

Distribution Future Energy Scenarios 2022

Local Authority:
Newport

What are Distribution Future Energy Scenarios?

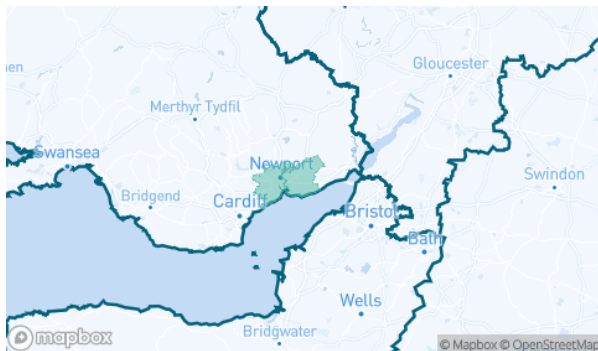
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Newport 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 Newport 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	525	1486	1279	1279	525	23322	12519	12519	525
Domestic	New dwellings	0	2728	2978	2978	3483	4024	3977	3977	3947
Electric vehicles	Electric vehicles	835	12821	15900	29681	29587	90432	79501	79687	65870
EV Charge Point	EV charge points	486	5865	8519	16113	17638	50539	49096	49449	51561
Heat pumps	Heat pump installations	110	3350	2961	9824	16471	36276	41348	70311	59811
Hydrogen electrolysis	MW (installed capacity)	0.0	0.2	1.6	0.2	4.6	1.9	3.5	2.3	9.7
Non domestic	Floorspace (metres squared) of new I&C developments	0	24214 4	30493 8	30493 8	32563 5	52005 5	51978 3	51978 3	52005 6
Other Distributed Generation	MW (installed capacity)	9.6	9.8	9.8	9.8	9.3	8.8	8.2	8.2	12.2
Resistive electric heating	Resistive electric heating units	5641	5047	4766	4951	4855	3856	1946	3684	3901
Solar Generation	MW (installed capacity)	30.6	35.6	43.2	54.9	53.5	61.5	105.0	152.7	155.0
Storage	MW (installed capacity)	0.5	0.9	1.9	3.6	4.9	5.0	11.7	28.3	35.8
Wind	MW (installed capacity)	14.1	14.2	14.3	15.8	15.4	15.8	26.0	45.2	41.6

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

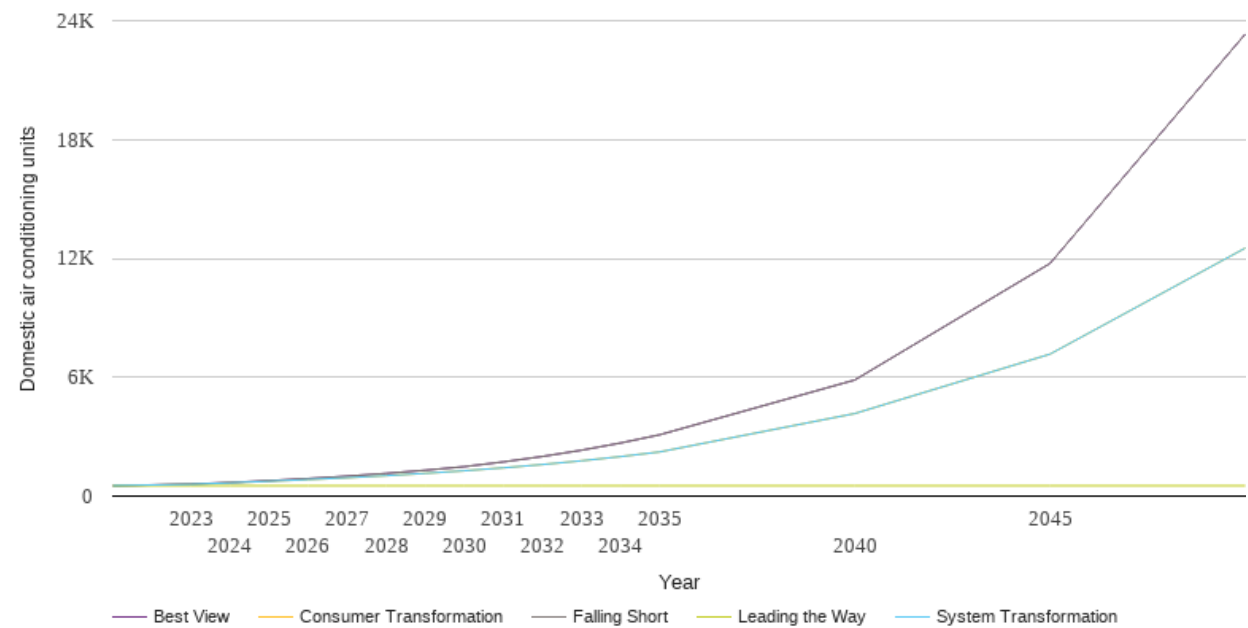
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

