

# Distribution Future Energy Scenarios 2022

Local Authority:  
Forest of Dean

## What are Distribution Future Energy Scenarios?

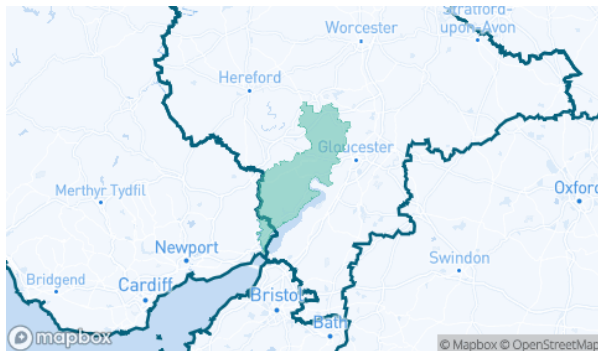
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Forest of Dean covered by the NGED licence areas.



## Scenario Summary

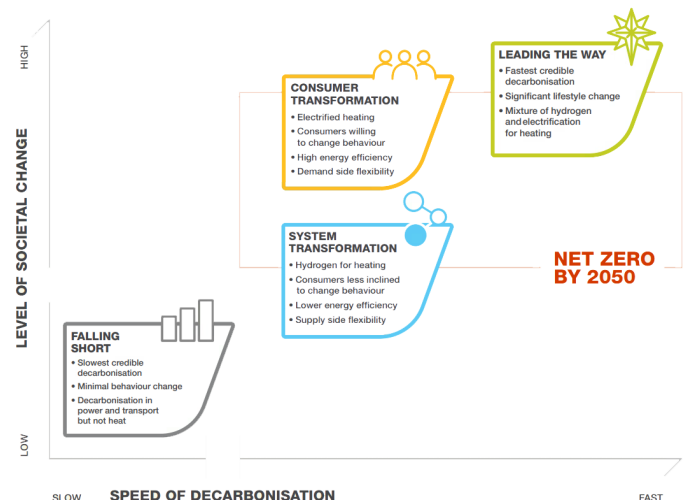
This DFES scenario framework includes three scenarios that are compliant with UK government targets of Net Zero greenhouse gas emissions by 2050. A summary of each scenario is below:

**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 Forest of Dean 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	0	0	0	0	13197	5608	5608	0
Domestic	New dwellings	0	1834	2005	2005	2387	2823	2775	2775	2748
Electric vehicles	Electric vehicles	915	7714	9670	17970	17887	54079	44756	44177	39514
EV Charge Point	EV charge points	524	3742	5569	10462	11550	33211	32420	33465	33867
Heat pumps	Heat pump installations	711	4507	4797	8231	12216	23072	25904	39220	35657
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	0.5	0.0	0.0	1.1	5.9	4.1	4.2
Non domestic	Floorspace (metres squared) of new I&C developments	0	73135	90339	90339	95482	12835	12833	12833	12835
			5	8	8	5	88	81	81	88
Other Distributed Generation	MW (installed capacity)	7.8	7.8	9.6	11.4	12.8	2.4	4.6	7.6	9.6
Resistive electric heating	Resistive electric heating units	6023	4705	4604	4985	4688	2846	1017	2989	3197
Solar Generation	MW (installed capacity)	42.3	48.1	54.6	62.5	59.0	82.3	130.9	162.4	160.4
Storage	MW (installed capacity)	0.0	0.4	1.1	2.1	3.2	3.6	9.1	20.3	25.8
Wind	MW (installed capacity)	0.8	0.8	0.9	1.6	1.3	1.4	3.2	8.9	7.3

## 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

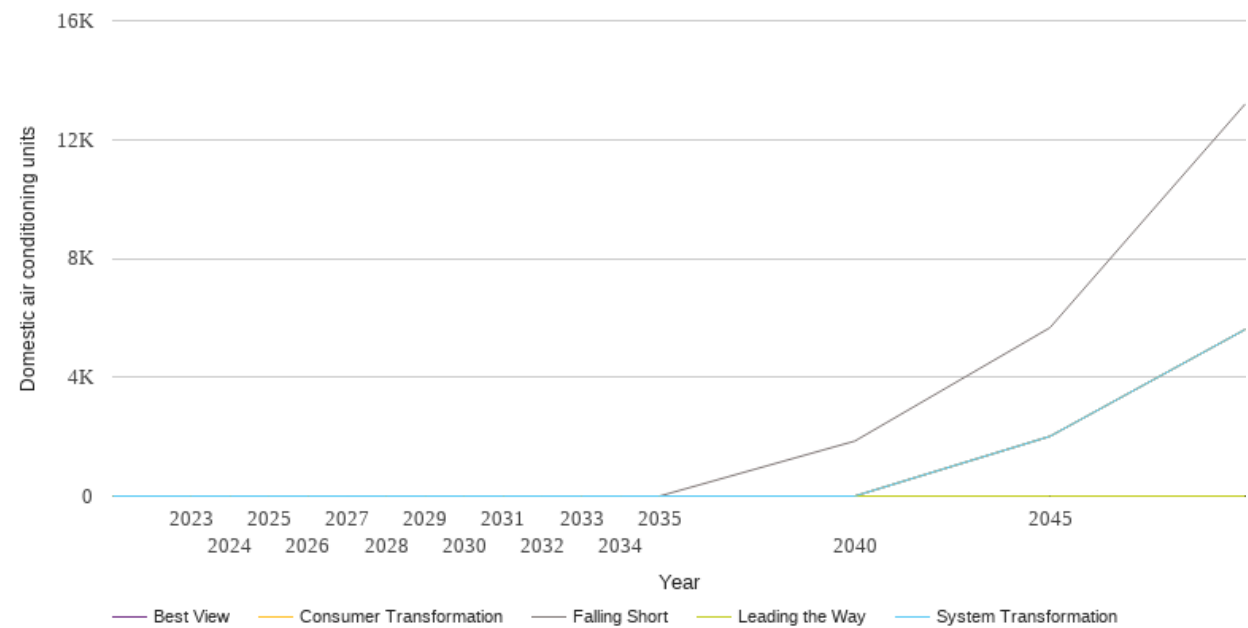
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

If you have any comments or queries regarding these reports, please contact [nged.energyplanning@nationalgrid.co.uk](mailto:nged.energyplanning@nationalgrid.co.uk).

