

Distribution Future Energy Scenarios 2022

Local Authority:
Bromsgrove

What are Distribution Future Energy Scenarios?

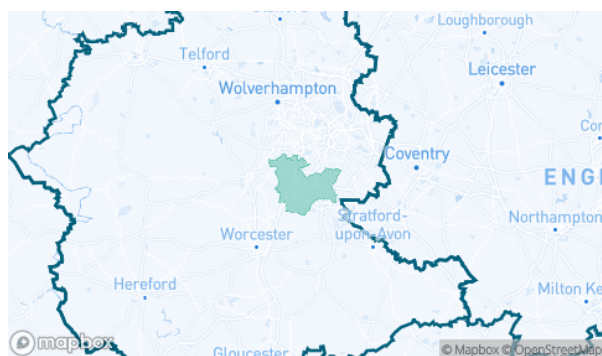
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Bromsgrove 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 Bromsgrove 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	311	186	186	0	21455	10028	10028	0
Domestic	New dwellings	0	2631	2844	2844	3315	4317	4238	4238	4181
Electric vehicles	Electric vehicles	1249	10487	12356	23013	22854	70100	59708	61547	49698
EV Charge Point	EV charge points	728	5250	7216	13617	14930	41453	37779	39984	40659
Heat pumps	Heat pump installations	331	2654	2803	6967	11216	21596	25229	42901	38382
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	2.7	0.0	0.5	2.4	12.9	8.8	10.3
Non domestic	Floorspace (metres squared) of new I&C developments	0	80730	96409	96409	105705	139018	139018	139018	139018
Other Distributed Generation	MW (installed capacity)	0.9	0.9	0.9	0.9	0.9	0.2	0.1	0.1	0.1
Resistive electric heating	Resistive electric heating units	3734	3255	3118	3309	3195	2491	1122	2328	2487
Solar Generation	MW (installed capacity)	8.6	13.3	19.8	28.3	26.5	41.7	77.2	109.8	105.4
Storage	MW (installed capacity)	0.0	0.3	1.1	10.3	11.3	3.4	8.4	28.0	33.1
Wind	MW (installed capacity)	0.1	0.1	0.1	0.4	0.4	0.5	1.6	4.8	3.8

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

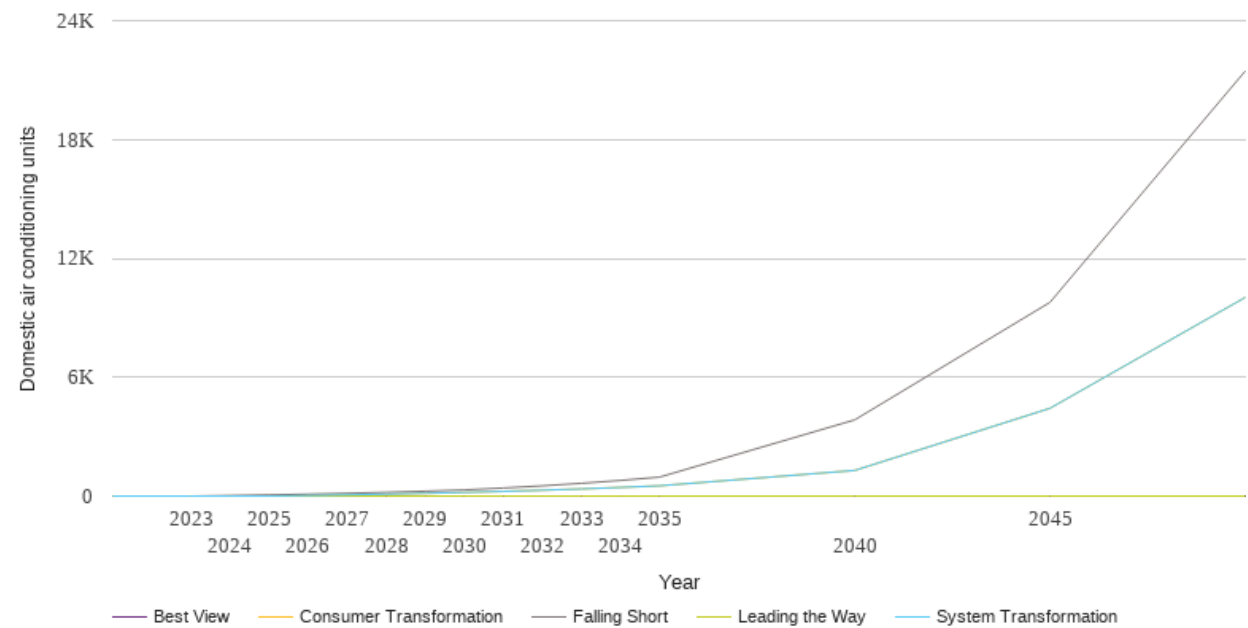
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

