

Distribution Future Energy Scenarios 2022

Local Authority:
Lichfield

What are Distribution Future Energy Scenarios?

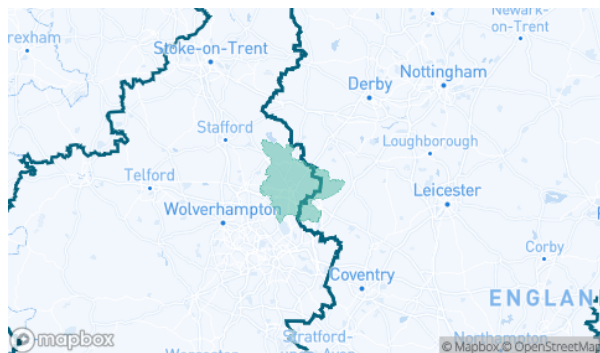
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Lichfield 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 Lichfield 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	442	263	263	0	22872	11002	11001	0
Domestic	New dwellings	0	1418	1401	1401	1444	1656	1541	1535	1453
Electric vehicles	Electric vehicles	1324	10750	12758	23675	23511	69685	57475	57930	48667
EV Charge Point	EV charge points	718	5214	7288	13744	15106	42048	38846	41032	41521
Heat pumps	Heat pump installations	595	3083	2844	7237	11708	23247	26451	43383	38198
Hydrogen electrolysis	MW (installed capacity)	0.0	0.2	1.3	0.2	0.5	1.5	8.2	5.5	6.6
Non domestic	Floorspace (metres squared) of new I&C developments	0	153317	169456	169456	182641	222713	222713	222713	222713
Other Distributed Generation	MW (installed capacity)	5.8	3.3	1.9	2.3	2.6	0.8	3.8	5.9	4.2
Resistive electric heating	Resistive electric heating units	5369	4445	4328	4599	4403	2833	1247	2968	3129
Solar Generation	MW (installed capacity)	11.4	15.7	22.4	30.1	26.9	51.8	97.5	128.4	120.7
Storage	MW (installed capacity)	0.0	0.3	1.1	2.2	3.2	3.7	8.9	20.9	26.9
Wind	MW (installed capacity)	1.9	2.0	2.0	2.5	2.4	2.7	5.1	10.8	9.3

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

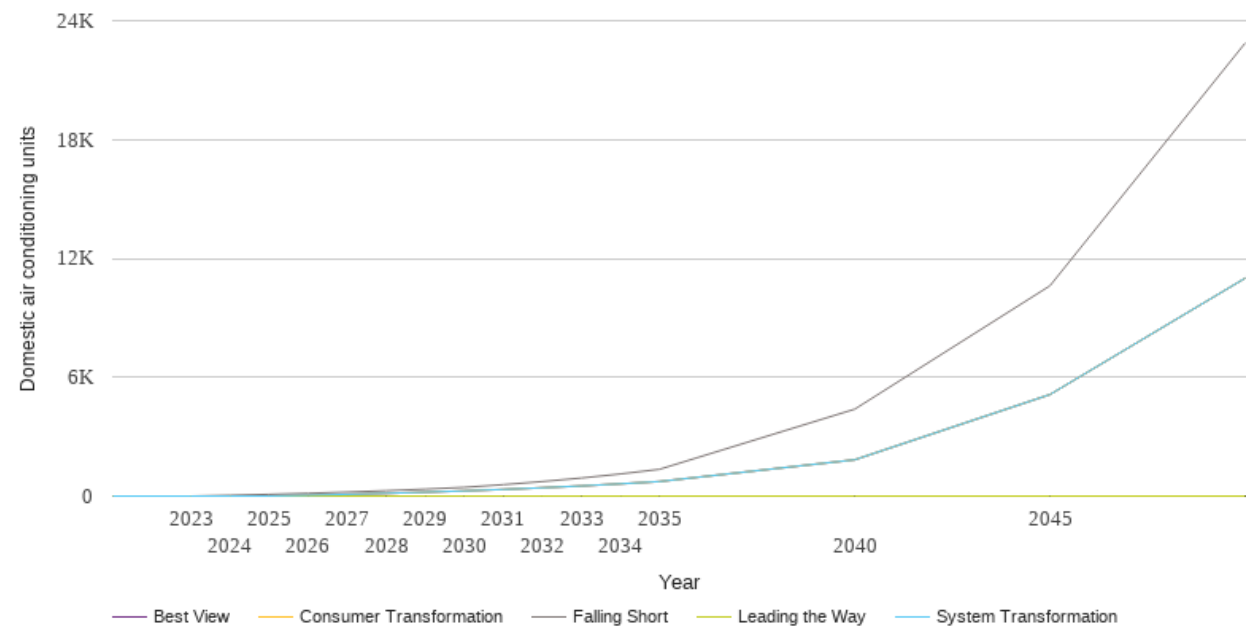
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