# Technology Summary: Air conditioning

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

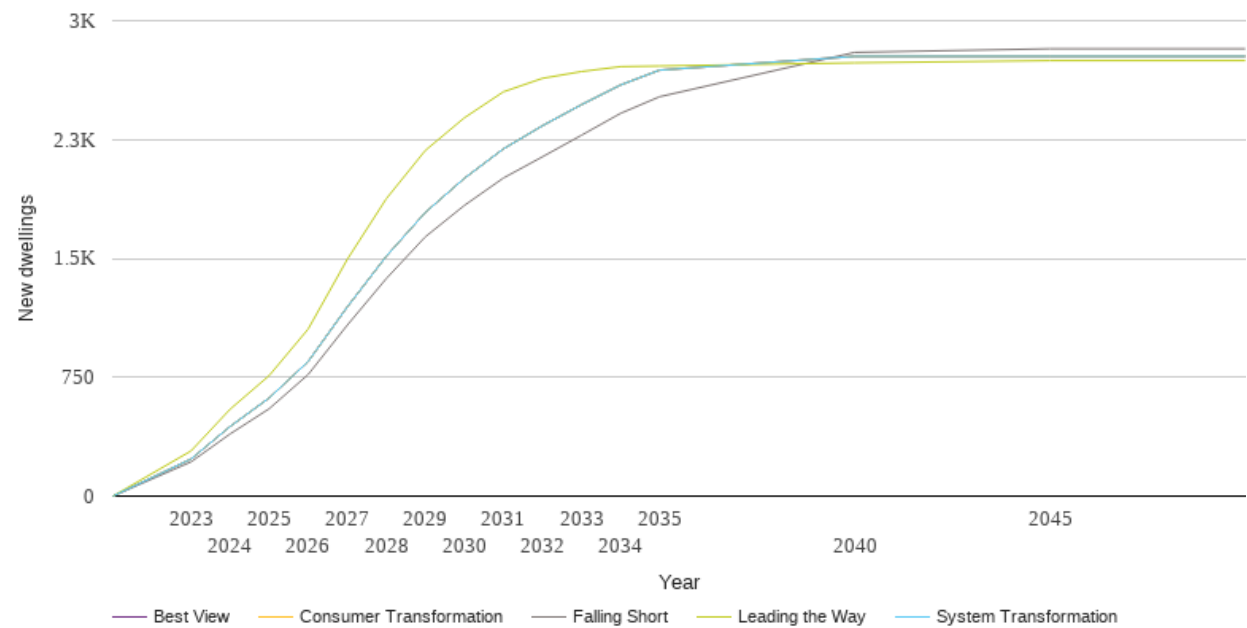
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	0	0	0	0	0
2025	0	0	0	0	0
2026	0	0	0	0	0
2027	0	0	0	0	0
2028	0	0	0	0	0
2029	0	0	0	0	0
2030	0	0	0	0	0
2031	0	0	0	0	0
2032	0	0	0	0	0
2033	0	0	0	0	0
2034	0	0	0	0	0
2035	0	0	0	0	0
2040	1851	0	0	0	0
2045	5668	2011	2011	0	2011
2050	13197	5608	5608	0	5608



# Technology Summary: Domestic

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

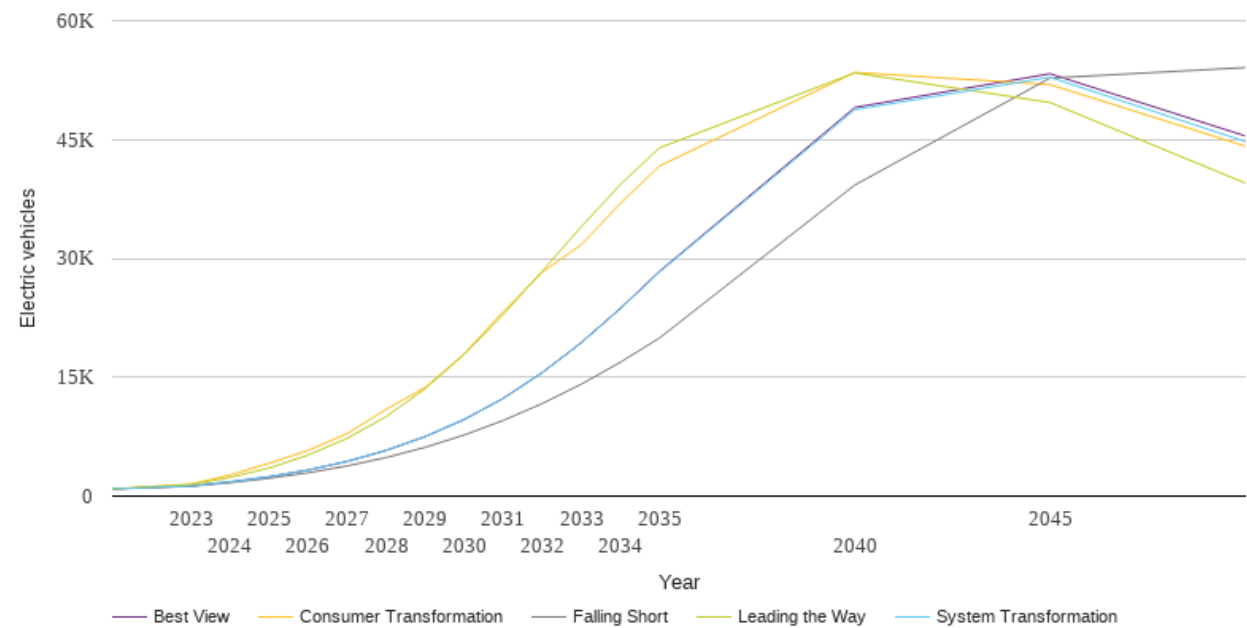
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	216	234	234	285	234
2024	392	439	439	548	439
2025	551	619	619	760	619
2026	767	849	849	1054	849
2027	1078	1193	1193	1493	1193
2028	1372	1513	1513	1876	1513
2029	1636	1790	1790	2181	1790
2030	1834	2005	2005	2387	2005
2031	2007	2191	2191	2551	2191
2032	2141	2337	2337	2636	2337
2033	2277	2470	2470	2679	2470
2034	2415	2594	2594	2710	2594
2035	2520	2688	2688	2714	2688
2040	2800	2775	2775	2734	2775
2045	2823	2775	2775	2748	2775
2050	2823	2775	2775	2748	2775