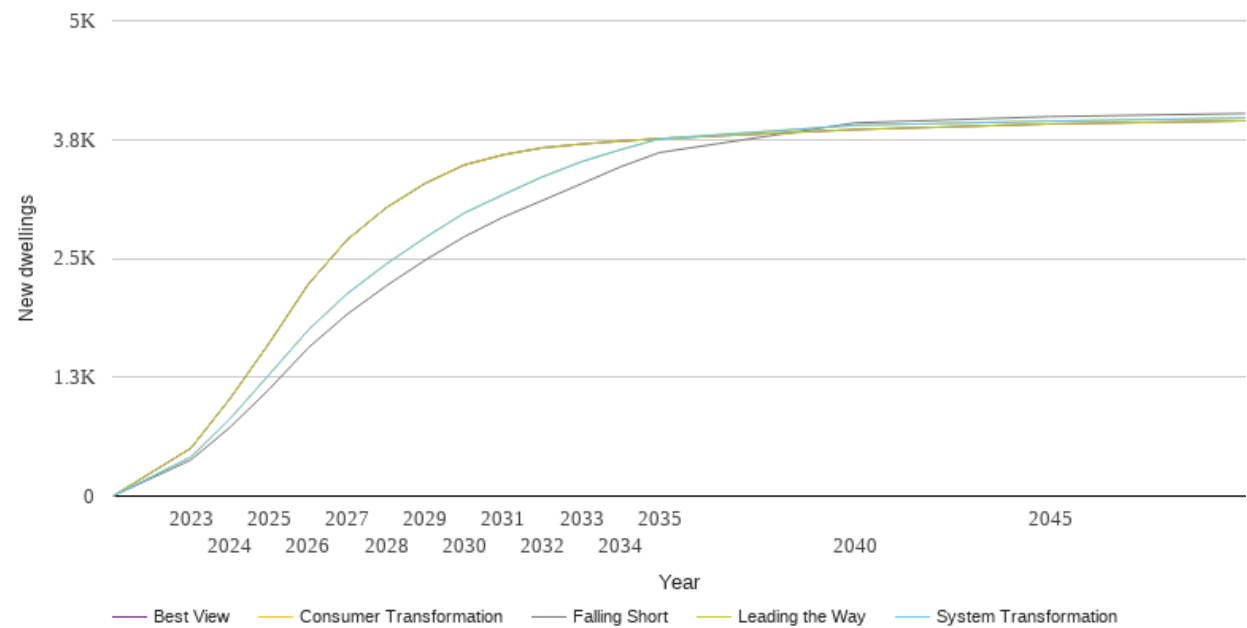
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	525	525	525	525	525
2023	605	595	595	525	605
2024	684	667	667	525	684
2025	778	750	750	525	778
2026	884	833	833	525	884
2027	1005	925	925	525	1005
2028	1144	1030	1030	525	1144
2029	1305	1148	1148	525	1305
2030	1486	1279	1279	525	1486
2031	1726	1427	1427	525	1726
2032	2000	1594	1594	525	2000
2033	2316	1781	1781	525	2316
2034	2679	1993	1993	525	2679
2035	3094	2228	2228	525	3094
2040	5860	4167	4167	525	5860
2045	11742	7166	7166	525	11742
2050	23322	12519	12519	525	23322



Technology Summary: Domestic

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

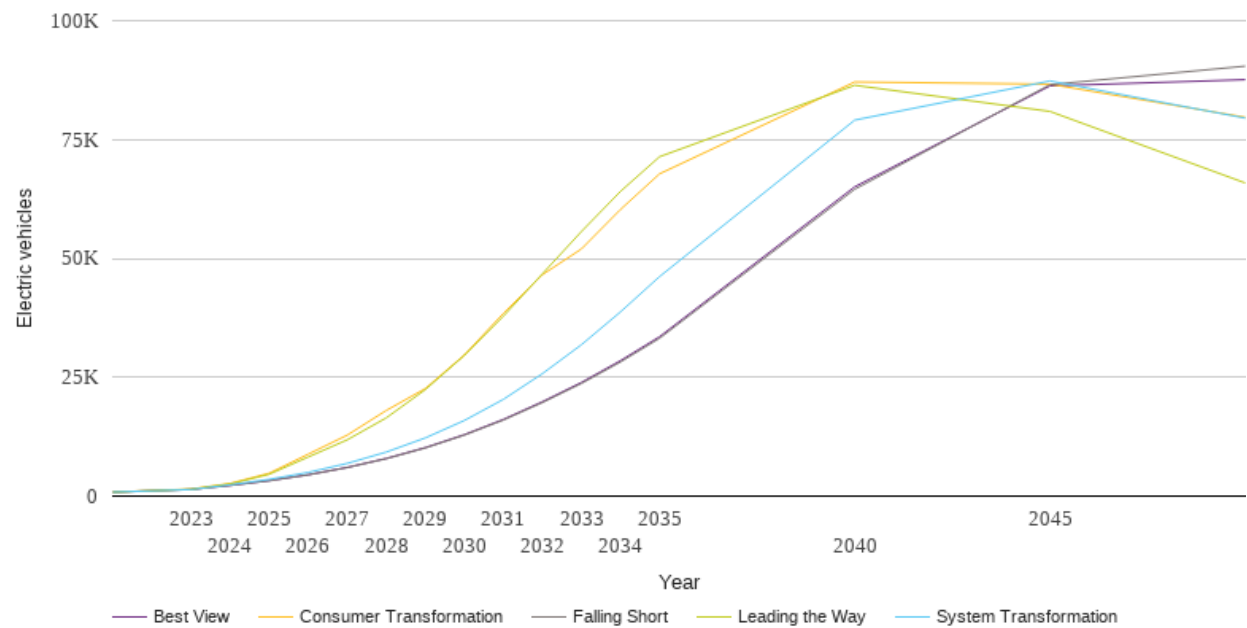
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	381	412	412	505	505
2024	724	814	814	1026	1026
2025	1123	1277	1277	1608	1608
2026	1558	1745	1745	2226	2226
2027	1913	2129	2129	2696	2696
2028	2211	2441	2441	3033	3033
2029	2483	2719	2719	3290	3290
2030	2728	2978	2978	3483	3483
2031	2935	3171	3171	3590	3590
2032	3109	3358	3358	3663	3663
2033	3285	3517	3517	3702	3702
2034	3463	3643	3643	3733	3733
2035	3613	3758	3758	3759	3759
2040	3925	3900	3900	3855	3855
2045	3991	3944	3944	3914	3914
2050	4024	3977	3977	3947	3947



