

# Distribution Future Energy Scenarios 2022

Local Authority:  
Ceredigion

## What are Distribution Future Energy Scenarios?

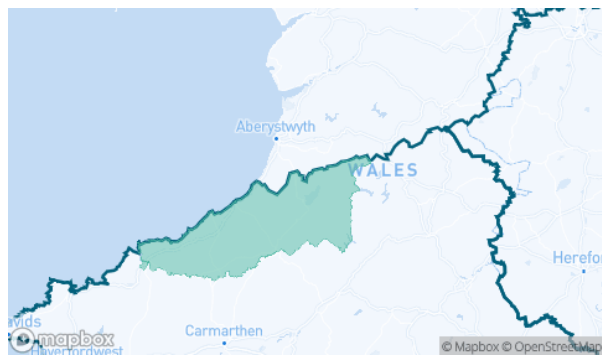
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Ceredigion covered by the NGED licence areas.



## Scenario Summary

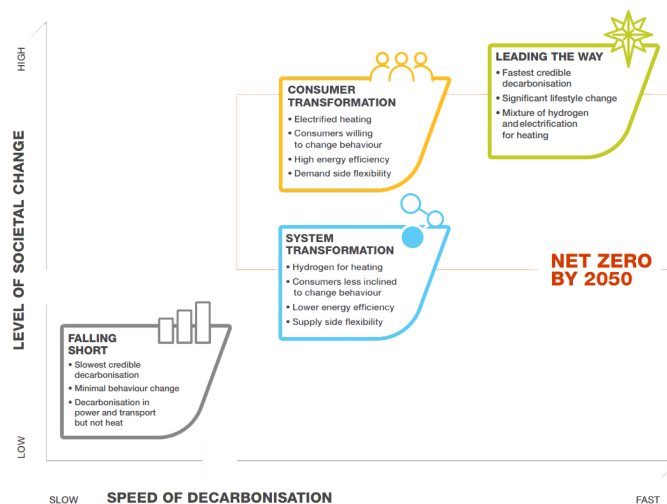
This DFES scenario framework includes three scenarios that are compliant with UK government targets of Net Zero greenhouse gas emissions by 2050. A summary of each scenario is below:

**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 Ceredigion 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	2765	1126	1126	0
Domestic	New dwellings	0	730	796	796	986	1038	1027	1027	1013
Electric vehicles	Electric vehicles	234	3661	4675	8775	8749	26445	22294	21647	19364
EV Charge Point	EV charge points	136	1628	2508	4789	5341	15713	15772	15597	16286
Heat pumps	Heat pump installations	1018	5197	6243	7038	8959	17530	17979	19624	18087
Hydrogen electrolysis	MW (installed capacity)	0.0	0.5	1.0	0.7	0.0	13.1	37.0	25.1	29.7
Non domestic	Floorspace (metres squared) of new I&C developments	0	29555	34795	34795	38251	46233	46233	46233	46233
Other Distributed Generation	MW (installed capacity)	15.6	5.3	5.3	5.6	5.6	5.1	15.0	15.3	20.4
Resistive electric heating	Resistive electric heating units	4378	3521	3432	3644	3478	1905	750	2157	2249
Solar Generation	MW (installed capacity)	10.3	15.9	23.7	28.0	20.0	76.7	153.6	171.4	145.9
Storage	MW (installed capacity)	0.0	0.2	1.0	1.6	2.3	2.9	7.2	14.6	19.4
Wind	MW (installed capacity)	3.0	3.4	4.4	15.9	13.3	18.3	47.0	147.7	117.8

## 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.

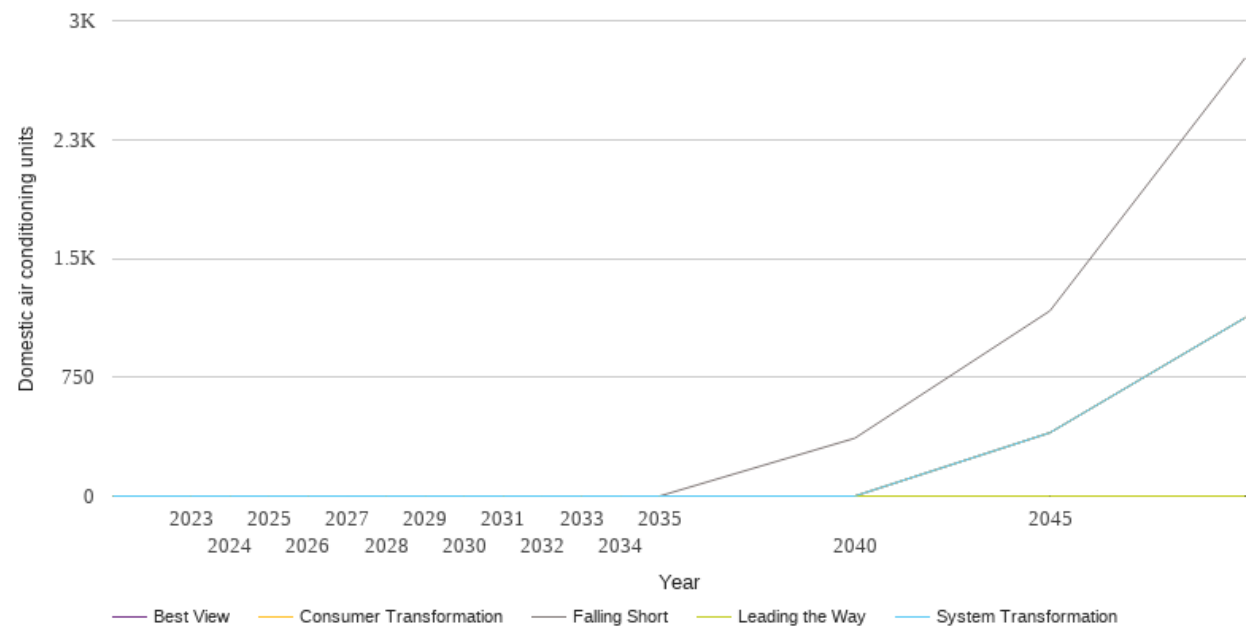
If you have any comments or queries regarding these reports, please contact

[nged.energyplanning@nationalgrid.co.uk](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.