# Technology Summary: Electric vehicles

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

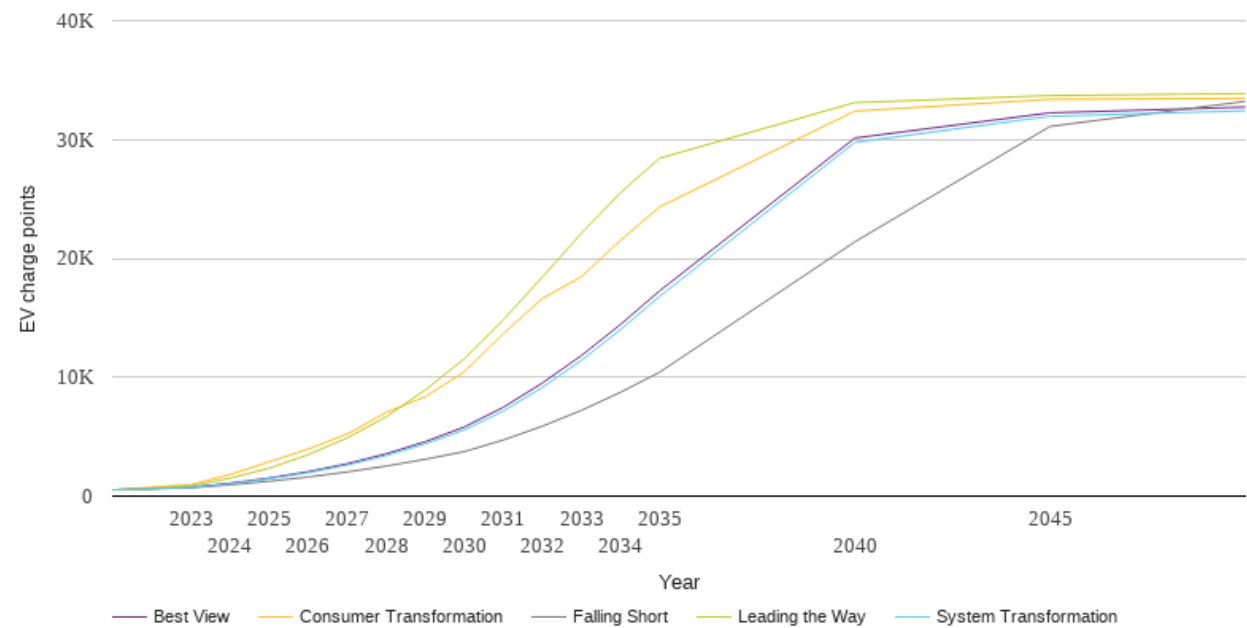
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	915	915	915	915	915
2023	1248	1280	1522	1434	1280
2024	1694	1788	2657	2360	1788
2025	2250	2438	4145	3540	2440
2026	2942	3285	5773	5182	3289
2027	3810	4377	7882	7296	4381
2028	4869	5766	10959	10034	5771
2029	6163	7512	13723	13576	7519
2030	7714	9670	17970	17887	9679
2031	9558	12336	23311	22937	12347
2032	11691	15565	28268	28415	15600
2033	14137	19345	31742	34018	19393
2034	16903	23644	36958	39343	23710
2035	19953	28278	41664	43953	28367
2040	39256	48768	53463	53411	49042
2045	52750	52861	51935	49672	53300
2050	54079	44756	44177	39514	45459