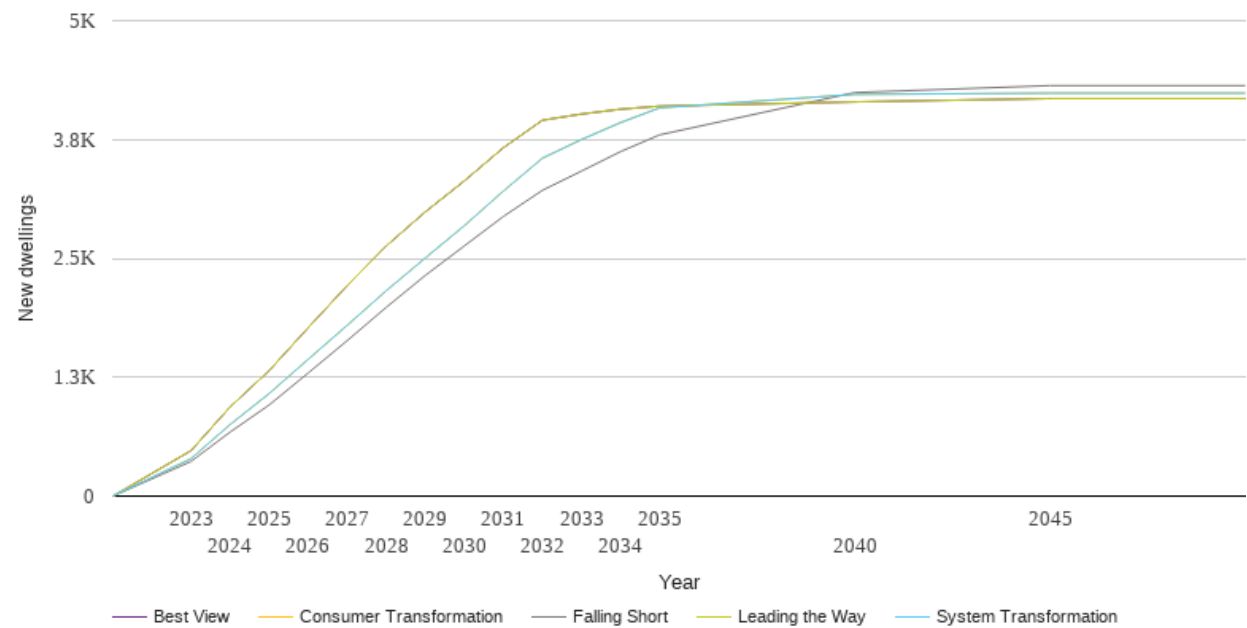
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	28	0	0	0	0
2025	61	0	0	0	0
2026	98	28	28	0	0
2027	141	61	61	0	0
2028	190	98	98	0	0
2029	247	140	140	0	0
2030	311	186	186	0	0
2031	408	238	238	0	0
2032	518	296	296	0	0
2033	645	362	362	0	0
2034	791	437	437	0	0
2035	958	520	520	0	0
2040	3849	1295	1295	0	0
2045	9781	4433	4433	0	0
2050	21455	10028	10028	0	0



Technology Summary: Domestic

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

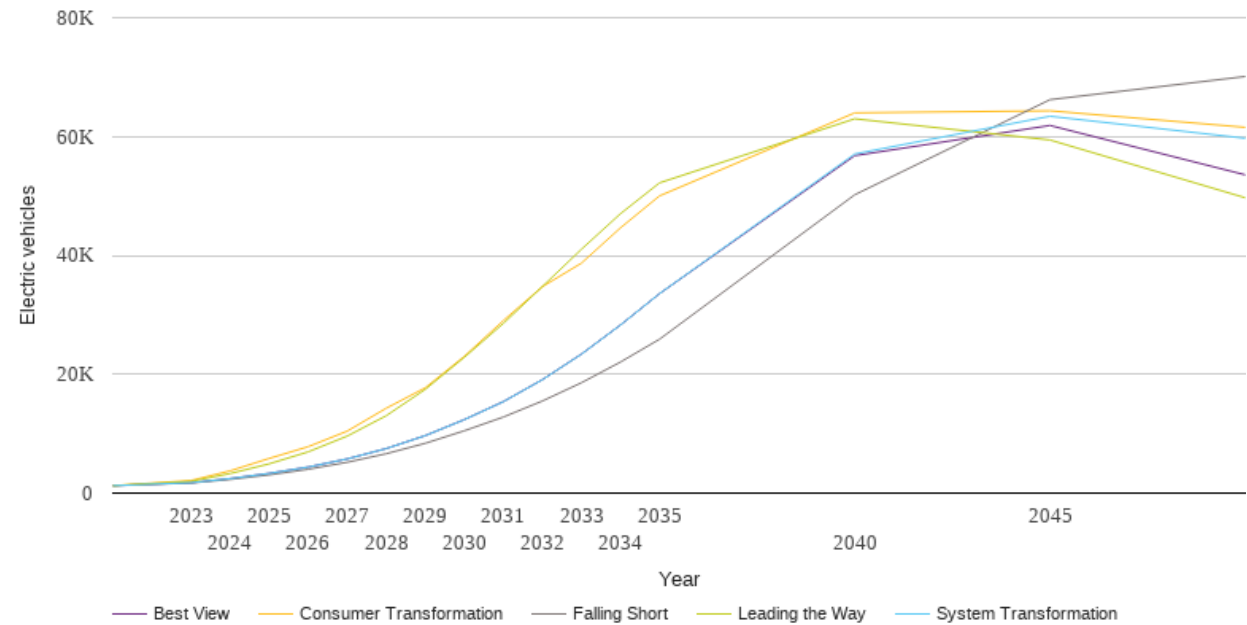
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	365	394	394	478	478
2024	673	752	752	937	937
2025	958	1078	1078	1319	1319
2026	1294	1438	1438	1770	1770
2027	1635	1796	1796	2214	2214
2028	1985	2160	2160	2631	2631
2029	2321	2504	2504	2989	2989
2030	2631	2844	2844	3315	3315
2031	2941	3208	3208	3664	3664
2032	3216	3554	3554	3953	3953
2033	3418	3750	3750	4018	4018
2034	3623	3928	3928	4069	4069
2035	3799	4083	4083	4101	4101
2040	4244	4225	4225	4146	4146
2045	4317	4238	4238	4181	4181
2050	4317	4238	4238	4181	4181



