

Distribution Future Energy Scenarios 2022

Local Authority:
Redditch

What are Distribution Future Energy Scenarios?

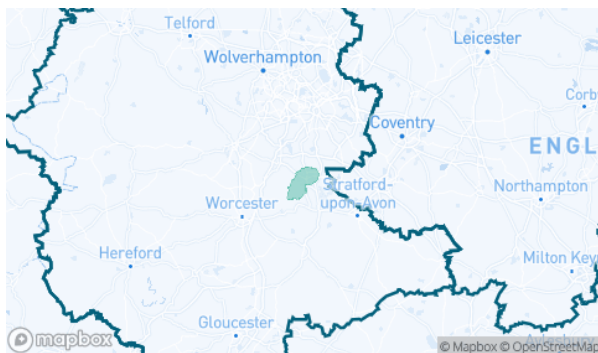
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

The scenarios use a scenario framework consistent with all electricity distribution network operators and the National Grid ESO Future Energy Scenarios. These aim to account for differing uptakes of Electric Vehicles, Heat Pumps, new domestic and I&C developments and distributed generation connections, that NGED use to assess the strategic development of our network.

A summary of the methodology and detailed reports are available on our website. DFES scenario projections are available on the interactive DFES map on the website [here](#).

Geographic Area Covered

This report covers the area of Redditch covered by the NGED licence areas.



Scenario Summary

This DFES scenario framework includes three scenarios that are compliant with UK government targets of Net Zero greenhouse gas emissions by 2050. A summary of each scenario is below:

Falling Short (FS) assumes non-compliance with the net zero emissions target. Low levels of decarbonisation and societal change.

System Transformation (ST) has high level of decarbonisation with lower societal change. Larger, more centralised solutions are developed. This scenario has the highest levels of hydrogen deployment.

Consumer Transformation (CT) has high levels of decarbonisation and societal change. Consumers adopt new technologies rapidly, and more decentralised solutions are developed. This scenario has significant electrification of domestic heat.

Leading the Way (LW) has very high levels of decarbonisation and societal change. Consumers adopt new technologies rapidly, and a mix of solutions are developed. This scenario aims for the “fastest credible” decarbonisation pathway.



Scenario Projections: at a glance

The DFES scenario projections at a Local Authority level include all customers connected to the distribution network within the area of the Local Authority at all voltage levels. Customers connected to the transmission network are not included in this analysis. The table below shows a breakdown of the total for Redditch for two specific years in the DFES analysis.

NGED also created a 5th 'Best View' forecast for the purposes of regulatory reporting and strategic network planning. This is a hybrid forecast built on local stakeholder engagement and historic performance, which reflects local authority ambition for the technologies where its influence is greatest. The Best View informs the likely amount of investment on the network across a licence area; however, changes in regional growth projections that affect investment requirements are supported through the uncertainty mechanism funding process.

Technology	Units	Baseline Total	2030				2050			
			FS	ST	CT	LW	FS	ST	CT	LW
Air conditioning	Domestic air conditioning units	0	570	338	338	0	2317 3	1150 4	1150 4	0
Domestic	New dwellings	0	1695	1883	1883	2264	3944	3918	3918	3892
Electric vehicles	Electric vehicles	971	7892	9886	1833 2	1825 0	5810 8	5248 1	5312 8	4314 8
EV Charge Point	EV charge points	461	3475	5125	9764	1070 0	3085 1	3006 5	3144 3	3187 2
Heat pumps	Heat pump installations	117	1695	1384	5427	9053	1870 6	2151 2	3647 7	3095 6
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2
Non domestic	Floorspace (metres squared) of new I&C developments	0	2906 0	3411 6	3411 6	3869 5	4874 3	4874 3	4874 3	4874 3
Other Distributed Generation	MW (installed capacity)	27.0	34.1	0.3	0.7	0.8	34.1	27.3	0.9	41.6
Resistive electric heating	Resistive electric heating units	3480	2921	2808	2978	2863	2011	886	1998	2053
Solar Generation	MW (installed capacity)	5.0	7.4	11.3	17.5	17.4	20.1	38.7	64.5	65.1
Storage	MW (installed capacity)	0.0	0.3	0.8	1.6	2.4	2.9	7.3	16.5	20.1
Wind	MW (installed capacity)	0.0	0.0	0.0	0.1	0.0	0.1	0.3	0.8	0.6

What does this mean for the local distribution network?

As the DFES scenario projections do not imply any electrical behaviour to the base units, electrical profiles are assigned to each technology type for different yearly snapshots. The profiled demand and generation outputs can be overlaid onto a network model and used to identify where there may be future network constraints on the Extra High Voltage (EHV) networks. The customer behaviour assumptions are summarised in the DFES: Customer Behaviour Report, and the detailed network review forms a key input to the NGED investment planning process, which includes the Network Development Plan and Distribution Network Options Assessment.