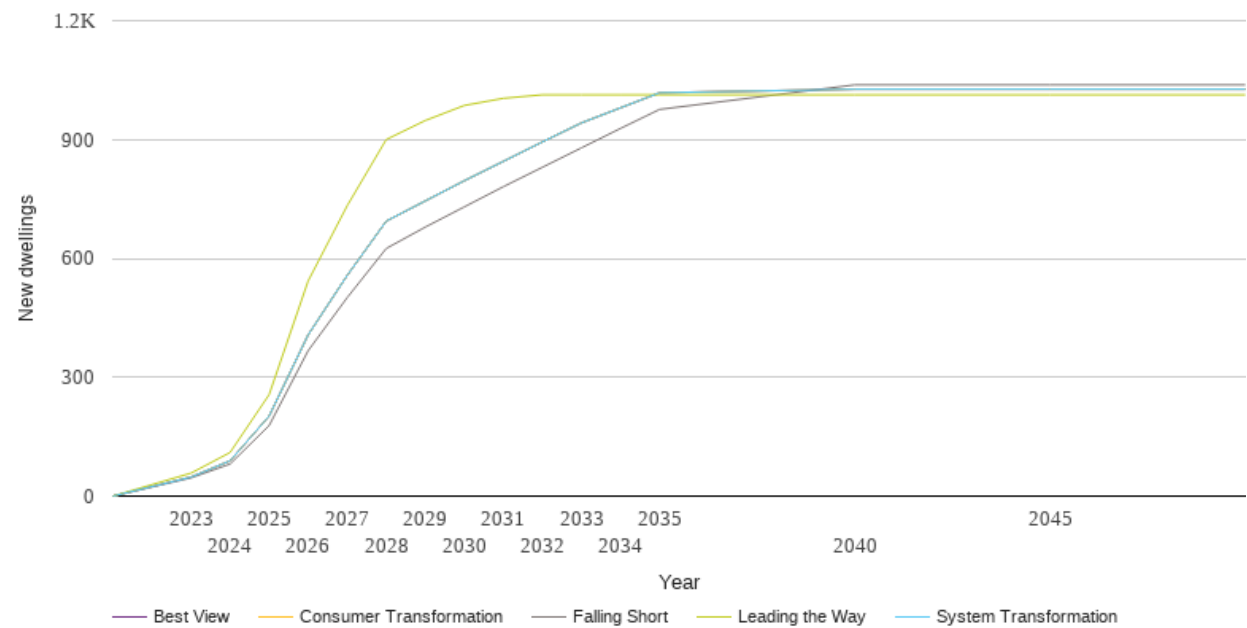
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	0	0	0	0	0
2025	0	0	0	0	0
2026	0	0	0	0	0
2027	0	0	0	0	0
2028	0	0	0	0	0
2029	0	0	0	0	0
2030	0	0	0	0	0
2031	0	0	0	0	0
2032	0	0	0	0	0
2033	0	0	0	0	0
2034	0	0	0	0	0
2035	0	0	0	0	0
2040	365	0	0	0	0
2045	1169	400	400	0	400
2050	2765	1126	1126	0	1126



# Technology Summary: Domestic

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

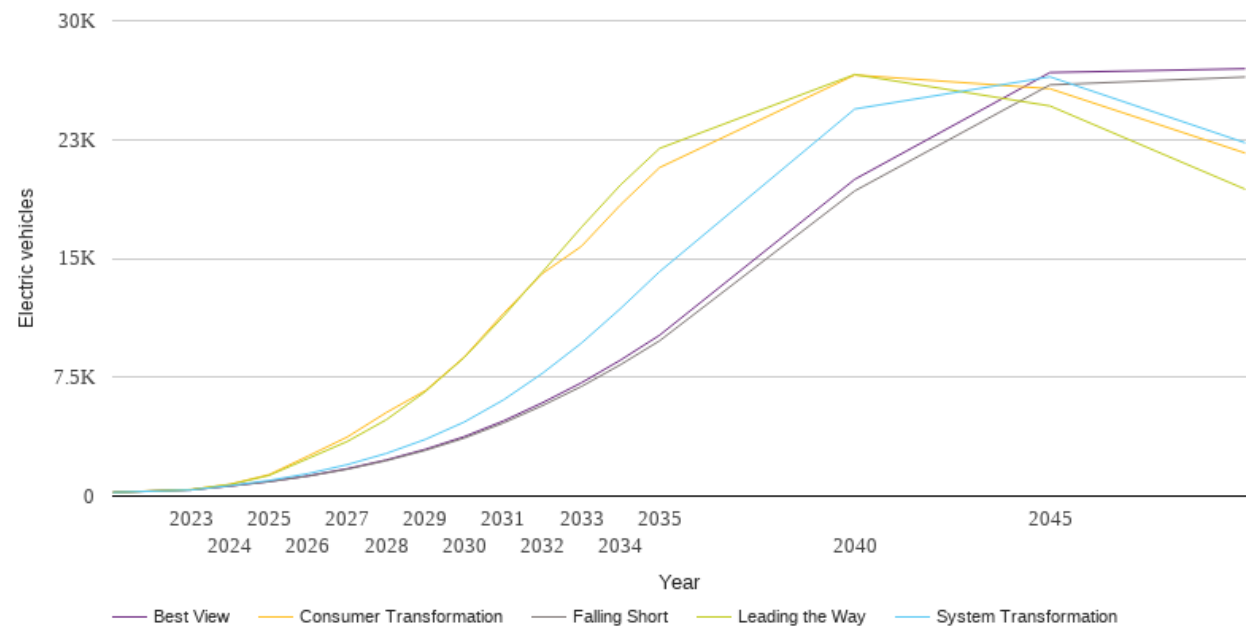
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	46	48	48	58	48
2024	81	89	89	110	89
2025	178	202	202	256	202
2026	367	407	407	543	407
2027	501	557	557	733	557
2028	625	694	694	900	694
2029	679	745	745	948	745
2030	730	796	796	986	796
2031	781	845	845	1004	845
2032	830	894	894	1013	894
2033	879	942	942	1013	942
2034	928	980	980	1013	980
2035	976	1018	1018	1013	1018
2040	1038	1027	1027	1013	1027
2045	1038	1027	1027	1013	1027
2050	1038	1027	1027	1013	1027



