

Distribution Future Energy Scenarios 2022

Local Authority:
Broxtowe

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 Broxtowe 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 Broxtowe 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	627	375	375	0	30681	14679	14679	0
Domestic	New dwellings	0	1945	1990	1990	2094	2286	2179	2179	2102
Electric vehicles	Electric vehicles	1950	12549	15011	27548	27330	82122	73772	73948	57331
EV Charge Point	EV charge points	984	5923	8411	15914	17514	48165	45540	48939	48786
Heat pumps	Heat pump installations	167	2080	1757	7128	11815	24263	28205	48491	43128
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	1.2	0.0	0.9	0.4	1.9	0.8	3.9
Non domestic	Floorspace (metres squared) of new I&C developments	0	45603	51651	51651	55379	61367	60998	60998	61367
Other Distributed Generation	MW (installed capacity)	7.1	7.1	7.1	7.1	7.0	7.1	0.0	0.0	0.0
Resistive electric heating	Resistive electric heating units	5180	4483	4330	4556	4409	3120	1477	3126	3268
Solar Generation	MW (installed capacity)	7.0	10.1	15.6	25.6	25.6	23.4	49.9	92.1	95.6
Storage	MW (installed capacity)	0.0	0.1	0.9	2.3	2.9	2.8	7.1	21.0	27.5
Wind	MW (installed capacity)	2.7	2.7	2.7	2.9	2.8	2.7	4.2	6.5	6.3

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

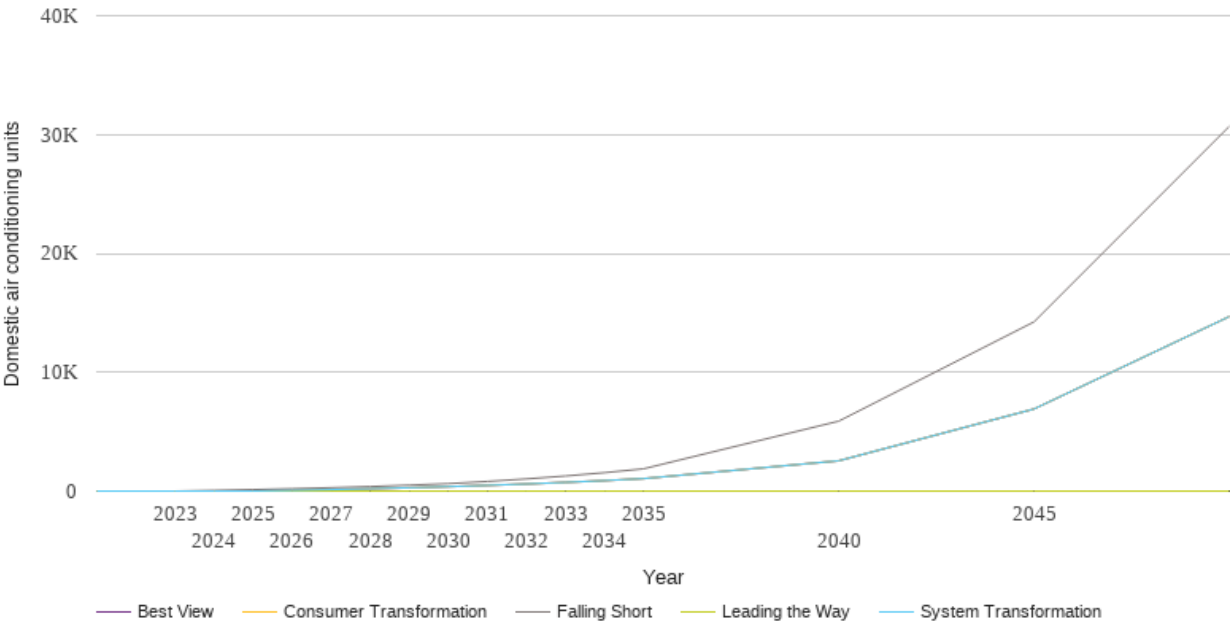
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

