

Distribution Future Energy Scenarios 2022

Local Authority:
Stroud

What are Distribution Future Energy Scenarios?

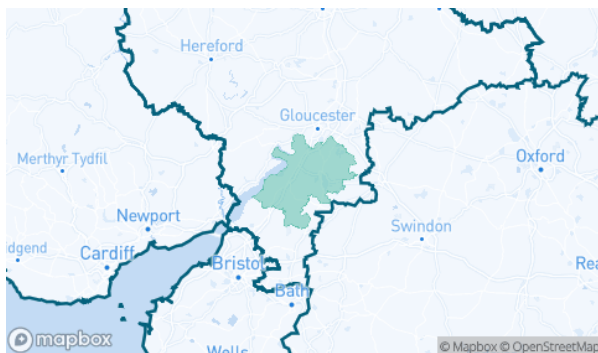
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Stroud covered by the NGED licence areas.



Scenario Summary

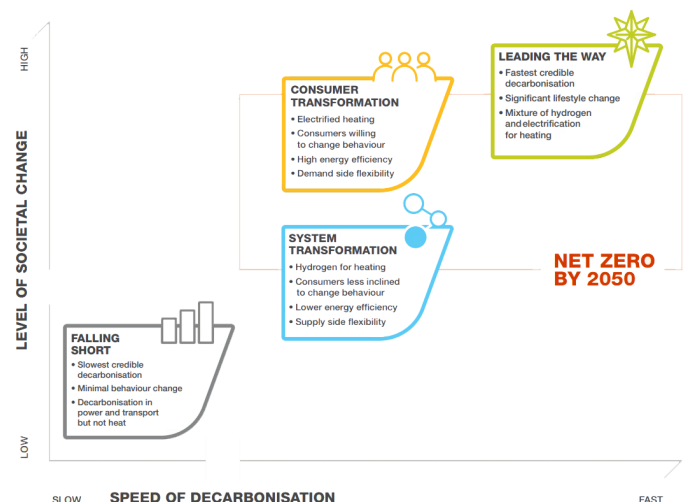
This DFES scenario framework includes three scenarios that are compliant with UK government targets of Net Zero greenhouse gas emissions by 2050. A summary of each scenario is below:

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 Stroud 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	176	105	105	0	22060	9899	9899	0
Domestic	New dwellings	0	5355	5980	5980	7231	16494	16389	16389	16323
Electric vehicles	Electric vehicles	1526	12752	15068	28056	27845	83031	66095	67251	58252
EV Charge Point	EV charge points	872	6071	8434	15785	17421	48216	44111	46626	47295
Heat pumps	Heat pump installations	1874	6391	6190	12258	18359	29716	35180	60893	53657
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	0.0	0.0	0.0	0.4	2.3	1.5	2.1
Non domestic	Floorspace (metres squared) of new I&C developments	0	22539 5	28310 3	28310 3	29457 1	55465 2	55465 2	55465 2	55465 2
Other Distributed Generation	MW (installed capacity)	6.4	6.5	6.5	6.7	6.5	6.5	2.7	0.5	4.2
Resistive electric heating	Resistive electric heating units	7545	6070	5925	6419	6069	4706	1742	4227	4390
Solar Generation	MW (installed capacity)	22.3	31.7	38.9	49.0	46.1	63.5	105.8	146.3	140.2
Storage	MW (installed capacity)	0.0	0.5	1.8	4.2	5.5	4.6	11.7	26.8	33.1
Wind	MW (installed capacity)	2.0	2.0	2.1	2.2	2.2	2.2	3.6	5.9	5.5

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.

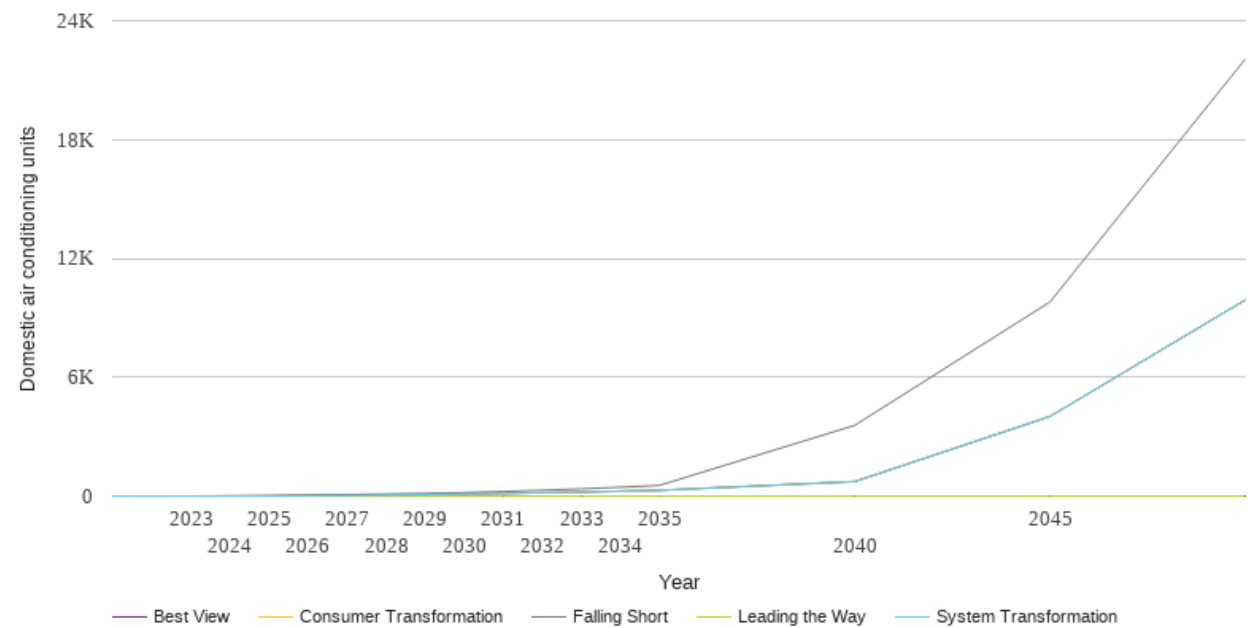
If you have any comments or queries regarding these reports, please contact

nged.energyplanning@nationalgrid.co.uk.