# Technology Summary: Electric vehicles

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

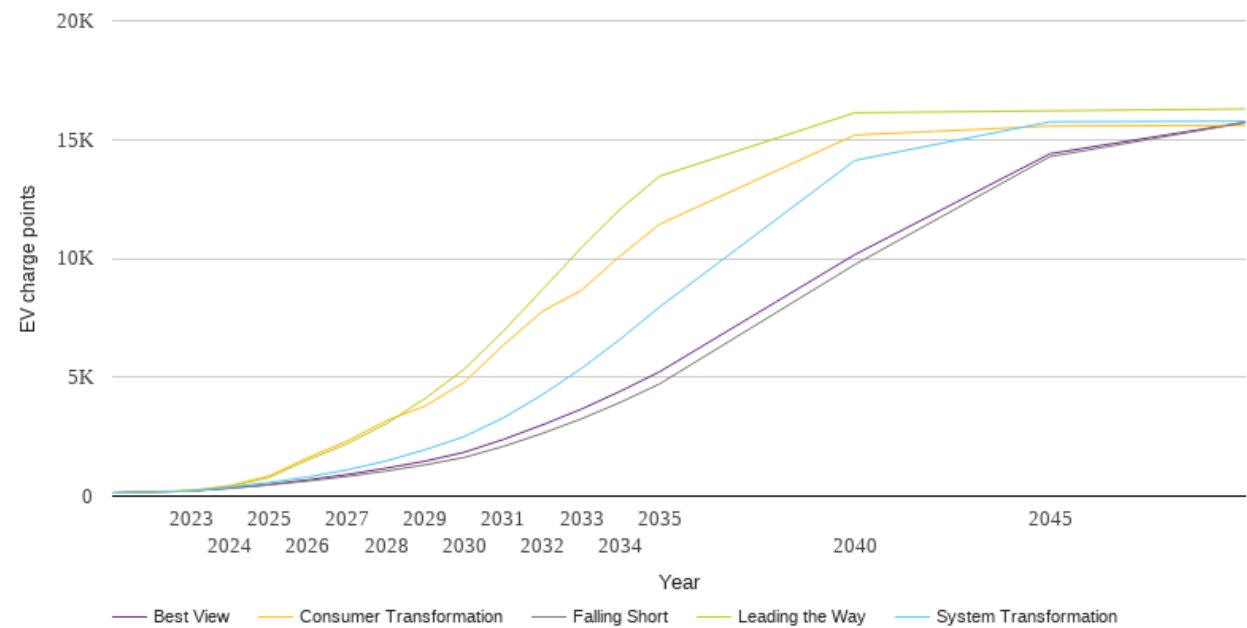
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	234	234	234	234	234
2023	392	387	410	408	392
2024	634	662	745	731	636
2025	910	987	1354	1305	919
2026	1259	1420	2529	2375	1277
2027	1696	1984	3726	3445	1728
2028	2234	2691	5266	4816	2280
2029	2885	3577	6653	6591	2951
2030	3661	4675	8775	8749	3754
2031	4611	6066	11519	11343	4740
2032	5711	7747	14048	14144	5890
2033	6921	9655	15765	16963	7151
2034	8292	11832	18379	19633	8581
2035	9797	14161	20730	21940	10151
2040	19258	24426	26572	26604	19990
2045	25949	26458	25706	24618	26727
2050	26445	22294	21647	19364	26967



# 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	136	136	136	136	136
2023	214	217	240	218	213
2024	337	386	442	407	336
2025	471	572	851	789	492
2026	634	807	1624	1527	686
2027	826	1104	2317	2202	907
2028	1054	1479	3171	3045	1175
2029	1316	1950	3792	4113	1472
2030	1628	2508	4789	5341	1844
2031	2091	3293	6348	6940	2383
2032	2639	4266	7775	8685	2994
2033	3251	5367	8661	10456	3660
2034	3948	6608	10113	12085	4413
2035	4719	7952	11438	13458	5228
2040	9737	14119	15190	16124	10155
2045	14278	15746	15566	16208	14403
2050	15713	15772	15597	16286	15728