Technology Summary: Electric vehicles

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

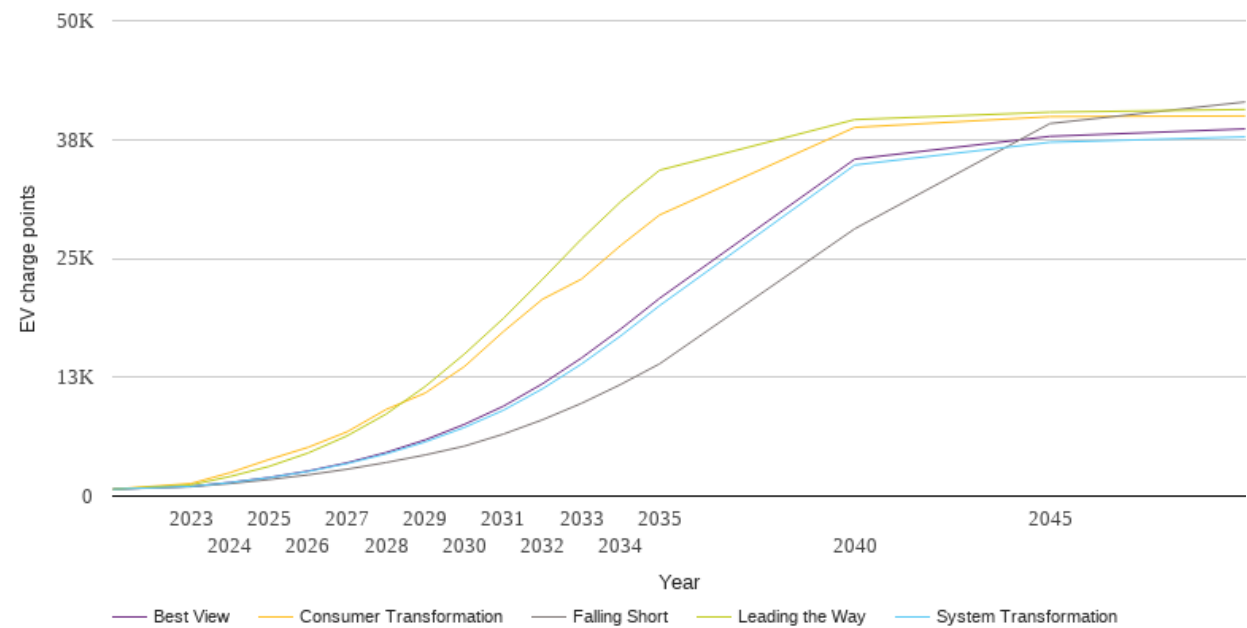
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1249	1249	1249	1249	1249
2023	1706	1749	2114	1977	1749
2024	2301	2432	3741	3287	2433
2025	3063	3311	5829	4918	3313
2026	4009	4375	7807	6936	4379
2027	5187	5747	10428	9591	5752
2028	6628	7487	14278	13022	7493
2029	8379	9668	17720	17462	9677
2030	10487	12356	23013	22854	12370
2031	12801	15381	29032	28556	15400
2032	15498	19078	34742	34758	19095
2033	18572	23379	38697	41036	23398
2034	22056	28280	44638	47017	28292
2035	25898	33569	50015	52206	33566
2040	50204	57067	63985	62989	56783
2045	66201	63412	64334	59419	61862
2050	70100	59708	61547	49698	53554