Technology Summary: Air conditioning

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

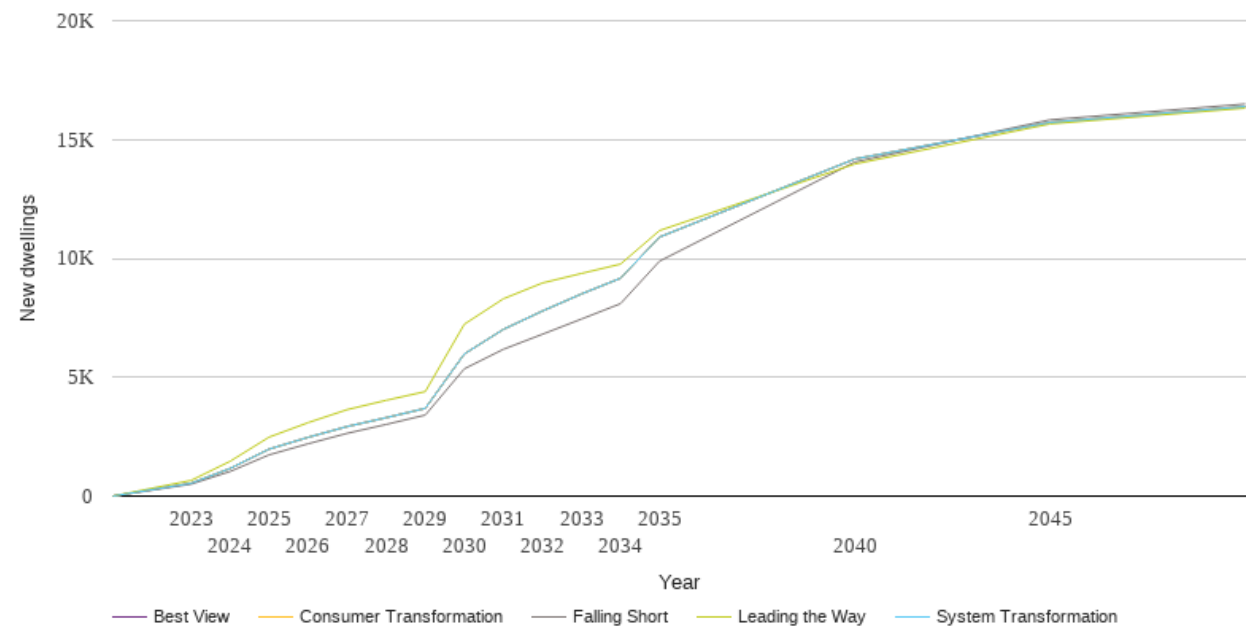
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	16	0	0	0	0
2025	35	0	0	0	0
2026	56	16	16	0	16
2027	80	34	34	0	34
2028	108	55	55	0	55
2029	140	79	79	0	79
2030	176	105	105	0	105
2031	231	135	135	0	135
2032	293	168	168	0	168
2033	365	205	205	0	205
2034	447	247	247	0	247
2035	541	294	294	0	294
2040	3572	733	733	0	733
2045	9800	4022	4022	0	4022
2050	22060	9899	9899	0	9899



Technology Summary: Domestic

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

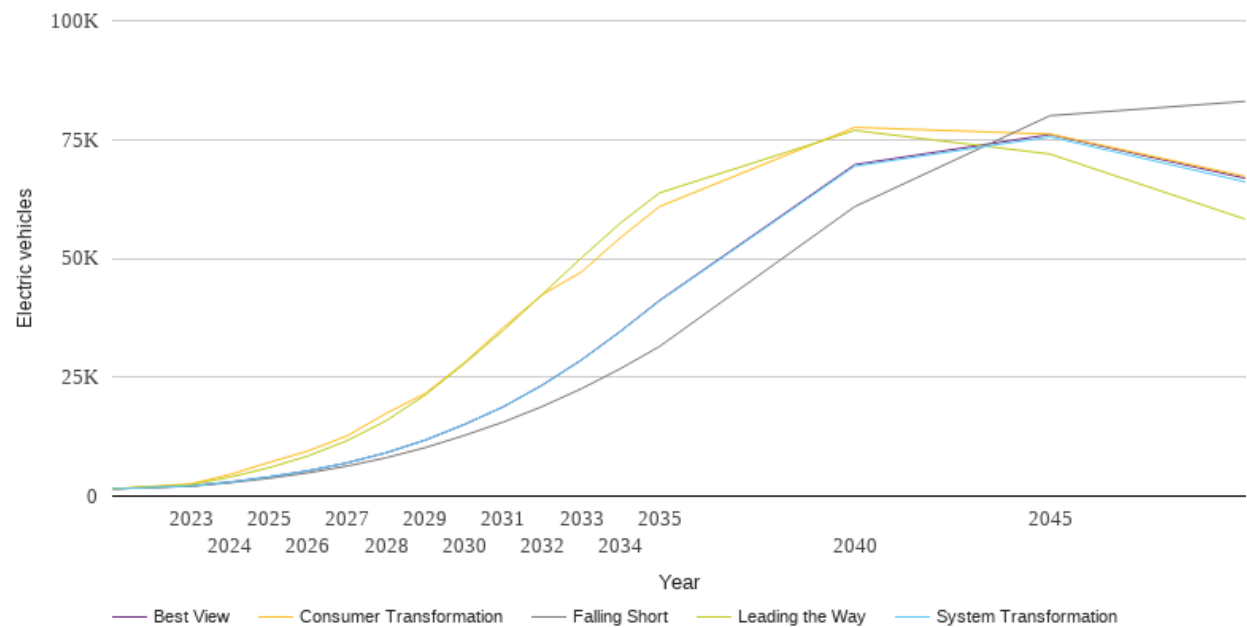
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	502	540	540	658	540
2024	1034	1161	1161	1463	1161
2025	1735	1976	1976	2481	1976
2026	2202	2472	2472	3090	2472
2027	2641	2927	2927	3638	2927
2028	3015	3299	3299	4030	3299
2029	3409	3690	3690	4396	3690
2030	5355	5980	5980	7231	5980
2031	6175	7013	7013	8300	7013
2032	6809	7785	7785	8965	7785
2033	7448	8504	8504	9366	8504
2034	8094	9164	9164	9759	9164
2035	9884	10897	10897	11171	10897
2040	14053	14179	14179	13970	14179
2045	15828	15723	15723	15657	15723
2050	16494	16389	16389	16323	16389