# Technology Summary: EV Charge Point

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

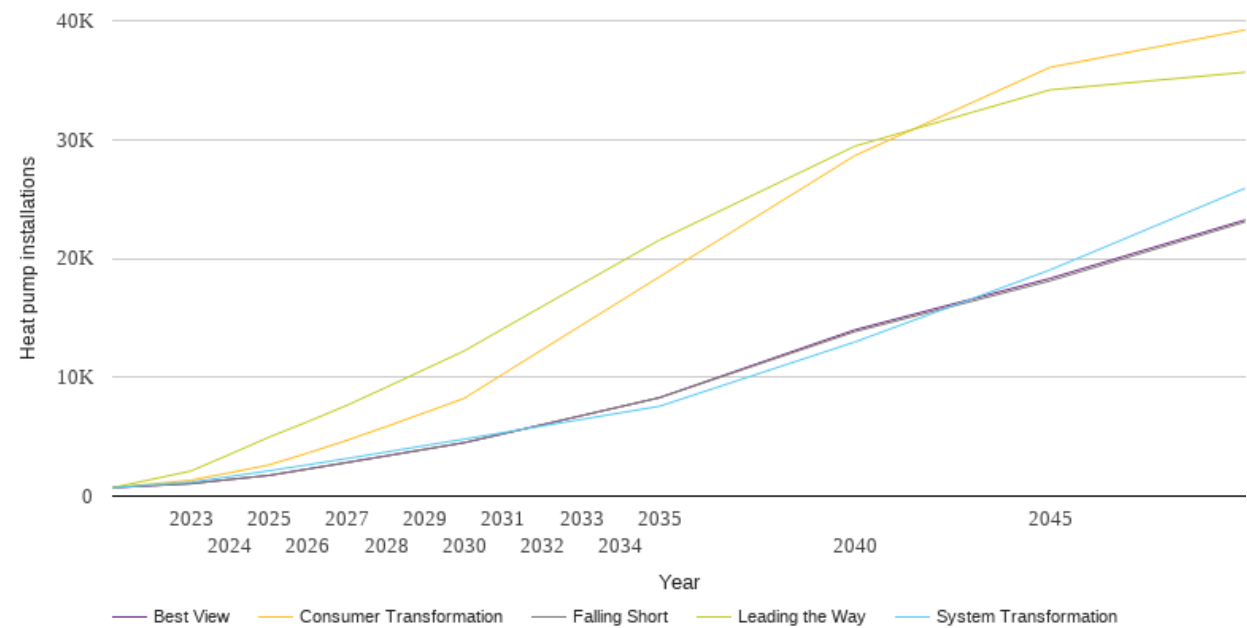
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	524	524	524	524	524
2023	702	741	966	856	750
2024	947	1059	1817	1508	1089
2025	1248	1457	2881	2340	1513
2026	1604	1968	3953	3489	2053
2027	2032	2612	5232	4901	2723
2028	2529	3412	7038	6679	3559
2029	3097	4395	8362	8930	4578
2030	3742	5569	10462	11550	5816
2031	4722	7169	13667	14837	7479
2032	5884	9147	16626	18430	9517
2033	7214	11429	18461	22127	11827
2034	8737	14001	21522	25531	14439
2035	10420	16796	24329	28427	17262
2040	21388	29758	32391	33108	30125
2045	31103	31956	33388	33697	32247
2050	33211	32420	33465	33867	32729



# Technology Summary: Heat pumps

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

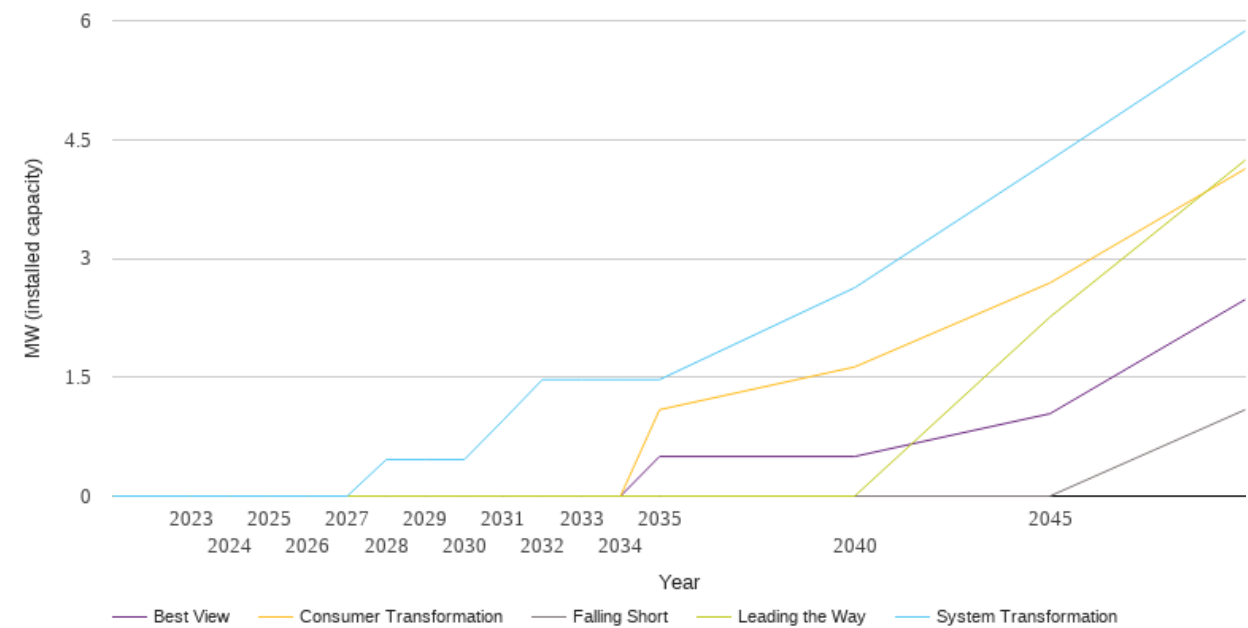
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	711	711	711	711	711
2023	1053	1173	1338	2115	1053
2024	1402	1649	1975	3526	1402
2025	1742	2132	2627	4964	1742
2026	2286	2640	3632	6271	2282
2027	2835	3163	4699	7650	2826
2028	3389	3707	5850	9155	3379
2029	3949	4257	7036	10686	3936
2030	4507	4797	8231	12216	4489
2031	5256	5346	10288	14100	5245
2032	6010	5901	12332	15965	6005
2033	6766	6450	14376	17840	6766
2034	7519	7006	16412	19689	7524
2035	8277	7559	18453	21550	8286
2040	13831	12961	28645	29439	13980
2045	18108	19025	36070	34178	18311
2050	23072	25904	39220	35657	23234