Incorporating your feedback

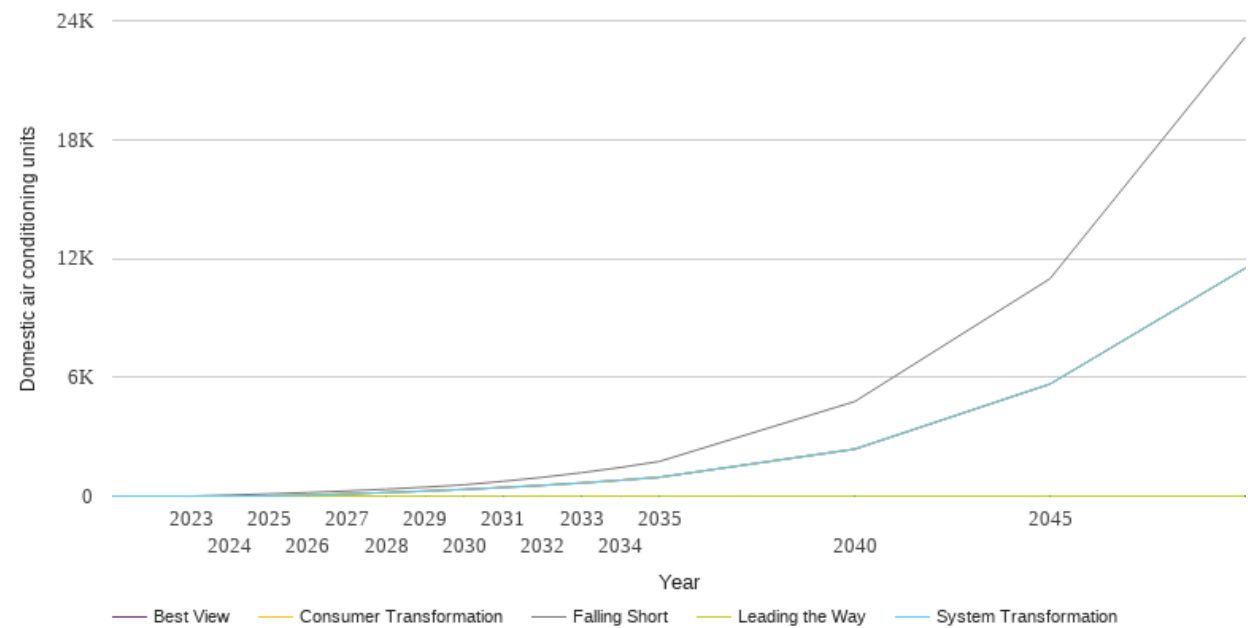
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios analysis.

If you have any comments or queries regarding these reports, please contact nged.energyplanning@nationalgrid.co.uk.

Technology Summary: Air conditioning

The table and graph below show the scenario projections for each of the DFES scenarios.

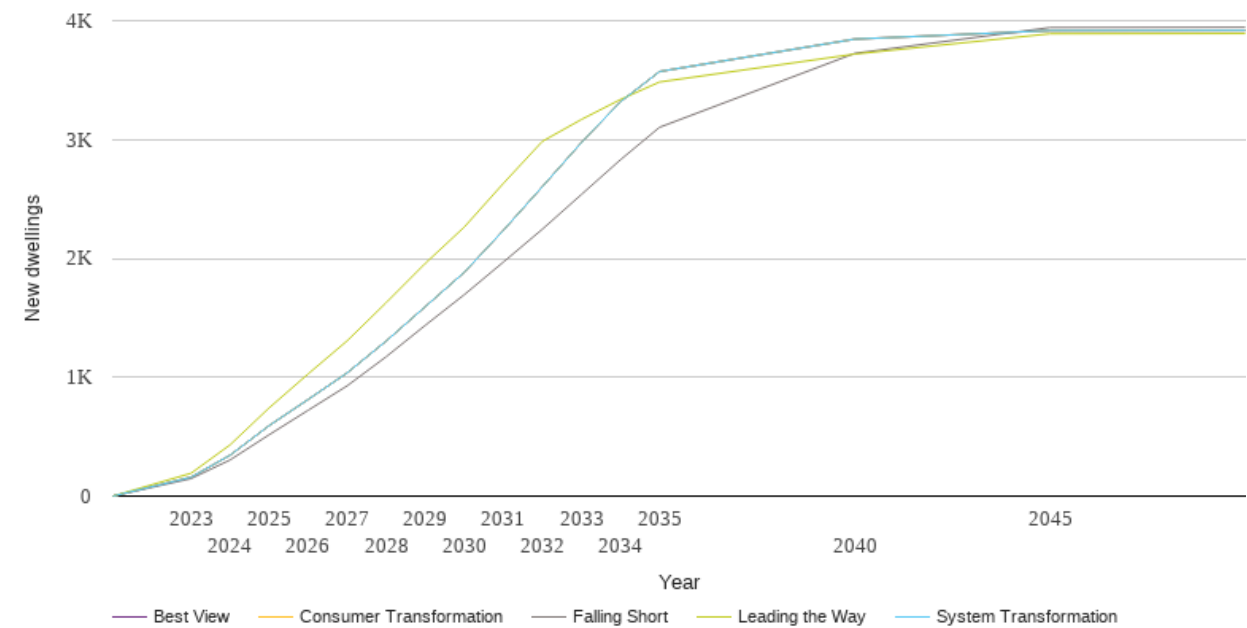
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	52	0	0	0	0
2025	112	0	0	0	0
2026	181	52	52	0	52
2027	260	111	111	0	111
2028	348	178	178	0	178
2029	452	254	254	0	254
2030	570	338	338	0	338
2031	746	434	434	0	434
2032	948	542	542	0	542
2033	1180	663	663	0	663
2034	1446	800	800	0	800
2035	1750	952	952	0	952
2040	4774	2371	2371	0	2371
2045	10974	5654	5654	0	5654
2050	23173	11504	11504	0	11504



Technology Summary: Domestic

The table and graph below show the scenario projections for each of the DFES scenarios.

