vehicle kilometres (million)	3,675,443,359		Assume fuel demand as a proxy for vkm
Per cent of cars travelling over 110 km/h	68%		RSA Free Speed Survey 2014
Per cent of cars that go at or below 110 km/h	32%		RSA Free Speed Survey 2014
Per cent of cars travelling between 110km/h and 120km/h	35%		RSA Free Speed Survey 2013
Estimated CO_2 emissions at 120km/h	179.00	g/km	CAF speed curves
Estimated CO_2 emissions at 110km/h	164.00	g/km	CAF speed curves
Estimated PM emissions at 120km/h	0.0146	g/km	CAF speed curves
Estimated PM emissions at 110km/h	0.0128	g/km	CAF speed curves
Estimated NOx emissions at 120km/h	0.2951	g/km	CAF speed curves
Estimated NOx emissions at 110km/h	0.2689	g/km	CAF speed curves
Average free speed on motorway	110	km/h	RSA Free Speed Survey 2013
Petrol as a per cent of car fuel demand	47%		Based on SEAI Energy Forecasts
Diesel as a per cent of car fuel demand	53%		Based on SEAI Energy Forecasts
Travelling time on motorway at 120km/h	57,681,667	hours	
Travelling time on motorway at 110km/h	62,925,455	hours	
Additional travelling time	5,243,788		
Annual fuel efficiency improvement	0.0%		

Goods fleet

LGVs	Value	Units	Notes
Total goods vehicle kilometres (million)	6,999,000,000	vkm	CSO - http://www.cso.ie/px/pxeirestat/Statire/SelectVarVal/Define.asp?maintable=THA10&PLanguage=0
Total LGVs vehicle kilometres (million)	4,899,300,000	vkm	% split taken from COPERT EPA model
Per cent on motorway	20%		
Total LGV motorway vehicle kilometres (million)	979,860,000		
Per cent of LGVs travelling over 110 km/h	68%		RSA Free Speed Survey 2014 - make same assumption as for cars
Per cent of LGVs that go at or below 110 km/h	32%		RSA Free Speed Survey 2014 - make same assumption as for cars
Per cent of LGVs travelling between 110km/h and 120km/h	35%		RSA Free Speed Survey 2013 - make same assumption as for cars
Estimated CO_2 emissions at 120km/h	318.64	g/km	CAF speed curves
Estimated CO_2 emissions at 110km/h	274.79	g/km	CAF speed curves
Estimated PM emissions at 120km/h	0.0560	g/km	CAF speed curves
Estimated PM emissions at 110km/h	0.0507	g/km	CAF speed curves
Estimated NOx emissions at 120km/h	0.8881	g/km	CAF speed curves
Estimated NOx emissions at 110km/h	0.7630	g/km	CAF speed curves
Average free speed on motorway	111	km/h	RSA Free Speed Survey 2013
Travelling time on motorway at 120km/h	8,165,500	hours	
Travelling time on motorway at 110km/h	8,907,818	hours	
Additional travelling time	742,318		
Percentage of overall goods vehicle kms	70%		
Annual fuel efficiency improvement	0.0%		

HGVs	Value	Units	Notes	
Total goods vehicle kilometres (million)	6,999,000,000	vkm	CSO - http://www.cso.ie/px/pxeirestat/Statire/SelectVarVal/Define.asp?maintable=THA10&PLanguage=0	
Total HGVs vehicle kilometres (million)	2,099,700,000		% split taken from COPERT EPA model	
Per cent on motorway	30%			
Total HGV motorway vehicle kilometres (million)	629,910,000			
Per cent of HGVs travelling over 80 km/h	85%		RSA Free Speed Survey 2014	
Per cent of HGVs that go at or below 80 km/h	15%		RSA Free Speed Survey 2014	
Per cent of HGVs travelling between 80km/h and 90km/h	17%		RSA Free Speed Survey 2013	
Estimated CO_2 emissions at 90km/h	436.49	g/km	CAF speed curves	436.49
Estimated CO_2 emissions at 80km/h	400.43	g/km	CAF speed curves	
Estimated PM emissions at 90km/h	0.0677		CAF speed curves	
Estimated PM emissions at 80km/h	0.0637		CAF speed curves	
Estimated NOx emissions at 90km/h	3.4549		CAF speed curves	
Estimated NOx emissions at 80km/h	3.2972		CAF speed curves	
Average free speed on motorway	84	km/h	RSA Free Speed Survey 2013	
Travelling time on motorway at 90km/h	6,999,000	hours		
Travelling time on motorway at 80km/h	7,873,875	hours		
Additional travelling time	874,875			
Percentage of overall goods vehicle kms	30%			
Annual fuel efficiency improvement	0.0%			

