

Distribution Future Energy Scenarios 2022

Local Authority:
Vale of Glamorgan

What are Distribution Future Energy Scenarios?

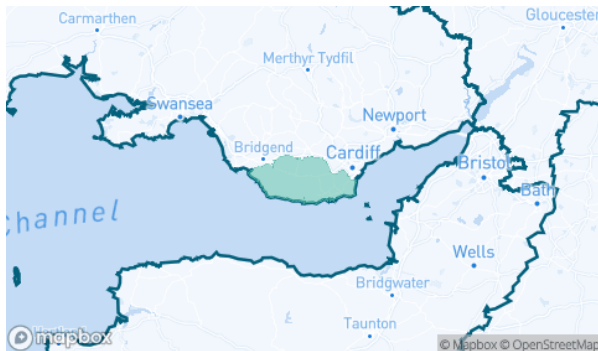
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Vale of Glamorgan covered by the NGED licence areas.



Scenario Summary

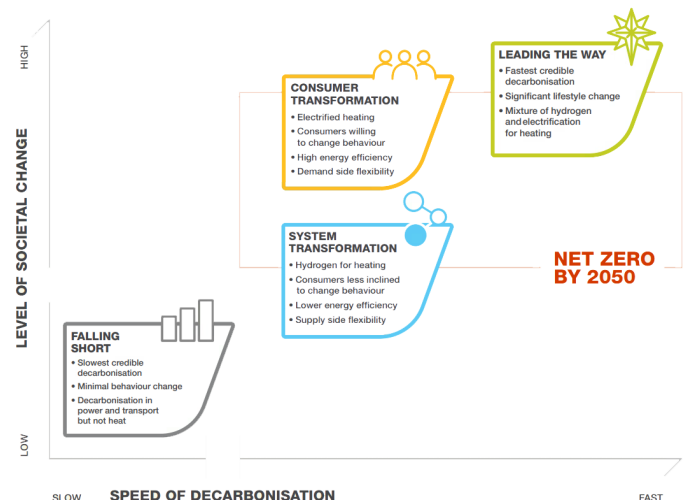
This DFES scenario framework includes three scenarios that are compliant with UK government targets of Net Zero greenhouse gas emissions by 2050. A summary of each scenario is below:

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 Vale of Glamorgan 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	320	992	826	826	320	18570	9660	9660	320
Domestic	New dwellings	0	2974	3183	3183	3737	3943	3867	3867	3808
Electric vehicles	Electric vehicles	782	12563	15016	28071	27928	87704	79472	81157	62306
EV Charge Point	EV charge points	677	6064	8366	15888	17323	48649	45253	46565	48637
Heat pumps	Heat pump installations	341	3668	3746	10312	17126	30493	35465	60404	51744
Hydrogen electrolysis	MW (installed capacity)	0.0	1.2	1.0	0.2	1.8	16.6	15.1	10.2	15.4
Non domestic	Floorspace (metres squared) of new I&C developments	0	175137	227075	227075	242475	408486	407476	407476	408486
Other Distributed Generation	MW (installed capacity)	0.6	0.6	0.9	2.7	0.7	0.6	2.9	3.4	1.8
Resistive electric heating	Resistive electric heating units	5255	4720	4502	4691	4598	3476	1738	3388	3564
Solar Generation	MW (installed capacity)	21.7	28.5	37.1	48.4	49.1	70.1	124.9	170.8	168.3
Storage	MW (installed capacity)	0.0	0.3	1.4	3.0	4.3	4.3	10.6	26.2	33.8
Wind	MW (installed capacity)	0.6	0.8	1.3	8.6	6.3	6.8	19.7	71.7	57.1

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.

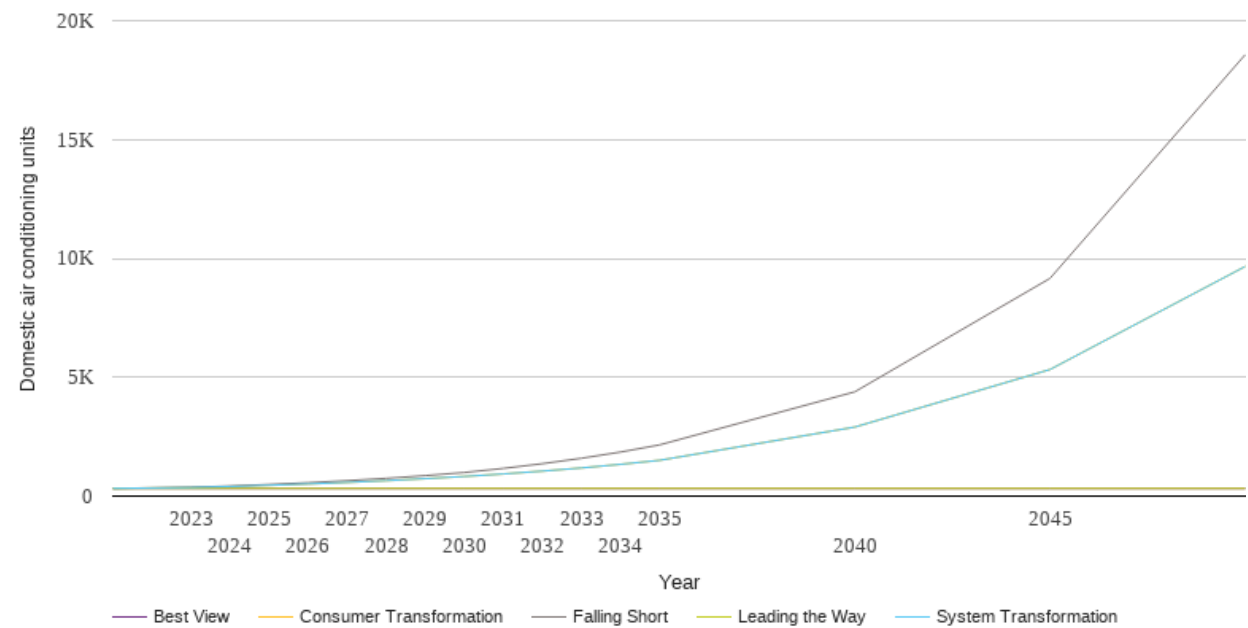
If you have any comments or queries regarding these reports, please contact

nged.energyplanning@nationalgrid.co.uk.