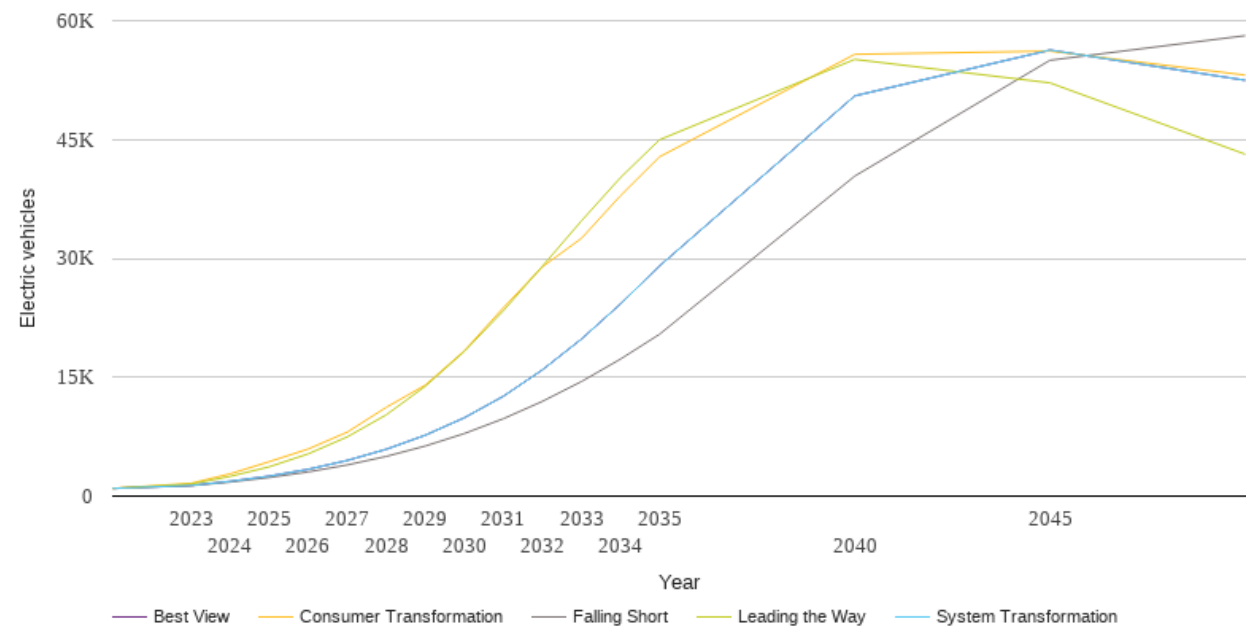
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	147	159	159	192	159
2024	304	344	344	431	344
2025	516	593	593	742	593
2026	722	813	813	1028	813
2027	928	1037	1037	1307	1037
2028	1173	1305	1305	1628	1305
2029	1437	1594	1594	1958	1594
2030	1695	1883	1883	2264	1883
2031	1969	2236	2236	2631	2236
2032	2246	2604	2604	2985	2604
2033	2538	2975	2975	3169	2975
2034	2830	3318	3318	3337	3318
2035	3103	3572	3572	3484	3572
2040	3725	3845	3845	3719	3845
2045	3942	3916	3916	3890	3916
2050	3944	3918	3918	3892	3918



Technology Summary: Electric vehicles

The table and graph below show the scenario projections for each of the DFES scenarios.

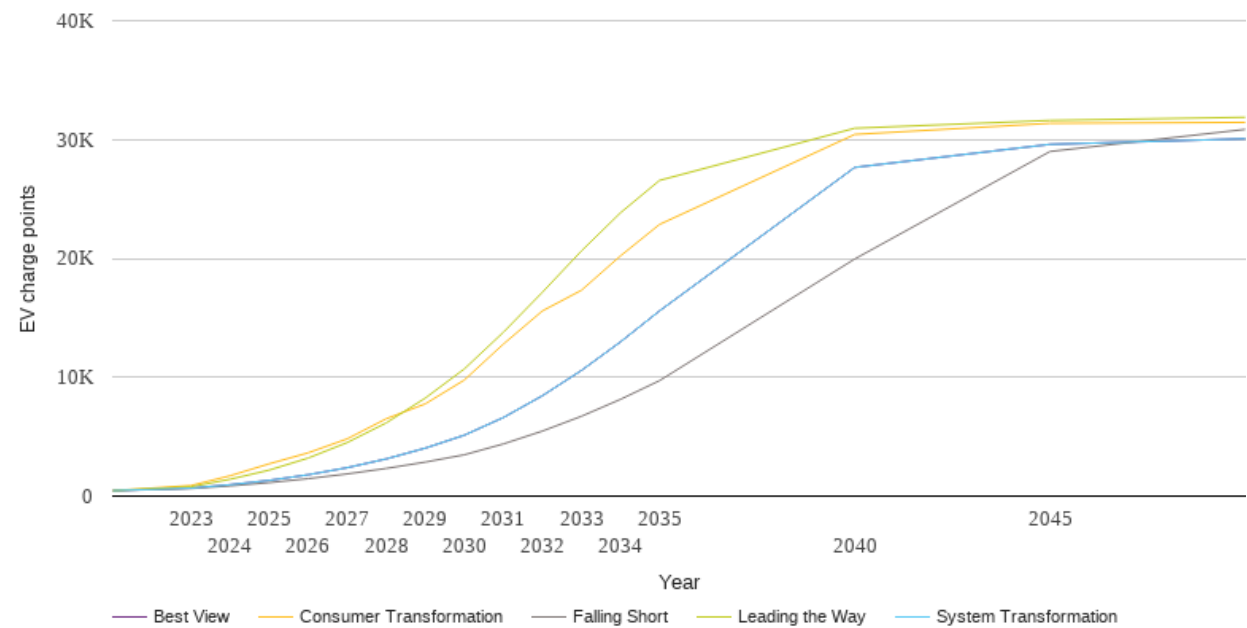
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	971	971	971	971	971
2023	1322	1345	1611	1516	1345
2024	1774	1857	2807	2488	1857
2025	2342	2517	4338	3692	2517
2026	3048	3380	5940	5324	3380
2027	3930	4496	8071	7471	4496
2028	5008	5909	11200	10253	5909
2029	6321	7688	14012	13861	7688
2030	7892	9886	18332	18250	9886
2031	9770	12604	23783	23395	12604
2032	11958	15934	28938	29012	15934
2033	14460	19821	32531	34740	19821
2034	17291	24252	37921	40202	24252
2035	20425	29047	42821	44971	29047
2040	40387	50511	55755	55118	50511
2045	55004	56291	56165	52151	56291
2050	58108	52481	53128	43148	52481



Technology Summary: EV Charge Point

The table and graph below show the scenario projections for each of the DFES scenarios.