Technology Summary: Electric vehicles

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

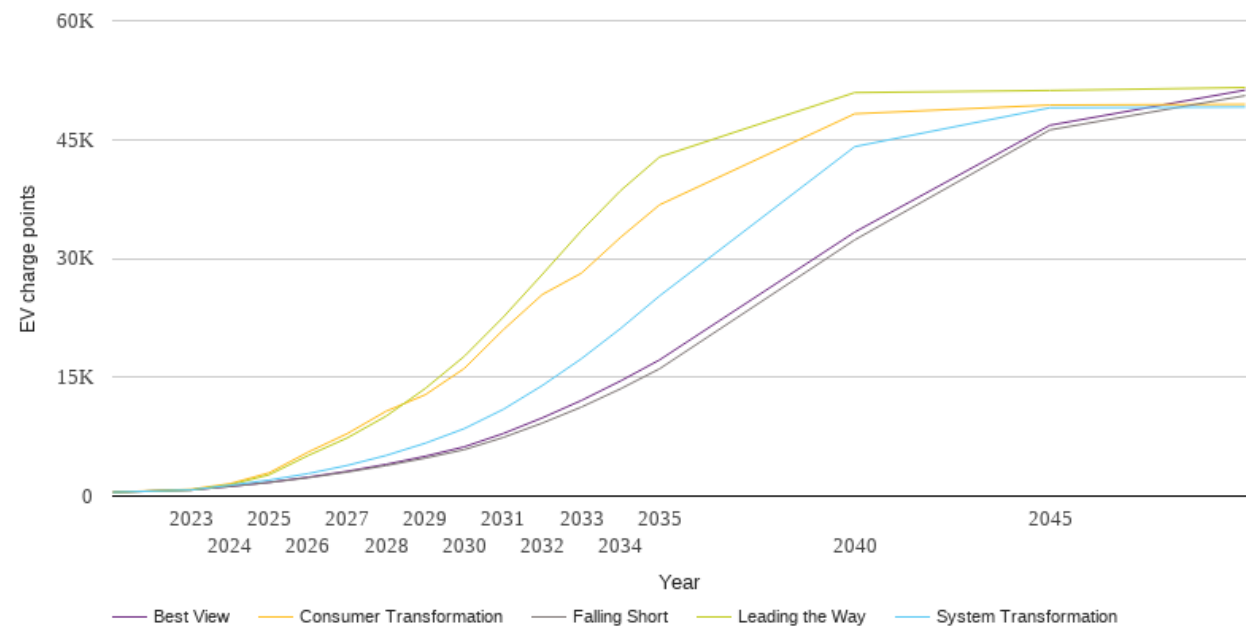
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	835	835	835	835	835
2023	1398	1381	1477	1431	1398
2024	2243	2374	2651	2565	2248
2025	3233	3519	4806	4582	3246
2026	4463	4985	8807	8219	4486
2027	5998	6875	12822	11834	6035
2028	7863	9257	18008	16447	7917
2029	10120	12238	22612	22397	10196
2030	12821	15900	29681	29587	12923
2031	15996	20349	38432	37842	16131
2032	19672	25753	46567	46747	19849
2033	23689	31845	51990	55658	23913
2034	28210	38748	60286	64098	28488
2035	33189	46167	67786	71382	33522
2040	64540	79091	87113	86411	65062
2045	86540	87320	86645	80913	86280
2050	90432	79501	79687	65870	87584