# Technology Summary: Hydrogen electrolysis

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

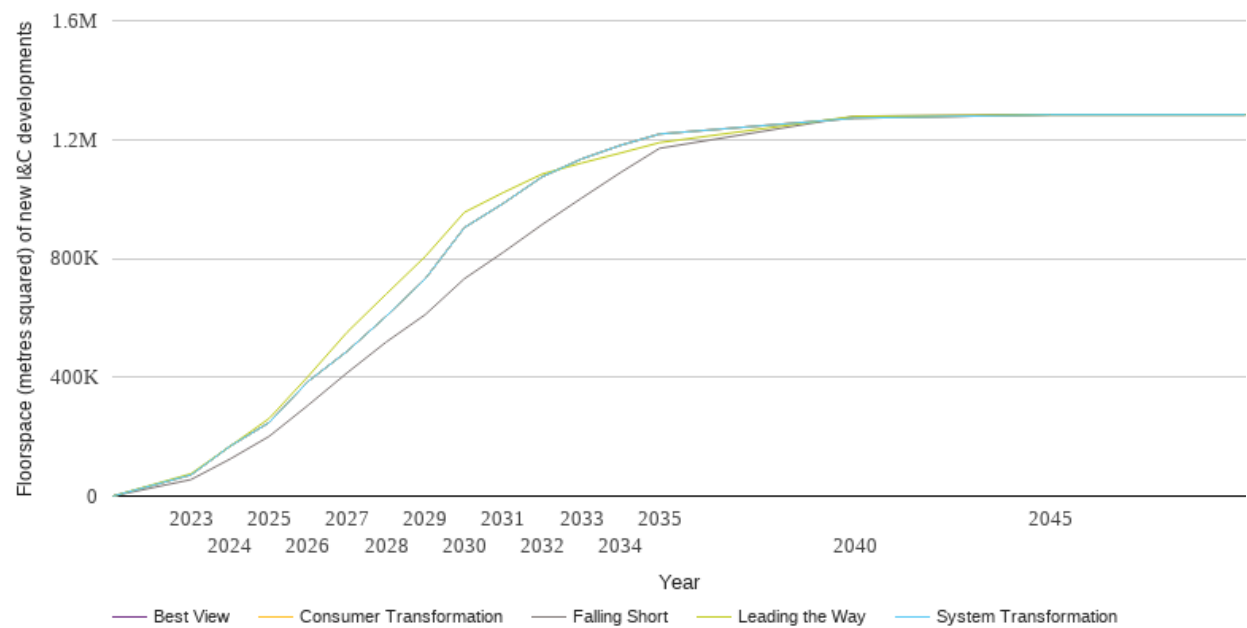
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0	0.0
2028	0.0	0.5	0.0	0.0	0.0
2029	0.0	0.5	0.0	0.0	0.0
2030	0.0	0.5	0.0	0.0	0.0
2031	0.0	1.0	0.0	0.0	0.0
2032	0.0	1.5	0.0	0.0	0.0
2033	0.0	1.5	0.0	0.0	0.0
2034	0.0	1.5	0.0	0.0	0.0
2035	0.0	1.5	1.1	0.0	0.5
2040	0.0	2.6	1.6	0.0	0.5
2045	0.0	4.2	2.7	2.3	1.0
2050	1.1	5.9	4.1	4.2	2.5



# Technology Summary: Non domestic

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

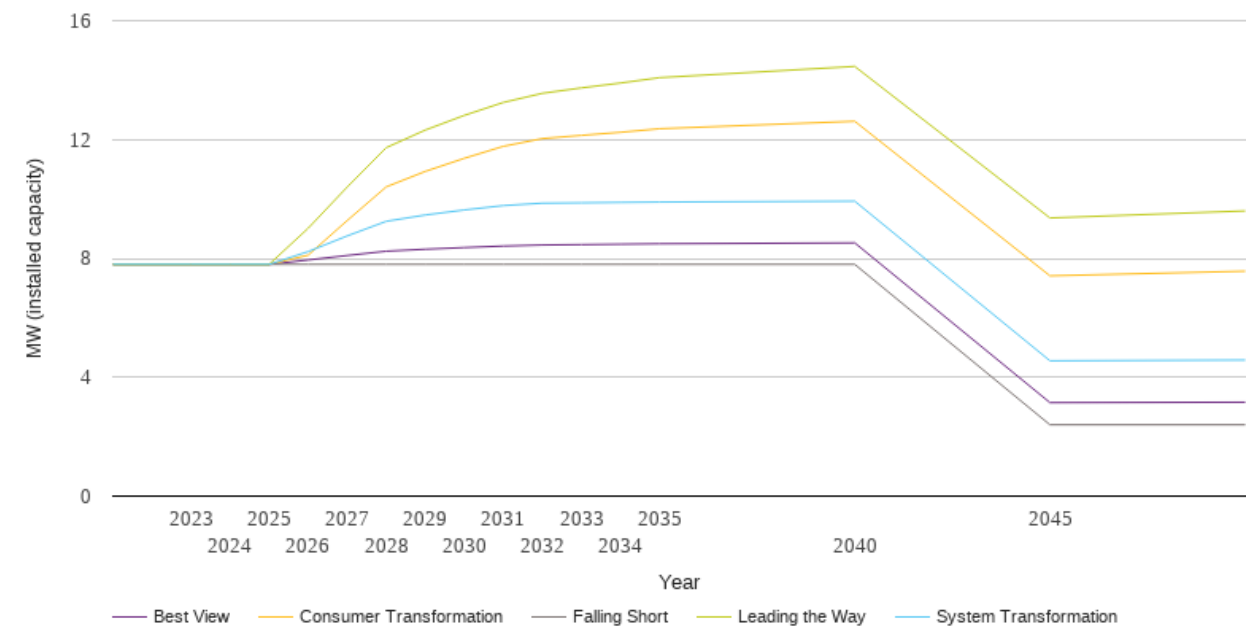
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	55590	71341	71341	75407	71341
2024	124589	167950	167950	167765	167950
2025	201076	247475	247475	261196	247475
2026	305904	386199	386199	402937	386199
2027	415052	487617	487617	551756	487617
2028	518621	605314	605314	679991	605314
2029	610821	731403	731403	806545	731403
2030	731355	903398	903398	954825	903398
2031	820778	985253	985253	1021673	985253
2032	914536	1074970	1074970	1084169	1074970
2033	1002513	1134514	1134514	1120697	1134514
2034	1088909	1180572	1180572	1154550	1180572
2035	1170334	1218489	1218489	1189569	1218489
2040	1278555	1271841	1271841	1278301	1271841
2045	1283588	1283381	1283381	1283588	1283381
2050	1283588	1283381	1283381	1283588	1283381