Technology Summary: Air conditioning

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

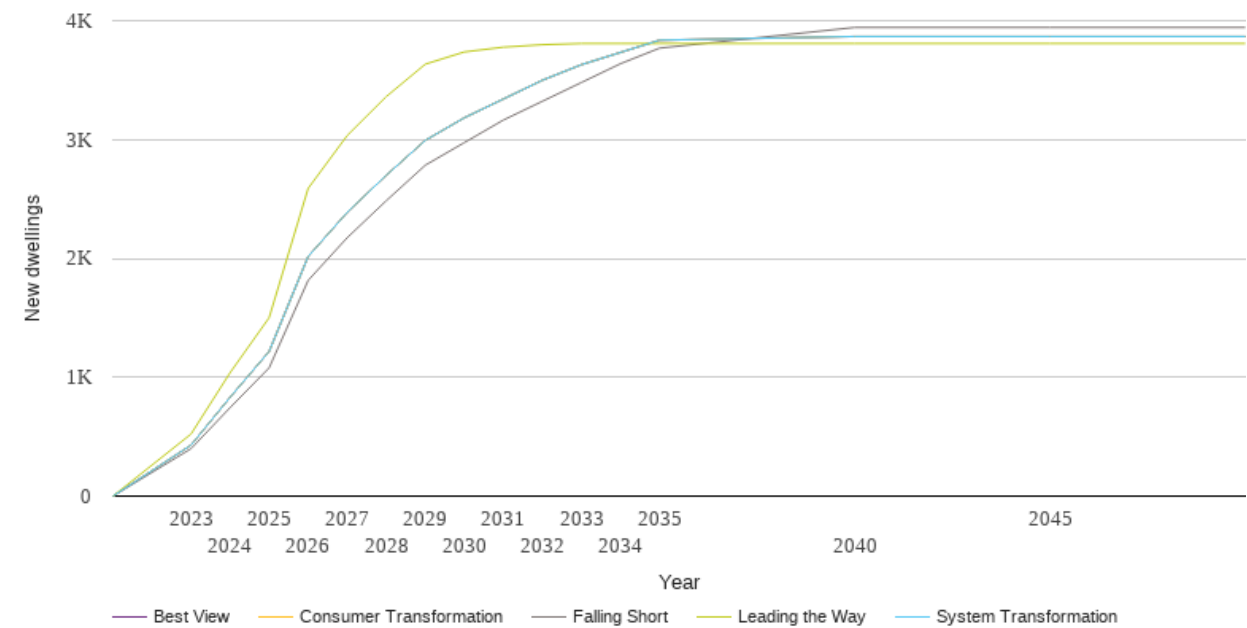
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	320	320	320	320	320
2023	368	362	362	320	320
2024	424	404	404	320	320
2025	489	454	454	320	320
2026	563	511	511	320	320
2027	648	575	575	320	320
2028	746	649	649	320	320
2029	862	733	733	320	320
2030	992	826	826	320	320
2031	1165	932	932	320	320
2032	1363	1051	1051	320	320
2033	1591	1184	1184	320	320
2034	1853	1336	1336	320	320
2035	2154	1504	1504	320	320
2040	4386	2903	2903	320	320
2045	9158	5324	5324	320	320
2050	18570	9660	9660	320	320