Technology Summary: EV Charge Point

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

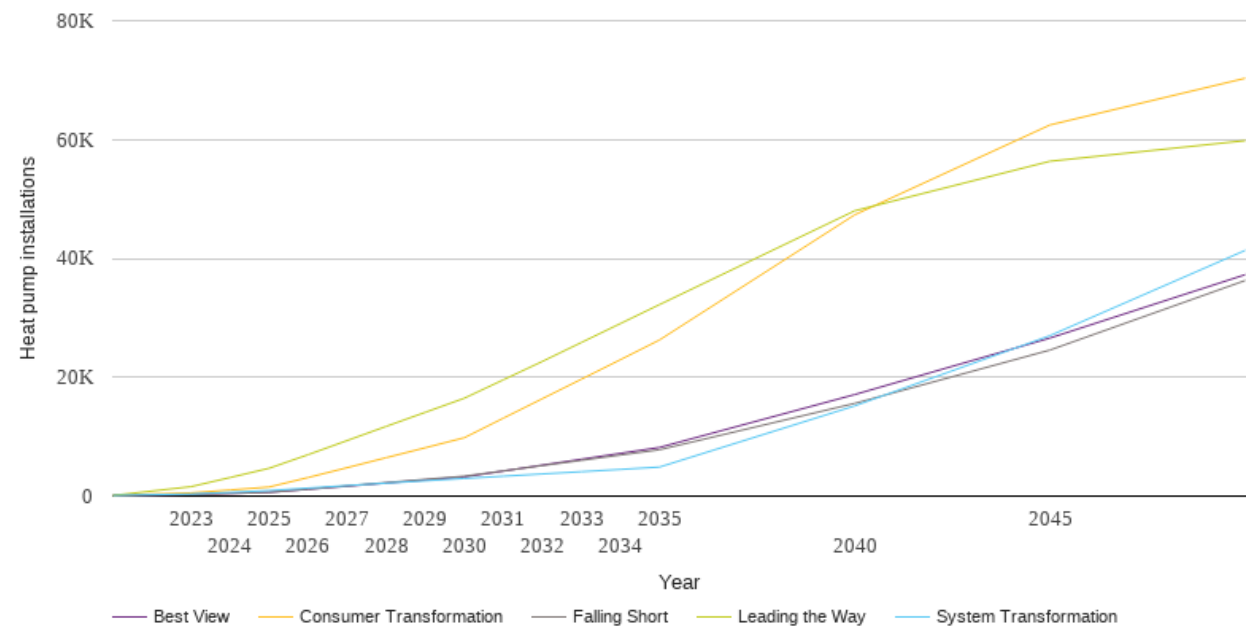
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	486	486	486	486	486
2023	770	776	857	772	769
2024	1217	1377	1568	1421	1218
2025	1715	2019	2938	2684	1737
2026	2319	2839	5552	5124	2384
2027	3032	3867	7878	7342	3133
2028	3853	5132	10717	10097	4008
2029	4791	6673	12791	13582	5031
2030	5865	8519	16113	17638	6220
2031	7409	10954	20999	22598	7901
2032	9220	13962	25450	27994	9878
2033	11240	17344	28139	33503	12074
2034	13534	21140	32649	38543	14527
2035	16064	25265	36758	42798	17186
2040	32333	44103	48250	50923	33318
2045	46219	49011	49355	51192	46800
2050	50539	49096	49449	51561	51240



Technology Summary: Heat pumps

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

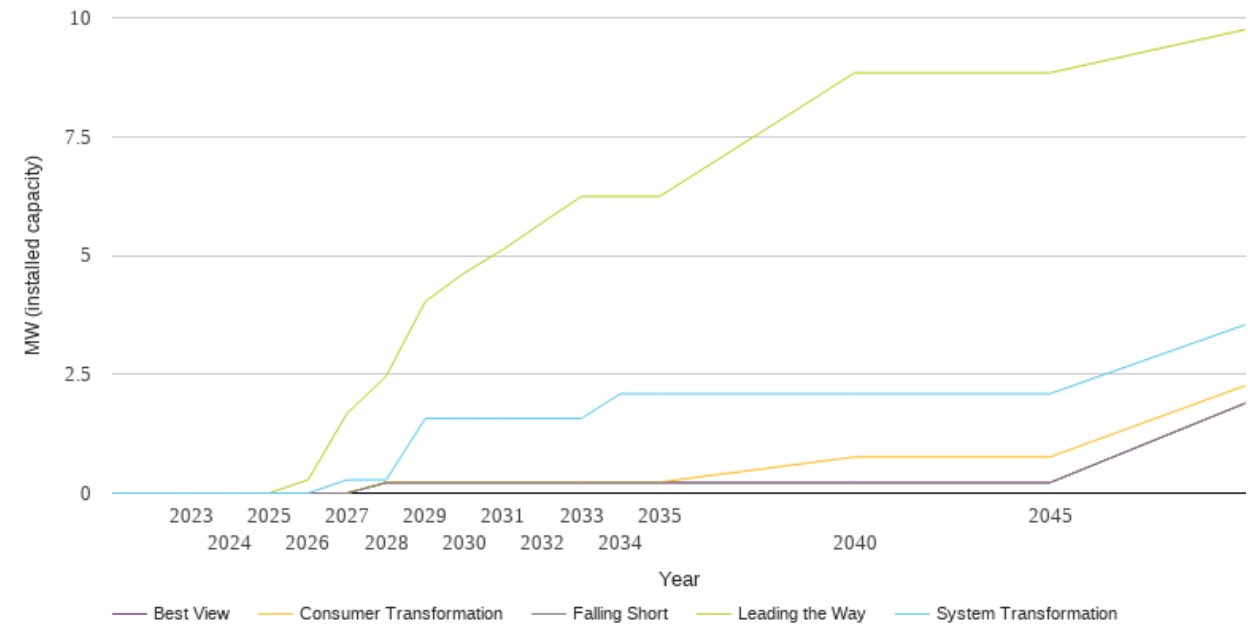
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	110	110	110	110	110
2023	275	348	544	1585	275
2024	451	629	1024	3120	451
2025	633	934	1528	4682	633
2026	1172	1349	3126	6970	1147
2027	1720	1770	4784	9348	1668
2028	2270	2179	6464	11732	2195
2029	2815	2576	8132	14098	2713
2030	3350	2961	9824	16471	3223
2031	4240	3347	13118	19571	4216
2032	5136	3726	16398	22666	5214
2033	6019	4104	19676	25857	6201
2034	6911	4489	22960	29040	7193
2035	7800	4886	26278	32227	8186
2040	15599	15183	47335	48011	17088
2045	24577	27003	62451	56344	26596
2050	36276	41348	70311	59811	37259