Technology Summary: Electric vehicles

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

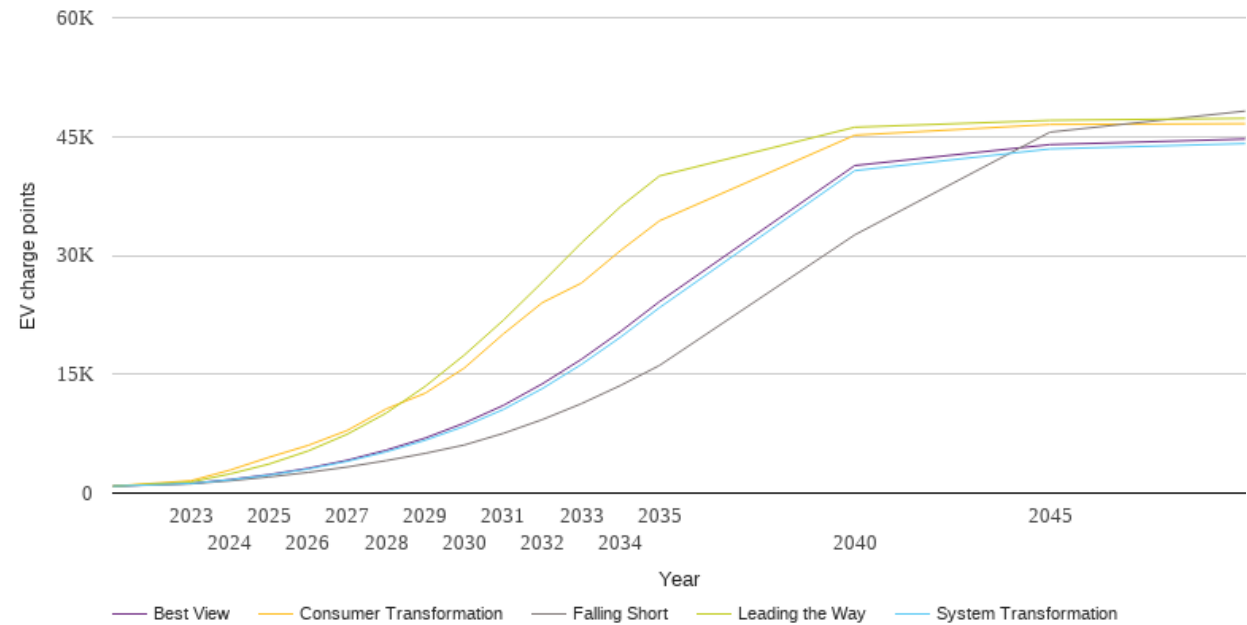
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1526	1526	1526	1526	1526
2023	2085	2131	2576	2410	2131
2024	2816	2955	4546	4003	2955
2025	3742	4024	7083	5980	4024
2026	4888	5319	9496	8446	5319
2027	6315	6997	12700	11678	6997
2028	8066	9119	17409	15863	9119
2029	10196	11784	21599	21277	11784
2030	12752	15068	28056	27845	15068
2031	15580	18791	35468	34858	18791
2032	18855	23308	42377	42450	23367
2033	22594	28580	47146	50134	28650
2034	26812	34579	54371	57438	34671
2035	31471	41035	60908	63785	41153
2040	60891	69417	77559	76914	69717
2045	80016	75578	76147	71956	76055
2050	83031	66095	67251	58252	66853