Technology Summary: EV Charge Point

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

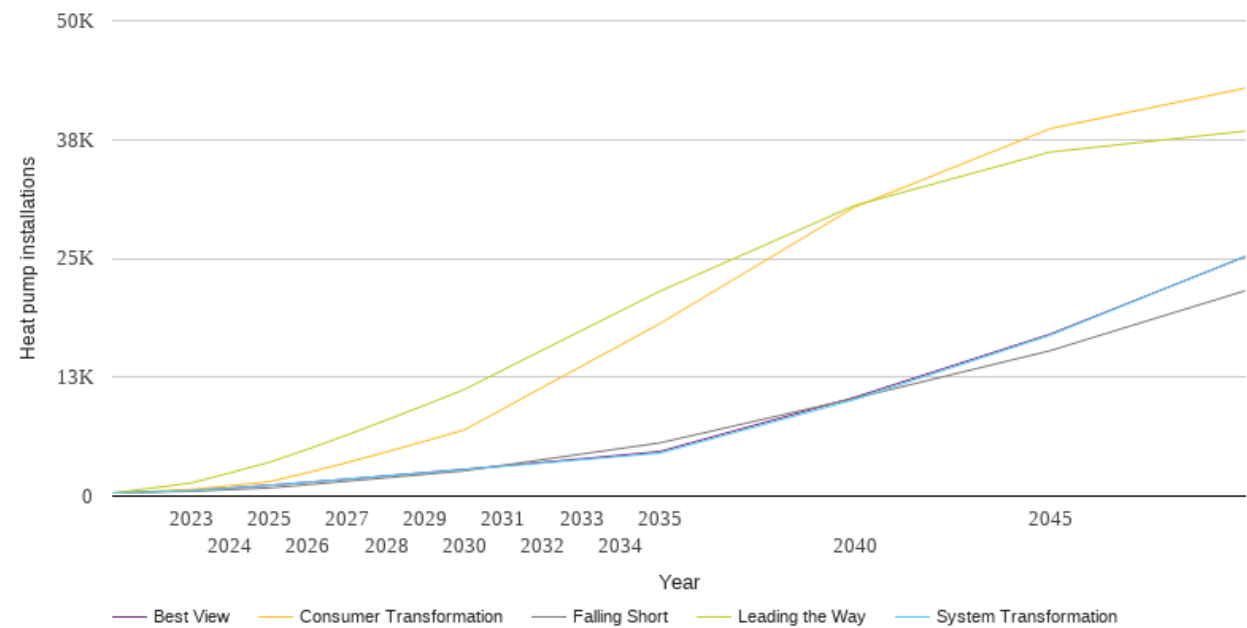
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	728	728	728	728	728
2023	985	1016	1323	1181	1021
2024	1317	1417	2463	2059	1428
2025	1734	1931	3849	3122	1956
2026	2233	2592	5132	4532	2641
2027	2829	3423	6765	6343	3508
2028	3530	4447	9115	8633	4589
2029	4330	5699	10845	11535	5917
2030	5250	7216	13617	14930	7542
2031	6519	9029	17301	18687	9455
2032	8024	11280	20701	22793	11809
2033	9756	13889	22822	27036	14521
2034	11728	16832	26341	30945	17549
2035	13908	20030	29566	34268	20798
2040	28116	34820	38777	39598	35437
2045	39182	37210	39909	40377	37836
2050	41453	37779	39984	40659	38620



Technology Summary: Heat pumps

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

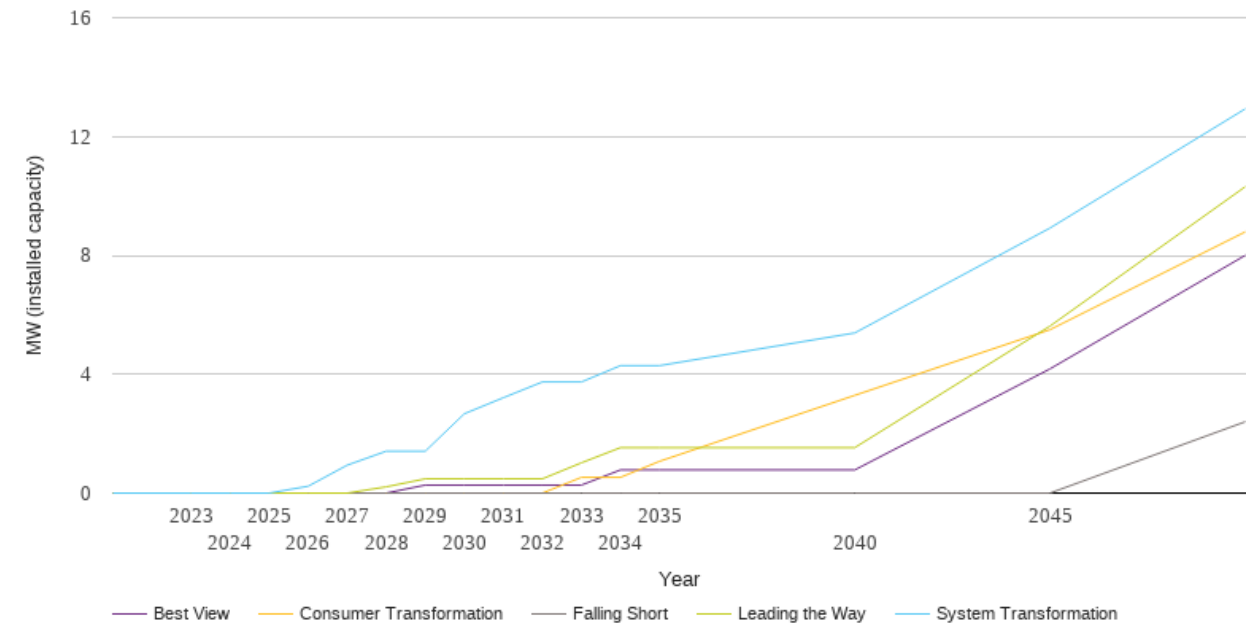
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	331	331	331	331	331
2023	503	578	704	1374	578
2024	676	852	1089	2447	852
2025	855	1132	1502	3544	1132
2026	1202	1456	2490	4953	1457
2027	1567	1785	3531	6438	1787
2028	1927	2120	4636	7991	2126
2029	2289	2460	5787	9580	2470
2030	2654	2803	6967	11216	2815
2031	3240	3136	9192	13281	3178
2032	3829	3478	11438	15344	3548
2033	4416	3822	13667	17401	3921
2034	5003	4166	15887	19458	4298
2035	5588	4513	18111	21525	4678
2040	10289	10155	30403	30569	10382
2045	15287	16918	38639	36181	17021
2050	21596	25229	42901	38382	25184



