

Distribution Future Energy Scenarios 2022

Local Authority:
Boston

What are Distribution Future Energy Scenarios?

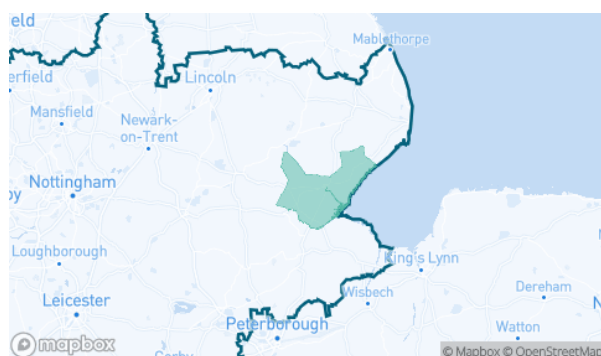
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Boston 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 Boston 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	180	108	108	0	13097	6017	6017	0
Domestic	New dwellings	0	2427	2716	2716	3290	4900	4891	4891	4875
Electric vehicles	Electric vehicles	911	5643	7591	13912	13966	44707	40893	40205	34639
EV Charge Point	EV charge points	437	2281	3713	6990	7689	22720	24190	25167	24808
Heat pumps	Heat pump installations	585	3136	3448	6582	9874	17561	20212	33010	29600
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	0.2	0.0	0.0	0.7	3.2	1.6	2.5
Non domestic	Floorspace (metres squared) of new I&C developments	0	59216	71084	71084	77593	142459	141980	141980	142613
Other Distributed Generation	MW (installed capacity)	16.7	21.3	21.6	22.1	22.2	21.3	21.7	3.5	31.9
Resistive electric heating	Resistive electric heating units	4326	3638	3502	3727	3581	2462	1025	2427	2581
Solar Generation	MW (installed capacity)	19.8	30.9	34.5	40.5	41.0	38.2	56.4	82.1	86.3
Storage	MW (installed capacity)	0.0	0.1	0.6	1.4	1.8	2.0	5.6	14.0	17.5
Wind	MW (installed capacity)	0.2	0.2	0.2	0.3	0.3	0.2	0.4	1.3	1.1

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

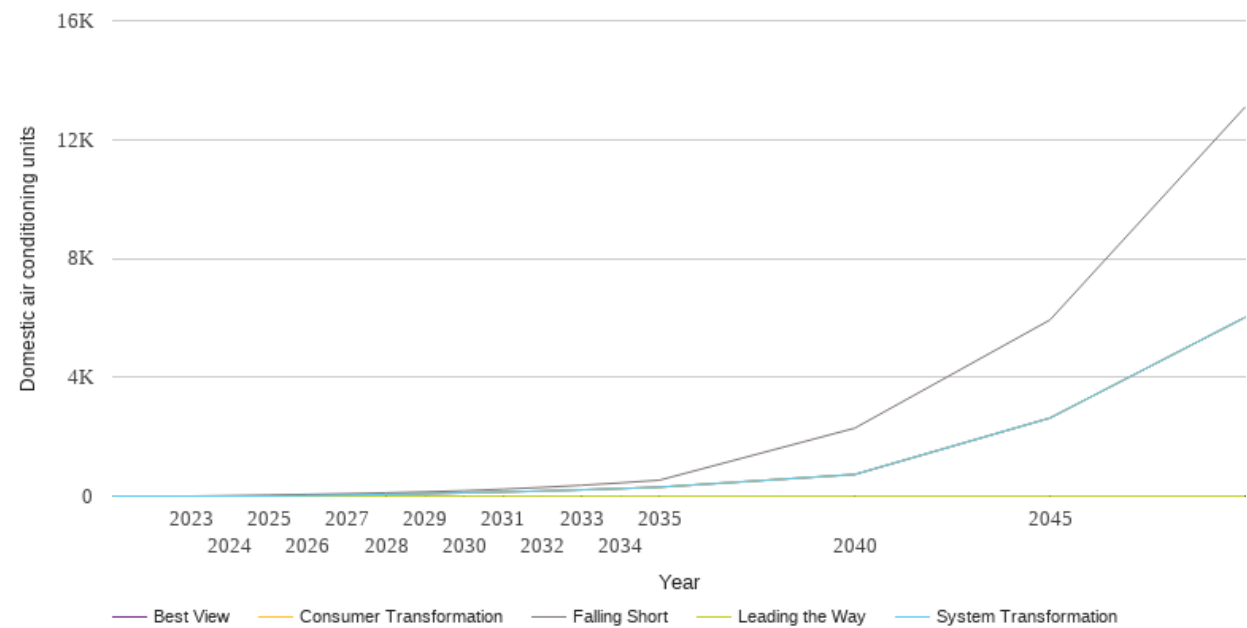
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