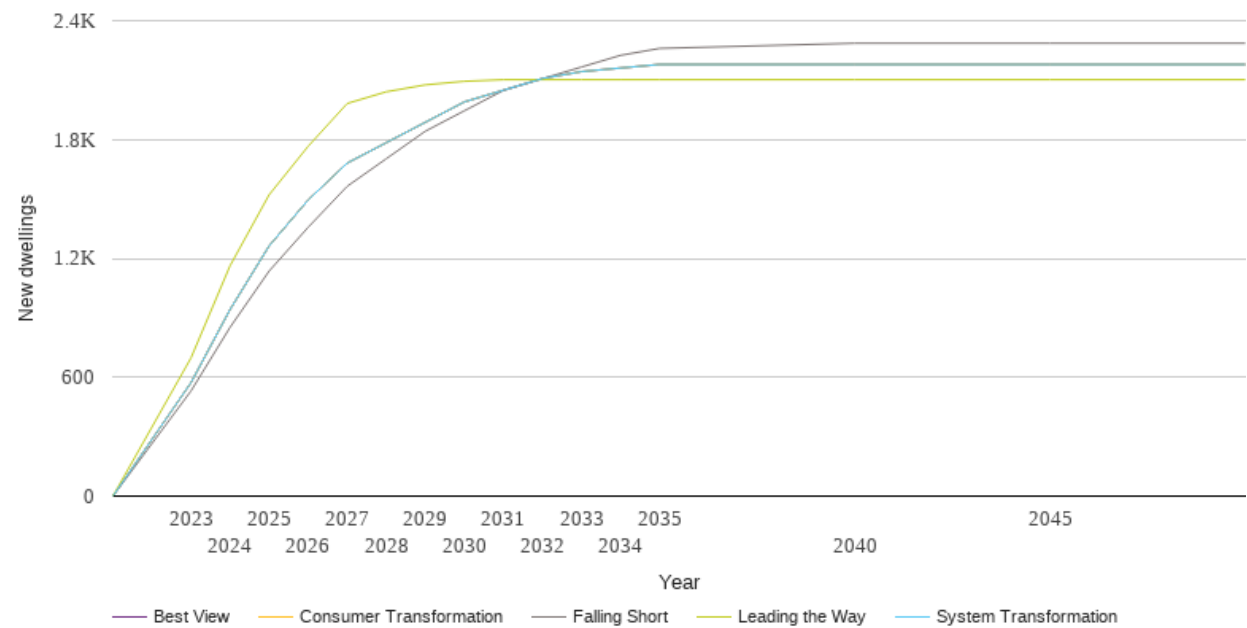
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	58	0	0	0	0
2025	124	0	0	0	0
2026	199	58	58	0	58
2027	285	123	123	0	123
2028	382	198	198	0	198
2029	498	282	282	0	282
2030	627	375	375	0	375
2031	812	481	481	0	481
2032	1025	599	599	0	599
2033	1270	732	732	0	732
2034	1551	883	883	0	883
2035	1873	1050	1050	0	1050
2040	5885	2550	2550	0	2550
2045	14236	6908	6908	0	6908
2050	30681	14679	14679	0	14679



Technology Summary: Domestic

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

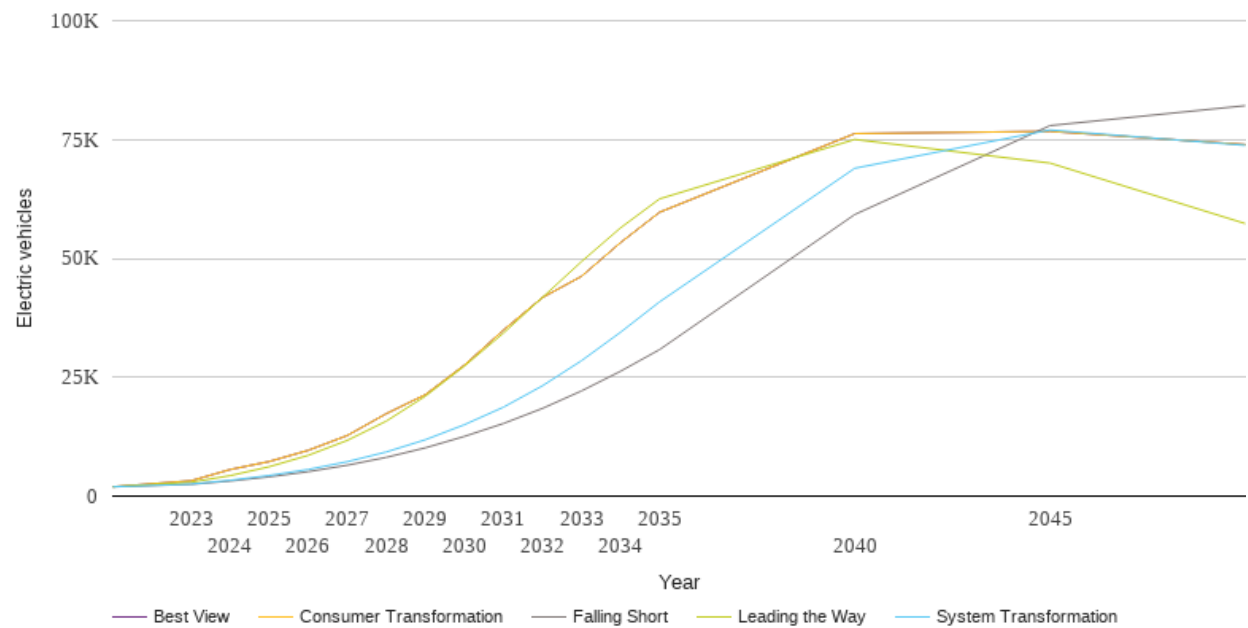
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	531	573	573	698	573
2024	852	942	942	1163	942
2025	1136	1263	1263	1521	1263
2026	1357	1495	1495	1766	1495
2027	1564	1681	1681	1982	1681
2028	1703	1784	1784	2041	1784
2029	1842	1887	1887	2076	1887
2030	1945	1990	1990	2094	1990
2031	2048	2049	2049	2102	2049
2032	2107	2108	2108	2102	2108
2033	2166	2143	2143	2102	2143
2034	2225	2161	2161	2102	2161
2035	2260	2179	2179	2102	2179
2040	2286	2179	2179	2102	2179
2045	2286	2179	2179	2102	2179
2050	2286	2179	2179	2102	2179