# Technology Summary: Other Distributed Generation

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

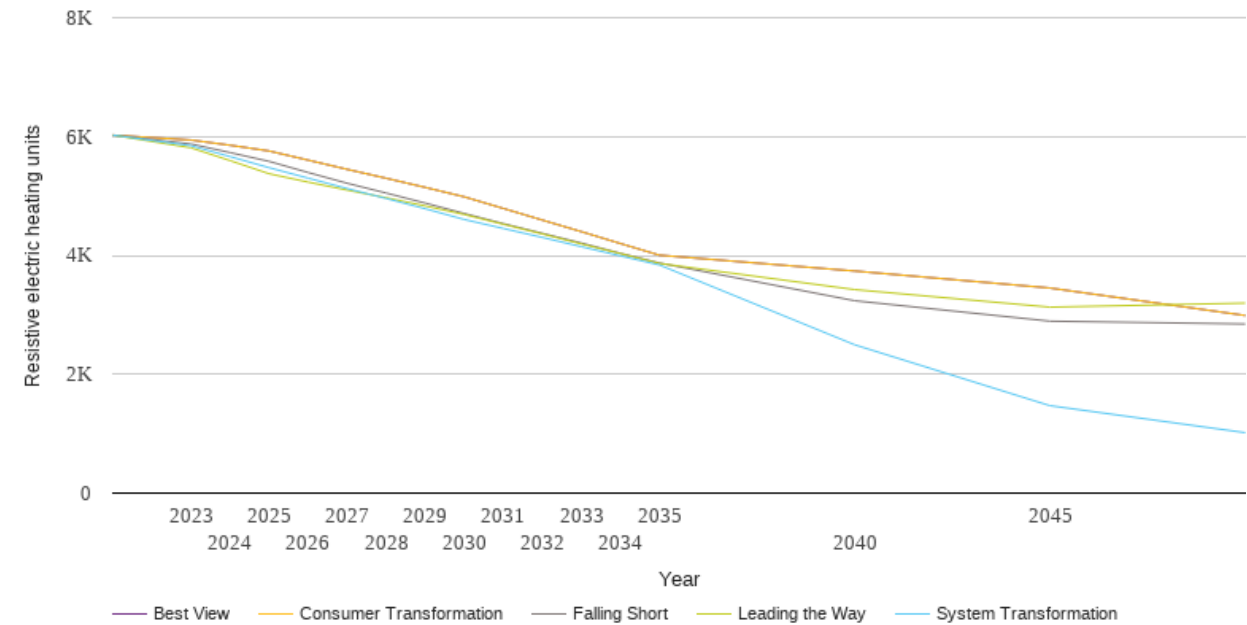
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	7.8	7.8	7.8	7.8	7.8
2023	7.8	7.8	7.8	7.8	7.8
2024	7.8	7.8	7.8	7.8	7.8
2025	7.8	7.8	7.8	7.8	7.8
2026	7.8	8.2	8.1	9.0	7.9
2027	7.8	8.8	9.3	10.4	8.1
2028	7.8	9.2	10.4	11.7	8.2
2029	7.8	9.5	10.9	12.3	8.3
2030	7.8	9.6	11.4	12.8	8.4
2031	7.8	9.8	11.8	13.2	8.4
2032	7.8	9.9	12.0	13.6	8.5
2033	7.8	9.9	12.1	13.7	8.5
2034	7.8	9.9	12.2	13.9	8.5
2035	7.8	9.9	12.4	14.1	8.5
2040	7.8	9.9	12.6	14.5	8.5
2045	2.4	4.6	7.4	9.4	3.1
2050	2.4	4.6	7.6	9.6	3.2