Technology Summary: Domestic

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

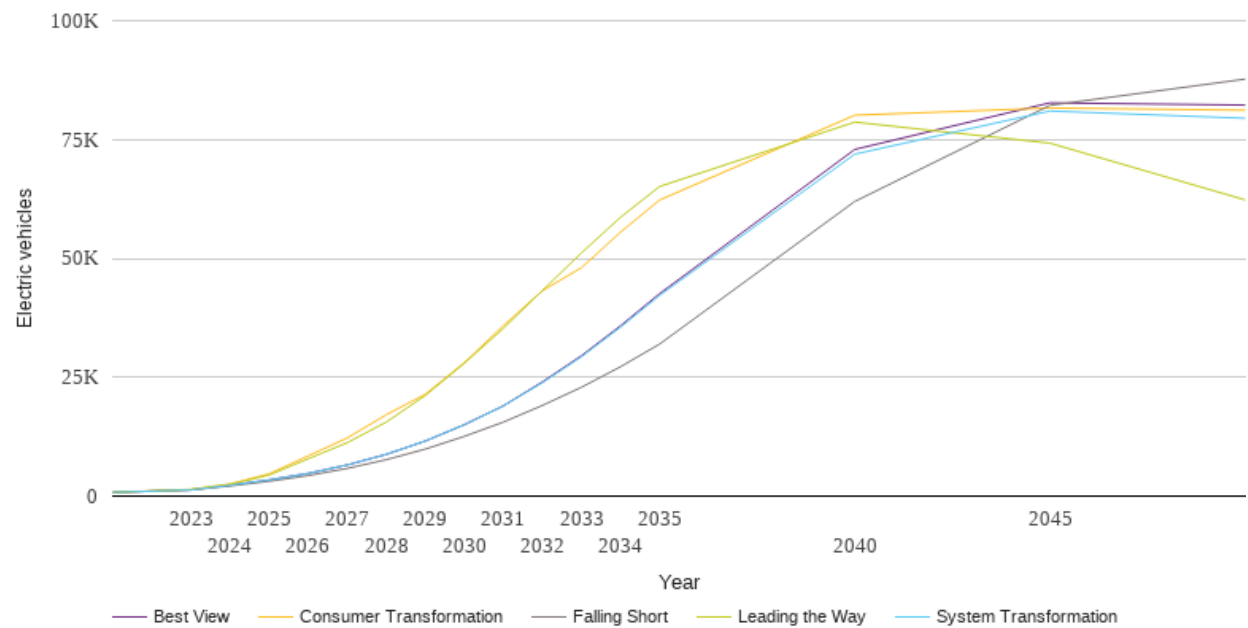
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	399	429	429	522	429
2024	744	831	831	1038	831
2025	1079	1217	1217	1501	1217
2026	1815	2016	2016	2589	2016
2027	2174	2387	2387	3034	2387
2028	2485	2699	2699	3361	2699
2029	2784	2993	2993	3634	2993
2030	2974	3183	3183	3737	3183
2031	3164	3341	3341	3777	3341
2032	3322	3499	3499	3798	3499
2033	3480	3630	3630	3808	3630
2034	3638	3733	3733	3808	3733
2035	3769	3836	3836	3808	3836
2040	3943	3867	3867	3808	3867
2045	3943	3867	3867	3808	3867
2050	3943	3867	3867	3808	3867



Technology Summary: Electric vehicles

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

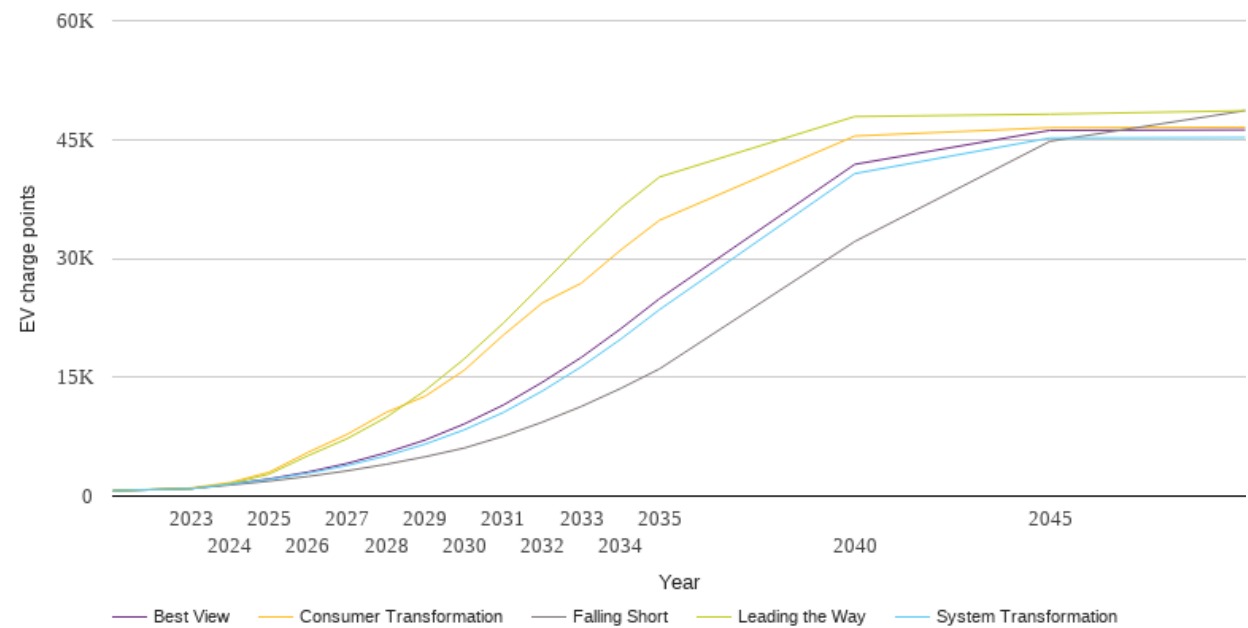
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	782	782	782	782	782
2023	1316	1310	1415	1360	1310
2024	2136	2280	2563	2458	2280
2025	3111	3396	4685	4430	3396
2026	4316	4769	8444	7845	4768
2027	5822	6545	12221	11235	6543
2028	7659	8777	17105	15566	8778
2029	9887	11576	21423	21159	11580
2030	12563	15016	28071	27928	15022
2031	15566	18978	35852	35276	18986
2032	19072	23840	43198	43245	24015
2033	22893	29312	48046	51149	29524
2034	27204	35524	55512	58637	35805
2035	31963	42199	62273	65121	42570
2040	61974	71924	80118	78664	72918
2045	82188	80998	81629	74233	82722
2050	87704	79472	81157	62306	82245