Technology Summary: EV Charge Point

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

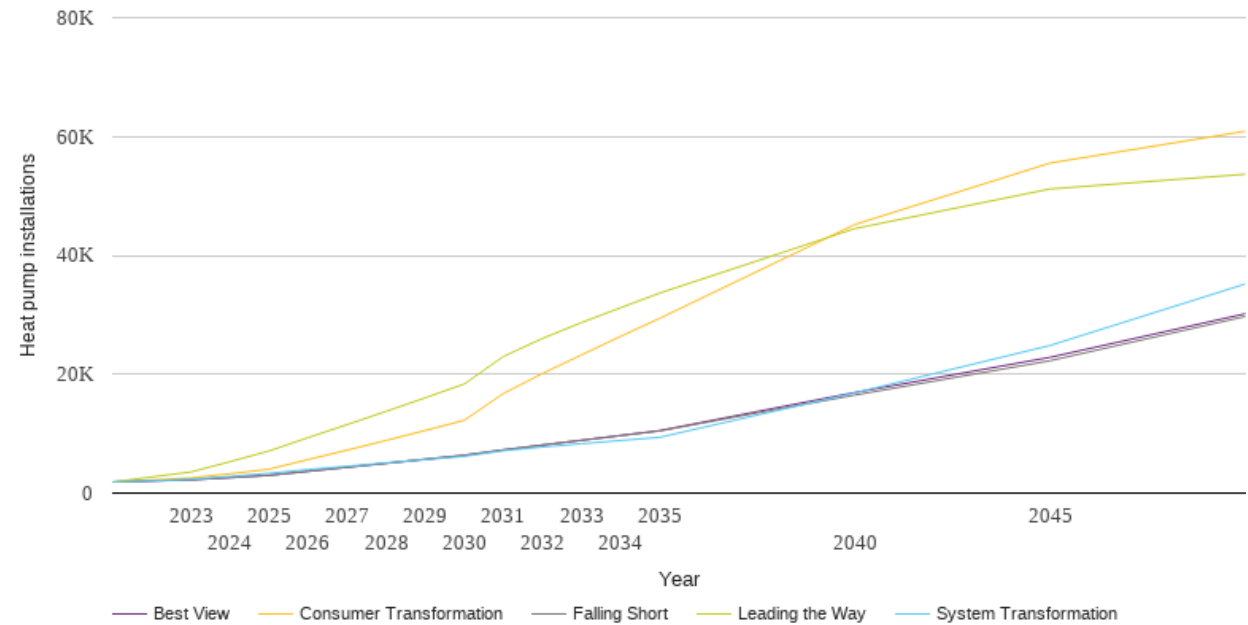
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	872	872	872	872	872
2023	1171	1209	1567	1400	1220
2024	1555	1674	2903	2422	1705
2025	2035	2272	4524	3668	2336
2026	2609	3039	6017	5315	3137
2027	3295	4007	7902	7428	4147
2028	4096	5209	10623	10100	5421
2029	5019	6674	12612	13482	6951
2030	6071	8434	15785	17421	8837
2031	7540	10560	20086	21820	11070
2032	9279	13196	24045	26625	13796
2033	11290	16244	26508	31584	16887
2034	13582	19676	30608	36149	20389
2035	16114	23412	34369	40029	24174
2040	32588	40692	45170	46176	41339
2045	45552	43433	46526	47043	43982
2050	48216	44111	46626	47295	44682



Technology Summary: Heat pumps

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

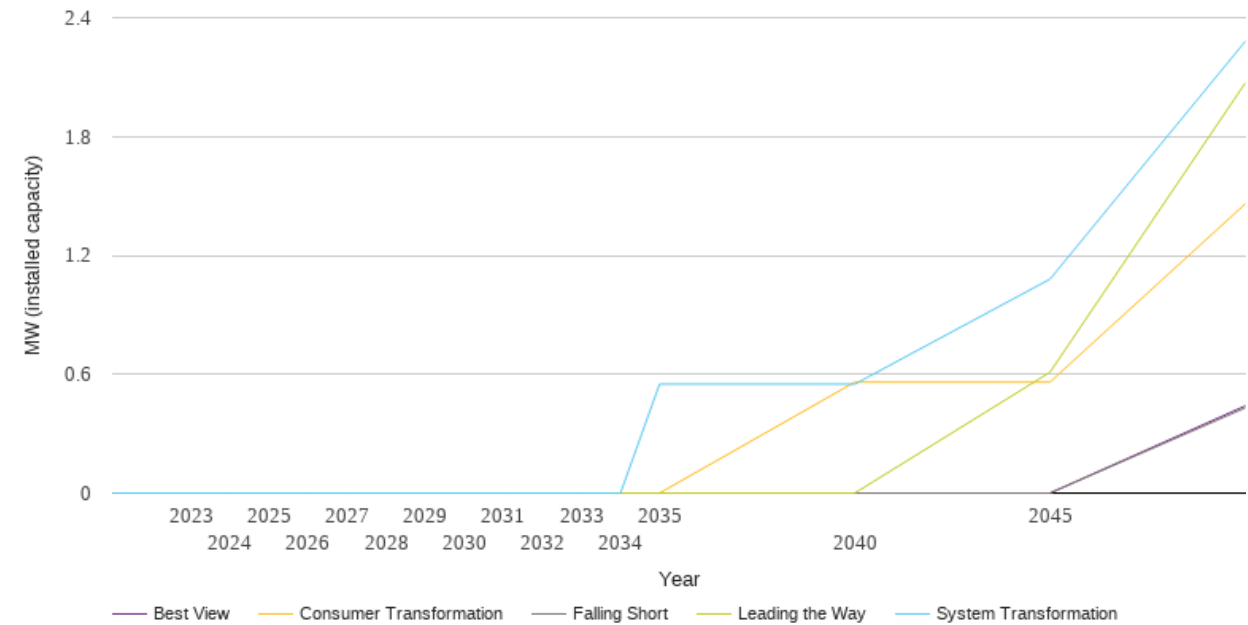
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1874	1874	1874	1874	1874
2023	2237	2326	2548	3557	2237
2024	2606	2810	3261	5287	2606
2025	2993	3344	4022	7091	2993
2026	3682	3964	5649	9337	3670
2027	4362	4520	7236	11529	4341
2028	5036	5080	8864	13760	5005
2029	5718	5634	10538	16033	5676
2030	6391	6190	12258	18359	6338
2031	7284	7132	16750	22978	7251
2032	8089	7754	20121	26015	8075
2033	8880	8308	23254	28688	8886
2034	9666	8850	26358	31175	9692
2035	10462	9381	29396	33647	10504
2040	16494	16862	45194	44507	16919
2045	22267	24834	55533	51178	22840
2050	29716	35180	60893	53657	30172