Technology Summary: Hydrogen electrolysis

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

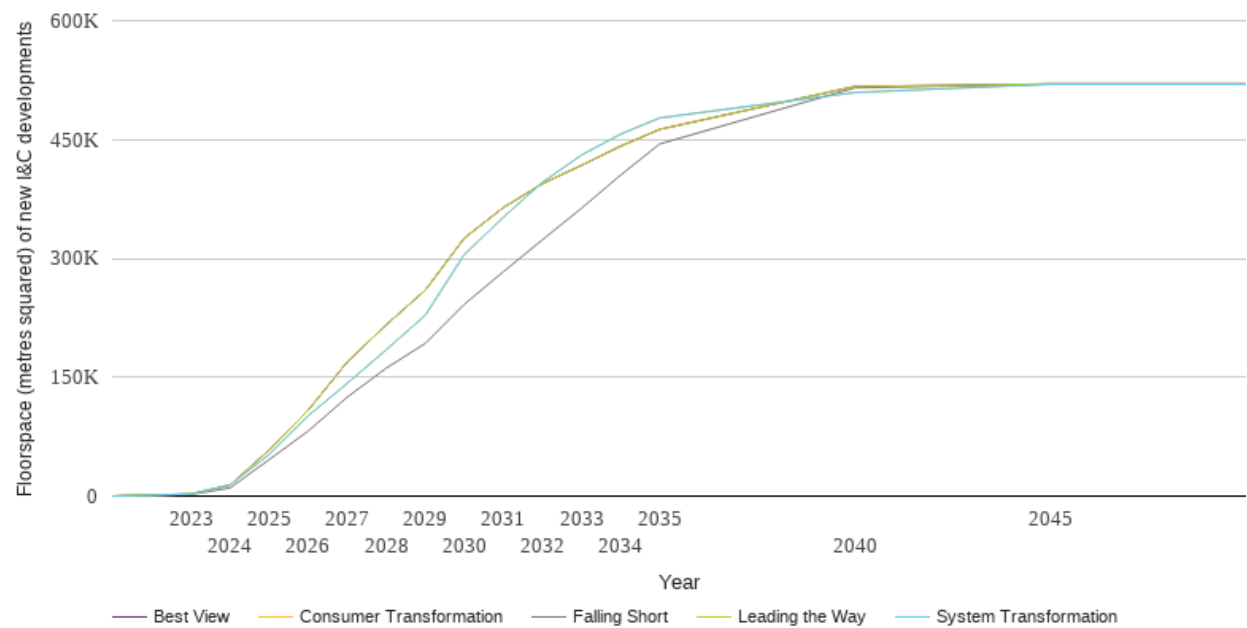
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.3	0.0
2027	0.0	0.3	0.0	1.7	0.0
2028	0.2	0.3	0.2	2.5	0.2
2029	0.2	1.6	0.2	4.0	0.2
2030	0.2	1.6	0.2	4.6	0.2
2031	0.2	1.6	0.2	5.1	0.2
2032	0.2	1.6	0.2	5.7	0.2
2033	0.2	1.6	0.2	6.2	0.2
2034	0.2	2.1	0.2	6.2	0.2
2035	0.2	2.1	0.2	6.2	0.2
2040	0.2	2.1	0.8	8.8	0.2
2045	0.2	2.1	0.8	8.8	0.2
2050	1.9	3.5	2.3	9.7	1.9



Technology Summary: Non domestic

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

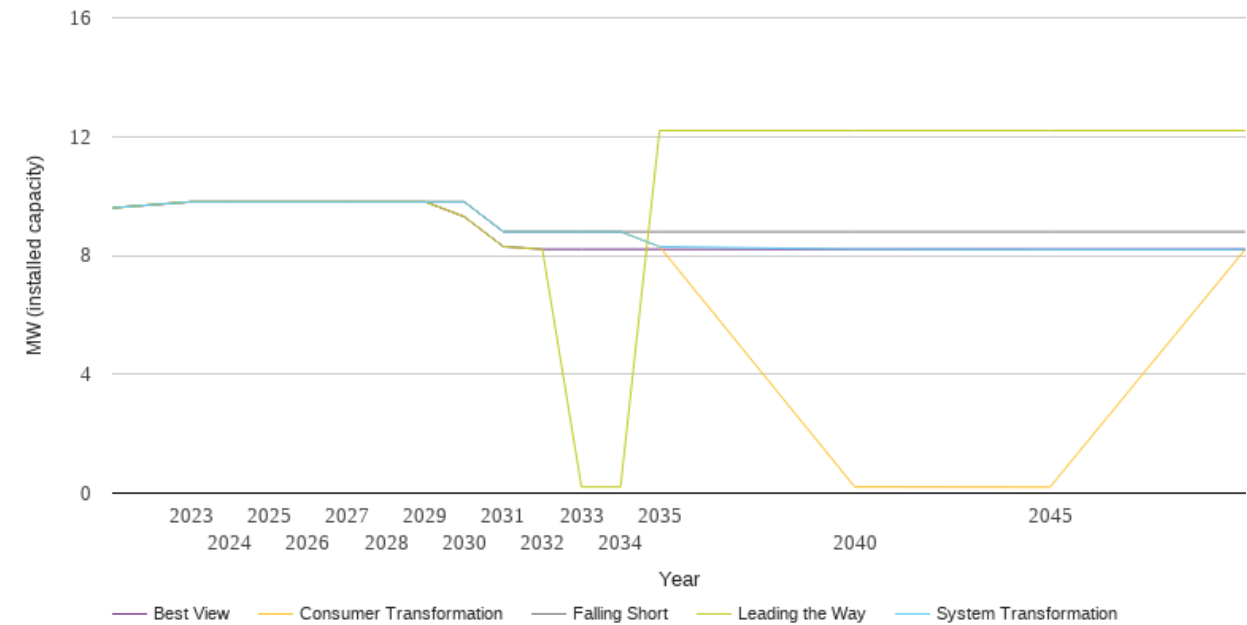
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	2045	2455	2455	2727	2727
2024	10334	14038	14038	13884	13884
2025	45971	52603	52603	58253	58253
2026	82064	101367	101367	108351	108351
2027	124831	142165	142165	169219	169219
2028	161480	184688	184688	216114	216114
2029	192622	228239	228239	259908	259908
2030	242144	304938	304938	325635	325635
2031	283129	351868	351868	364151	364151
2032	323463	396121	396121	394368	394368
2033	363220	430387	430387	417452	417452
2034	404999	456763	456763	441588	441588
2035	444337	477209	477209	462777	462777
2040	515243	509408	509408	516993	516993
2045	520055	519783	519783	520056	520056
2050	520055	519783	519783	520056	520056