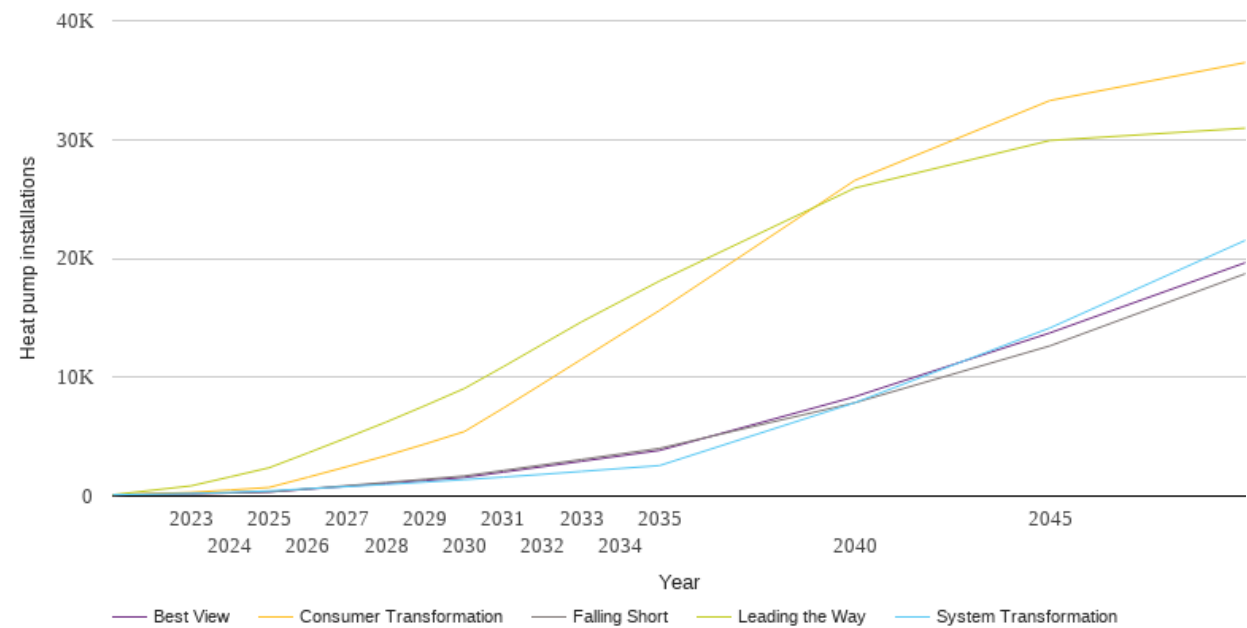
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	461	461	461	461	461
2023	636	670	887	785	670
2024	856	954	1710	1417	954
2025	1131	1321	2714	2183	1321
2026	1467	1794	3641	3199	1794
2027	1866	2390	4815	4504	2390
2028	2328	3128	6510	6156	3128
2029	2861	4036	7760	8247	4036
2030	3475	5125	9764	10700	5125
2031	4388	6609	12790	13782	6609
2032	5471	8445	15581	17150	8445
2033	6717	10573	17319	20630	10573
2034	8141	12975	20210	23836	12975
2035	9715	15585	22858	26562	15585
2040	19951	27655	30429	30951	27655
2045	28993	29596	31364	31608	29596
2050	30851	30065	31443	31872	30065



Technology Summary: Heat pumps

The table and graph below show the scenario projections for each of the DFES scenarios.

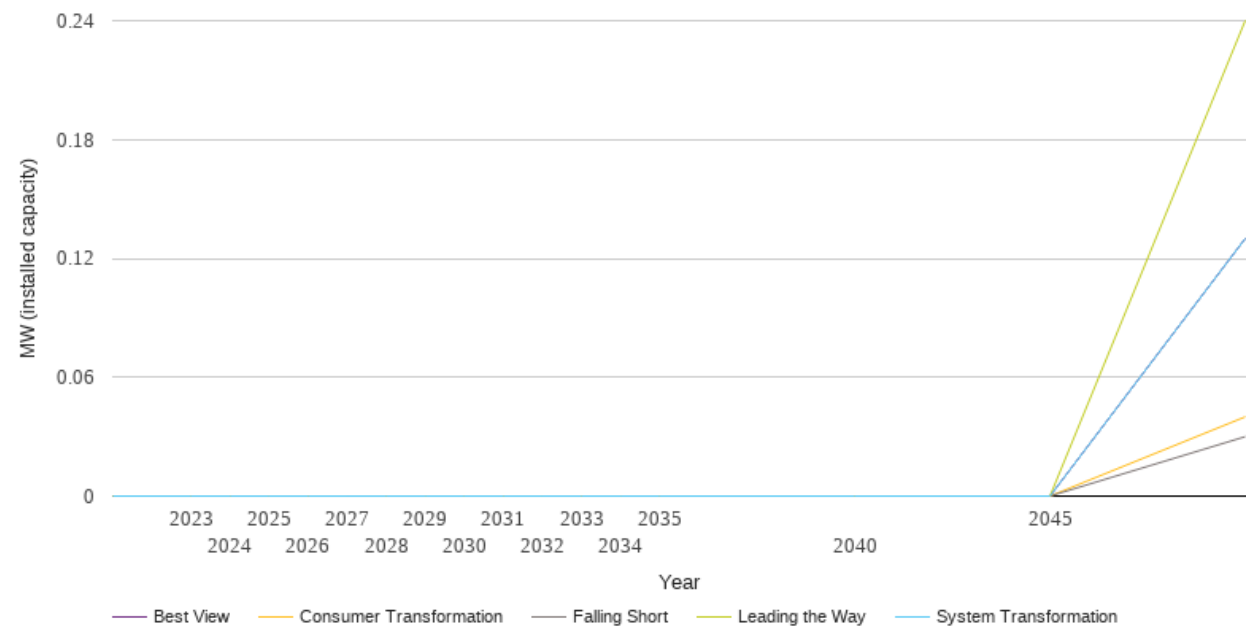
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	117	117	117	117	117
2023	195	213	310	861	195
2024	267	316	510	1615	267
2025	348	435	729	2385	348
2026	611	621	1594	3636	586
2027	879	799	2481	4921	827
2028	1149	980	3403	6230	1071
2029	1421	1179	4386	7618	1320
2030	1695	1384	5427	9053	1567
2031	2157	1597	7405	10889	2021
2032	2619	1831	9450	12778	2474
2033	3083	2074	11509	14656	2929
2034	3549	2323	13575	16380	3386
2035	4014	2567	15618	18094	3842
2040	7855	7854	26561	25917	8359
2045	12639	14148	33281	29919	13733
2050	18706	21512	36477	30956	19636