Technology Summary: Hydrogen electrolysis

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

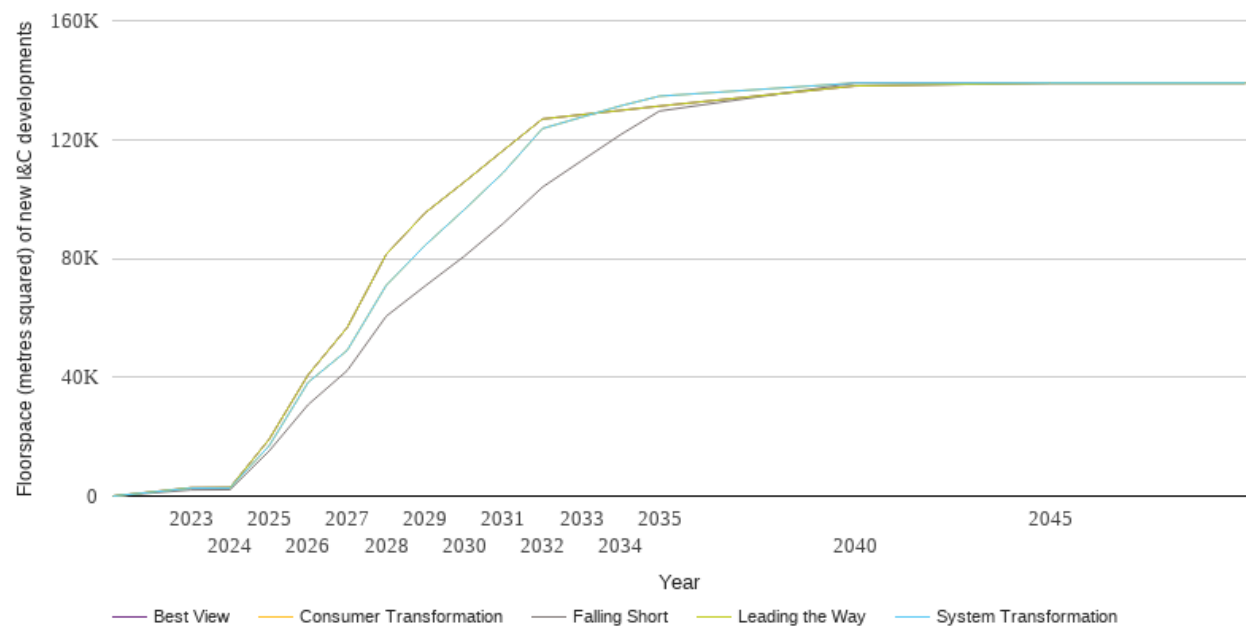
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.2	0.0	0.0	0.0
2027	0.0	0.9	0.0	0.0	0.0
2028	0.0	1.4	0.0	0.2	0.0
2029	0.0	1.4	0.0	0.5	0.3
2030	0.0	2.7	0.0	0.5	0.3
2031	0.0	3.2	0.0	0.5	0.3
2032	0.0	3.7	0.0	0.5	0.3
2033	0.0	3.7	0.5	1.0	0.3
2034	0.0	4.3	0.5	1.5	0.8
2035	0.0	4.3	1.1	1.5	0.8
2040	0.0	5.4	3.3	1.5	0.8
2045	0.0	8.9	5.5	5.6	4.2
2050	2.4	12.9	8.8	10.3	8.0



Technology Summary: Non domestic

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

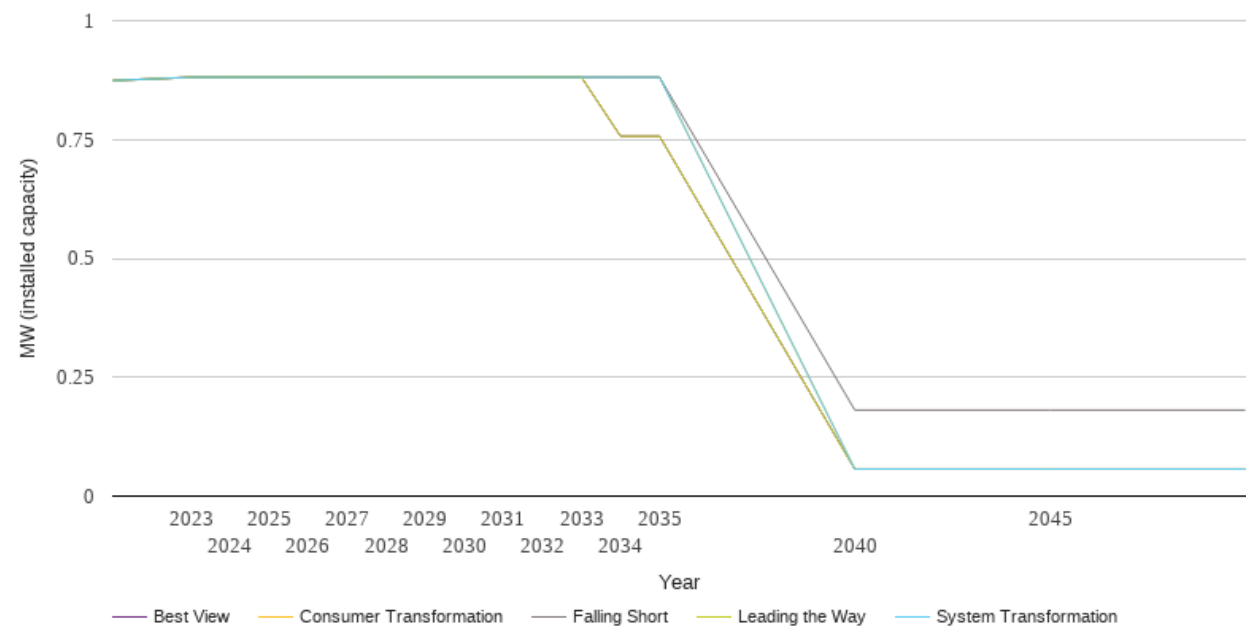
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	2066	2656	2656	2803	2803
2024	2154	2715	2715	2877	2877
2025	15163	16905	16905	19101	19101
2026	30792	38288	38288	40828	40828
2027	42240	49044	49044	56745	56745
2028	60543	70933	70933	81348	81348
2029	70761	84459	84459	95367	95367
2030	80730	96409	96409	105705	105705
2031	91795	108906	108906	116371	116371
2032	103956	123681	123681	126905	126905
2033	112830	127503	127503	128354	128354
2034	121616	131325	131325	129803	129803
2035	129594	134600	134600	131251	131251
2040	139018	139018	139018	138032	138032
2045	139018	139018	139018	139018	139018
2050	139018	139018	139018	139018	139018