Technology Summary: Electric vehicles

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

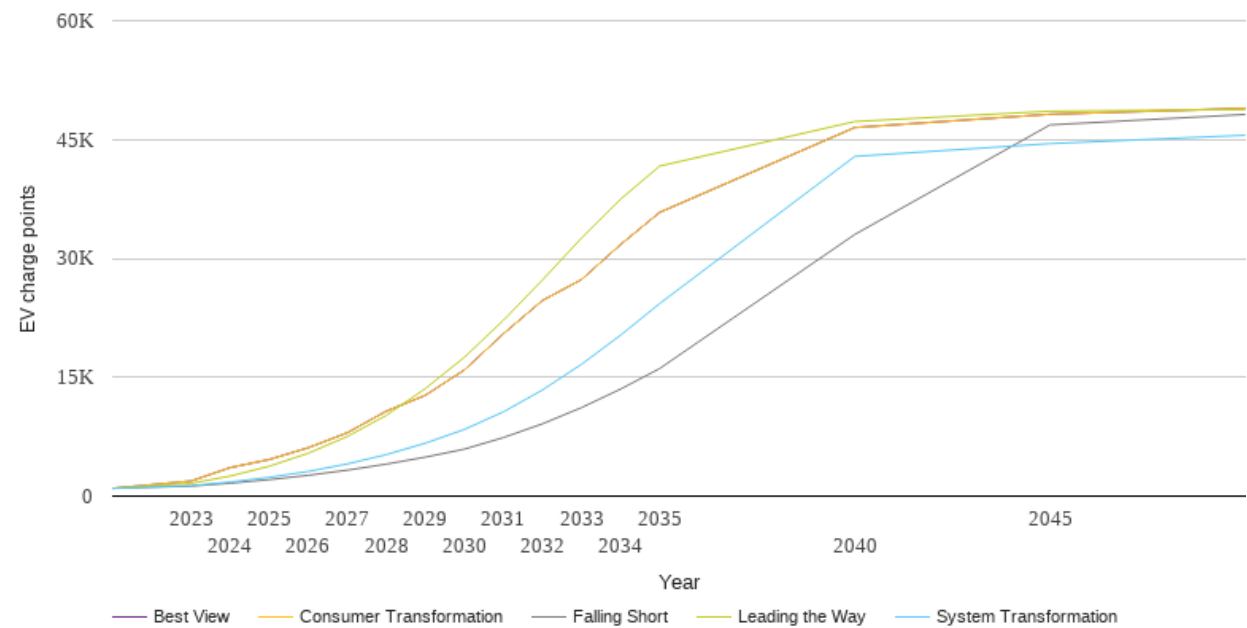
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1950	1950	1950	1950	1950
2023	2482	2529	3223	2912	3223
2024	3171	3315	5577	4300	5577
2025	4042	4333	7264	6168	7264
2026	5133	5597	9617	8566	9617
2027	6491	7228	12738	11709	12738
2028	8144	9280	17331	15763	17331
2029	10146	11850	21333	21005	21333
2030	12549	15011	27548	27330	27548
2031	15269	18694	34916	34271	34916
2032	18439	23193	41760	41776	41760
2033	22119	28474	46227	49316	46227
2034	26258	34457	53311	56413	53311
2035	30811	40853	59700	62514	59700
2040	59228	68956	76254	75017	76254
2045	77930	77015	76728	70049	76728
2050	82122	73772	73948	57331	73948



Technology Summary: EV Charge Point

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

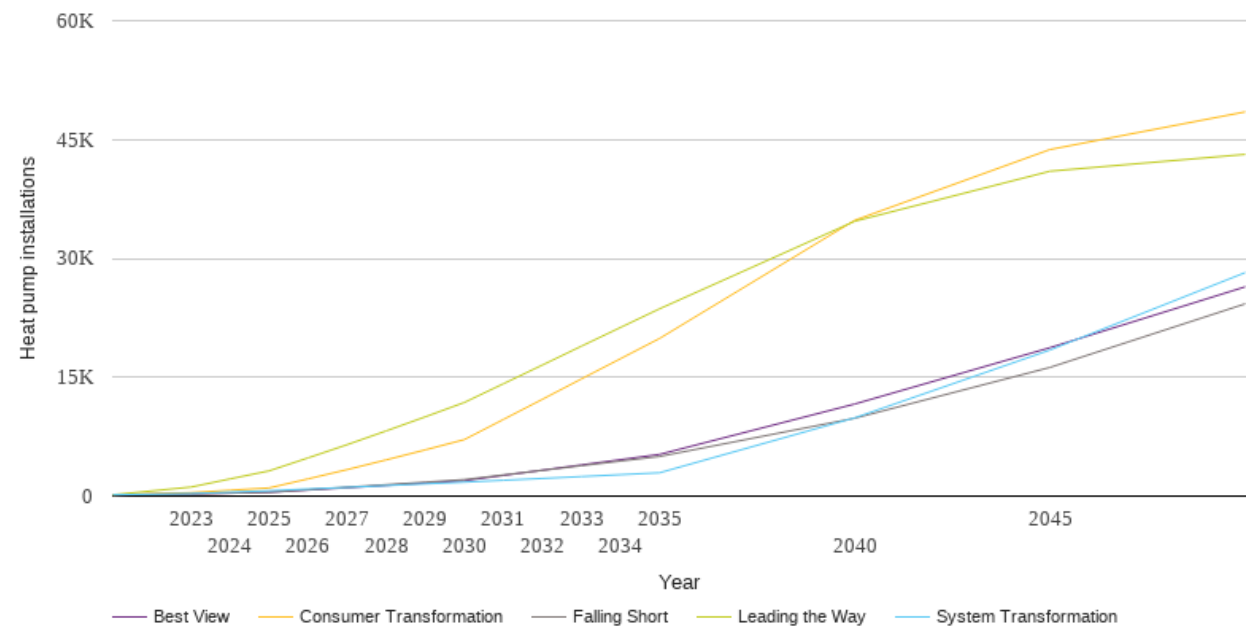
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	984	984	984	984	984
2023	1262	1316	1897	1607	1897
2024	1623	1772	3589	2523	3589
2025	2074	2361	4614	3765	4614
2026	2620	3110	6101	5403	6101
2027	3272	4058	7987	7518	7987
2028	4035	5234	10720	10187	10720
2029	4915	6676	12715	13565	12715
2030	5923	8411	15914	17514	15914
2031	7385	10632	20480	22171	20480
2032	9119	13389	24683	27265	24683
2033	11163	16631	27325	32569	27325
2034	13500	20294	31738	37463	31738
2035	16088	24284	35798	41647	35798
2040	33018	42874	46515	47273	46515
2045	46849	44483	48190	48578	48190
2050	48165	45540	48939	48786	48939