Technology Summary: EV Charge Point

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

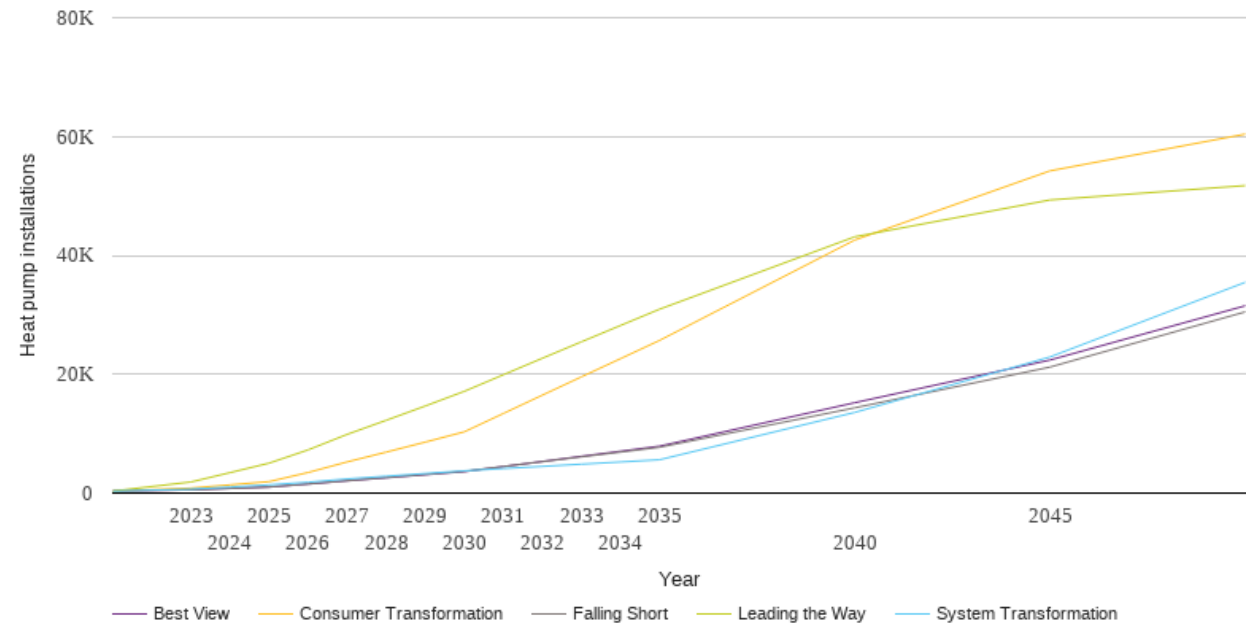
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	677	677	677	677	677
2023	952	940	1027	947	945
2024	1393	1502	1703	1564	1514
2025	1886	2110	3018	2776	2167
2026	2484	2885	5529	5113	3041
2027	3189	3861	7795	7257	4124
2028	4011	5077	10564	9944	5476
2029	4969	6567	12611	13339	7084
2030	6064	8366	15888	17323	9107
2031	7561	10556	20318	21833	11497
2032	9336	13264	24384	26748	14373
2033	11321	16331	26886	31760	17512
2034	13572	19783	31037	36369	21090
2035	16059	23534	34817	40275	24918
2040	32132	40700	45445	47902	41867
2045	44778	45192	46498	48204	46162
2050	48649	45253	46565	48637	46234



Technology Summary: Heat pumps

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

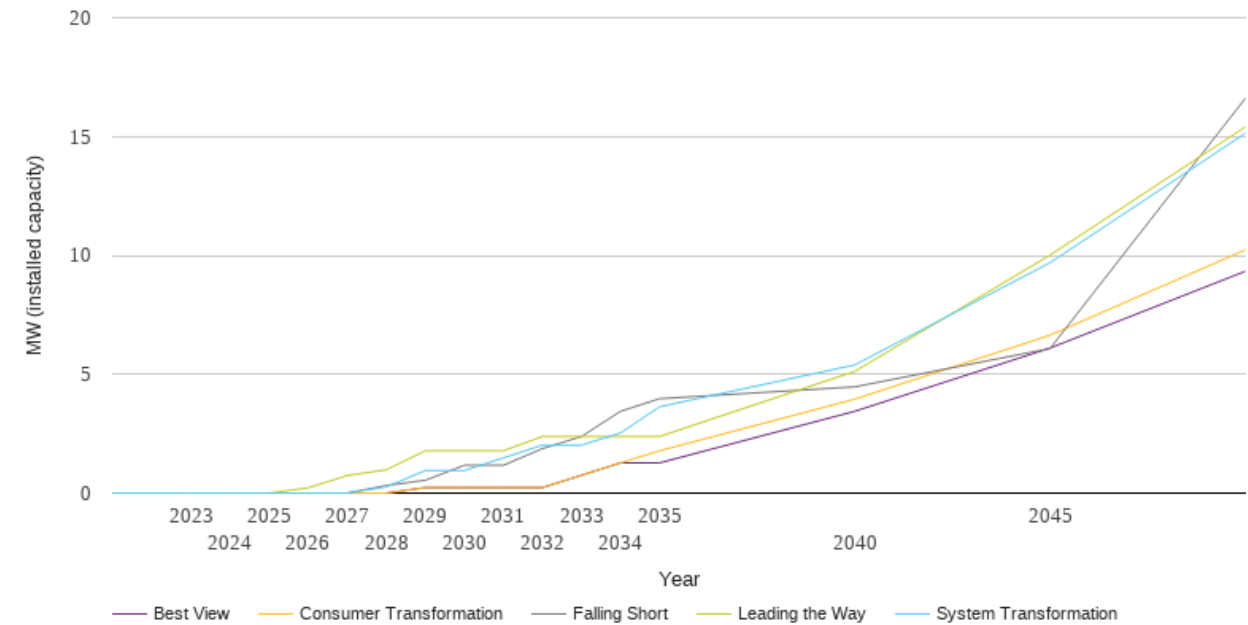
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	341	341	341	341	341
2023	560	663	838	1872	560
2024	791	1017	1382	3443	791
2025	1023	1392	1932	5039	1023
2026	1540	1829	3466	7274	1526
2027	2093	2383	5250	9884	2070
2028	2615	2846	6897	12251	2577
2029	3139	3299	8582	14657	3096
2030	3668	3746	10312	17126	3615
2031	4471	4123	13398	19913	4464
2032	5287	4494	16486	22694	5326
2033	6101	4867	19562	25457	6189
2034	6900	5238	22621	28205	7036
2035	7709	5609	25691	30944	7897
2040	14352	13578	42580	43129	15213
2045	21204	22907	54222	49325	22388
2050	30493	35465	60404	51744	31518