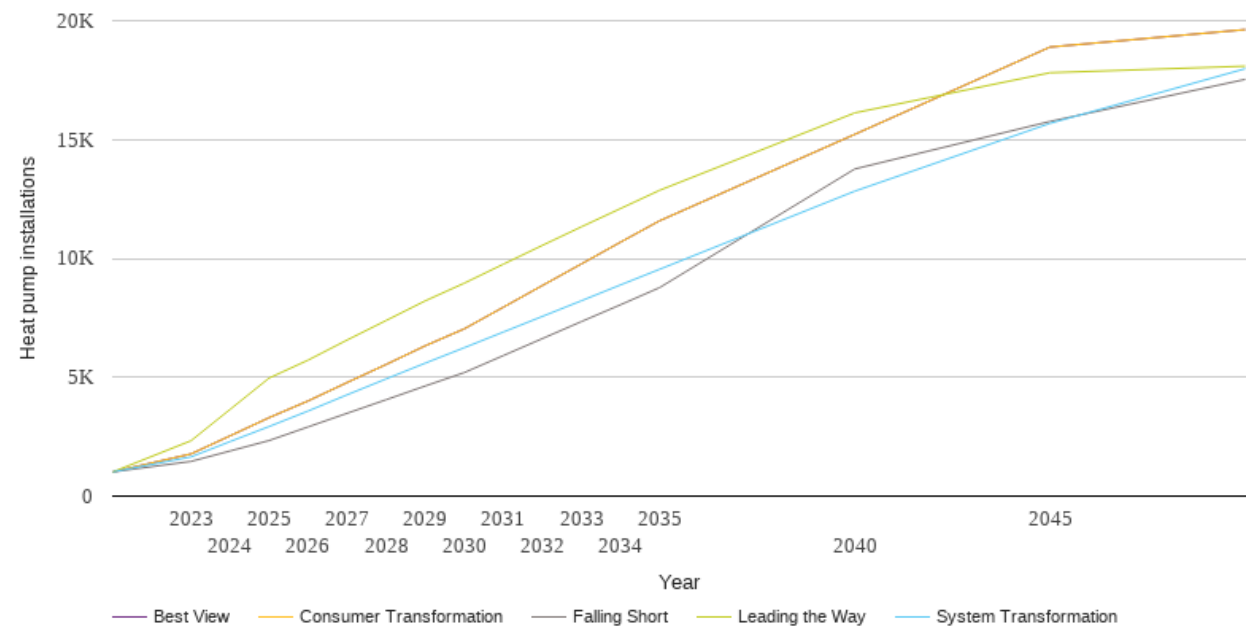




# Technology Summary: Heat pumps

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

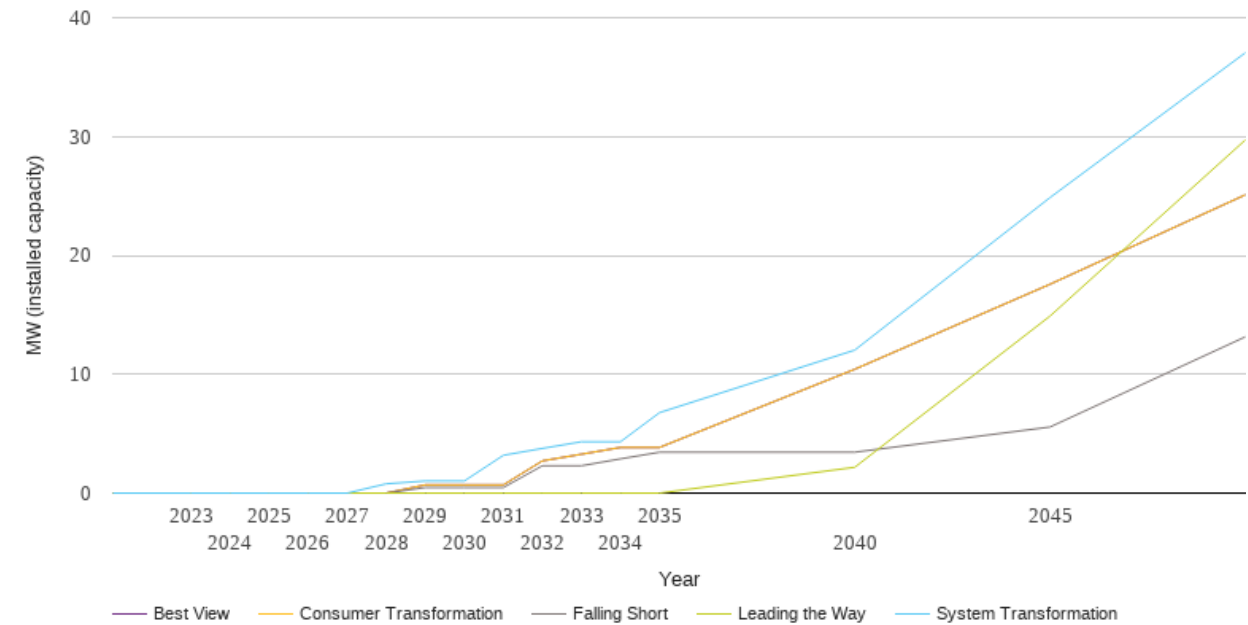
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1018	1018	1018	1018	1018
2023	1460	1649	1774	2329	1774
2024	1897	2294	2535	3646	2535
2025	2337	2927	3300	4965	3300
2026	2911	3580	4005	5722	4005
2027	3485	4263	4779	6567	4779
2028	4056	4932	5540	7389	5540
2029	4633	5594	6324	8214	6324
2030	5197	6243	7038	8959	7038
2031	5912	6903	7947	9757	7947
2032	6627	7560	8859	10548	8859
2033	7343	8219	9769	11329	9769
2034	8049	8884	10682	12096	10682
2035	8769	9541	11581	12863	11581
2040	13761	12828	15218	16121	15218
2045	15760	15680	18890	17810	18890
2050	17530	17979	19624	18087	19624