Technology Summary: Heat pumps

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

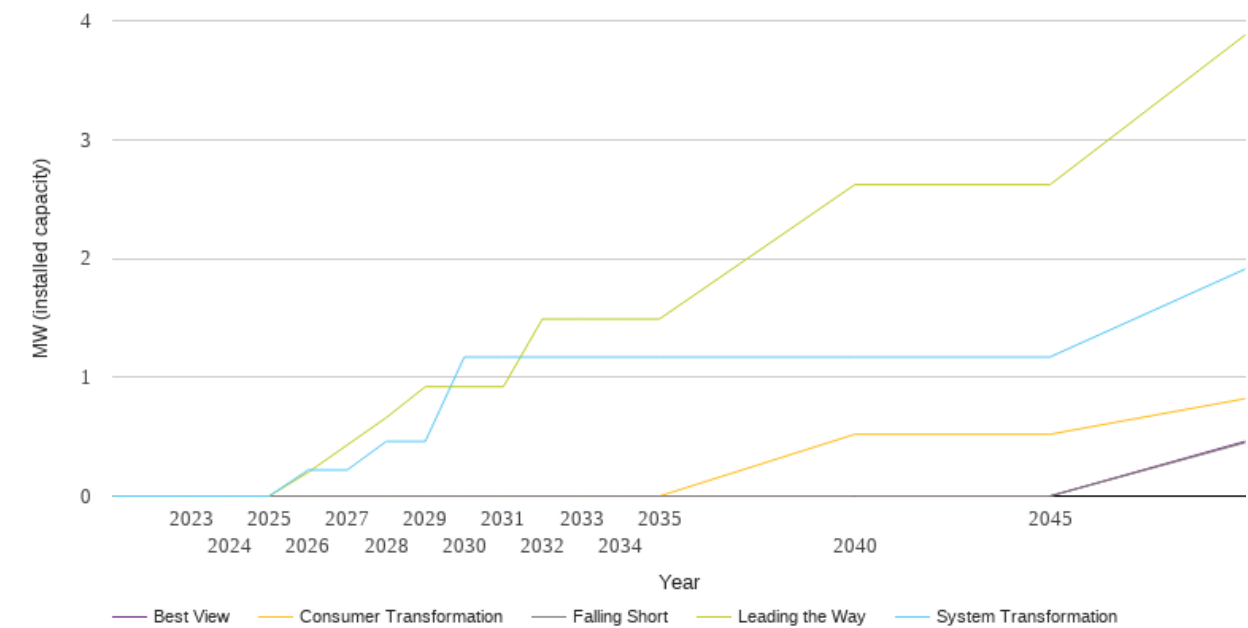
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	167	167	167	167	167
2023	267	316	435	1141	267
2024	382	501	736	2168	382
2025	482	676	1029	3183	482
2026	804	894	2176	4824	770
2027	1120	1102	3344	6491	1057
2028	1440	1326	4574	8229	1351
2029	1757	1548	5835	10003	1648
2030	2080	1757	7128	11815	1948
2031	2667	1996	9672	14178	2609
2032	3251	2224	12216	16540	3269
2033	3835	2462	14792	18923	3934
2034	4419	2703	17341	21283	4596
2035	4998	2942	19893	23638	5260
2040	9829	9879	34808	34690	11622
2045	16239	18435	43737	41000	18729
2050	24263	28205	48491	43128	26412