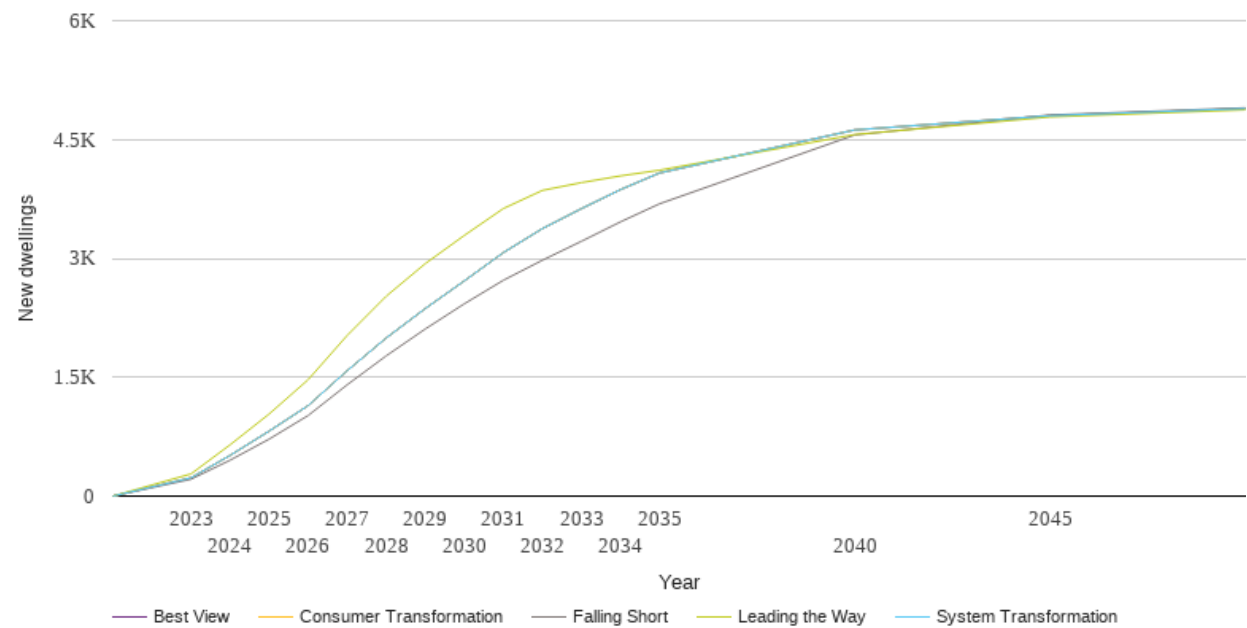
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	16	0	0	0	0
2025	35	0	0	0	0
2026	57	17	17	0	17
2027	82	36	36	0	36
2028	110	57	57	0	57
2029	143	81	81	0	81
2030	180	108	108	0	108
2031	233	138	138	0	138
2032	294	172	172	0	172
2033	364	210	210	0	210
2034	444	253	253	0	253
2035	536	301	301	0	301
2040	2286	728	728	0	728
2045	5928	2628	2628	0	2628
2050	13097	6017	6017	0	6017



Technology Summary: Domestic

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

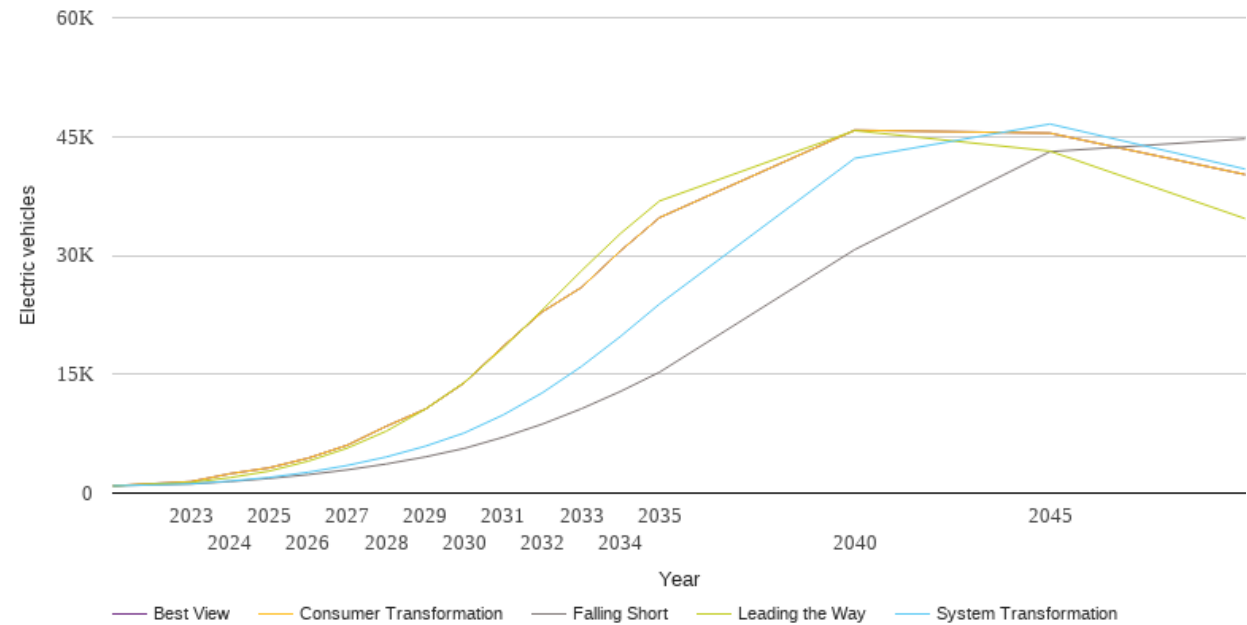
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	213	231	231	280	231
2024	453	513	513	647	513
2025	719	820	820	1036	820
2026	1017	1142	1142	1469	1142
2027	1405	1583	1583	2028	1583
2028	1770	1996	1996	2523	1996
2029	2109	2367	2367	2934	2367
2030	2427	2716	2716	3290	2716
2031	2724	3073	3073	3629	3073
2032	2977	3376	3376	3858	3376
2033	3216	3628	3628	3956	3628
2034	3461	3868	3868	4041	3868
2035	3689	4078	4078	4113	4078
2040	4558	4621	4621	4563	4621
2045	4810	4801	4801	4785	4801
2050	4900	4891	4891	4875	4891