Technology Summary: Other Distributed Generation

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

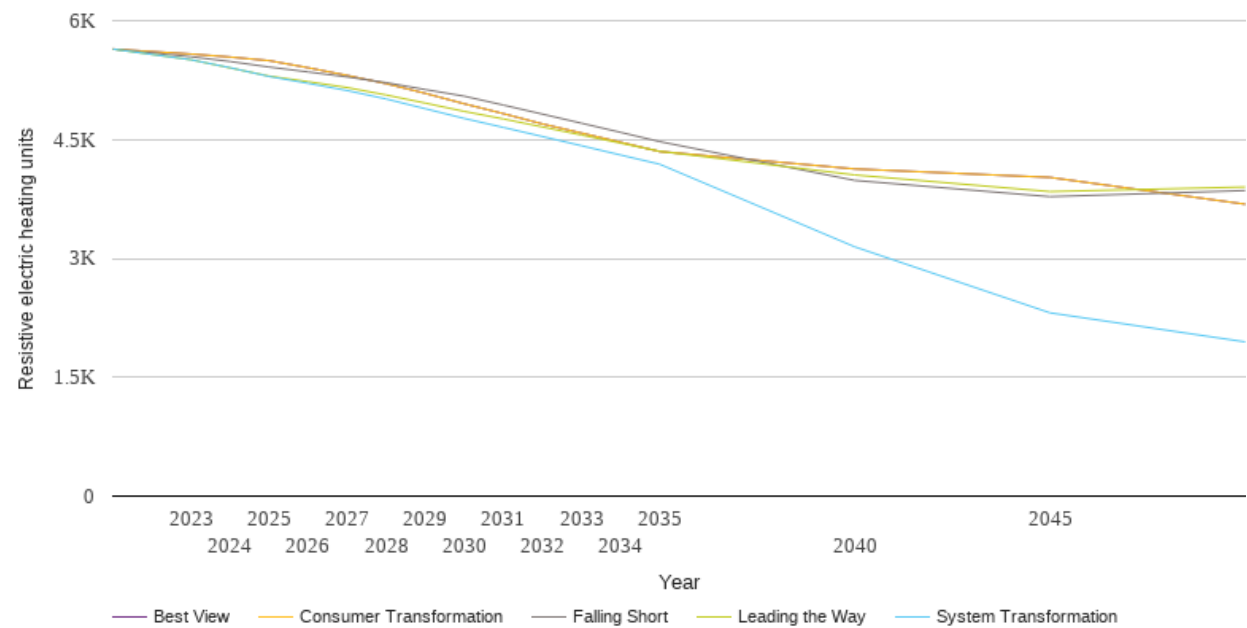
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	9.6	9.6	9.6	9.6	9.6
2023	9.8	9.8	9.8	9.8	9.8
2024	9.8	9.8	9.8	9.8	9.8
2025	9.8	9.8	9.8	9.8	9.8
2026	9.8	9.8	9.8	9.8	9.8
2027	9.8	9.8	9.8	9.8	9.8
2028	9.8	9.8	9.8	9.8	9.8
2029	9.8	9.8	9.8	9.8	9.8
2030	9.8	9.8	9.8	9.3	9.3
2031	8.8	8.8	8.8	8.3	8.3
2032	8.8	8.8	8.8	8.2	8.2
2033	8.8	8.8	8.8	0.2	8.2
2034	8.8	8.8	8.8	0.2	8.2
2035	8.8	8.3	8.3	12.2	8.2
2040	8.8	8.2	0.2	12.2	8.2
2045	8.8	8.2	0.2	12.2	8.2
2050	8.8	8.2	8.2	12.2	8.2