Technology Summary: Hydrogen electrolysis

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

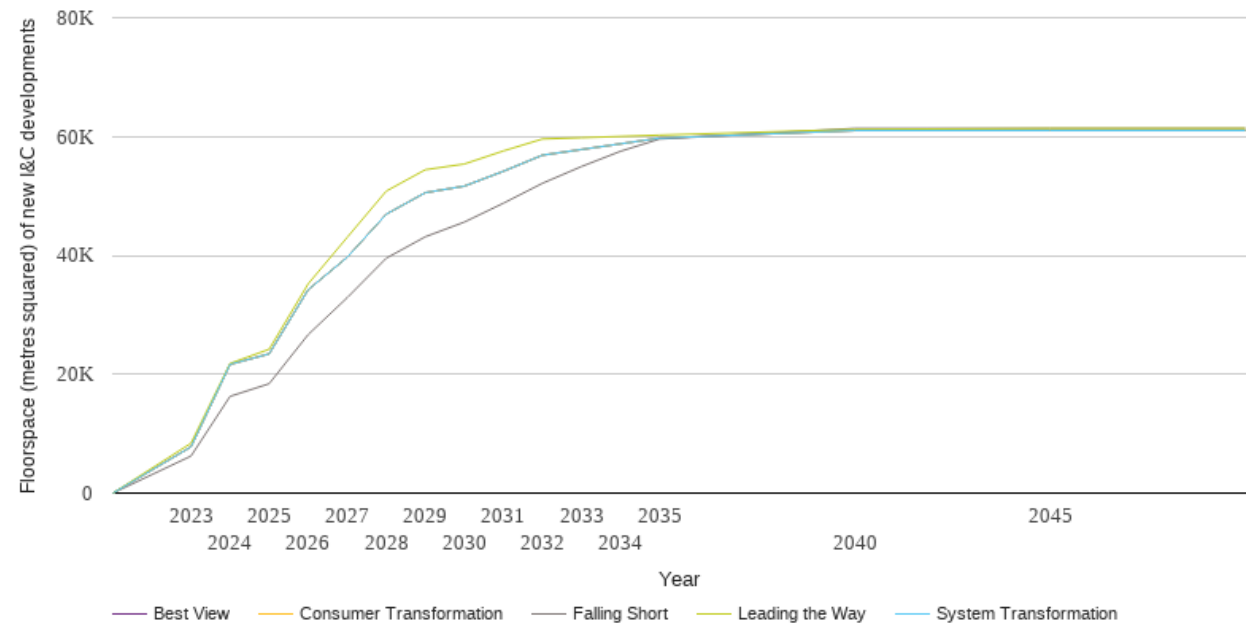
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.2	0.0	0.2	0.0
2027	0.0	0.2	0.0	0.4	0.0
2028	0.0	0.5	0.0	0.7	0.0
2029	0.0	0.5	0.0	0.9	0.0
2030	0.0	1.2	0.0	0.9	0.0
2031	0.0	1.2	0.0	0.9	0.0
2032	0.0	1.2	0.0	1.5	0.0
2033	0.0	1.2	0.0	1.5	0.0
2034	0.0	1.2	0.0	1.5	0.0
2035	0.0	1.2	0.0	1.5	0.0
2040	0.0	1.2	0.5	2.6	0.0
2045	0.0	1.2	0.5	2.6	0.0
2050	0.4	1.9	0.8	3.9	0.5



Technology Summary: Non domestic

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

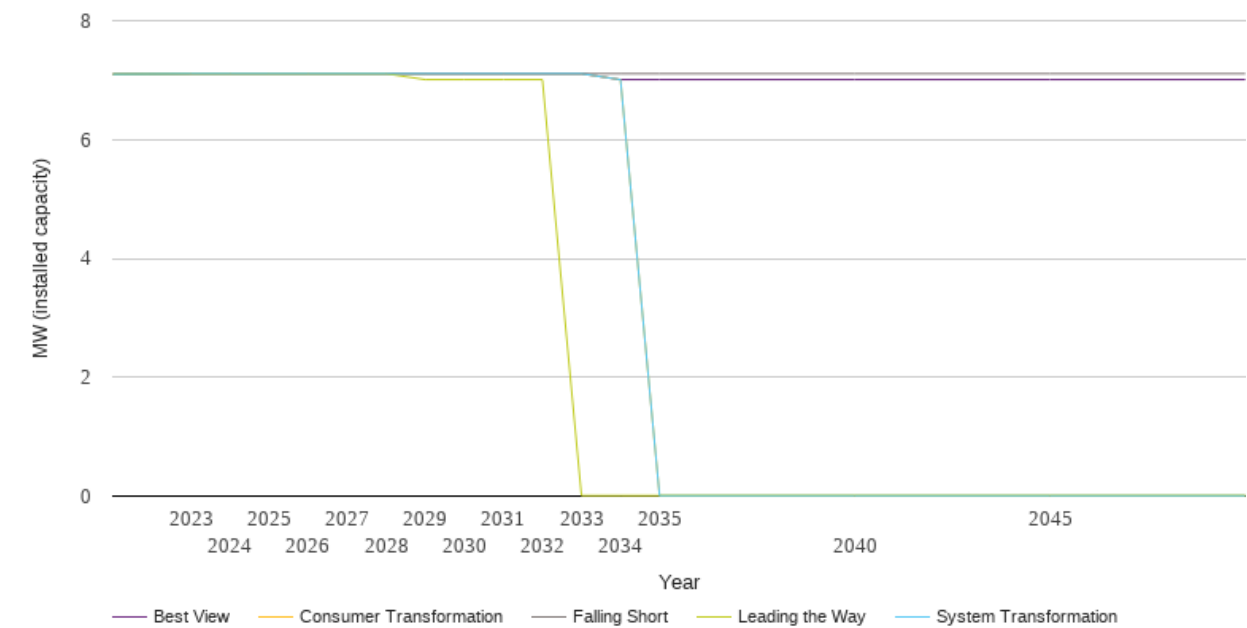
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	6237	7782	7782	8399	7782
2024	16277	21662	21662	21822	21662
2025	18402	23426	23426	24199	23426
2026	26667	34219	34219	35207	34219
2027	32882	39679	39679	43032	39679
2028	39527	46932	46932	50818	46932
2029	43127	50548	50548	54412	50548
2030	45603	51651	51651	55379	51651
2031	48778	54155	54155	57572	54155
2032	52128	56861	56861	59582	56861
2033	54954	57817	57817	59800	57817
2034	57520	58773	58773	60017	58773
2035	59583	59730	59730	60235	59730
2040	61367	60998	60998	61210	60998
2045	61367	60998	60998	61367	60998
2050	61367	60998	60998	61367	60998