Technology Summary: Hydrogen electrolysis

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

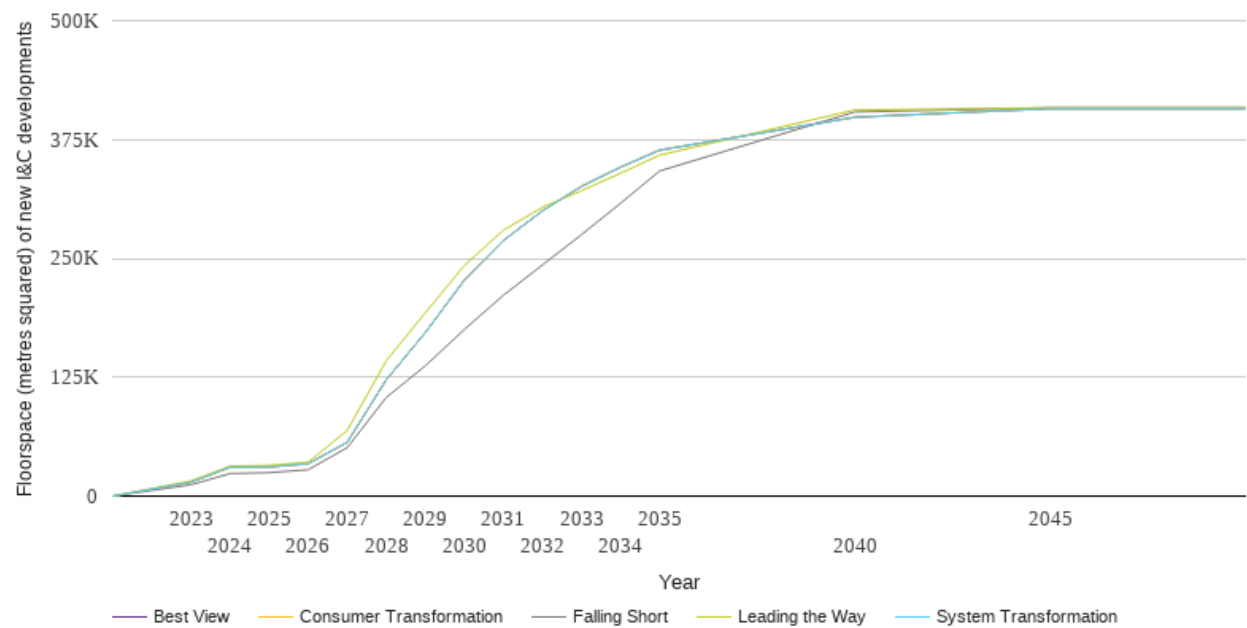
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.2	0.0
2027	0.0	0.0	0.0	0.7	0.0
2028	0.3	0.3	0.0	1.0	0.0
2029	0.5	1.0	0.2	1.8	0.2
2030	1.2	1.0	0.2	1.8	0.2
2031	1.2	1.5	0.2	1.8	0.2
2032	1.9	2.0	0.2	2.4	0.2
2033	2.4	2.0	0.7	2.4	0.7
2034	3.4	2.5	1.3	2.4	1.3
2035	4.0	3.6	1.8	2.4	1.3
2040	4.5	5.4	3.9	5.1	3.4
2045	6.1	9.7	6.6	10.0	6.1
2050	16.6	15.1	10.2	15.4	9.3