Forecast Motorway Vehicle kms	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Petrol car	3,246,356,641	2,998,995,750	2,631,327,270	2,693,464,284	2,801,001,693	2,865,734,249	2,969,587,877	3,025,857,212	3,082,126,546	3,138,395,881	3,194,665,215	3,250,934,550	3,186,108,921	3,121,283,293	3,056,457,664	2,991,632,036	2,926,806,408	2,959,086,985	2,894,261,356	2,829,435,728	2,764,610,100	3,088,209,293
Diesel car	3,675,443,359	3,932,753,244	4,231,569,548	4,600,008,871	4,779,498,744	4,895,775,803	4,977,919,039	5,019,025,744	5,060,132,448	5,101,239,153	5,142,345,858	5,183,452,563	5,117,485,023	5,051,517,484	4,985,549,945	4,919,582,405	4,853,614,866	4,890,100,039	4,926,585,211	4,963,070,384	4,999,555,557	5,036,040,730
Total car	6,921,800,000	6,931,748,994	6,862,896,817	7,293,473,156	7,580,500,437	7,761,510,052	7,947,506,916	8,044,882,955	8,142,258,994	8,239,635,034	8,337,011,073	8,434,387,112	8,303,593,944	8,172,800,777	8,042,007,609	7,911,214,441	7,780,421,274	7,849,187,023	7,820,846,568	7,792,506,112	7,764,165,657	8,124,250,023
Diesel LGV	979,860,000	985,712,207	1,092,615,891	1,239,817,046	1,350,733,562	1,409,086,835	1,514,514,822	1,547,425,751	1,580,336,680	1,613,247,610	1,646,158,539	1,679,069,468	1,681,328,708	1,683,587,948	1,685,847,188	1,688,106,428	1,690,365,668	1,687,620,020	1,684,874,372	1,682,128,723	1,679,383,075	1,676,637,427
Diesel HGV	629,910,000	633,672,133	702,395,930	797,025,244	868,328,719	905,841,536	973,616,671	994,773,697	1,015,930,723	1,037,087,749	1,058,244,775	1,079,401,801	1,080,854,170	1,082,306,538	1,083,758,907	1,085,211,275	1,086,663,644	1,084,898,584	1,083,133,525	1,081,368,465	1,079,603,405	1,077,838,346