Technology Summary: Other Distributed Generation

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

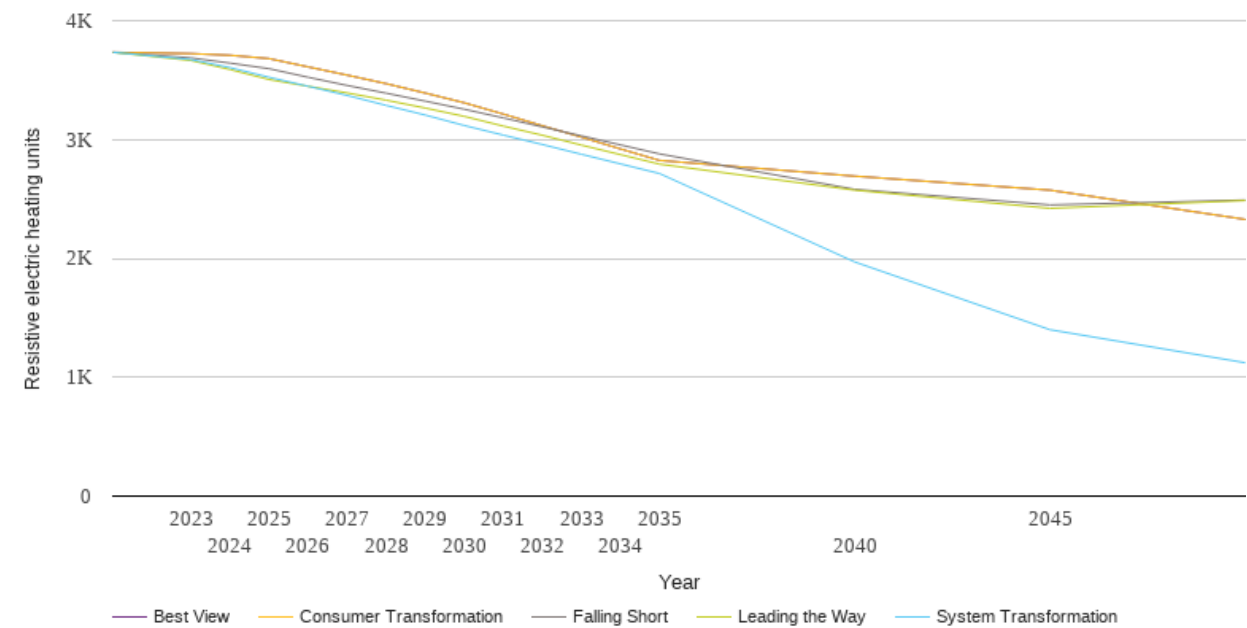
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.9	0.9	0.9	0.9	0.9
2023	0.9	0.9	0.9	0.9	0.9
2024	0.9	0.9	0.9	0.9	0.9
2025	0.9	0.9	0.9	0.9	0.9
2026	0.9	0.9	0.9	0.9	0.9
2027	0.9	0.9	0.9	0.9	0.9
2028	0.9	0.9	0.9	0.9	0.9
2029	0.9	0.9	0.9	0.9	0.9
2030	0.9	0.9	0.9	0.9	0.9
2031	0.9	0.9	0.9	0.9	0.9
2032	0.9	0.9	0.9	0.9	0.9
2033	0.9	0.9	0.9	0.9	0.9
2034	0.9	0.9	0.9	0.8	0.8
2035	0.9	0.9	0.9	0.8	0.8
2040	0.2	0.1	0.1	0.1	0.1
2045	0.2	0.1	0.1	0.1	0.1
2050	0.2	0.1	0.1	0.1	0.1