Technology Summary: Electric vehicles

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

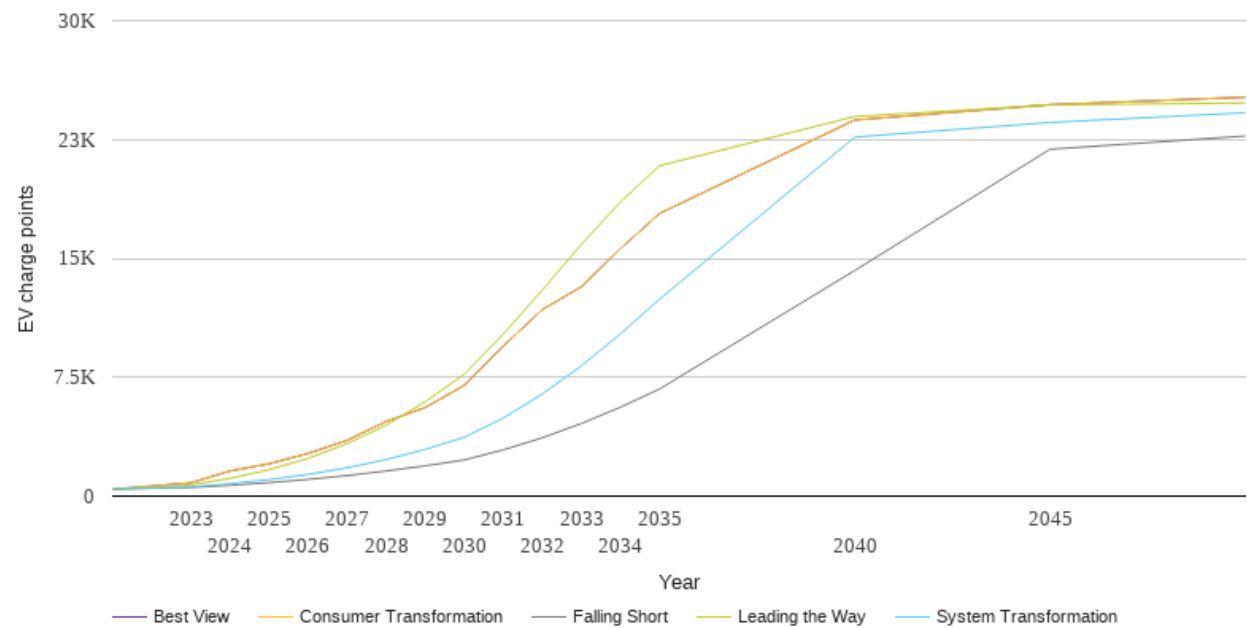
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	911	911	911	911	911
2023	1152	1168	1454	1337	1454
2024	1460	1520	2447	1951	2447
2025	1845	1973	3186	2777	3186
2026	2328	2630	4412	4027	4412
2027	2934	3484	6043	5676	6043
2028	3670	4562	8434	7814	8434
2029	4566	5916	10596	10587	10596
2030	5643	7591	13912	13966	13912
2031	7061	9877	18551	18349	18551
2032	8708	12663	22886	23128	22886
2033	10643	15983	25958	28058	25958
2034	12833	19770	30574	32760	30574
2035	15261	23869	34767	36868	34767
2040	30732	42249	45797	45750	45797
2045	43096	46578	45426	43155	45426
2050	44707	40893	40205	34639	40205