Notes: Assume fuel demand forecasts as a proxy for vehicle kilometres

Value of Time (hrs)	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
120km/h	57,681,667	57,764,575	57,190,807	60,778,943	63,170,837	64,679,250	66,229,224	67,040,691	67,852,158	68,663,625	69,475,092	70,286,559	69,196,616	68,106,673	67,016,730	65,926,787	64,836,844	65,409,892	65,173,721	64,937,551	64,701,380	67,702,084
110km/h	62,925,455	63,015,900	62,389,971	66,304,301	68,913,640	70,559,182	72,250,063	73,135,300	74,020,536	74,905,773	75,791,010	76,676,246	75,487,218	74,298,189	73,109,160	71,920,131	70,731,102	71,356,246	71,098,605	70,840,965	70,583,324	73,856,818
Additional travelling time (Cars)	5,243,788	5,251,325	5,199,164	5,525,358	5,742,803	5,879,932	6,020,839	6,094,608	6,168,378	6,242,148	6,315,917	6,389,687	6,290,601	6,191,516	6,092,430	5,993,344	5,894,259	5,946,354	5,924,884	5,903,414	5,881,944	6,154,735
120km/h	8,165,500	8,214,268	9,105,132	10,331,809	11,256,113	11,742,390	12,620,957	12,895,215	13,169,472	13,443,730	13,717,988	13,992,246	14,011,073	14,029,900	14,048,727	14,067,554	14,086,381	14,063,500	14,040,620	14,017,739	13,994,859	13,971,979
110km/h	8,907,818	8,961,020	9,932,872	11,271,064	12,279,396	12,809,880	13,768,317	14,067,507	14,366,697	14,665,887	14,965,078	15,264,268	15,284,806	15,305,345	15,325,884	15,346,422	15,366,961	15,342,000	15,317,040	15,292,079	15,267,119	15,242,158
Additional travelling time (LGVs)	742,318	746,752	827,739	939,255	1,023,283	1,067,490	1,147,360	1,172,292	1,197,225	1,222,157	1,247,090	1,272,022	1,273,734	1,275,445	1,277,157	1,278,869	1,280,580	1,278,500	1,276,420	1,274,340	1,272,260	1,270,180
90km/h	6,999,000	7,040,801	7,804,399	8,855,836	9,648,097	10,064,906	10,817,963	11,053,041	11,288,119	11,523,197	11,758,275	11,993,353	12,009,491	12,025,628	12,041,766	12,057,903	12,074,040	12,054,429	12,034,817	12,015,205	11,995,593	11,975,982
80km/h	7,873,875	7,920,902	8,779,949	9,962,816	10,854,109	11,323,019	12,170,208	12,434,671	12,699,134	12,963,597	13,228,060	13,492,523	13,510,677	13,528,832	13,546,986	13,565,141	13,583,296	13,561,232	13,539,169	13,517,106	13,495,043	13,472,979
Additional travelling time (HGVs)	874,875	880,100	975,550	1,106,980	1,206,012	1,258,113	1,352,245	1,381,630	1,411,015	1,440,400	1,469,784	1,499,169	1,501,186	1,503,204	1,505,221	1,507,238	1,509,255	1,506,804	1,504,352	1,501,901	1,499,449	1,496,998

CO_2 Speed Curves (g/km)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Petrol cars - estimated CO_2 emissions at 120km/h	179.70	179.70	179.70	179.70	179.70	179.70	179.70	179.70	179.70	179.70	179.70	179.70	179.70	179.70	179.70	179.70	179.70	179.70	179.70	179.70
Petrol cars - estimated CO_2 emissions at 110km/h	171.07	171.07	171.07	171.07	171.07	171.07	171.07	171.07	171.07	171.07	171.07	171.07	171.07	171.07	171.07	171.07	171.07	171.07	171.07	171.07
Diesel cars - estimated CO_2 emissions at 120km/h	166.78	166.78	166.78	166.78	166.78	166.78	166.78	166.78	166.78	166.78	166.78	166.78	166.78	166.78	166.78	166.78	166.78	166.78	166.78	166.78
Diesel cars - estimated CO_2 emissions at 110km/h	155.16	155.16	155.16	155.16	155.16	155.16	155.16	155.16	155.16	155.16	155.16	155.16	155.16	155.16	155.16	155.16	155.16	155.16	155.16	155.16
LGVs - estimated CO_2 emissions at 120km/h	318.64	318.64	318.64	318.64	318.64	318.64	318.64	318.64	318.64	318.64	318.64	318.64	318.64	318.64	318.64	318.64	318.64	318.64	318.64	318.64
LGVs - estimated CO_2 emissions at 110km/h	274.79	274.79	274.79	274.79	274.79	274.79	274.79	274.79	274.79	274.79	274.79	274.79	274.79	274.79	274.79	274.79	274.79	274.79	274.79	274.79
HGVs - estimated CO_2 emissions at 90km/h	436.49	436.49	436.49	436.49	436.49	436.49	436.49	436.49	436.49	436.49	436.49	436.49	436.49	436.49	436.49	436.49	436.49	436.49	436.49	436.49
HGVs - estimated CO_2 emissions at 80km/h	400.43	400.43	400.43	400.43	400.43	400.43	400.43	400.43	400.43	400.43	400.43	400.43	400.43	400.43	400.43	400.43	400.43	400.43	400.43	400.43