Technology Summary: Hydrogen electrolysis

The table and graph below show the scenario projections for each of the DFES scenarios.

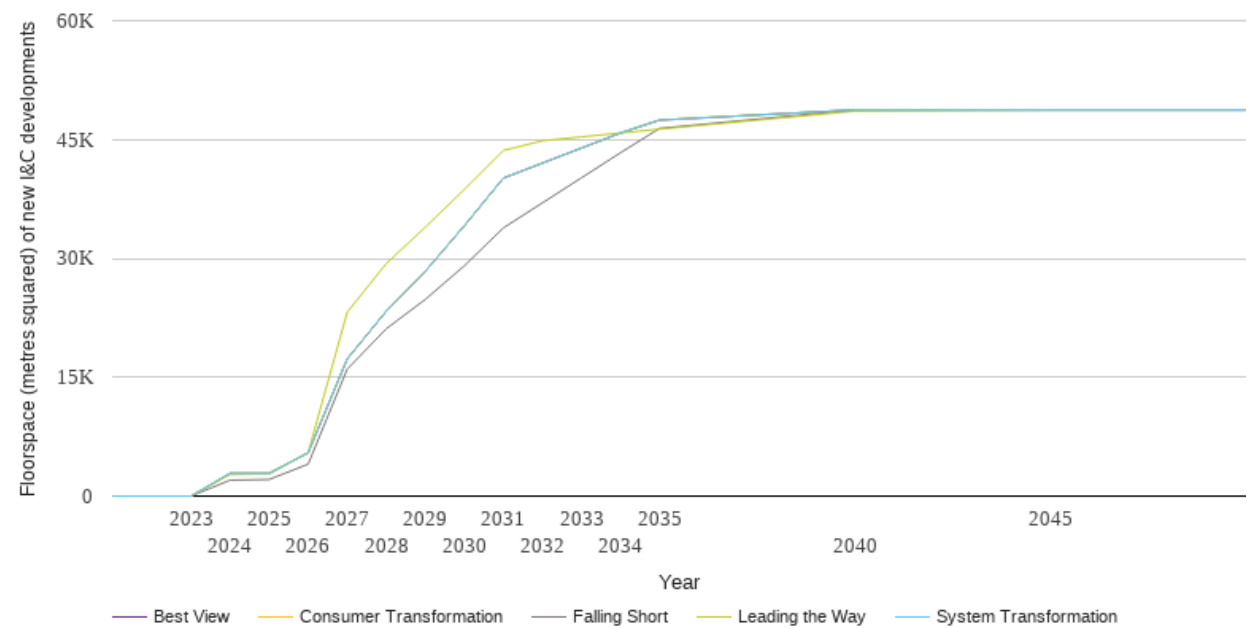
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0	0.0
2028	0.0	0.0	0.0	0.0	0.0
2029	0.0	0.0	0.0	0.0	0.0
2030	0.0	0.0	0.0	0.0	0.0
2031	0.0	0.0	0.0	0.0	0.0
2032	0.0	0.0	0.0	0.0	0.0
2033	0.0	0.0	0.0	0.0	0.0
2034	0.0	0.0	0.0	0.0	0.0
2035	0.0	0.0	0.0	0.0	0.0
2040	0.0	0.0	0.0	0.0	0.0
2045	0.0	0.0	0.0	0.0	0.0
2050	0.0	0.1	0.0	0.2	0.1



Technology Summary: Non domestic

The table and graph below show the scenario projections for each of the DFES scenarios.