# Technology Summary: Hydrogen electrolysis

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

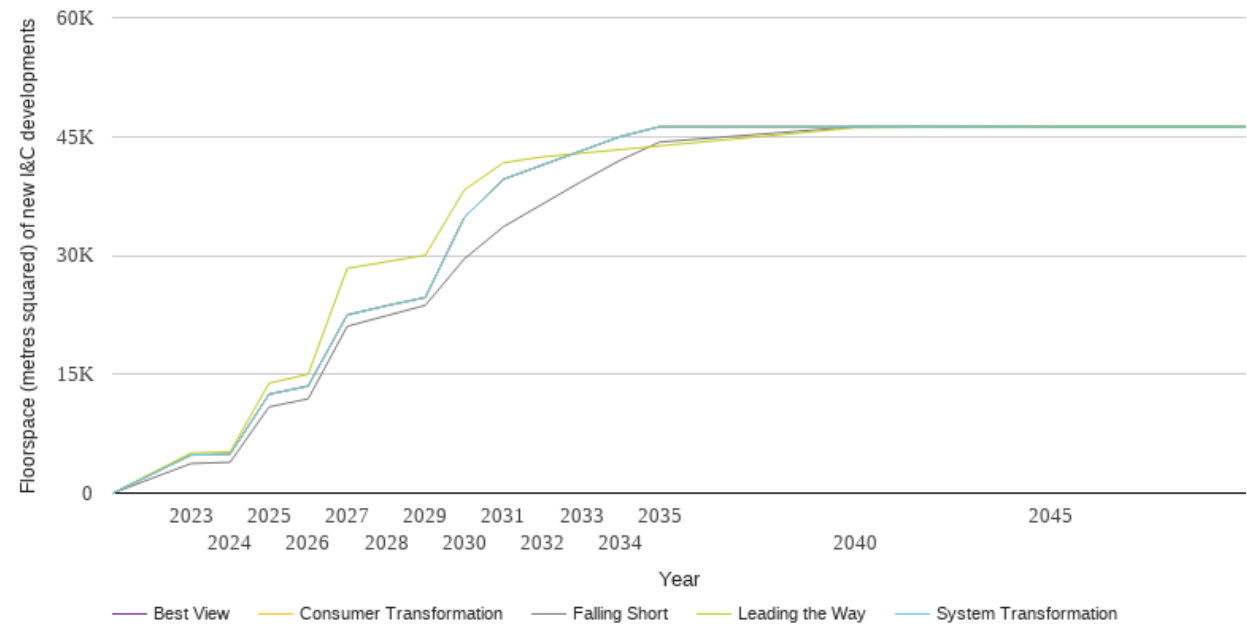
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0	0.0
2028	0.0	0.8	0.0	0.0	0.0
2029	0.5	1.0	0.7	0.0	0.7
2030	0.5	1.0	0.7	0.0	0.7
2031	0.5	3.2	0.7	0.0	0.7
2032	2.3	3.8	2.7	0.0	2.7
2033	2.3	4.3	3.3	0.0	3.3
2034	2.9	4.3	3.8	0.0	3.8
2035	3.4	6.8	3.8	0.0	3.8
2040	3.4	12.0	10.4	2.2	10.4
2045	5.6	24.9	17.6	14.9	17.6
2050	13.1	37.0	25.1	29.7	25.1



# Technology Summary: Non domestic

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

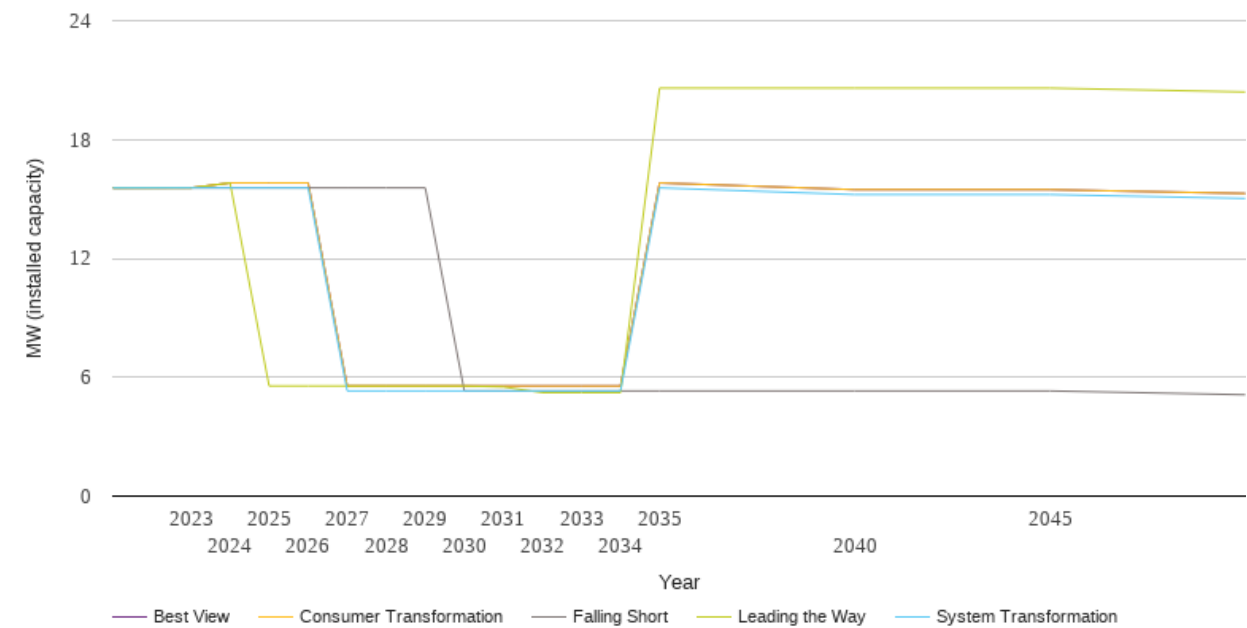
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	3733	4800	4800	5067	4800
2024	3893	4907	4907	5200	4907
2025	10880	12480	12480	13867	12480
2026	11893	13507	13507	15000	13507
2027	21047	22487	22487	28357	22487
2028	22372	23638	23638	29188	23638
2029	23697	24683	24683	30019	24683
2030	29555	34795	34795	38251	34795
2031	33613	39607	39607	41689	39607
2032	36472	41405	41405	42433	41405
2033	39330	43203	43203	42893	43203
2034	42028	45002	45002	43353	45002
2035	44300	46233	46233	43813	46233
2040	46233	46233	46233	46113	46233
2045	46233	46233	46233	46233	46233
2050	46233	46233	46233	46233	46233