Technology Summary: Non domestic

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

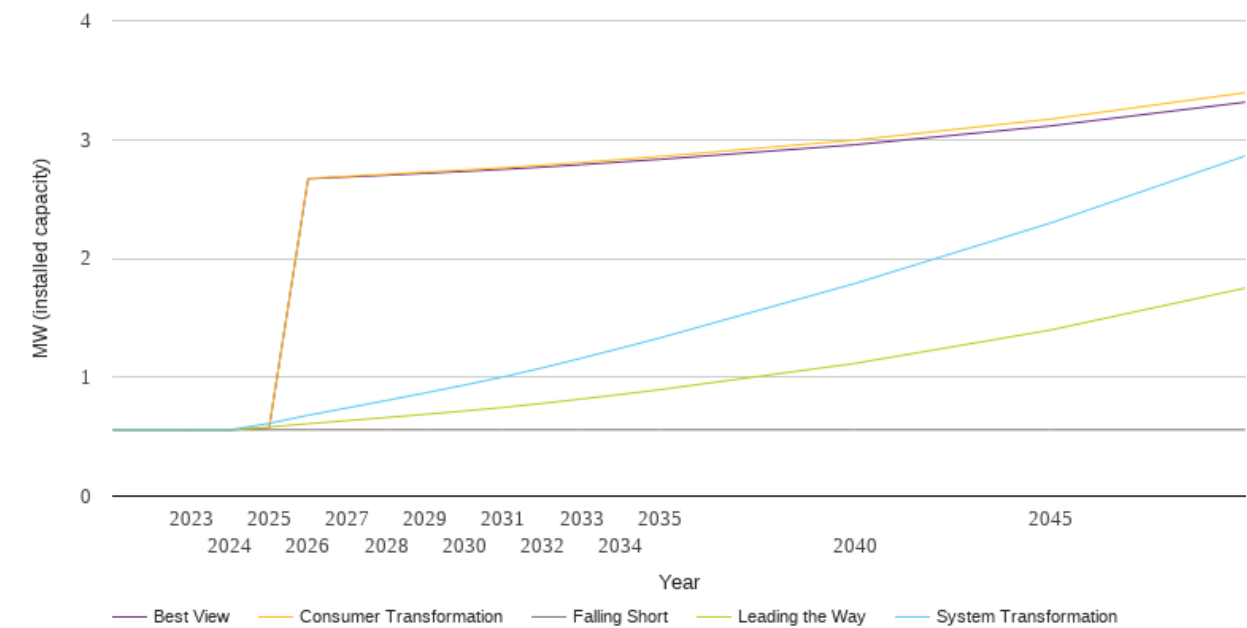
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	11946	14710	14710	16033	14710
2024	23683	30382	30382	31524	30382
2025	24634	30709	30709	32316	30709
2026	27718	34036	34036	35700	34036
2027	50950	56578	56578	68989	56578
2028	103781	122327	122327	142377	122327
2029	136977	171989	171989	192746	171989
2030	175137	227075	227075	242475	227075
2031	211176	268821	268821	279696	268821
2032	243017	300006	300006	303677	300006
2033	274964	325795	325795	321221	325795
2034	307921	345959	345959	339516	345959
2035	341917	363841	363841	358560	363841
2040	403986	398476	398476	406102	398476
2045	408486	407476	407476	408486	407476
2050	408486	407476	407476	408486	407476



Technology Summary: Other Distributed Generation

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

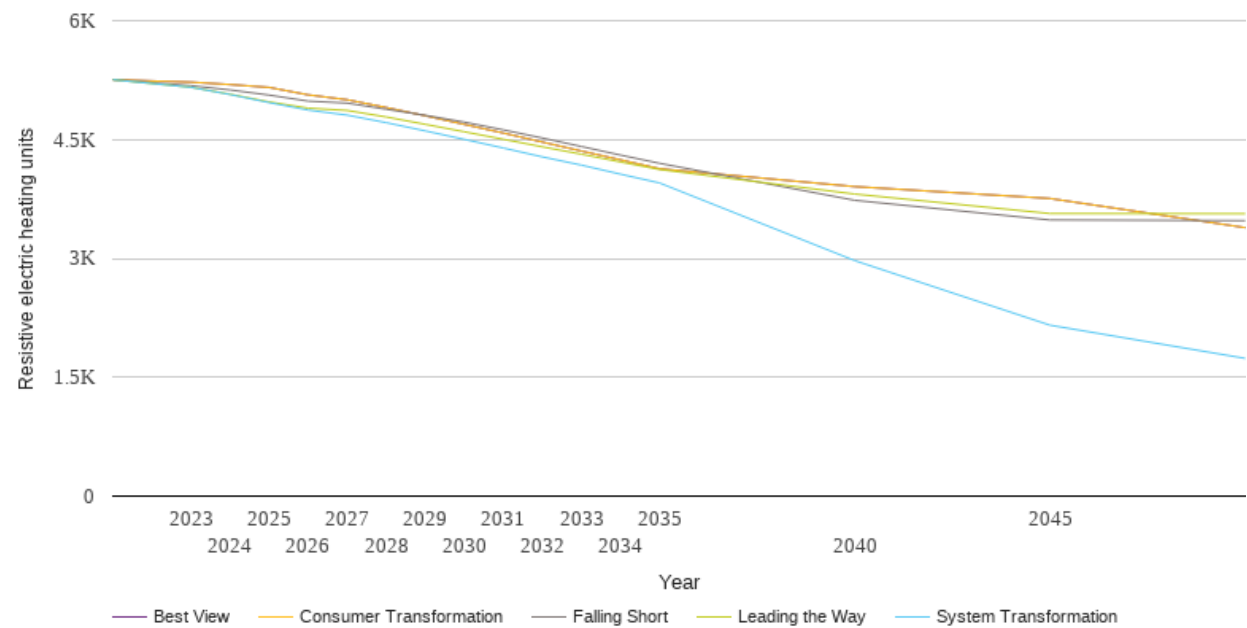
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.6	0.6	0.6	0.6	0.6
2023	0.6	0.6	0.6	0.6	0.6
2024	0.6	0.6	0.6	0.6	0.6
2025	0.6	0.6	0.6	0.6	0.6
2026	0.6	0.7	2.7	0.6	2.7
2027	0.6	0.7	2.7	0.6	2.7
2028	0.6	0.8	2.7	0.7	2.7
2029	0.6	0.9	2.7	0.7	2.7
2030	0.6	0.9	2.7	0.7	2.7
2031	0.6	1.0	2.8	0.7	2.7
2032	0.6	1.1	2.8	0.8	2.8
2033	0.6	1.2	2.8	0.8	2.8
2034	0.6	1.2	2.8	0.9	2.8
2035	0.6	1.3	2.9	0.9	2.8
2040	0.6	1.8	3.0	1.1	3.0
2045	0.6	2.3	3.2	1.4	3.1
2050	0.6	2.9	3.4	1.8	3.3