# Technology Summary: Resistive electric heating

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

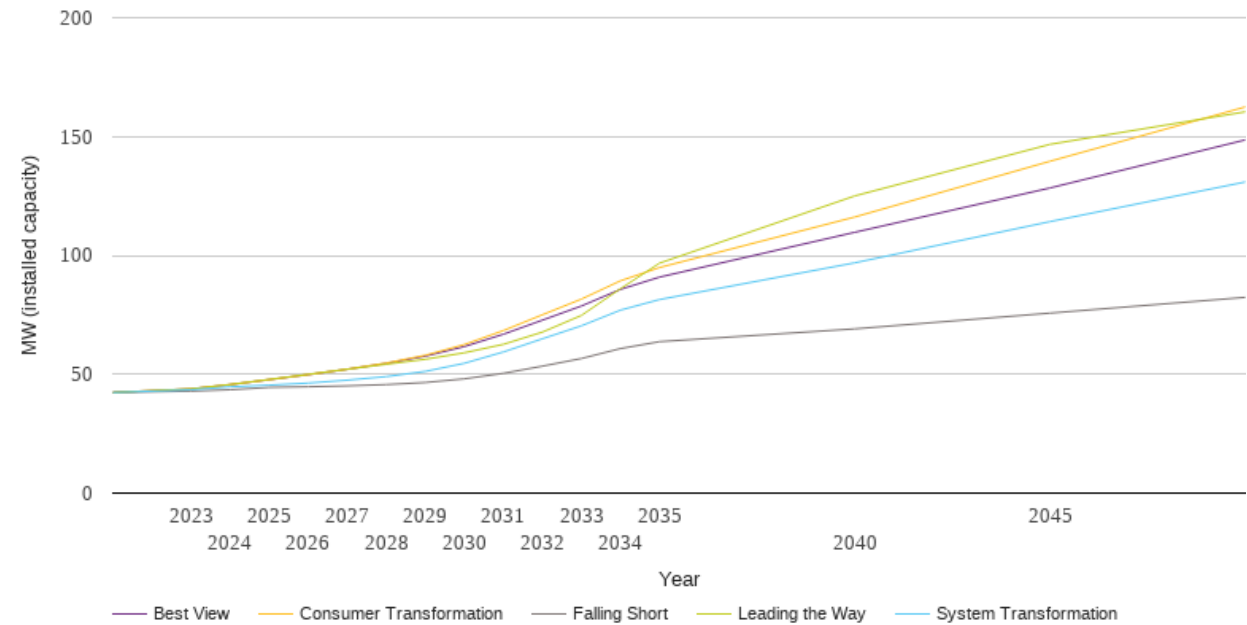
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	6023	6023	6023	6023	6023
2023	5875	5845	5941	5810	5941
2024	5730	5663	5854	5595	5854
2025	5582	5476	5757	5374	5757
2026	5395	5300	5603	5233	5603
2027	5214	5125	5448	5099	5448
2028	5049	4957	5298	4970	5298
2029	4880	4785	5144	4832	5144
2030	4705	4604	4985	4688	4985
2031	4534	4453	4790	4524	4790
2032	4371	4302	4594	4361	4594
2033	4208	4146	4399	4192	4399
2034	4035	3992	4199	4030	4199
2035	3872	3838	4003	3864	4003
2040	3237	2495	3737	3424	3737
2045	2893	1471	3451	3129	3451
2050	2846	1017	2989	3197	2989



# Technology Summary: Solar Generation

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

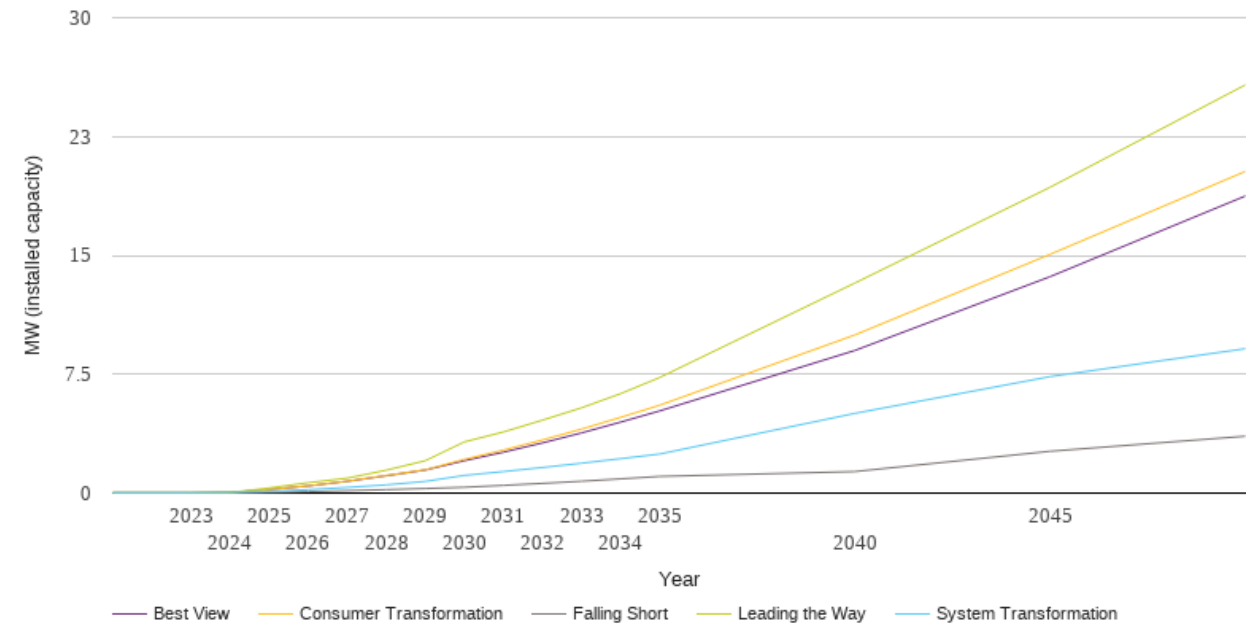
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	42.3	42.3	42.3	42.3	42.3
2023	42.9	43.5	43.8	43.8	43.8
2024	43.5	44.7	45.6	45.7	45.6
2025	44.5	45.4	47.7	47.8	47.7
2026	44.7	46.3	49.8	49.9	49.8
2027	45.1	47.5	52.1	52.1	52.1
2028	45.6	49.0	54.7	54.2	54.6
2029	46.5	51.2	58.0	56.3	57.6
2030	48.1	54.6	62.5	59.0	61.6
2031	50.4	59.4	68.4	62.6	66.8
2032	53.4	64.9	75.0	67.7	72.8
2033	56.6	70.4	81.6	74.7	78.7
2034	60.8	77.0	89.3	86.0	85.7
2035	63.7	81.4	94.9	96.7	90.9
2040	69.1	96.9	116.1	125.0	109.7
2045	75.7	114.2	139.6	146.7	128.4
2050	82.3	130.9	162.4	160.4	148.6