# Technology Summary: Other Distributed Generation

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

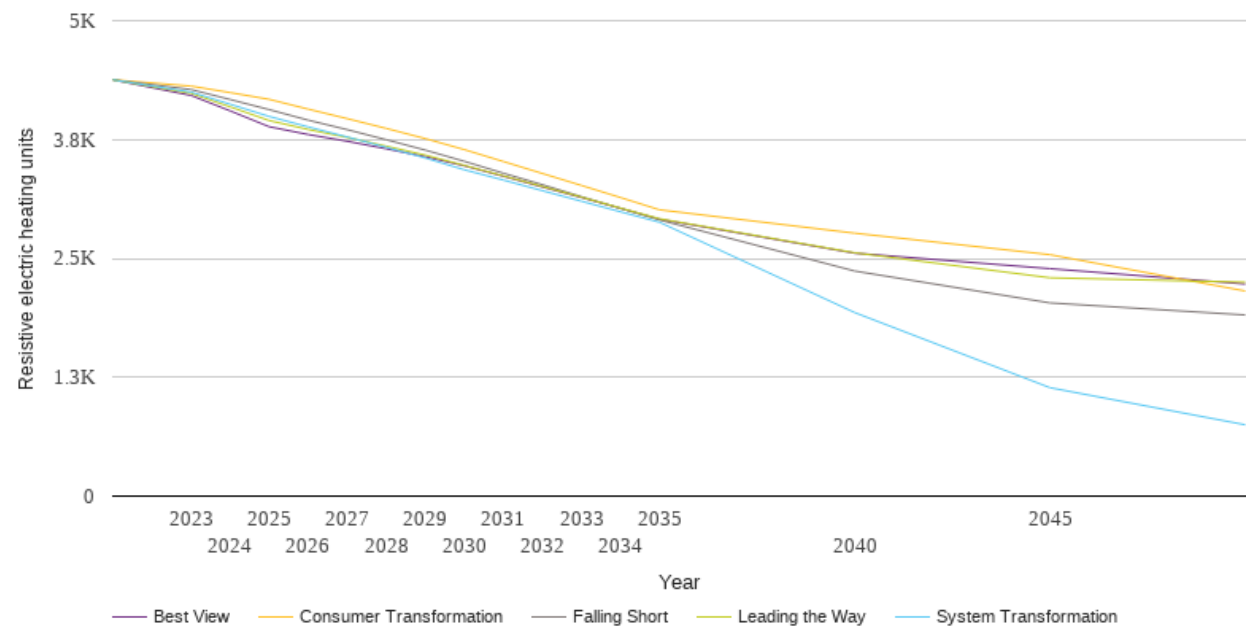
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	15.6	15.6	15.6	15.6	15.6
2023	15.6	15.6	15.6	15.6	15.6
2024	15.6	15.6	15.8	15.8	15.8
2025	15.6	15.6	15.8	5.6	15.8
2026	15.6	15.6	15.8	5.6	15.8
2027	15.6	5.3	5.6	5.6	5.6
2028	15.6	5.3	5.6	5.6	5.6
2029	15.6	5.3	5.6	5.6	5.6
2030	5.3	5.3	5.6	5.6	5.6
2031	5.3	5.3	5.6	5.5	5.6
2032	5.3	5.3	5.6	5.2	5.6
2033	5.3	5.3	5.6	5.2	5.6
2034	5.3	5.3	5.6	5.2	5.6
2035	5.3	15.6	15.8	20.6	15.8
2040	5.3	15.2	15.5	20.6	15.5
2045	5.3	15.2	15.5	20.6	15.5
2050	5.1	15.0	15.3	20.4	15.3