Technology Summary: EV Charge Point

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

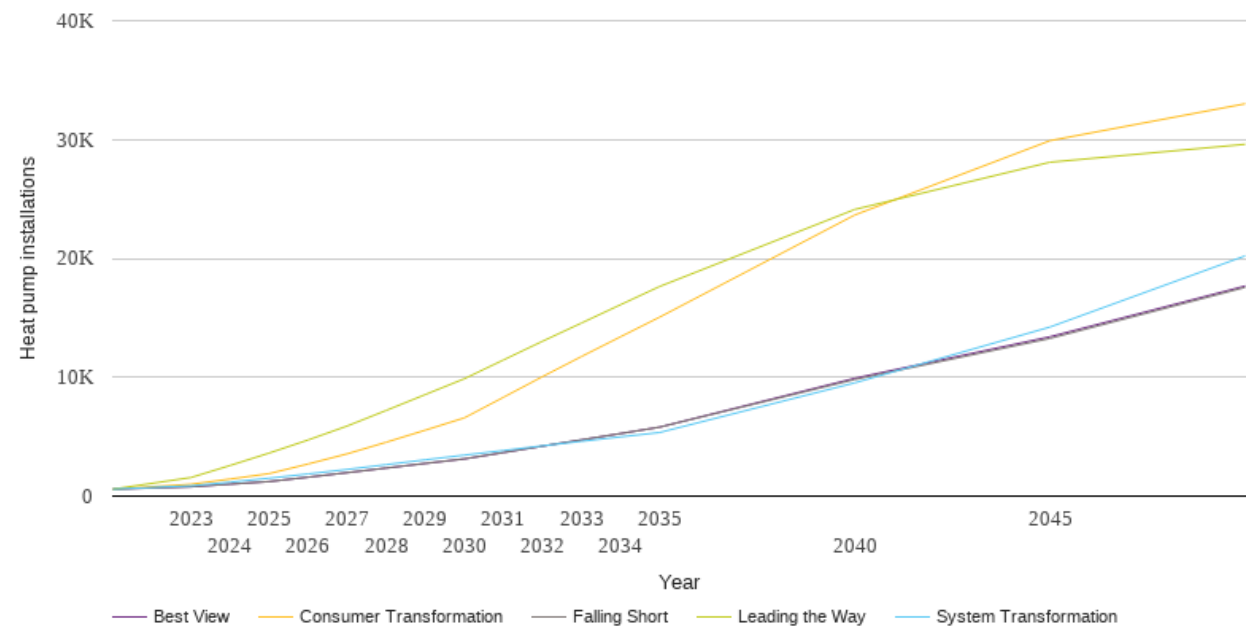
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	437	437	437	437	437
2023	544	582	838	712	838
2024	679	781	1585	1115	1585
2025	849	1040	2038	1662	2038
2026	1053	1369	2692	2382	2692
2027	1298	1787	3520	3311	3520
2028	1584	2308	4714	4482	4714
2029	1910	2945	5592	5960	5592
2030	2281	3713	6990	7689	6990
2031	2920	4931	9475	10225	9475
2032	3683	6444	11769	13002	11769
2033	4583	8222	13215	15893	13215
2034	5614	10234	15618	18566	15618
2035	6753	12424	17834	20847	17834
2040	14236	22652	23732	23950	23732
2045	21887	23578	24698	24676	24698
2050	22720	24190	25167	24808	25167



Technology Summary: Heat pumps

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

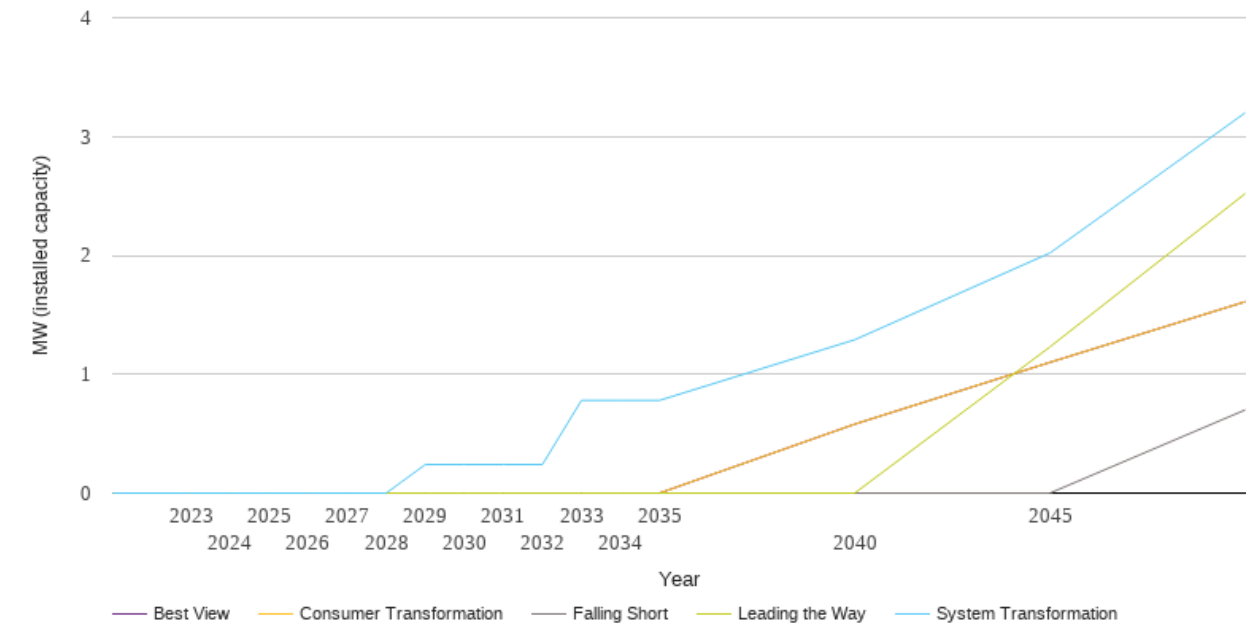
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	585	585	585	585	585
2023	786	866	995	1563	786
2024	1006	1173	1432	2574	1006
2025	1221	1505	1890	3620	1221
2026	1592	1866	2702	4723	1590
2027	1975	2244	3557	5897	1970
2028	2364	2648	4532	7208	2356
2029	2754	3053	5547	8541	2744
2030	3136	3448	6582	9874	3124
2031	3667	3834	8310	11452	3659
2032	4205	4227	10048	13024	4200
2033	4730	4608	11743	14559	4731
2034	5260	4982	13401	16100	5263
2035	5795	5348	15054	17632	5804
2040	9806	9527	23650	24117	9912
2045	13261	14224	29904	28091	13405
2050	17561	20212	33010	29600	17677