Technology Summary: Hydrogen electrolysis

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

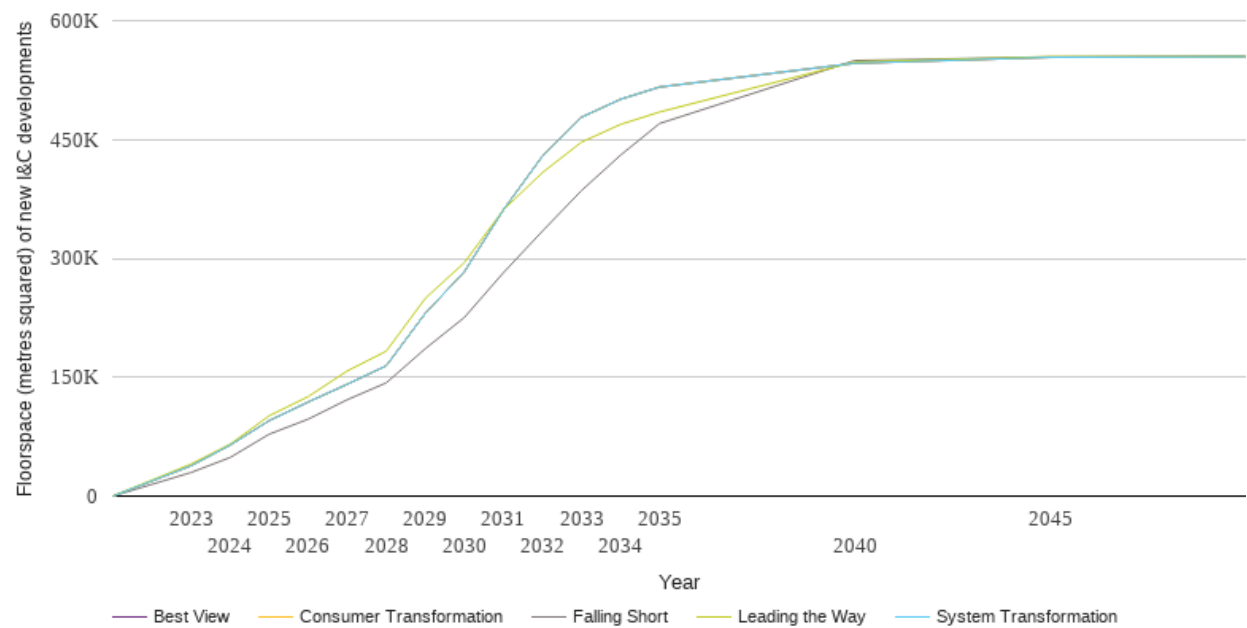
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0	0.0
2028	0.0	0.0	0.0	0.0	0.0
2029	0.0	0.0	0.0	0.0	0.0
2030	0.0	0.0	0.0	0.0	0.0
2031	0.0	0.0	0.0	0.0	0.0
2032	0.0	0.0	0.0	0.0	0.0
2033	0.0	0.0	0.0	0.0	0.0
2034	0.0	0.0	0.0	0.0	0.0
2035	0.0	0.6	0.0	0.0	0.0
2040	0.0	0.6	0.6	0.0	0.0
2045	0.0	1.1	0.6	0.6	0.0
2050	0.4	2.3	1.5	2.1	0.4



Technology Summary: Non domestic

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

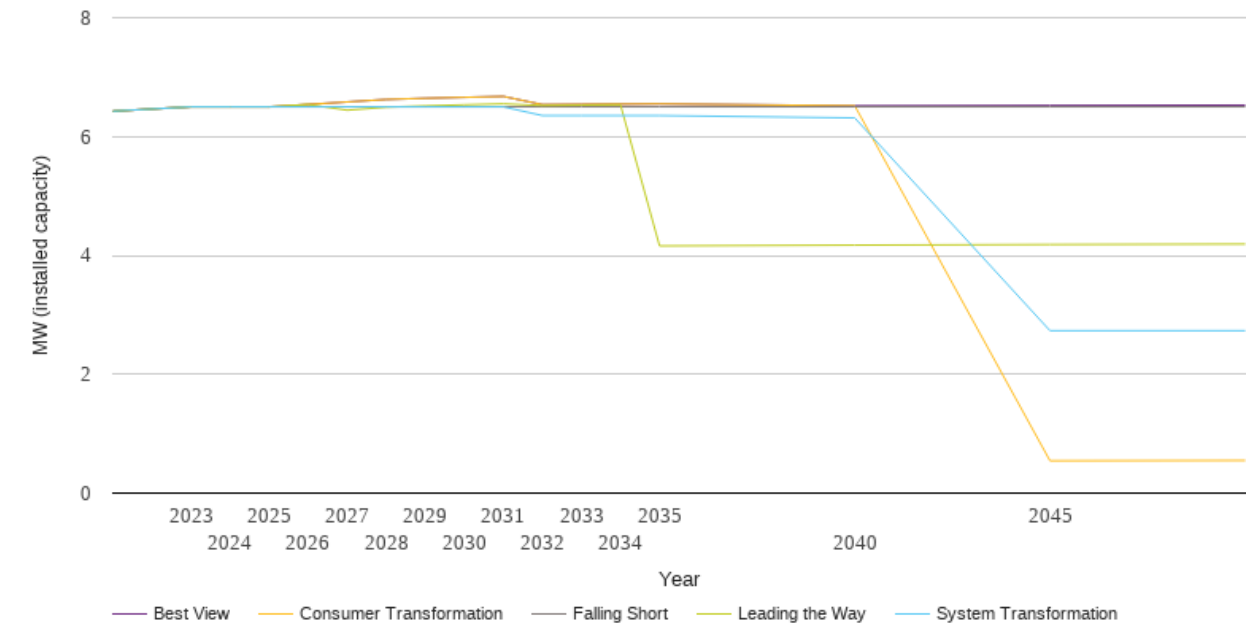
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	29776	38283	38283	40410	38283
2024	48689	64329	64329	65409	64329
2025	78104	95130	95130	101331	95130
2026	97089	118699	118699	125535	118699
2027	121608	141132	141132	157884	141132
2028	142911	164428	164428	182913	164428
2029	186054	230668	230668	249561	230668
2030	225395	283103	283103	294571	283103
2031	281840	361204	361204	361257	361204
2032	334386	429083	429083	408252	429083
2033	385589	478147	478147	446737	478147
2034	430234	500777	500777	469044	500777
2035	470207	516230	516230	484717	516230
2040	549702	546238	546238	547984	546238
2045	554202	553809	553809	554652	553809
2050	554652	554652	554652	554652	554652