Technology Summary: Other Distributed Generation

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

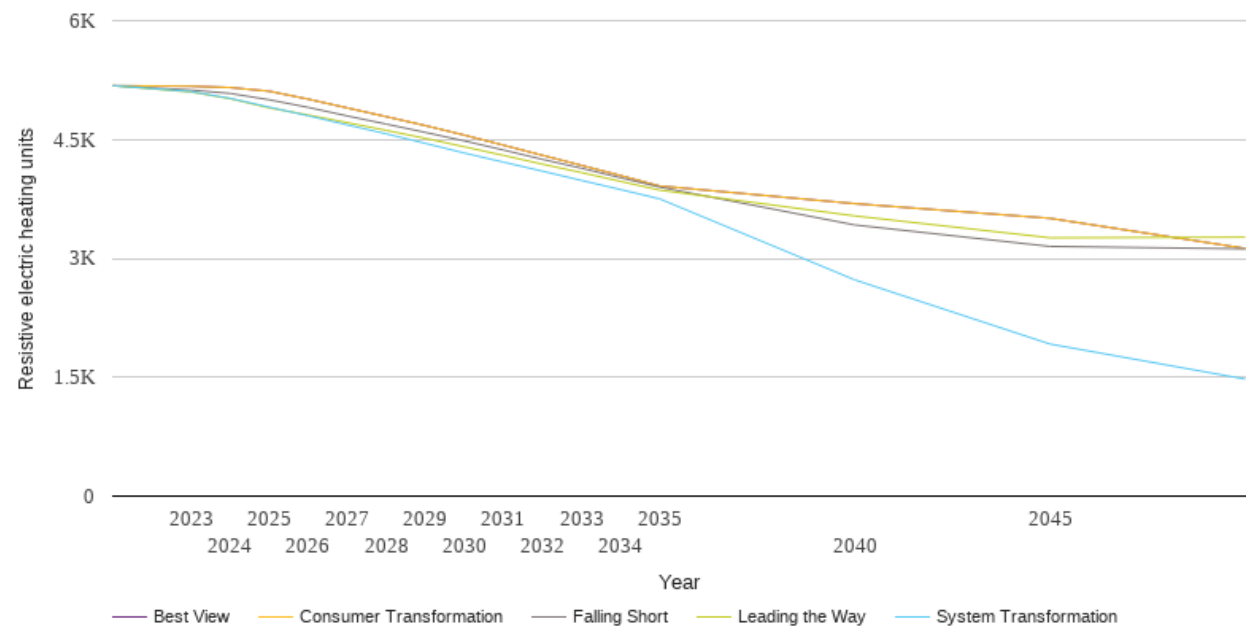
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	7.1	7.1	7.1	7.1	7.1
2023	7.1	7.1	7.1	7.1	7.1
2024	7.1	7.1	7.1	7.1	7.1
2025	7.1	7.1	7.1	7.1	7.1
2026	7.1	7.1	7.1	7.1	7.1
2027	7.1	7.1	7.1	7.1	7.1
2028	7.1	7.1	7.1	7.1	7.1
2029	7.1	7.1	7.1	7.0	7.1
2030	7.1	7.1	7.1	7.0	7.1
2031	7.1	7.1	7.1	7.0	7.1
2032	7.1	7.1	7.1	7.0	7.1
2033	7.1	7.1	7.1	0.0	7.1
2034	7.1	7.0	7.0	0.0	7.0
2035	7.1	0.0	0.0	0.0	7.0
2040	7.1	0.0	0.0	0.0	7.0
2045	7.1	0.0	0.0	0.0	7.0
2050	7.1	0.0	0.0	0.0	7.0