Technology Summary: Hydrogen electrolysis

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

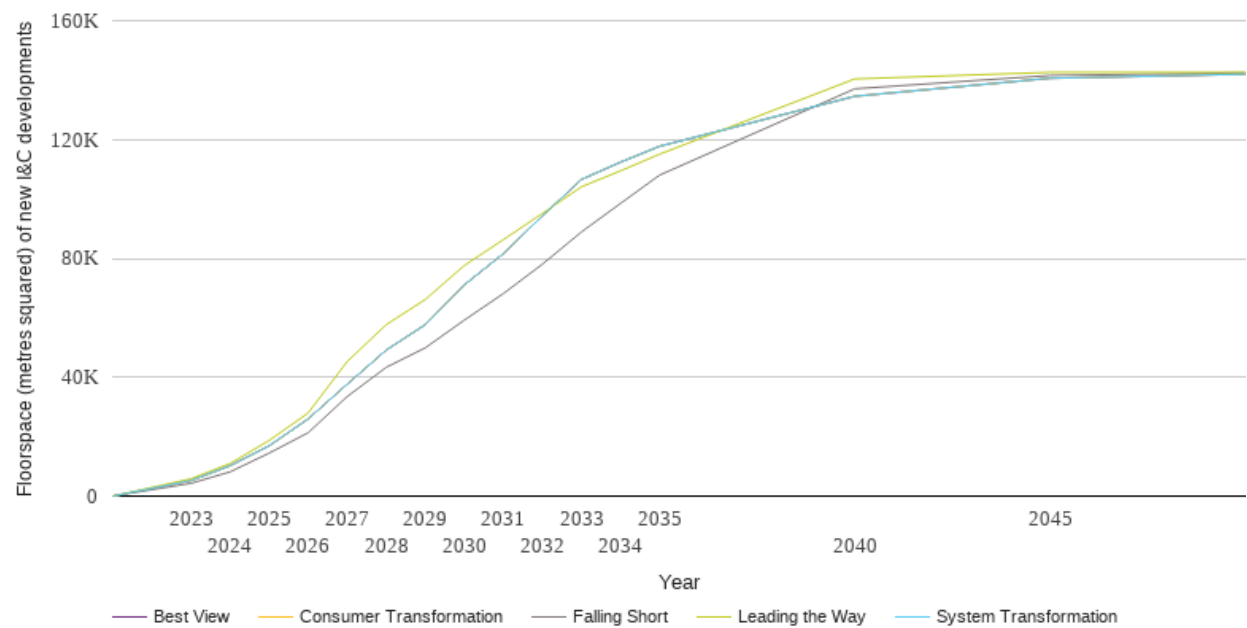
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0	0.0
2028	0.0	0.0	0.0	0.0	0.0
2029	0.0	0.2	0.0	0.0	0.0
2030	0.0	0.2	0.0	0.0	0.0
2031	0.0	0.2	0.0	0.0	0.0
2032	0.0	0.2	0.0	0.0	0.0
2033	0.0	0.8	0.0	0.0	0.0
2034	0.0	0.8	0.0	0.0	0.0
2035	0.0	0.8	0.0	0.0	0.0
2040	0.0	1.3	0.6	0.0	0.6
2045	0.0	2.0	1.1	1.2	1.1
2050	0.7	3.2	1.6	2.5	1.6



Technology Summary: Non domestic

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

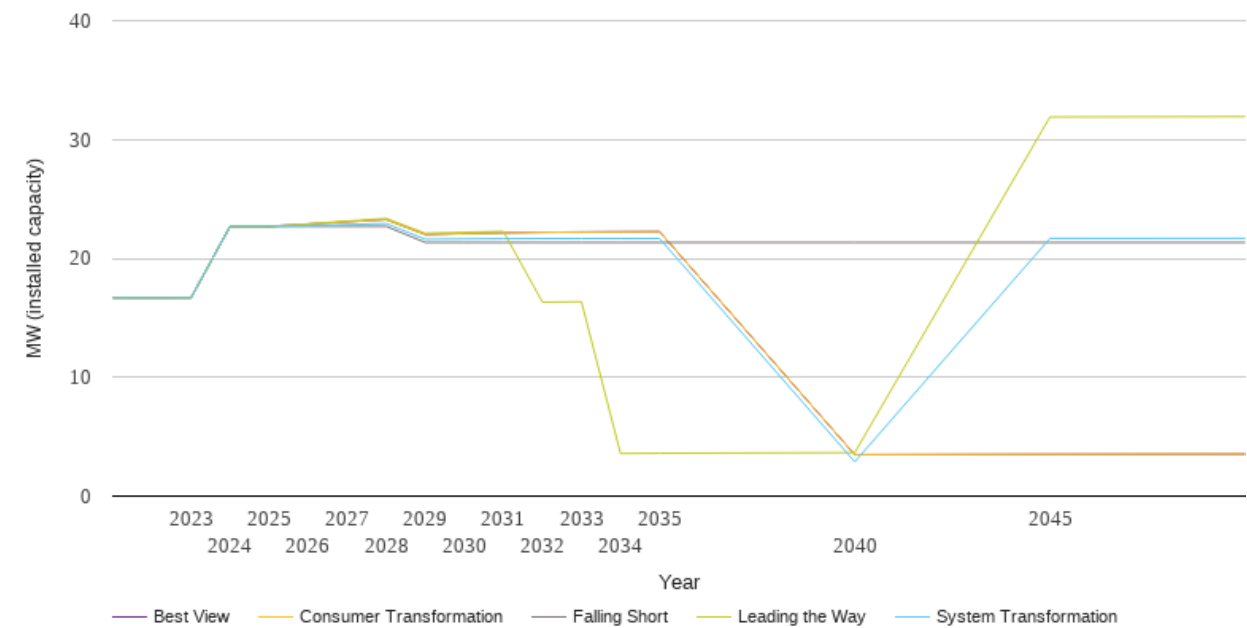
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	4310	5234	5234	5841	5234
2024	8145	10236	10236	10945	10236
2025	14473	16923	16923	18722	16923
2026	21322	25973	25973	27965	25973
2027	33511	37671	37671	45289	37671
2028	43336	49137	49137	57692	49137
2029	49899	57692	57692	66164	57692
2030	59216	71084	71084	77593	71084
2031	68150	81594	81594	86307	81594
2032	78045	94315	94315	95117	94315
2033	88902	106556	106556	104097	106556
2034	98500	112379	112379	109465	112379
2035	108026	117722	117722	115059	117722
2040	137059	134555	134555	140398	134555
2045	141559	140630	140630	142613	140630
2050	142459	141980	141980	142613	141980