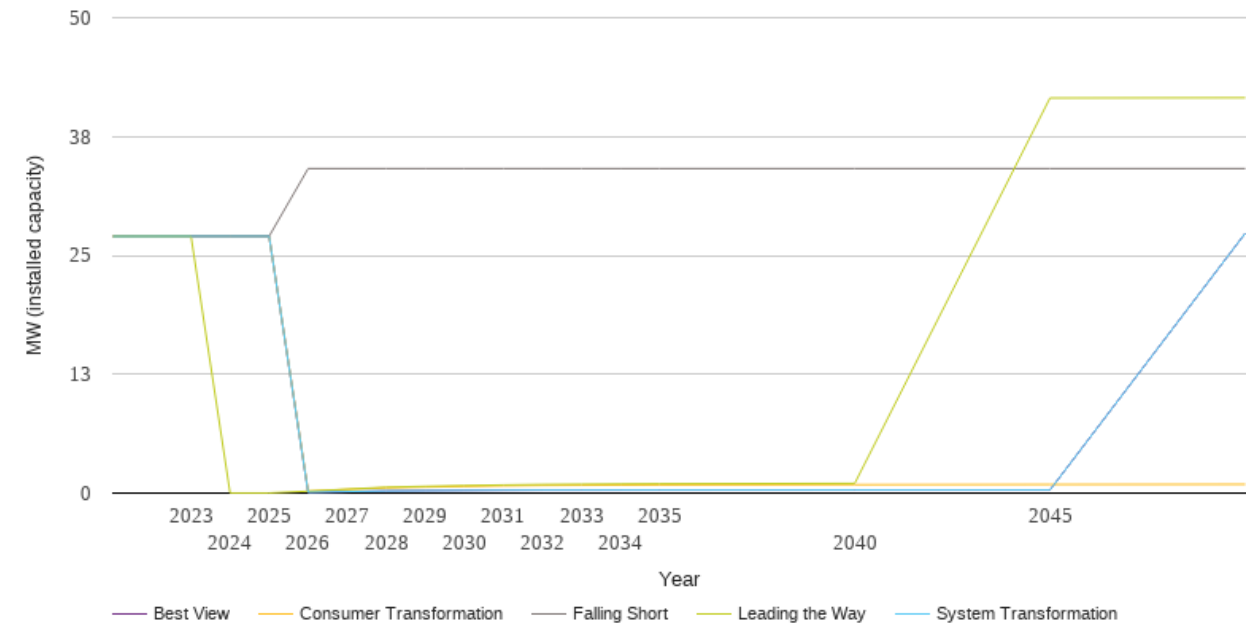
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	2009	2870	2870	2727	2870
2025	2095	2870	2870	2798	2870
2026	4031	5471	5471	5471	5471
2027	16016	17312	17312	23204	17312
2028	21113	23332	23332	29346	23332
2029	24816	28372	28372	33940	28372
2030	29060	34116	34116	38695	34116
2031	33846	40130	40130	43613	40130
2032	37008	42028	42028	44848	42028
2033	40170	43927	43927	45335	43927
2034	43333	45826	45826	45822	45826
2035	46409	47454	47454	46309	47454
2040	48743	48743	48743	48581	48743
2045	48743	48743	48743	48743	48743
2050	48743	48743	48743	48743	48743



Technology Summary: Other Distributed Generation

The table and graph below show the scenario projections for each of the DFES scenarios.

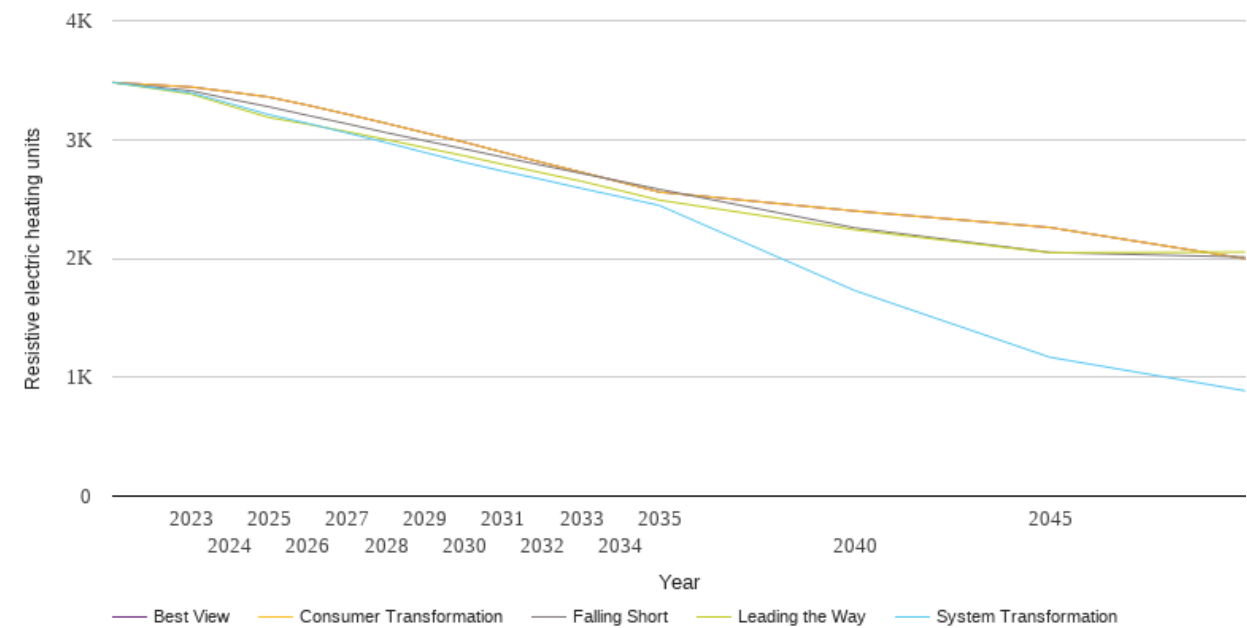
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	27.0	27.0	27.0	27.0	27.0
2023	27.0	27.0	27.0	27.0	27.0
2024	27.0	27.0	27.0	0.0	27.0
2025	27.0	27.0	27.0	0.0	27.0
2026	34.1	0.1	0.2	0.2	0.1
2027	34.1	0.2	0.4	0.4	0.2
2028	34.1	0.2	0.6	0.6	0.2
2029	34.1	0.3	0.6	0.7	0.3
2030	34.1	0.3	0.7	0.8	0.3
2031	34.1	0.3	0.8	0.9	0.3
2032	34.1	0.3	0.8	0.9	0.3
2033	34.1	0.3	0.8	0.9	0.3
2034	34.1	0.3	0.8	1.0	0.3
2035	34.1	0.3	0.9	1.0	0.3
2040	34.1	0.3	0.9	1.0	0.3
2045	34.1	0.3	0.9	41.6	0.3
2050	34.1	27.3	0.9	41.6	27.3



Technology Summary: Resistive electric heating

The table and graph below show the scenario projections for each of the DFES scenarios.