Technology Summary: Resistive electric heating

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

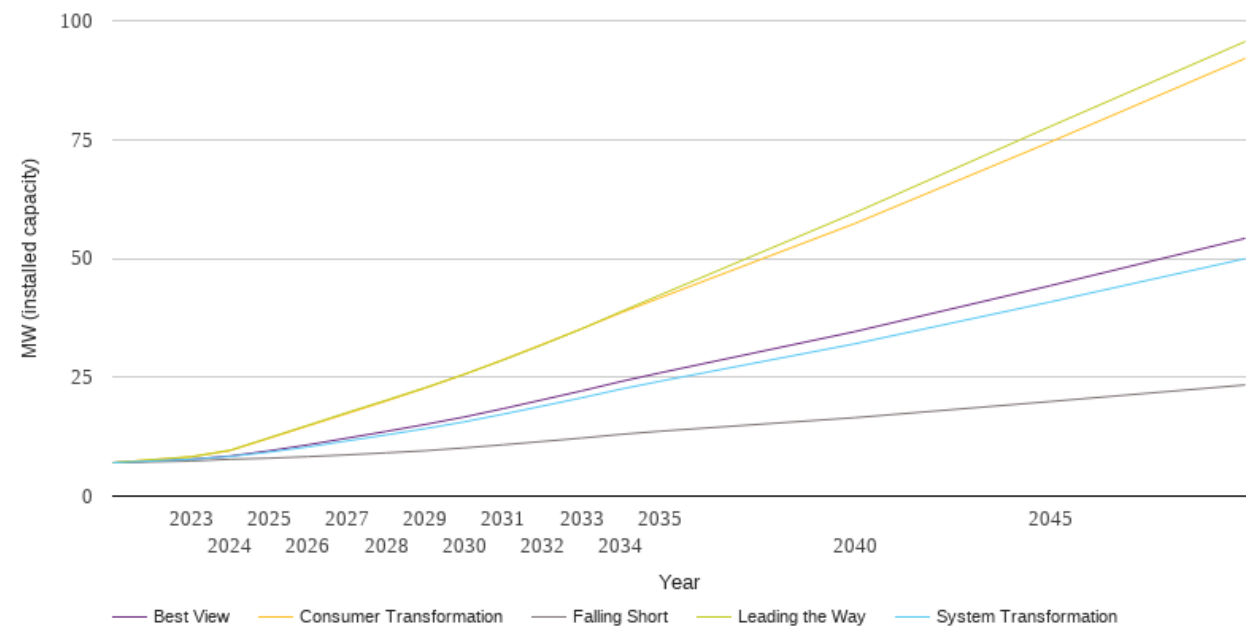
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	5180	5180	5180	5180	5180
2023	5124	5105	5173	5100	5173
2024	5082	5020	5156	5016	5156
2025	5002	4909	5110	4900	5110
2026	4906	4800	5010	4810	5010
2027	4798	4685	4899	4713	4899
2028	4695	4572	4789	4616	4789
2029	4590	4452	4676	4515	4676
2030	4483	4330	4556	4409	4556
2031	4368	4215	4429	4300	4429
2032	4250	4101	4301	4189	4301
2033	4138	3984	4174	4083	4174
2034	4018	3869	4046	3972	4046
2035	3900	3752	3914	3862	3914
2040	3422	2729	3691	3536	3691
2045	3151	1919	3506	3260	3506
2050	3120	1477	3126	3268	3126



Technology Summary: Solar Generation

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

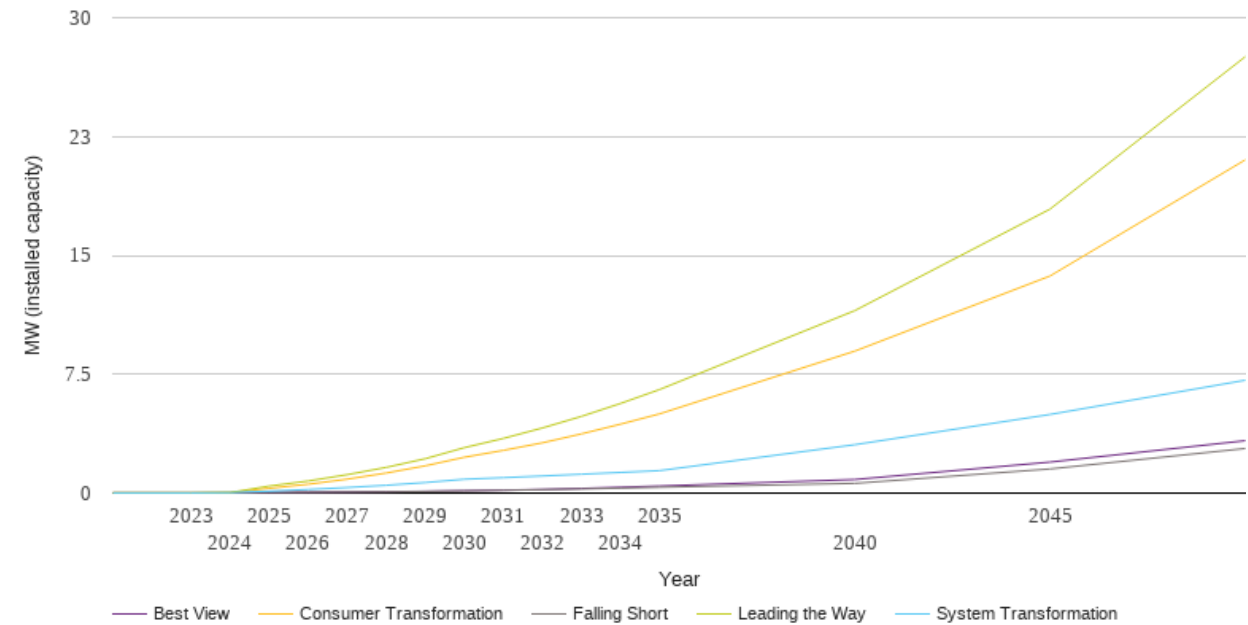
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	7.0	7.0	7.0	7.0	7.0
2023	7.4	7.7	8.2	8.3	7.8
2024	7.7	8.3	9.6	9.6	8.4
2025	8.0	9.3	12.2	12.3	9.5
2026	8.3	10.3	14.8	14.9	10.8
2027	8.7	11.6	17.4	17.6	12.2
2028	9.1	12.9	20.0	20.2	13.6
2029	9.5	14.2	22.7	22.8	15.1
2030	10.1	15.6	25.6	25.6	16.6
2031	10.8	17.2	28.7	28.6	18.4
2032	11.5	18.9	31.9	31.8	20.3
2033	12.2	20.7	35.2	35.2	22.1
2034	13.0	22.5	38.5	38.8	24.1
2035	13.6	24.1	41.7	42.2	25.9
2040	16.5	32.0	57.3	59.6	34.6
2045	19.9	40.8	74.5	77.7	44.2
2050	23.4	49.9	92.1	95.6	54.2