Technology Summary: Other Distributed Generation

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

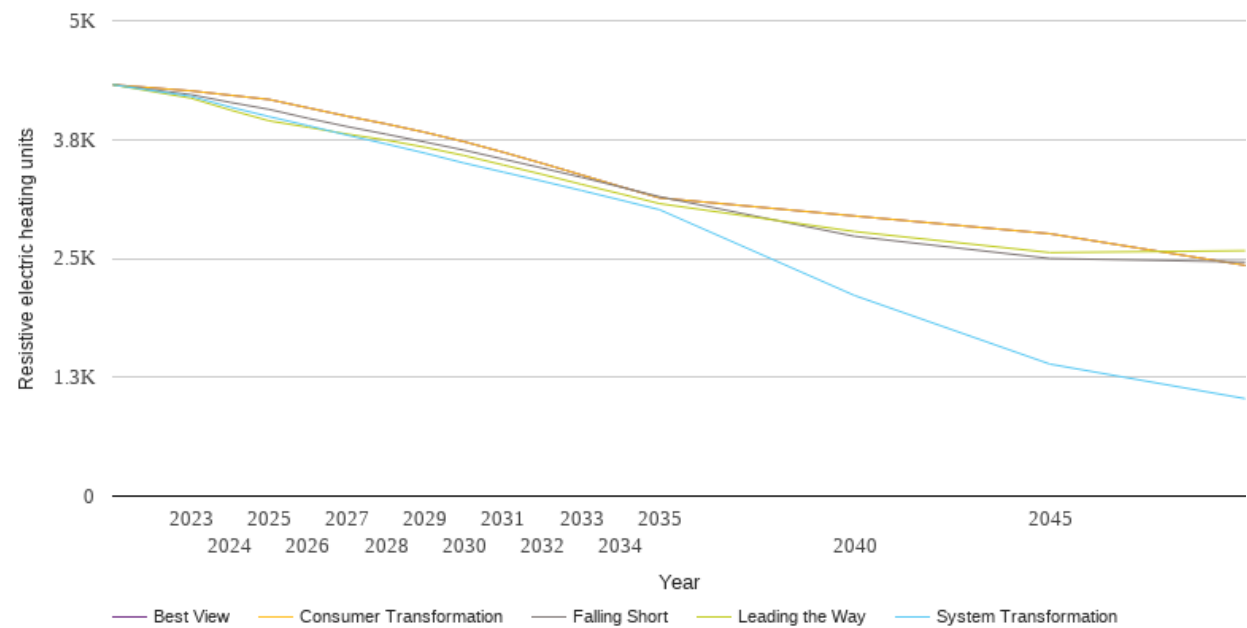
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	16.7	16.7	16.7	16.7	16.7
2023	16.7	16.7	16.7	16.7	16.7
2024	22.7	22.7	22.7	22.7	22.7
2025	22.7	22.7	22.7	22.7	22.7
2026	22.7	22.8	22.9	22.9	22.9
2027	22.7	22.8	23.1	23.1	23.1
2028	22.7	22.9	23.3	23.4	23.3
2029	21.3	21.6	22.0	22.1	22.0
2030	21.3	21.6	22.1	22.2	22.1
2031	21.3	21.7	22.2	22.3	22.2
2032	21.3	21.7	22.2	16.3	22.2
2033	21.3	21.7	22.2	16.4	22.2
2034	21.3	21.7	22.2	3.6	22.2
2035	21.3	21.7	22.2	3.6	22.2
2040	21.3	2.9	3.5	3.7	3.5
2045	21.3	21.7	3.5	31.9	3.5
2050	21.3	21.7	3.5	31.9	3.5