Technology Summary: Other Distributed Generation

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

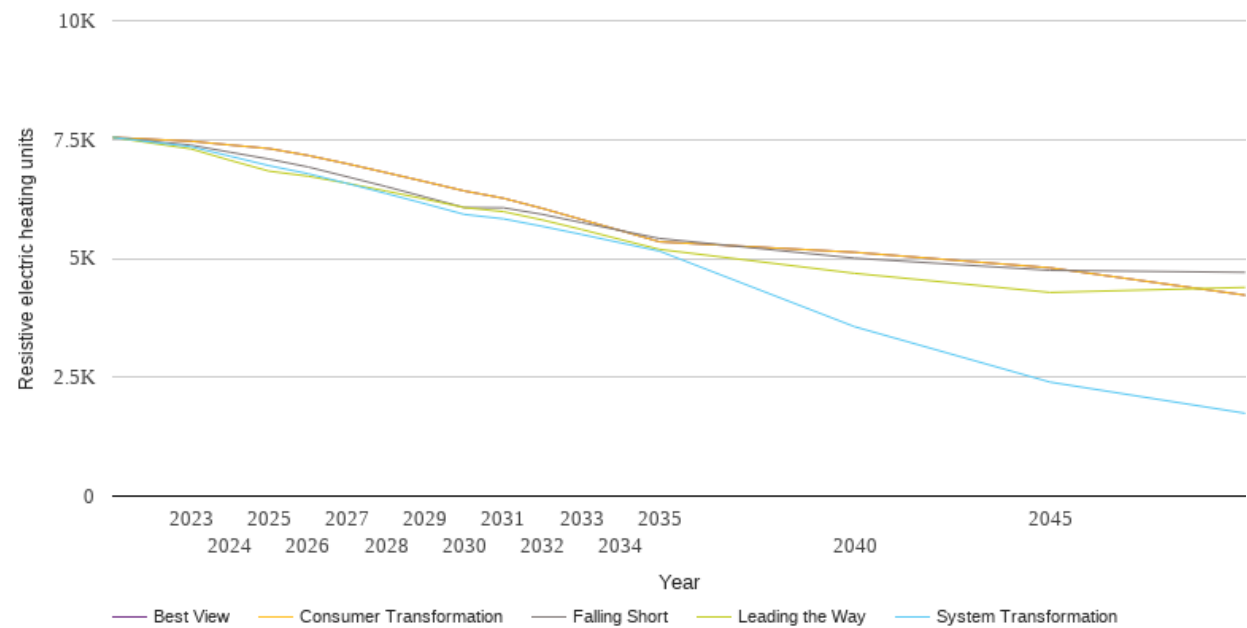
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	6.4	6.4	6.4	6.4	6.4
2023	6.5	6.5	6.5	6.5	6.5
2024	6.5	6.5	6.5	6.5	6.5
2025	6.5	6.5	6.5	6.5	6.5
2026	6.5	6.5	6.5	6.5	6.5
2027	6.5	6.5	6.6	6.4	6.6
2028	6.5	6.5	6.6	6.5	6.6
2029	6.5	6.5	6.6	6.5	6.6
2030	6.5	6.5	6.7	6.5	6.7
2031	6.5	6.5	6.7	6.6	6.7
2032	6.5	6.4	6.5	6.5	6.5
2033	6.5	6.4	6.5	6.5	6.5
2034	6.5	6.4	6.5	6.5	6.5
2035	6.5	6.4	6.5	4.2	6.5
2040	6.5	6.3	6.5	4.2	6.5
2045	6.5	2.7	0.5	4.2	6.5
2050	6.5	2.7	0.5	4.2	6.5