Technology Summary: Resistive electric heating

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

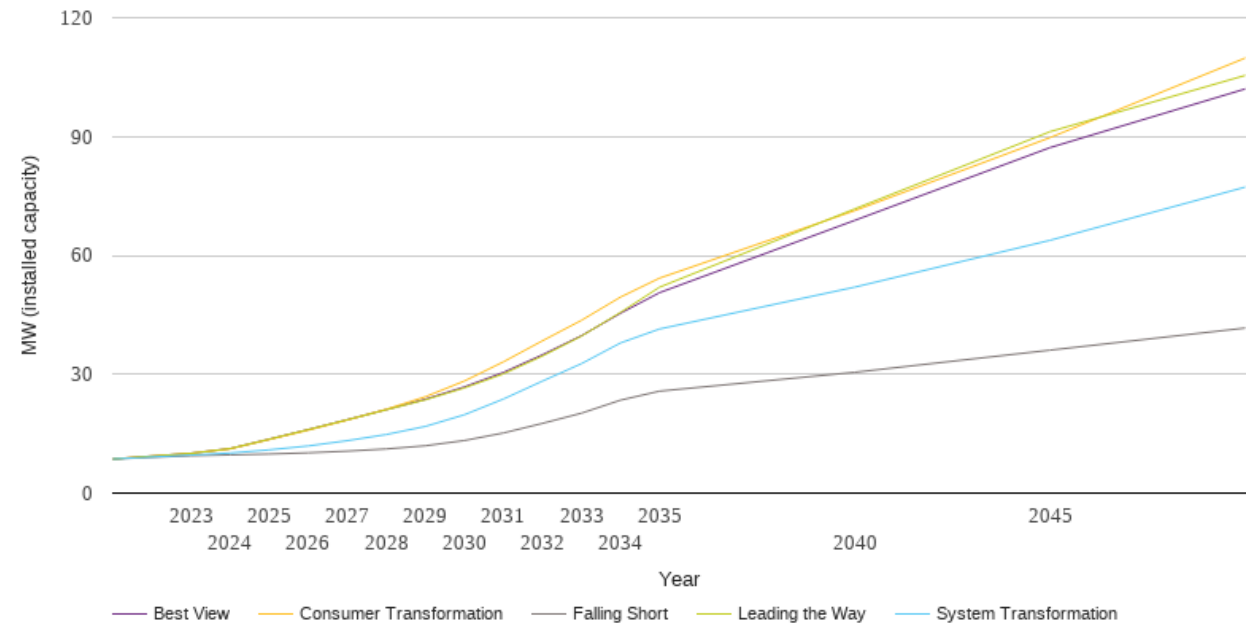
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	3734	3734	3734	3734	3734
2023	3687	3673	3723	3665	3723
2024	3643	3605	3709	3589	3709
2025	3596	3524	3681	3505	3681
2026	3524	3448	3611	3448	3611
2027	3455	3371	3542	3392	3542
2028	3390	3287	3470	3331	3470
2029	3323	3206	3391	3265	3391
2030	3255	3118	3309	3195	3309
2031	3182	3037	3214	3113	3214
2032	3106	2958	3116	3036	3116
2033	3031	2876	3020	2953	3020
2034	2955	2795	2921	2873	2921
2035	2879	2714	2824	2793	2824
2040	2581	1970	2692	2574	2692
2045	2450	1400	2574	2421	2574
2050	2491	1122	2328	2487	2328



Technology Summary: Solar Generation

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

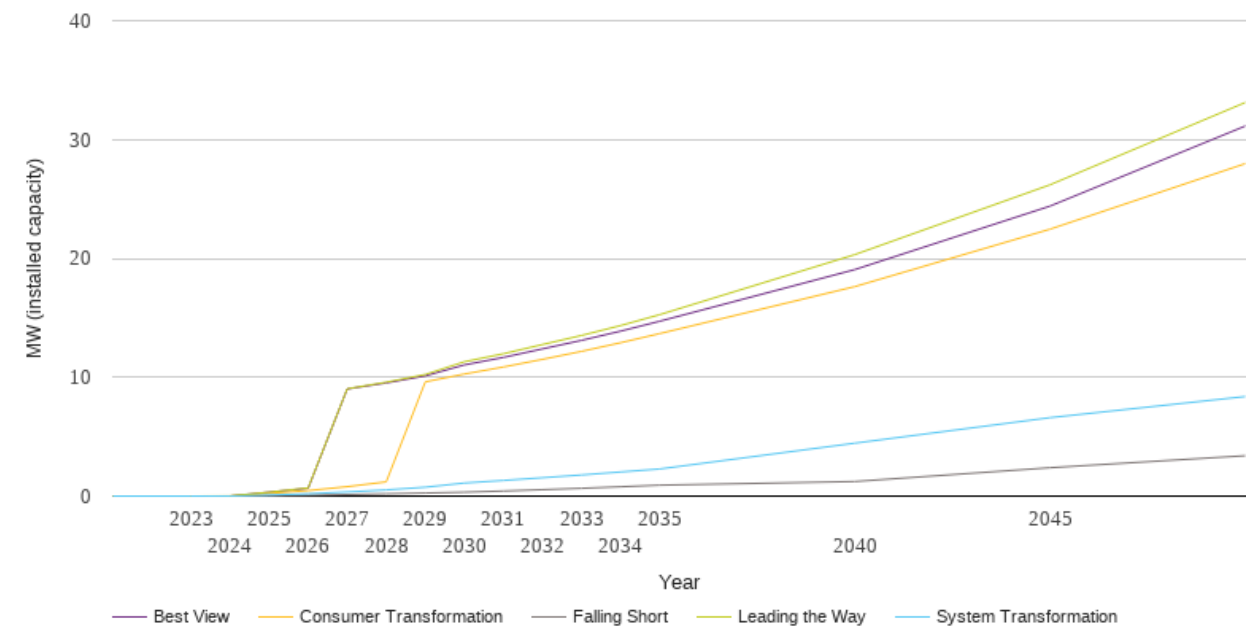
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	8.6	8.6	8.6	8.6	8.6
2023	9.4	9.6	10.0	10.0	10.0
2024	9.6	10.1	11.2	11.2	11.2
2025	9.9	10.9	13.5	13.6	13.6
2026	10.2	11.9	15.9	16.0	16.0
2027	10.6	13.2	18.4	18.5	18.5
2028	11.1	14.8	21.2	21.0	21.1
2029	11.9	16.8	24.3	23.5	23.7
2030	13.3	19.8	28.3	26.5	26.8
2031	15.2	23.7	33.1	30.1	30.5
2032	17.6	28.3	38.4	34.6	34.9
2033	20.2	32.7	43.6	39.6	39.7
2034	23.5	37.9	49.5	45.6	45.4
2035	25.7	41.4	54.3	52.0	50.6
2040	30.5	52.0	71.3	71.7	68.8
2045	36.1	63.8	89.7	91.2	87.2
2050	41.7	77.2	109.8	105.4	102.0