Technology Summary: Resistive electric heating

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

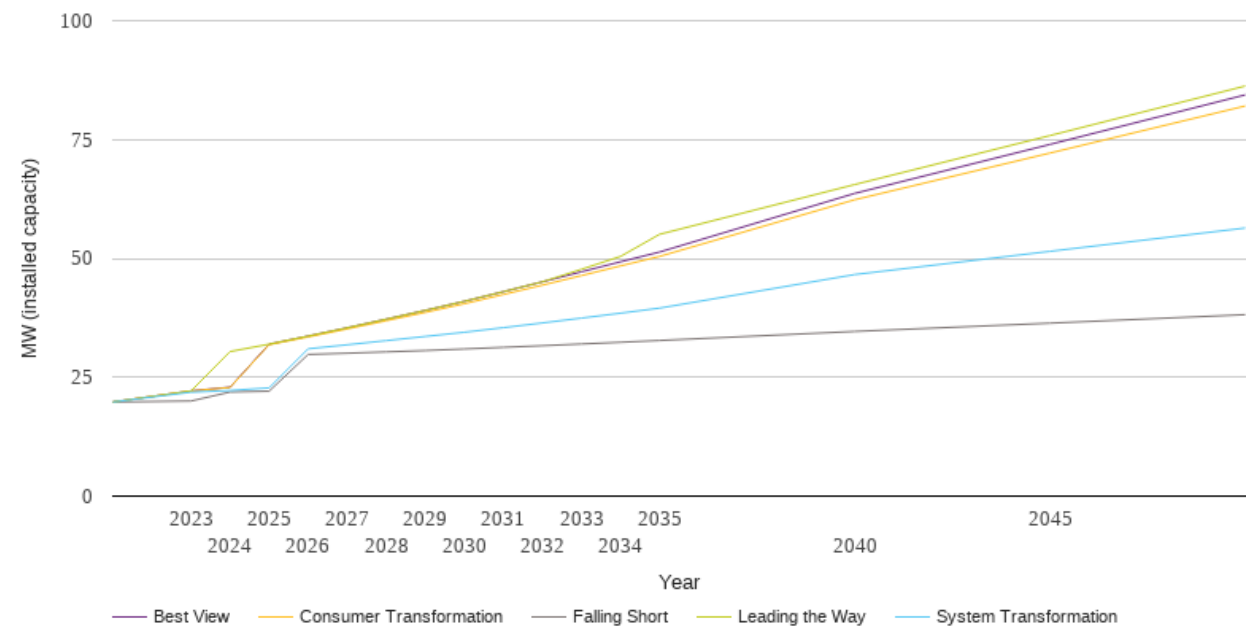
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	4326	4326	4326	4326	4326
2023	4222	4204	4262	4185	4262
2024	4141	4092	4216	4061	4216
2025	4067	3991	4171	3947	4171
2026	3973	3896	4083	3879	4083
2027	3886	3796	3995	3807	3995
2028	3806	3703	3914	3744	3914
2029	3723	3606	3825	3668	3825
2030	3638	3502	3727	3581	3727
2031	3544	3407	3616	3482	3616
2032	3450	3312	3499	3383	3499
2033	3353	3214	3378	3279	3378
2034	3251	3114	3255	3179	3255
2035	3149	3012	3136	3076	3136
2040	2732	2109	2946	2782	2946
2045	2499	1388	2759	2561	2759
2050	2462	1025	2427	2581	2427



Technology Summary: Solar Generation

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

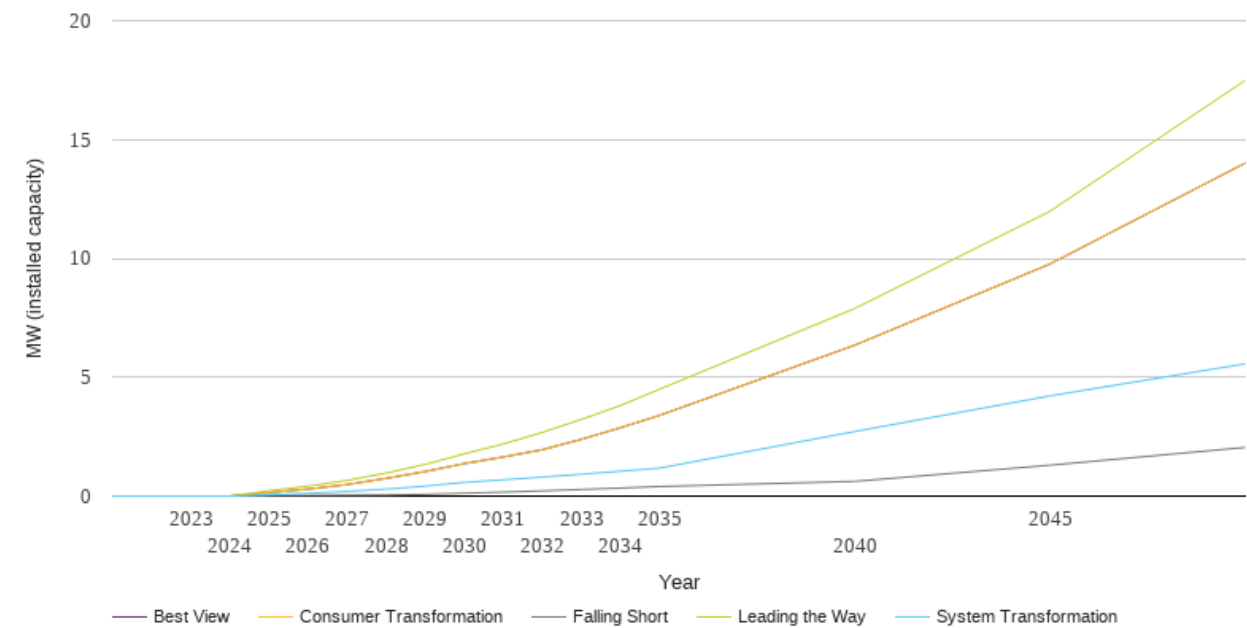
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	19.8	19.8	19.8	19.8	19.8
2023	20.0	21.9	22.1	22.1	22.1
2024	21.9	22.2	22.8	30.4	22.9
2025	22.1	22.8	31.9	32.0	32.0
2026	29.8	31.0	33.5	33.6	33.6
2027	30.1	31.8	35.2	35.4	35.4
2028	30.3	32.7	36.9	37.2	37.2
2029	30.6	33.6	38.6	39.1	39.1
2030	30.9	34.5	40.5	41.0	41.0
2031	31.3	35.4	42.4	43.0	43.0
2032	31.6	36.4	44.4	45.1	45.1
2033	32.0	37.4	46.4	47.7	47.2
2034	32.4	38.5	48.4	50.4	49.3
2035	32.7	39.5	50.4	55.1	51.3
2040	34.6	46.6	62.3	65.5	63.7
2045	36.4	51.5	72.2	75.8	74.0
2050	38.2	56.4	82.1	86.3	84.4