Technology Summary: Resistive electric heating

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

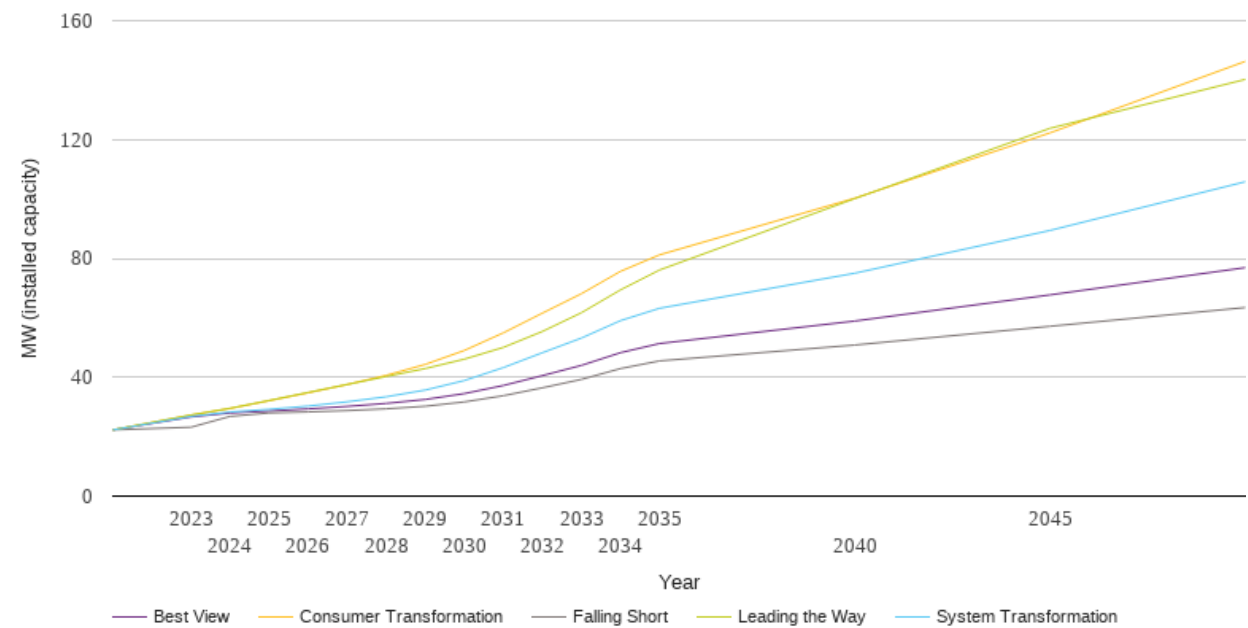
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	7545	7545	7545	7545	7545
2023	7382	7348	7464	7302	7464
2024	7233	7150	7386	7063	7386
2025	7088	6950	7310	6835	7310
2026	6923	6781	7165	6729	7165
2027	6717	6577	6990	6579	6990
2028	6510	6364	6803	6416	6803
2029	6290	6148	6613	6246	6613
2030	6070	5925	6419	6069	6419
2031	6065	5832	6265	5984	6265
2032	5926	5674	6051	5808	6051
2033	5754	5504	5818	5609	5818
2034	5586	5328	5586	5397	5586
2035	5419	5152	5349	5189	5349
2040	5005	3562	5128	4685	5128
2045	4749	2398	4802	4284	4802
2050	4706	1742	4227	4390	4227



Technology Summary: Solar Generation

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

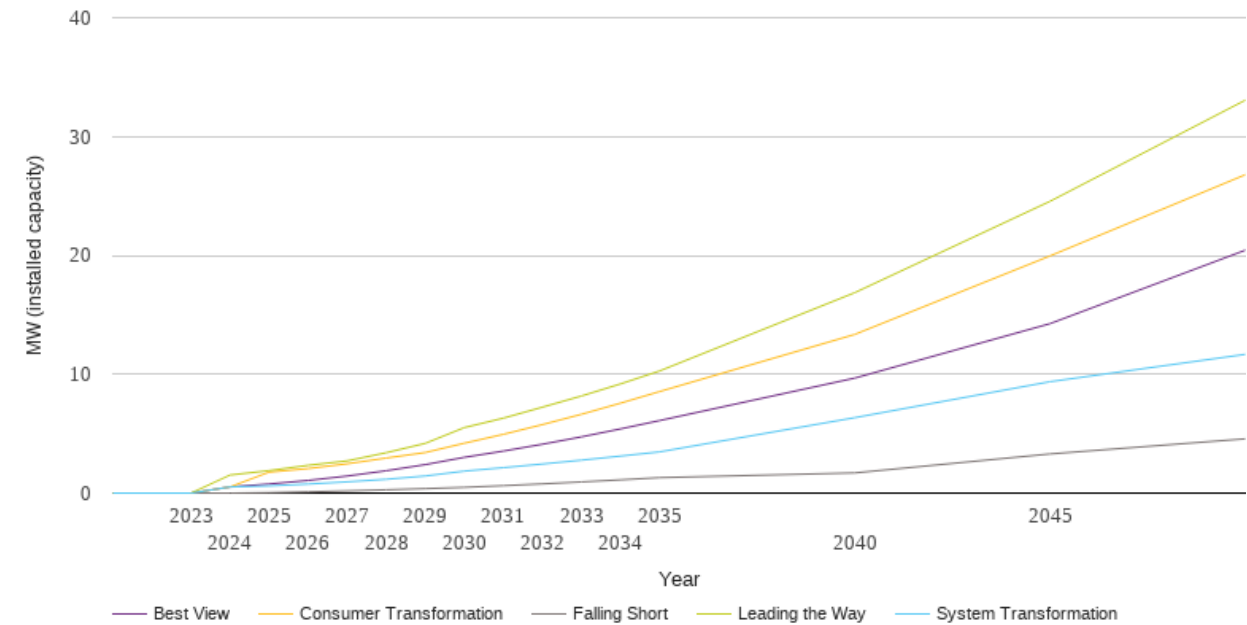
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	22.3	22.3	22.3	22.3	22.3
2023	23.2	26.8	27.3	27.3	26.6
2024	26.8	28.3	29.5	29.5	28.0
2025	28.0	29.2	32.1	32.2	28.6
2026	28.3	30.3	34.7	34.9	29.3
2027	28.8	31.7	37.6	37.6	30.2
2028	29.4	33.4	40.6	40.3	31.2
2029	30.2	35.7	44.3	42.9	32.5
2030	31.7	38.9	49.0	46.1	34.5
2031	33.8	43.2	54.9	50.0	37.2
2032	36.4	48.3	61.6	55.4	40.5
2033	39.3	53.2	68.1	61.7	44.0
2034	42.9	59.1	75.6	69.4	48.3
2035	45.5	63.2	81.2	76.1	51.3
2040	50.8	75.0	100.3	100.1	58.9
2045	57.1	89.4	122.2	123.8	67.7
2050	63.5	105.8	146.3	140.2	76.9