Technology Summary: Resistive electric heating

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

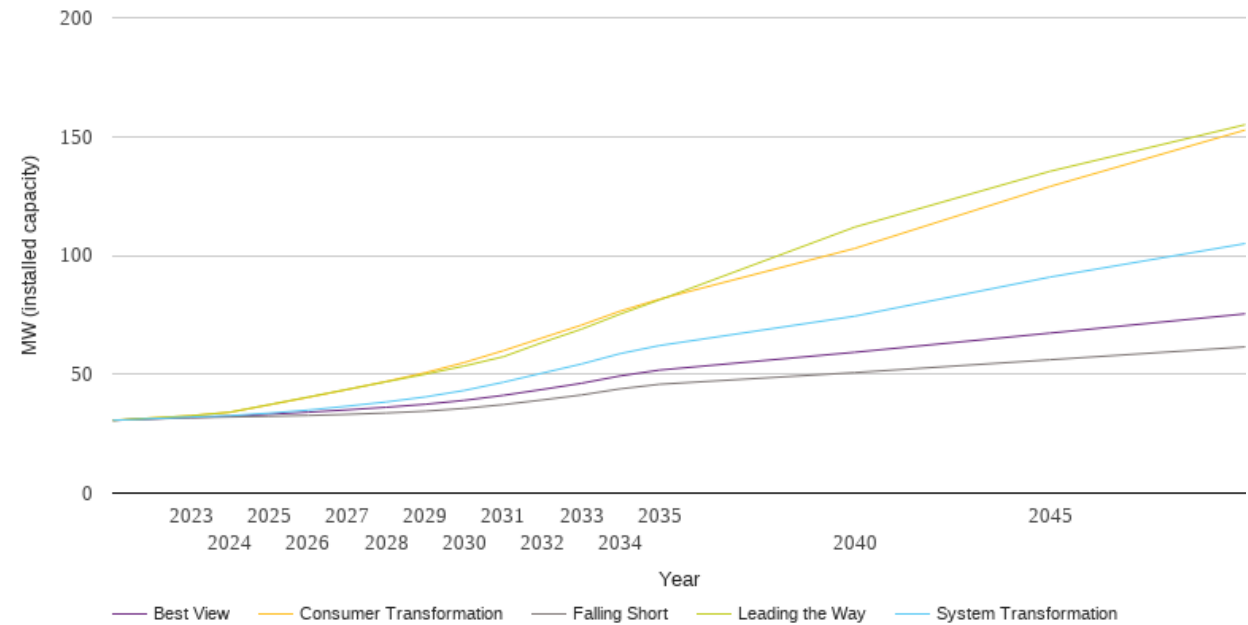
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	5641	5641	5641	5641	5641
2023	5545	5507	5579	5507	5579
2024	5485	5407	5541	5404	5541
2025	5415	5296	5496	5301	5496
2026	5353	5209	5406	5230	5406
2027	5290	5118	5309	5156	5309
2028	5218	5012	5205	5062	5205
2029	5131	4889	5083	4960	5083
2030	5047	4766	4951	4855	4951
2031	4935	4653	4827	4760	4827
2032	4821	4538	4697	4659	4697
2033	4706	4422	4582	4557	4582
2034	4591	4305	4466	4455	4466
2035	4474	4189	4349	4352	4349
2040	3984	3146	4129	4053	4129
2045	3779	2313	4022	3843	4022
2050	3856	1946	3684	3901	3684



Technology Summary: Solar Generation

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

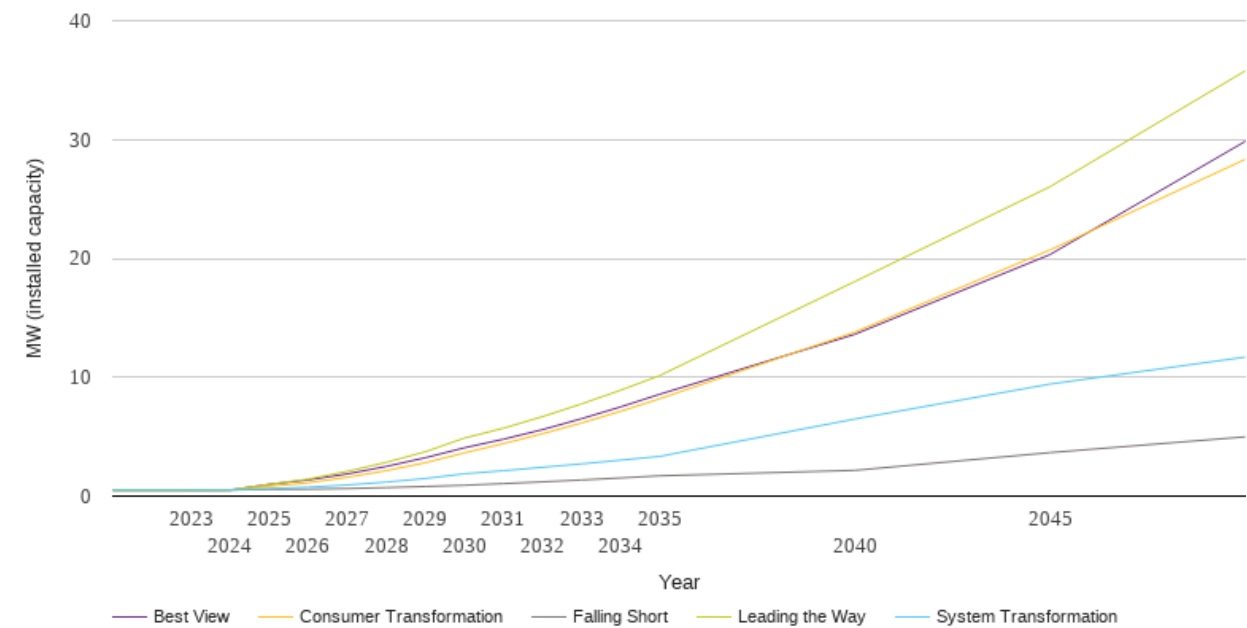
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	30.6	30.6	30.6	30.6	30.6
2023	31.7	32.0	32.5	32.6	31.8
2024	32.0	32.6	34.0	34.0	32.3
2025	32.3	33.6	37.1	37.2	33.1
2026	32.6	34.9	40.3	40.4	34.0
2027	33.1	36.6	43.6	43.6	35.0
2028	33.7	38.3	47.0	46.8	36.1
2029	34.5	40.5	50.7	50.0	37.4
2030	35.6	43.2	54.9	53.5	39.0
2031	37.2	46.6	59.9	57.4	41.1
2032	39.2	50.5	65.3	63.4	43.6
2033	41.3	54.3	70.7	69.0	46.2
2034	43.9	58.7	76.6	75.4	49.3
2035	45.8	62.1	81.6	81.3	51.8
2040	50.7	74.4	102.9	111.9	59.2
2045	56.1	90.9	129.0	135.4	67.3
2050	61.5	105.0	152.7	155.0	75.4