# Technology Summary: Resistive electric heating

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

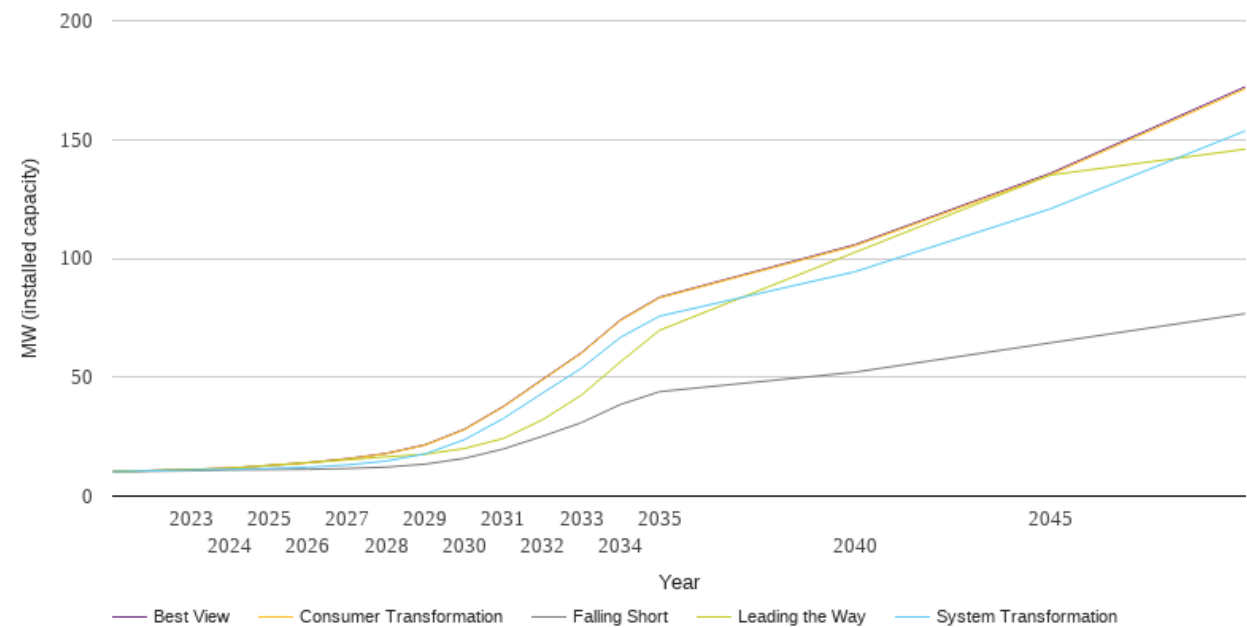
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	4378	4378	4378	4378	4378
2023	4276	4249	4312	4236	4214
2024	4171	4122	4244	4094	4052
2025	4065	3993	4173	3950	3885
2026	3954	3883	4070	3856	3803
2027	3854	3777	3970	3772	3732
2028	3748	3668	3867	3680	3653
2029	3639	3556	3760	3586	3569
2030	3521	3432	3644	3478	3474
2031	3396	3324	3519	3368	3364
2032	3275	3212	3393	3256	3251
2033	3149	3101	3267	3144	3140
2034	3026	2990	3140	3029	3026
2035	2904	2880	3011	2917	2912
2040	2367	1930	2765	2559	2555
2045	2032	1140	2539	2296	2392
2050	1905	750	2157	2249	2231



# Technology Summary: Solar Generation

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

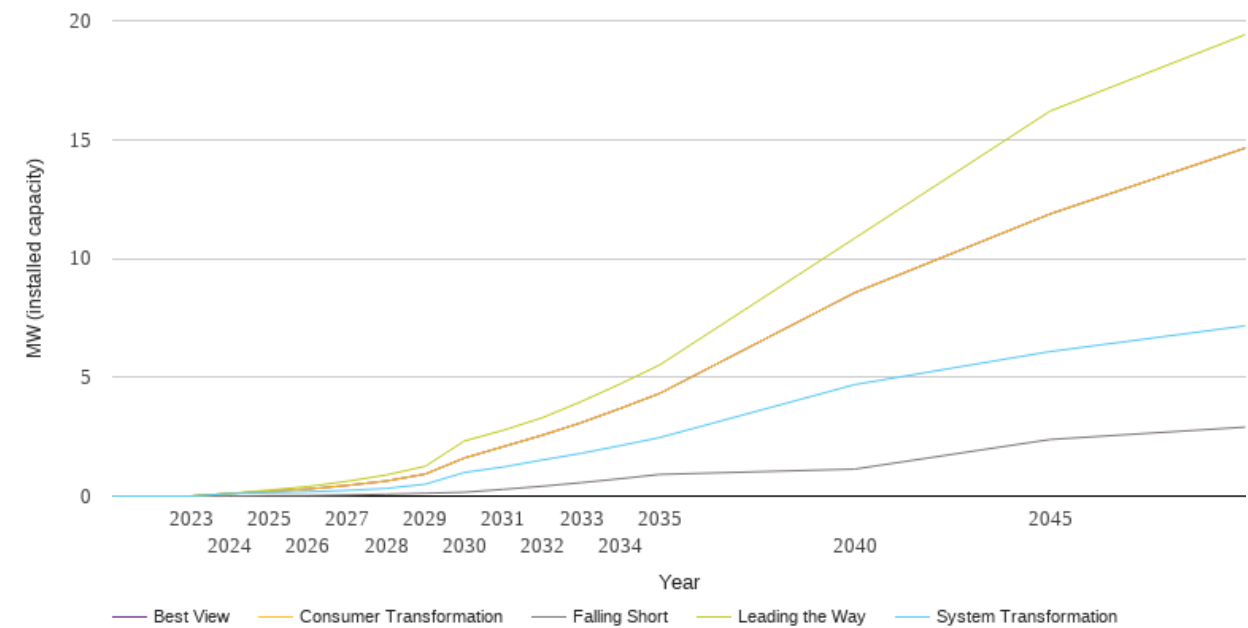
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	10.3	10.3	10.3	10.3	10.3
2023	10.7	11.0	11.2	11.2	11.2
2024	11.0	11.3	11.7	11.7	11.7
2025	11.1	11.6	12.8	12.9	12.9
2026	11.3	12.1	14.0	14.1	14.1
2027	11.6	13.1	15.6	15.3	15.7
2028	12.2	14.7	17.8	16.5	17.9
2029	13.4	17.8	21.5	17.6	21.6
2030	15.9	23.7	28.0	20.0	28.1
2031	19.8	32.6	37.5	24.2	37.7
2032	25.2	43.3	48.9	32.1	49.1
2033	30.9	53.8	60.1	42.5	60.3
2034	38.6	66.8	73.9	56.5	74.1
2035	43.9	75.7	83.4	69.7	83.6
2040	52.1	94.4	105.3	102.5	105.7
2045	64.4	120.8	135.1	135.0	135.7
2050	76.7	153.6	171.4	145.9	172.2