PM Speed Curves (g/km)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Petrol cars - estimated PM emissions at 120km/h	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046
Petrol cars - estimated PM emissions at 110km/h	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039
Diesel cars - estimated PM emissions at 120km/h	0.0589	0.0589	0.0589	0.0589	0.0589	0.0589	0.0589	0.0589	0.0589	0.0589	0.0589	0.0589	0.0589	0.0589	0.0589	0.0589	0.0589	0.0589	0.0589	0.0589
Diesel cars - estimated PM emissions at 110km/h	0.0523	0.0523	0.0523	0.0523	0.0523	0.0523	0.0523	0.0523	0.0523	0.0523	0.0523	0.0523	0.0523	0.0523	0.0523	0.0523	0.0523	0.0523	0.0523	0.0523
LGVs - estimated PM emissions at 120km/h	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560
LGVs - estimated PM emissions at 110km/h	0.0507	0.0507	0.0507	0.0507	0.0507	0.0507	0.0507	0.0507	0.0507	0.0507	0.0507	0.0507	0.0507	0.0507	0.0507	0.0507	0.0507	0.0507	0.0507	0.0507
HGVs - estimated PM emissions at 90km/h	0.0677	0.0677	0.0677	0.0677	0.0677	0.0677	0.0677	0.0677	0.0677	0.0677	0.0677	0.0677	0.0677	0.0677	0.0677	0.0677	0.0677	0.0677	0.0677	0.0677
HGVs - estimated PM emissions at 80km/h	0.0637	0.0637	0.0637	0.0637	0.0637	0.0637	0.0637	0.0637	0.0637	0.0637	0.0637	0.0637	0.0637	0.0637	0.0637	0.0637	0.0637	0.0637	0.0637	0.0637

NOx Speed Curves (g/km)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Petrol cars - estimated NOx emissions at 120km/h	0.1982	0.1982	0.1982	0.1982	0.1982	0.1982	0.1982	0.1982	0.1982	0.1982	0.1982	0.1982	0.1982	0.1982	0.1982	0.1982	0.1982	0.1982	0.1982	0.1982
Petrol cars - estimated NOx emissions at 110km/h	0.1844	0.1844	0.1844	0.1844	0.1844	0.1844	0.1844	0.1844	0.1844	0.1844	0.1844	0.1844	0.1844	0.1844	0.1844	0.1844	0.1844	0.1844	0.1844	0.1844
Diesel cars - estimated NOx emissions at 120km/h	0.7225	0.7225	0.7225	0.7225	0.7225	0.7225	0.7225	0.7225	0.7225	0.7225	0.7225	0.7225	0.7225	0.7225	0.7225	0.7225	0.7225	0.7225	0.7225	0.7225
Diesel cars - estimated NOx emissions at 110km/h	0.6413	0.6413	0.6413	0.6413	0.6413	0.6413	0.6413	0.6413	0.6413	0.6413	0.6413	0.6413	0.6413	0.6413	0.6413	0.6413	0.6413	0.6413	0.6413	0.6413
LGVs - estimated NOx emissions at 120km/h	0.8881	0.8881	0.8881	0.8881	0.8881	0.8881	0.8881	0.8881	0.8881	0.8881	0.8881	0.8881	0.8881	0.8881	0.8881	0.8881	0.8881	0.8881	0.8881	0.8881
LGVs - estimated NOx emissions at 110km/h	0.7630	0.7630	0.7630	0.7630	0.7630	0.7630	0.7630	0.7630	0.7630	0.7630	0.7630	0.7630	0.7630	0.7630	0.7630	0.7630	0.7630	0.7630	0.7630	0.7630
HGVs - estimated NOx emissions at 90km/h	3.4549	3.4549	3.4549	3.4549	3.4549	3.4549	3.4549	3.4549	3.4549	3.4549	3.4549	3.4549	3.4549	3.4549	3.4549	3.4549	3.4549	3.4549	3.4549	3.4549
HGVs - estimated NOx emissions at 80km/h	3.2972	3.2972	3.2972	3.2972	3.2972	3.2972	3.2972	3.2972	3.2972	3.2972	3.2972	3.2972	3.2972	3.2972	3.2972	3.2972	3.2972	3.2972	3.2972	3.2972

Average Biofuel Blend

Average biofuel blend (% by energy)	2016	2020	2030
Average ethanol blend	2.8%	3.2%	2.7%
Average biodiesel blend	3.7%	4.4%	4.5%

Average biofuel blend (% by energy)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Petrol vehicle average biofuel blend	2.8%	2.9%	3.0%	3.1%	3.2%	3.2%	3.1%	3.1%	3.0%	3.0%	2.9%	2.9%	2.8%	2.8%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%
Diesel vehicle average biofuel blend	3.7%	3.9%	4.1%	4.3%	4.4%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%

Notes: Assume blends are the same in both baseline and scenario