Technology Summary: Storage

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

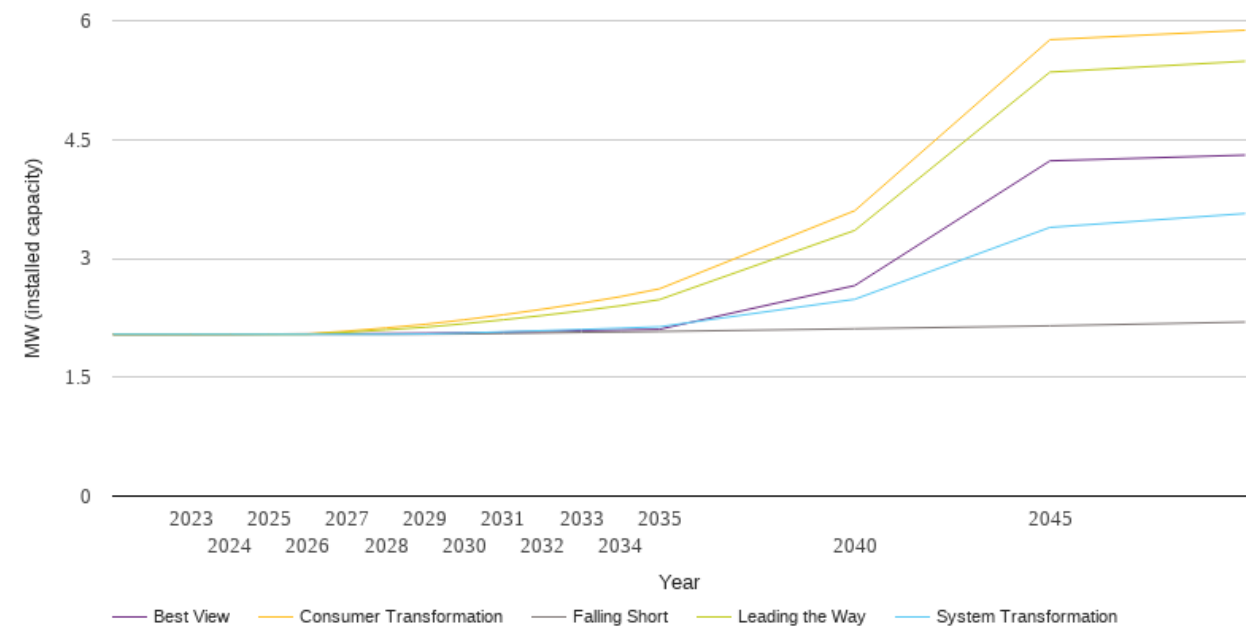
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.5	0.5	1.5	0.5
2025	0.0	0.6	1.8	1.9	0.8
2026	0.1	0.8	2.1	2.3	1.1
2027	0.2	0.9	2.5	2.7	1.4
2028	0.3	1.2	2.9	3.4	1.9
2029	0.4	1.4	3.4	4.2	2.4
2030	0.5	1.8	4.2	5.5	3.0
2031	0.6	2.1	4.9	6.3	3.5
2032	0.8	2.4	5.8	7.2	4.1
2033	0.9	2.8	6.6	8.2	4.7
2034	1.1	3.1	7.6	9.2	5.4
2035	1.3	3.5	8.5	10.3	6.1
2040	1.7	6.3	13.3	16.9	9.7
2045	3.3	9.4	20.0	24.5	14.3
2050	4.6	11.7	26.8	33.1	20.4



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	2.0	2.0	2.0	2.0	2.0
2023	2.0	2.0	2.0	2.0	2.0
2024	2.0	2.0	2.0	2.0	2.0
2025	2.0	2.0	2.0	2.0	2.0
2026	2.0	2.0	2.0	2.0	2.0
2027	2.0	2.0	2.1	2.1	2.1
2028	2.0	2.0	2.1	2.1	2.1
2029	2.0	2.0	2.2	2.1	2.1
2030	2.0	2.1	2.2	2.2	2.1
2031	2.1	2.1	2.3	2.2	2.1
2032	2.1	2.1	2.4	2.3	2.1
2033	2.1	2.1	2.4	2.3	2.1
2034	2.1	2.1	2.5	2.4	2.1
2035	2.1	2.1	2.6	2.5	2.1
2040	2.1	2.5	3.6	3.4	2.7
2045	2.1	3.4	5.8	5.4	4.2
2050	2.2	3.6	5.9	5.5	4.3



National Grid Electricity Distribution PLC 09223384)
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