Technology Summary: Storage

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

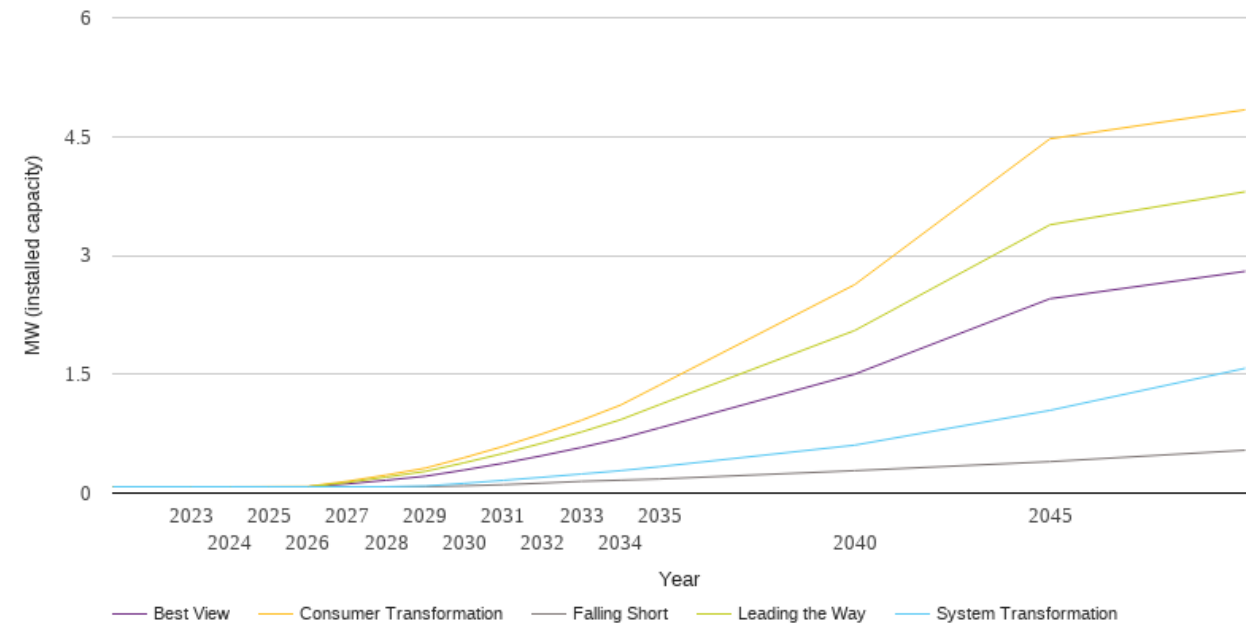
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.1	0.2	0.3	0.3
2026	0.1	0.2	0.5	0.7	0.7
2027	0.1	0.3	0.8	9.0	9.0
2028	0.2	0.5	1.2	9.6	9.5
2029	0.3	0.7	9.6	10.2	10.1
2030	0.3	1.1	10.3	11.3	11.0
2031	0.4	1.3	10.9	12.0	11.7
2032	0.5	1.5	11.5	12.7	12.4
2033	0.7	1.8	12.2	13.5	13.1
2034	0.8	2.0	12.9	14.3	13.9
2035	0.9	2.3	13.7	15.3	14.7
2040	1.2	4.5	17.6	20.3	19.1
2045	2.4	6.6	22.5	26.2	24.4
2050	3.4	8.4	28.0	33.1	31.1



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	0.1	0.1	0.1	0.1	0.1
2023	0.1	0.1	0.1	0.1	0.1
2024	0.1	0.1	0.1	0.1	0.1
2025	0.1	0.1	0.1	0.1	0.1
2026	0.1	0.1	0.1	0.1	0.1
2027	0.1	0.1	0.1	0.1	0.1
2028	0.1	0.1	0.2	0.2	0.2
2029	0.1	0.1	0.3	0.3	0.2
2030	0.1	0.1	0.4	0.4	0.3
2031	0.1	0.2	0.6	0.5	0.4
2032	0.1	0.2	0.7	0.6	0.5
2033	0.1	0.2	0.9	0.8	0.6
2034	0.2	0.3	1.1	0.9	0.7
2035	0.2	0.3	1.4	1.1	0.8
2040	0.3	0.6	2.6	2.1	1.5
2045	0.4	1.0	4.5	3.4	2.5
2050	0.5	1.6	4.8	3.8	2.8



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