Technology Summary: Storage

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

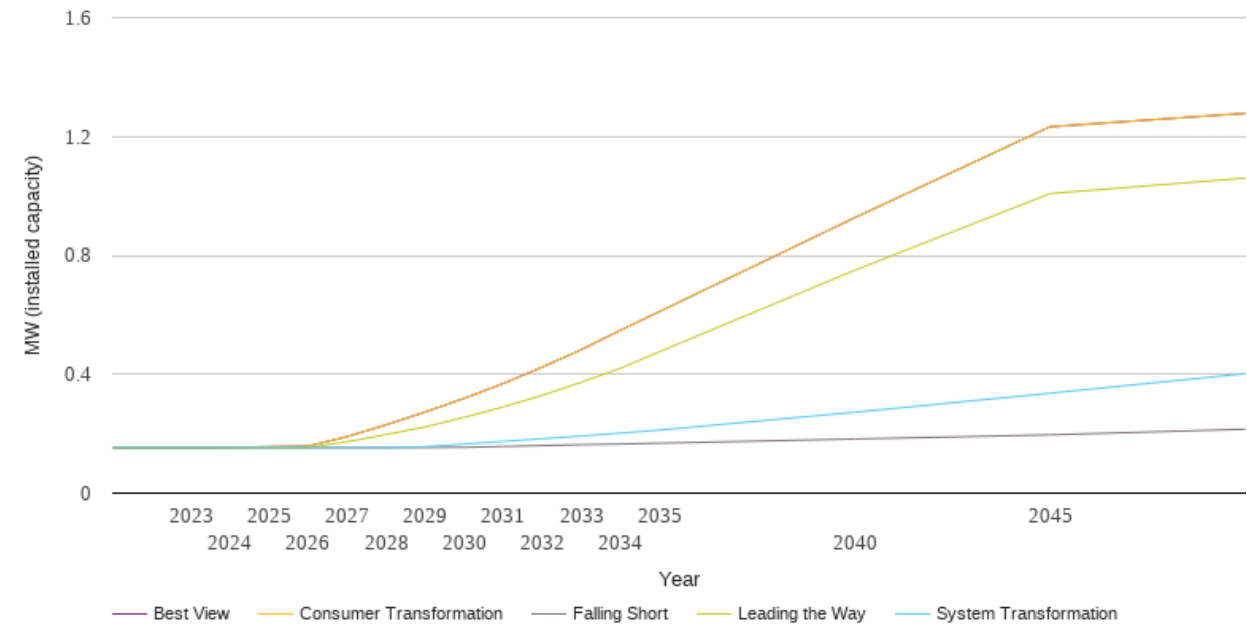
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.1	0.1	0.2	0.1
2026	0.0	0.1	0.3	0.4	0.3
2027	0.0	0.2	0.5	0.7	0.5
2028	0.0	0.3	0.7	1.0	0.7
2029	0.1	0.4	1.0	1.3	1.0
2030	0.1	0.6	1.4	1.8	1.4
2031	0.2	0.7	1.6	2.2	1.6
2032	0.2	0.8	2.0	2.7	2.0
2033	0.3	0.9	2.4	3.2	2.4
2034	0.3	1.0	2.9	3.8	2.9
2035	0.4	1.2	3.4	4.5	3.4
2040	0.6	2.7	6.3	7.9	6.3
2045	1.3	4.2	9.8	12.0	9.8
2050	2.0	5.6	14.0	17.5	14.0



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	0.2	0.2	0.2	0.2	0.2
2023	0.2	0.2	0.2	0.2	0.2
2024	0.2	0.2	0.2	0.2	0.2
2025	0.2	0.2	0.2	0.2	0.2
2026	0.2	0.2	0.2	0.2	0.2
2027	0.2	0.2	0.2	0.2	0.2
2028	0.2	0.2	0.2	0.2	0.2
2029	0.2	0.2	0.3	0.2	0.3
2030	0.2	0.2	0.3	0.3	0.3
2031	0.2	0.2	0.4	0.3	0.4
2032	0.2	0.2	0.4	0.3	0.4
2033	0.2	0.2	0.5	0.4	0.5
2034	0.2	0.2	0.5	0.4	0.5
2035	0.2	0.2	0.6	0.5	0.6
2040	0.2	0.3	0.9	0.7	0.9
2045	0.2	0.3	1.2	1.0	1.2
2050	0.2	0.4	1.3	1.1	1.3



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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