Technology Summary: Storage

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

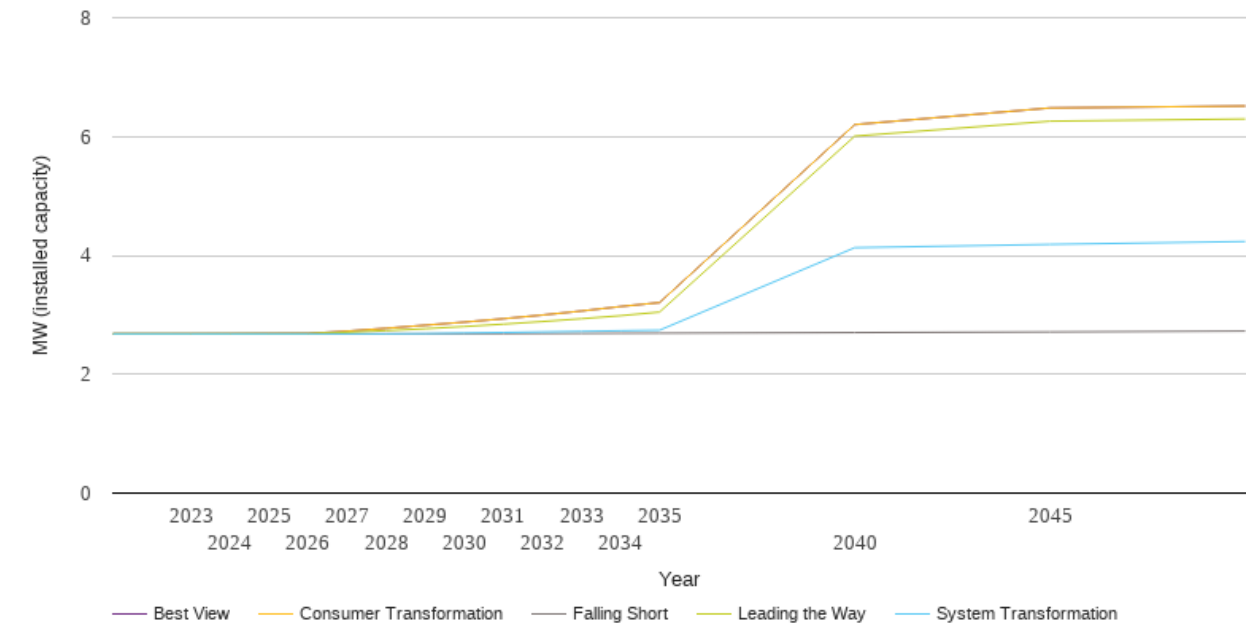
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.1	0.3	0.4	0.0
2026	0.1	0.2	0.6	0.8	0.1
2027	0.1	0.4	0.9	1.2	0.1
2028	0.1	0.5	1.3	1.6	0.1
2029	0.1	0.7	1.7	2.2	0.1
2030	0.1	0.9	2.3	2.9	0.1
2031	0.2	1.0	2.7	3.4	0.2
2032	0.2	1.1	3.2	4.1	0.2
2033	0.3	1.2	3.7	4.8	0.3
2034	0.3	1.3	4.4	5.7	0.4
2035	0.4	1.4	5.0	6.5	0.4
2040	0.6	3.1	9.0	11.5	0.9
2045	1.5	5.0	13.7	17.9	2.0
2050	2.8	7.1	21.0	27.5	3.3



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	2.7	2.7	2.7	2.7	2.7
2023	2.7	2.7	2.7	2.7	2.7
2024	2.7	2.7	2.7	2.7	2.7
2025	2.7	2.7	2.7	2.7	2.7
2026	2.7	2.7	2.7	2.7	2.7
2027	2.7	2.7	2.7	2.7	2.7
2028	2.7	2.7	2.8	2.7	2.8
2029	2.7	2.7	2.8	2.8	2.8
2030	2.7	2.7	2.9	2.8	2.9
2031	2.7	2.7	2.9	2.8	2.9
2032	2.7	2.7	3.0	2.9	3.0
2033	2.7	2.7	3.1	2.9	3.1
2034	2.7	2.7	3.1	3.0	3.1
2035	2.7	2.7	3.2	3.0	3.2
2040	2.7	4.1	6.2	6.0	6.2
2045	2.7	4.2	6.5	6.3	6.5
2050	2.7	4.2	6.5	6.3	6.5



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))
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