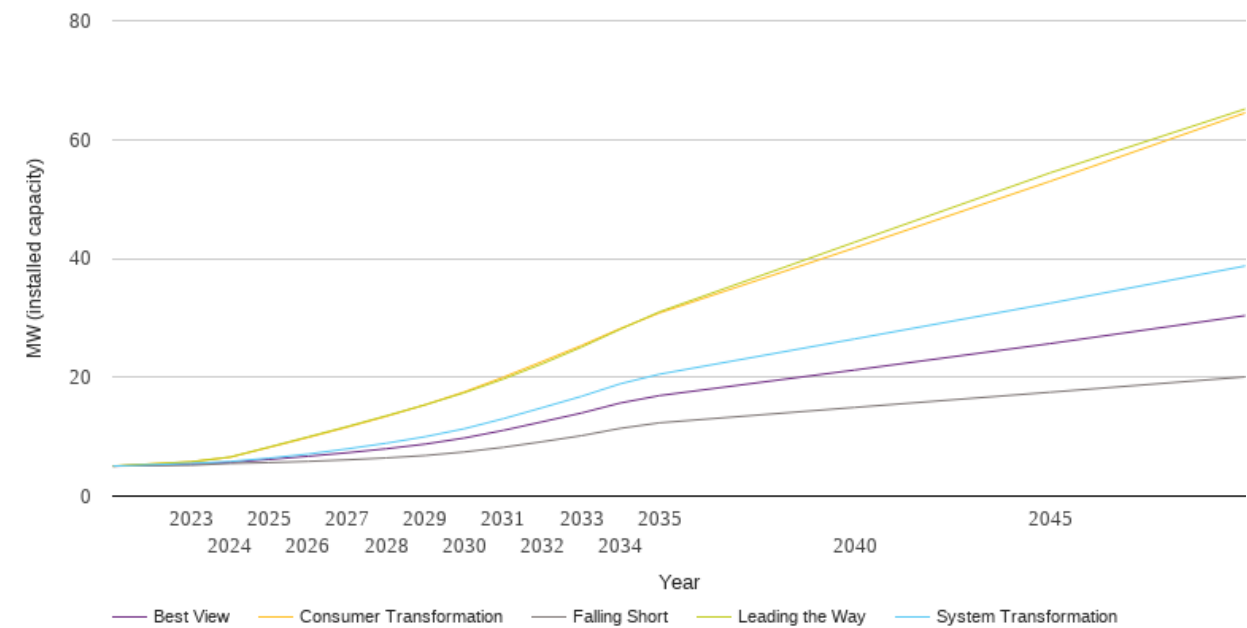
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	3480	3480	3480	3480	3480
2023	3410	3393	3442	3382	3442
2024	3341	3302	3401	3283	3401
2025	3275	3209	3357	3185	3357
2026	3202	3135	3288	3128	3288
2027	3132	3055	3213	3066	3213
2028	3058	2974	3136	3000	3136
2029	2989	2890	3056	2931	3056
2030	2921	2808	2978	2863	2978
2031	2851	2733	2892	2790	2892
2032	2783	2663	2806	2719	2806
2033	2715	2589	2725	2649	2725
2034	2649	2518	2642	2570	2642
2035	2581	2445	2558	2490	2558
2040	2257	1729	2399	2241	2399
2045	2050	1168	2260	2048	2260
2050	2011	886	1998	2053	1998



Technology Summary: Solar Generation

The table and graph below show the scenario projections for each of the DFES scenarios.

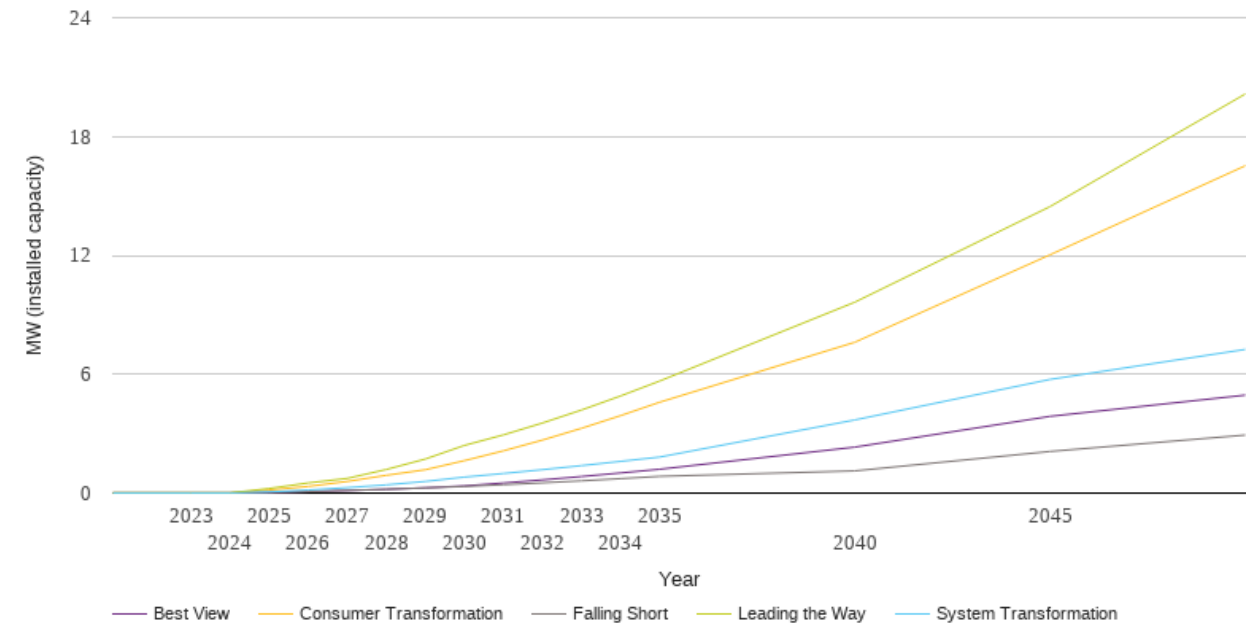
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	5.0	5.0	5.0	5.0	5.0
2023	5.2	5.5	5.8	5.8	5.4
2024	5.5	5.8	6.5	6.6	5.7
2025	5.6	6.4	8.2	8.3	6.2
2026	5.8	7.1	9.9	10.0	6.7
2027	6.1	7.9	11.6	11.7	7.3
2028	6.4	8.9	13.4	13.5	8.0
2029	6.8	10.0	15.4	15.4	8.8
2030	7.4	11.3	17.5	17.4	9.8
2031	8.2	13.0	20.0	19.7	11.1
2032	9.2	14.9	22.7	22.3	12.5
2033	10.2	16.8	25.3	25.1	14.0
2034	11.4	18.9	28.2	28.1	15.7
2035	12.3	20.5	30.8	31.0	16.9
2040	14.9	26.4	41.8	42.7	21.2
2045	17.5	32.4	53.0	54.4	25.7
2050	20.1	38.7	64.5	65.1	30.4