Technology Summary: Resistive electric heating

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

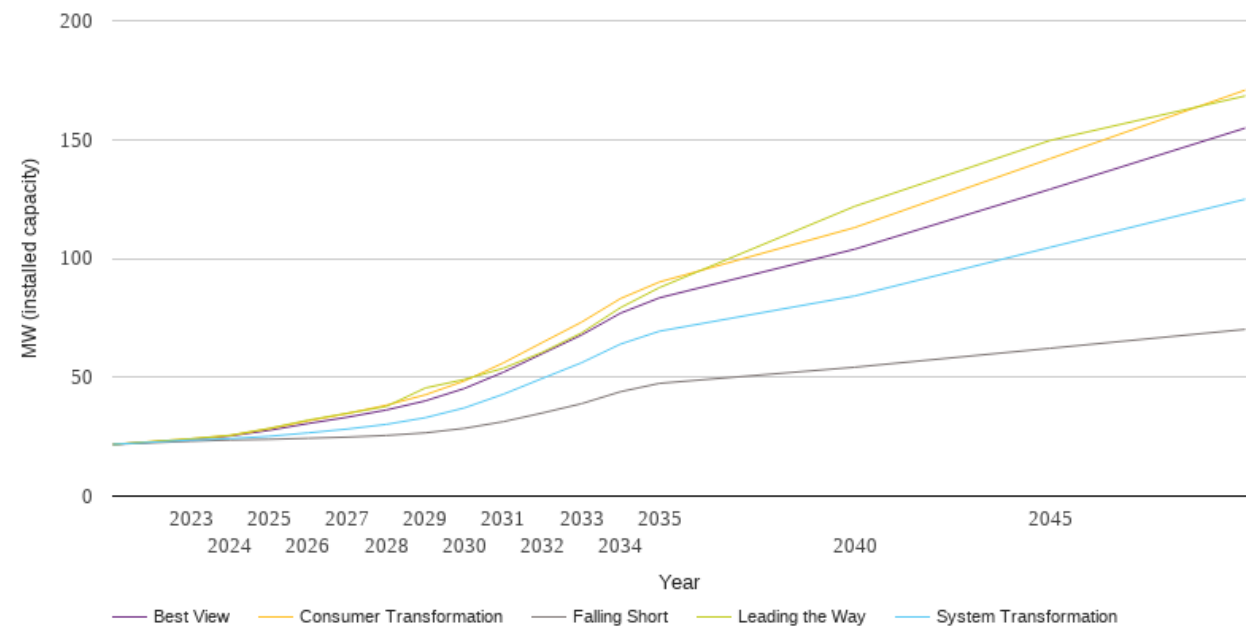
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	5255	5255	5255	5255	5255
2023	5180	5159	5224	5160	5224
2024	5126	5068	5194	5072	5194
2025	5061	4966	5158	4975	5158
2026	4985	4872	5064	4896	5064
2027	4960	4808	5002	4867	5002
2028	4882	4713	4904	4785	4904
2029	4806	4609	4800	4692	4800
2030	4720	4502	4691	4598	4691
2031	4622	4393	4582	4503	4582
2032	4519	4281	4468	4408	4468
2033	4412	4177	4355	4315	4355
2034	4304	4063	4244	4217	4244
2035	4200	3952	4131	4122	4131
2040	3733	2972	3906	3812	3906
2045	3485	2157	3756	3566	3756
2050	3476	1738	3388	3564	3388



Technology Summary: Solar Generation

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

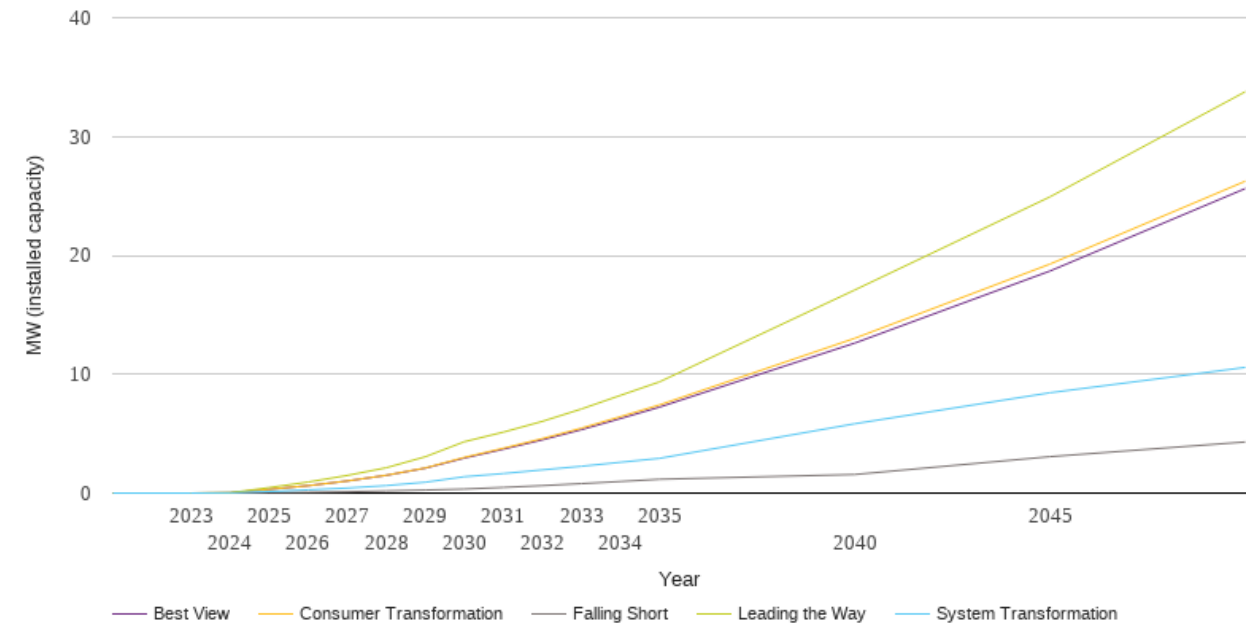
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	21.7	21.7	21.7	21.7	21.7
2023	23.1	23.6	24.1	24.1	23.8
2024	23.6	24.2	25.5	25.6	25.3
2025	23.9	25.2	28.3	28.5	27.7
2026	24.3	26.6	31.6	32.0	30.5
2027	24.8	28.2	34.7	34.8	33.2
2028	25.5	30.2	38.2	37.7	36.2
2029	26.6	33.0	42.6	45.5	40.1
2030	28.5	37.1	48.4	49.1	45.3
2031	31.3	42.9	56.0	53.8	52.1
2032	35.0	49.5	64.6	60.5	59.9
2033	38.9	56.1	73.2	68.6	67.8
2034	43.9	63.9	83.1	79.3	76.9
2035	47.4	69.4	90.1	87.7	83.4
2040	54.2	84.2	113.0	121.9	103.9
2045	62.2	104.6	141.9	149.6	129.1
2050	70.1	124.9	170.8	168.3	154.8