Technology Summary: Storage

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

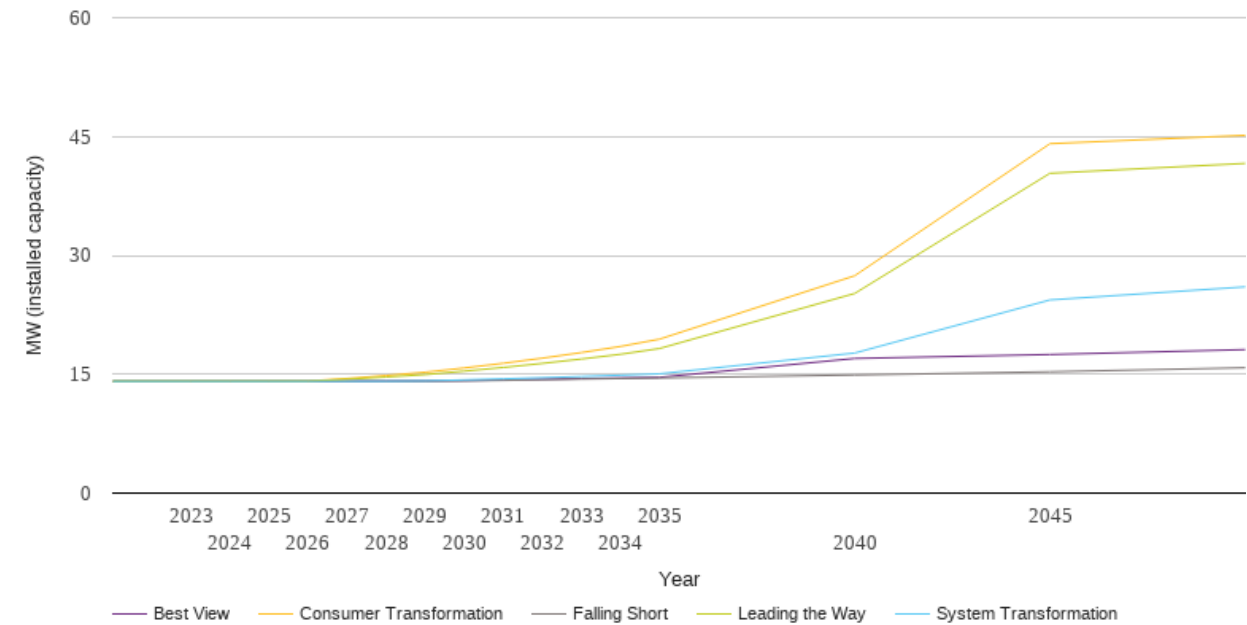
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.5	0.5	0.5	0.5	0.5
2023	0.5	0.5	0.5	0.5	0.5
2024	0.5	0.5	0.5	0.5	0.5
2025	0.6	0.6	0.8	1.0	1.0
2026	0.6	0.7	1.1	1.4	1.4
2027	0.6	0.9	1.6	2.1	1.9
2028	0.7	1.2	2.1	2.8	2.5
2029	0.8	1.5	2.8	3.7	3.2
2030	0.9	1.9	3.6	4.9	4.1
2031	1.0	2.1	4.4	5.7	4.8
2032	1.2	2.4	5.2	6.7	5.6
2033	1.4	2.7	6.1	7.8	6.5
2034	1.5	3.0	7.1	8.9	7.5
2035	1.7	3.3	8.2	10.1	8.6
2040	2.2	6.5	13.8	18.0	13.6
2045	3.7	9.4	20.7	26.0	20.3
2050	5.0	11.7	28.3	35.8	29.8



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	14.1	14.1	14.1	14.1	14.1
2023	14.1	14.1	14.1	14.1	14.1
2024	14.1	14.1	14.1	14.1	14.1
2025	14.1	14.1	14.1	14.1	14.1
2026	14.1	14.1	14.1	14.1	14.1
2027	14.1	14.1	14.5	14.4	14.1
2028	14.1	14.1	14.8	14.6	14.1
2029	14.1	14.2	15.3	15.0	14.2
2030	14.2	14.3	15.8	15.4	14.2
2031	14.2	14.4	16.4	15.9	14.3
2032	14.3	14.6	17.0	16.4	14.4
2033	14.4	14.7	17.7	16.9	14.5
2034	14.5	14.9	18.5	17.5	14.5
2035	14.5	15.1	19.4	18.2	14.6
2040	14.9	17.7	27.4	25.2	17.0
2045	15.3	24.4	44.1	40.4	17.5
2050	15.8	26.0	45.2	41.6	18.1



National Grid Electricity Distribution PLC 09223384)
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