Technology Summary: Storage

The table and graph below show the scenario projections for each of the DFES scenarios.

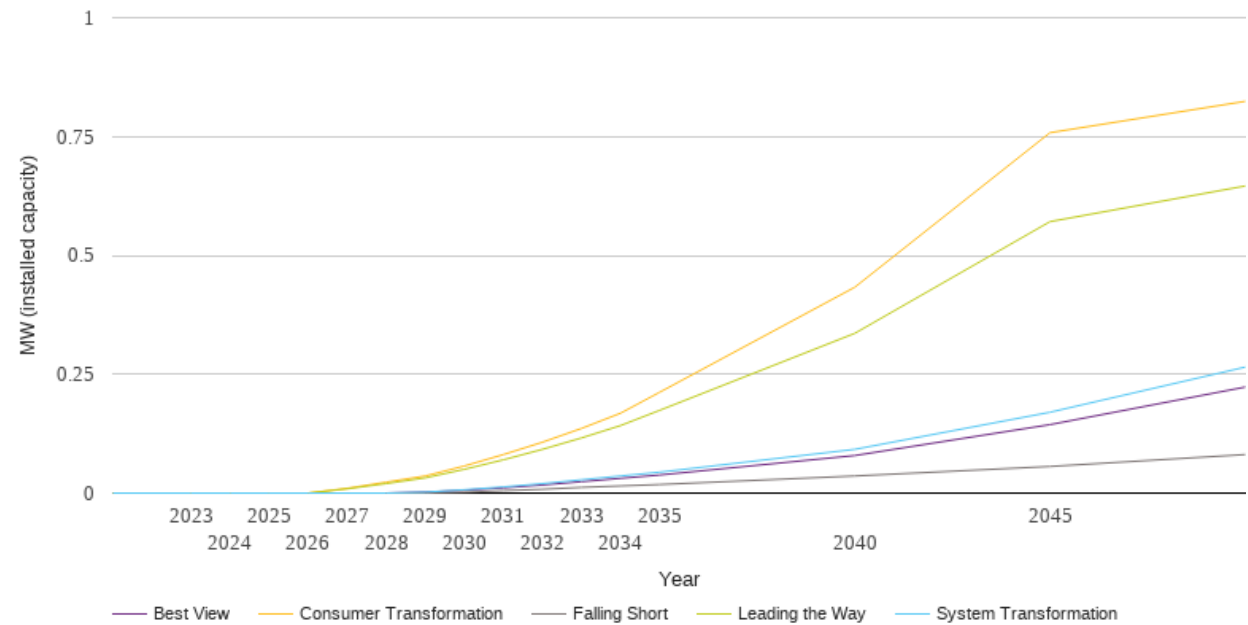
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.1	0.2	0.2	0.0
2026	0.1	0.2	0.3	0.5	0.1
2027	0.1	0.3	0.6	0.7	0.1
2028	0.2	0.4	0.9	1.2	0.2
2029	0.3	0.6	1.2	1.7	0.3
2030	0.3	0.8	1.6	2.4	0.4
2031	0.4	1.0	2.1	2.9	0.5
2032	0.5	1.2	2.7	3.5	0.7
2033	0.6	1.4	3.3	4.2	0.8
2034	0.7	1.6	3.9	4.9	1.0
2035	0.8	1.8	4.6	5.7	1.2
2040	1.1	3.7	7.6	9.6	2.3
2045	2.1	5.7	12.0	14.5	3.9
2050	2.9	7.3	16.5	20.1	4.9



Technology Summary: Wind

The table and graph below show the scenario projections for each of the DFES scenarios.

Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0	0.0
2028	0.0	0.0	0.0	0.0	0.0
2029	0.0	0.0	0.0	0.0	0.0
2030	0.0	0.0	0.1	0.0	0.0
2031	0.0	0.0	0.1	0.1	0.0
2032	0.0	0.0	0.1	0.1	0.0
2033	0.0	0.0	0.1	0.1	0.0
2034	0.0	0.0	0.2	0.1	0.0
2035	0.0	0.0	0.2	0.2	0.0
2040	0.0	0.1	0.4	0.3	0.1
2045	0.1	0.2	0.8	0.6	0.1
2050	0.1	0.3	0.8	0.6	0.2



National Grid Electricity Distribution PLC 09223384)
National Grid Electricity Distribution (East Midlands) Plc (company number 02366923))
National Grid Electricity Distribution (West Midlands) Plc (company number 03600574))
National Grid Electricity Distribution (South West) Plc (company number 02366894))
National Grid Electricity Distribution (South Wales) Plc (company number 02366985))
(collectively, “NGED”)

nged.networkstrategy@nationalgrid.co.uk