Technology Summary: Storage

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

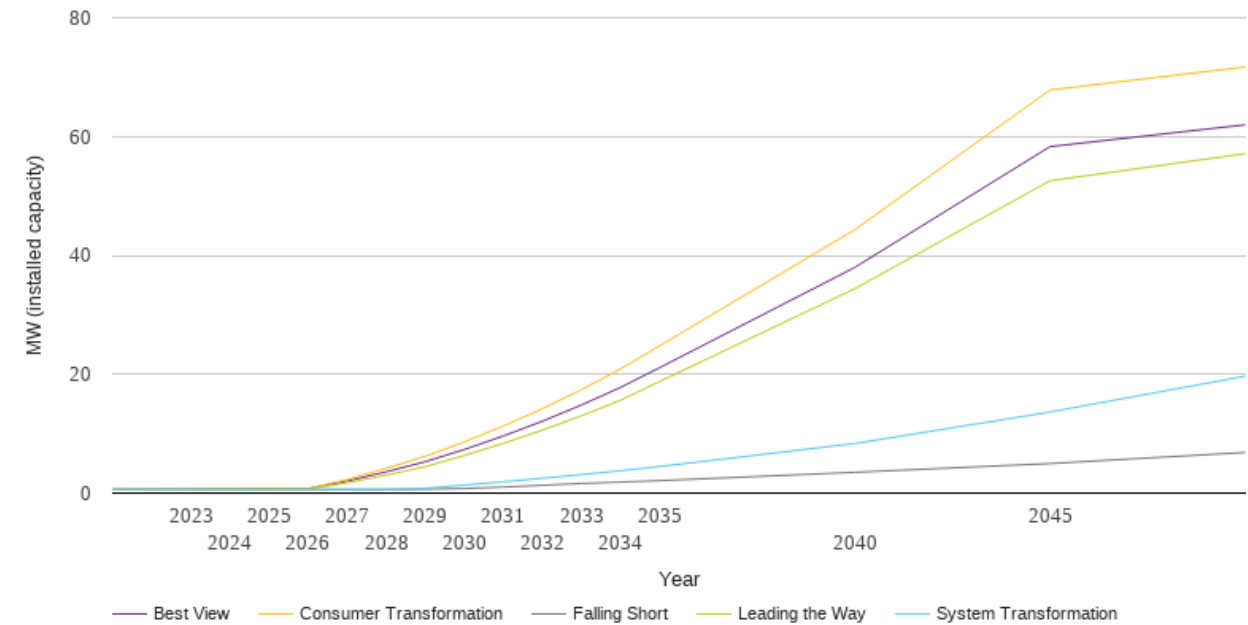
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.1	0.1	0.3	0.5	0.3
2026	0.1	0.3	0.6	0.9	0.6
2027	0.1	0.4	1.0	1.5	1.0
2028	0.2	0.6	1.5	2.1	1.5
2029	0.3	0.9	2.1	3.1	2.1
2030	0.3	1.4	3.0	4.3	2.9
2031	0.5	1.6	3.8	5.1	3.7
2032	0.6	2.0	4.6	6.0	4.5
2033	0.8	2.3	5.5	7.1	5.3
2034	1.0	2.6	6.4	8.2	6.3
2035	1.2	2.9	7.4	9.4	7.2
2040	1.6	5.8	13.0	17.1	12.6
2045	3.1	8.4	19.3	24.9	18.7
2050	4.3	10.6	26.2	33.8	25.6



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	0.6	0.6	0.6	0.6	0.6
2023	0.6	0.6	0.6	0.6	0.6
2024	0.6	0.6	0.7	0.6	0.7
2025	0.6	0.6	0.7	0.6	0.7
2026	0.6	0.6	0.8	0.7	0.8
2027	0.6	0.6	2.3	1.7	2.0
2028	0.6	0.6	4.2	3.0	3.6
2029	0.6	0.8	6.2	4.4	5.3
2030	0.8	1.3	8.6	6.3	7.3
2031	1.0	1.9	11.3	8.4	9.6
2032	1.3	2.5	14.2	10.6	12.1
2033	1.6	3.1	17.4	13.0	14.8
2034	1.9	3.8	20.9	15.6	17.8
2035	2.1	4.5	24.8	18.8	21.1
2040	3.5	8.3	44.3	34.4	38.0
2045	5.0	13.6	67.8	52.6	58.3
2050	6.8	19.7	71.7	57.1	62.0



National Grid Electricity Distribution PLC 09223384)
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