# Technology Summary: Storage

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

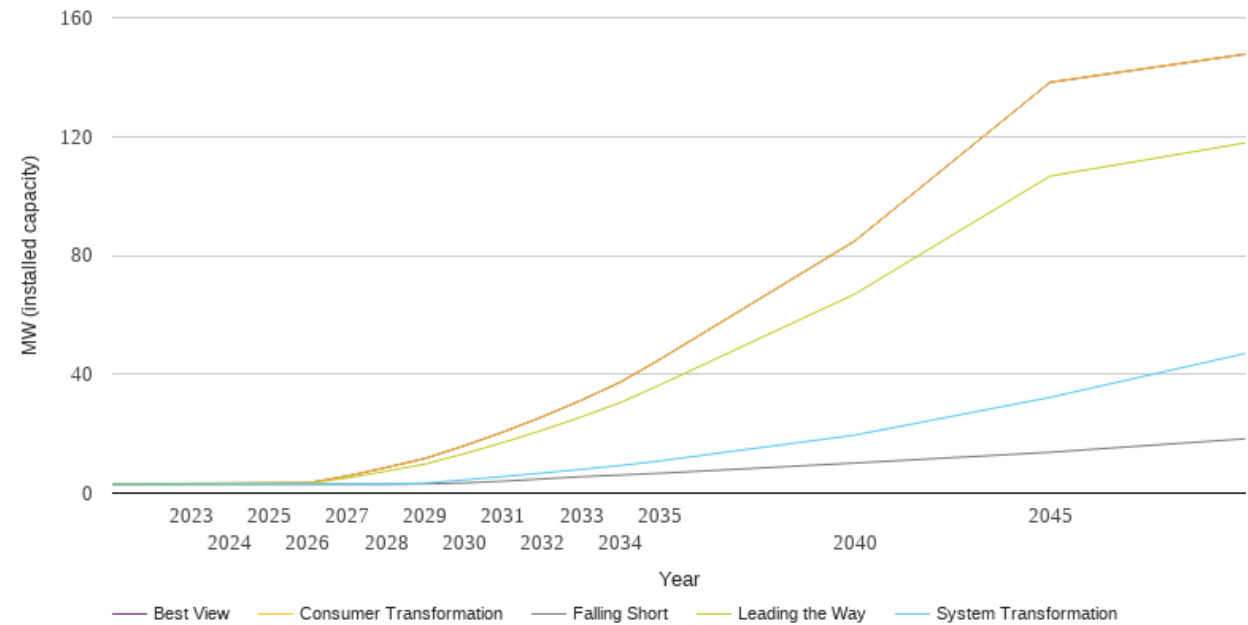
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.1	0.1	0.1	0.1
2025	0.0	0.1	0.2	0.3	0.2
2026	0.0	0.2	0.3	0.4	0.3
2027	0.0	0.2	0.4	0.6	0.4
2028	0.1	0.3	0.6	0.9	0.6
2029	0.1	0.5	0.9	1.3	0.9
2030	0.2	1.0	1.6	2.3	1.6
2031	0.3	1.2	2.1	2.8	2.1
2032	0.4	1.5	2.6	3.3	2.6
2033	0.6	1.8	3.1	4.0	3.1
2034	0.7	2.1	3.7	4.7	3.7
2035	0.9	2.5	4.3	5.5	4.3
2040	1.1	4.7	8.6	10.8	8.6
2045	2.4	6.1	11.9	16.2	11.9
2050	2.9	7.2	14.6	19.4	14.6



# 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	3.0	3.0	3.0	3.0	3.0
2023	3.0	3.0	3.2	3.0	3.2
2024	3.0	3.0	3.3	3.2	3.3
2025	3.0	3.0	3.4	3.3	3.4
2026	3.0	3.0	3.4	3.3	3.4
2027	3.0	3.0	5.7	5.1	5.7
2028	3.0	3.0	8.6	7.4	8.6
2029	3.1	3.4	11.7	9.8	11.7
2030	3.4	4.4	15.9	13.3	15.9
2031	4.0	5.6	20.6	17.1	20.6
2032	4.8	6.7	25.7	21.2	25.7
2033	5.5	8.0	31.3	25.6	31.3
2034	6.1	9.3	37.4	30.5	37.4
2035	6.7	10.8	44.9	36.3	44.9
2040	10.1	19.5	84.8	67.0	84.8
2045	13.7	32.2	138.2	106.7	138.2
2050	18.3	47.0	147.7	117.8	147.7





National Grid Electricity Distribution PLC 09223384)  
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National Grid Electricity Distribution (West Midlands) Plc (company number 03600574))  
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