# Technology Summary: Storage

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

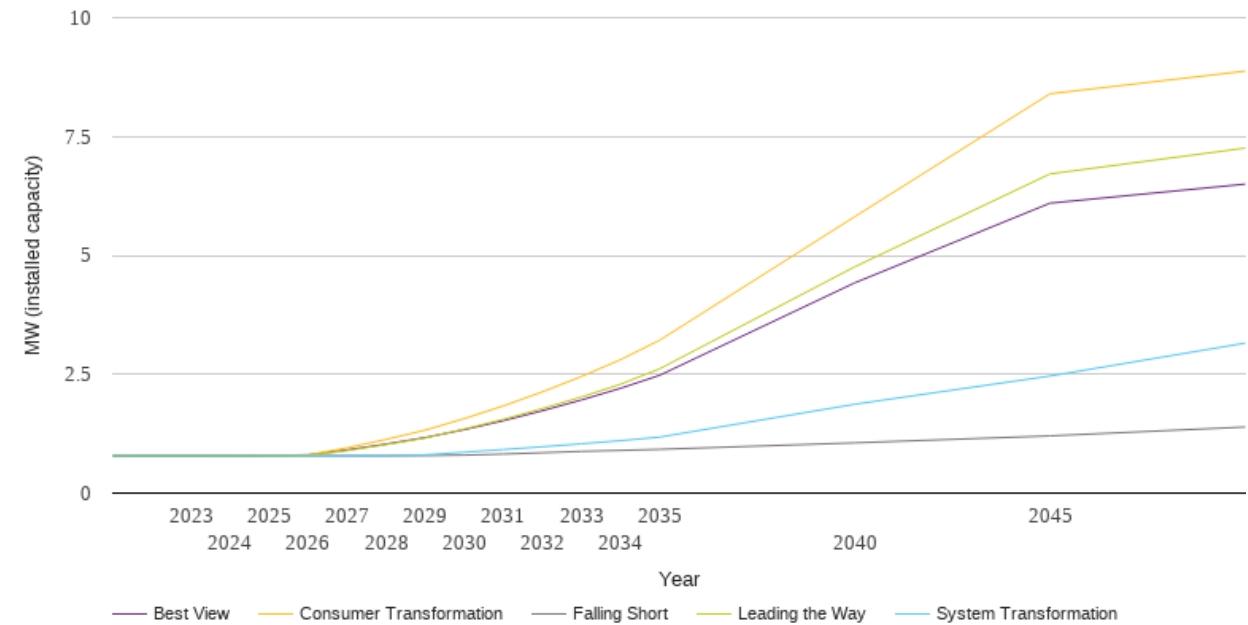
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.1	0.2	0.3	0.2
2026	0.1	0.2	0.4	0.7	0.4
2027	0.2	0.4	0.8	0.9	0.7
2028	0.2	0.5	1.1	1.4	1.1
2029	0.3	0.7	1.5	2.0	1.5
2030	0.4	1.1	2.1	3.2	2.0
2031	0.5	1.4	2.7	3.9	2.6
2032	0.6	1.6	3.4	4.6	3.2
2033	0.7	1.9	4.0	5.4	3.8
2034	0.9	2.2	4.8	6.3	4.5
2035	1.1	2.5	5.5	7.3	5.2
2040	1.4	5.0	10.0	13.3	9.0
2045	2.6	7.3	15.1	19.3	13.7
2050	3.6	9.1	20.3	25.8	18.7



# 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	0.8	0.8	0.8	0.8	0.8
2023	0.8	0.8	0.8	0.8	0.8
2024	0.8	0.8	0.8	0.8	0.8
2025	0.8	0.8	0.8	0.8	0.8
2026	0.8	0.8	0.8	0.8	0.8
2027	0.8	0.8	1.0	0.9	0.9
2028	0.8	0.8	1.1	1.0	1.0
2029	0.8	0.8	1.3	1.2	1.2
2030	0.8	0.9	1.6	1.3	1.3
2031	0.8	0.9	1.8	1.6	1.5
2032	0.8	1.0	2.1	1.8	1.7
2033	0.9	1.0	2.5	2.0	2.0
2034	0.9	1.1	2.8	2.3	2.2
2035	0.9	1.2	3.2	2.6	2.5
2040	1.1	1.9	5.8	4.8	4.4
2045	1.2	2.5	8.4	6.7	6.1
2050	1.4	3.2	8.9	7.3	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))  
National Grid Electricity Distribution (South Wales) Plc (company number 02366985))  
(collectively, “NGED”)

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