If you have any comments or queries regarding these reports, please contact nged.energyplanning@nationalgrid.co.uk.

Technology Summary: Air conditioning

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

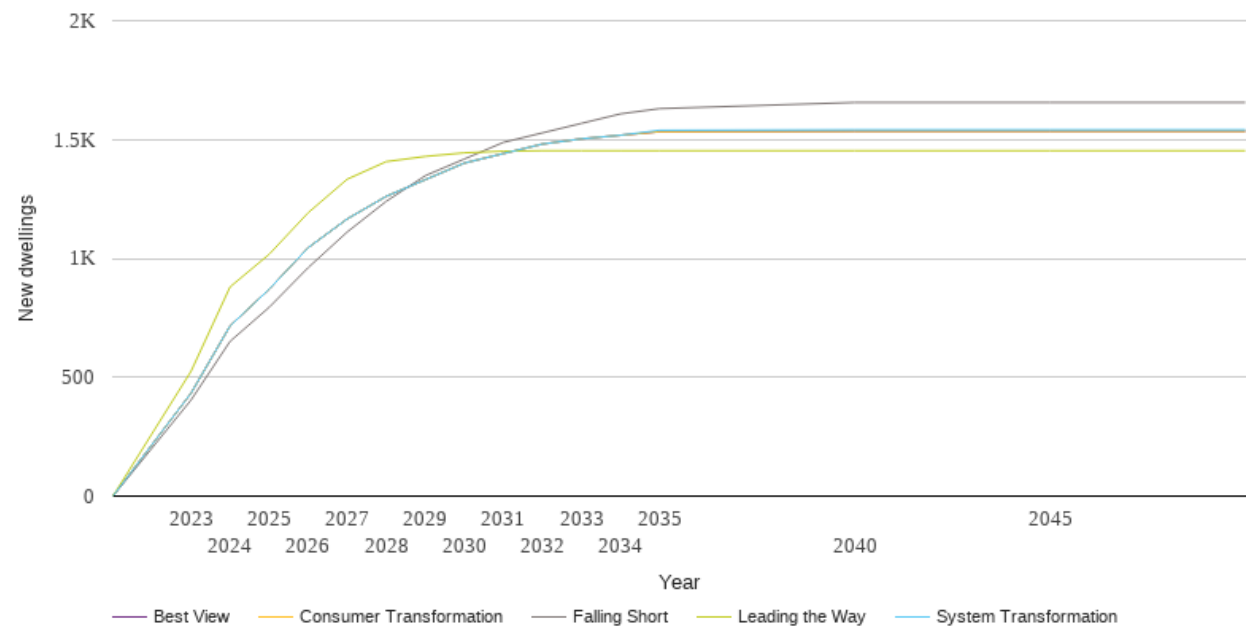
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	40	0	0	0	0
2025	87	0	0	0	0
2026	141	41	41	0	41
2027	202	87	87	0	87
2028	271	139	139	0	139
2029	351	198	198	0	198
2030	442	263	263	0	263
2031	578	337	337	0	337
2032	734	420	420	0	420
2033	913	513	513	0	513
2034	1118	619	619	0	619
2035	1353	736	736	0	736
2040	4389	1833	1833	0	1833
2045	10617	5128	5127	0	5127
2050	22872	11002	11001	0	11001



Technology Summary: Domestic

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

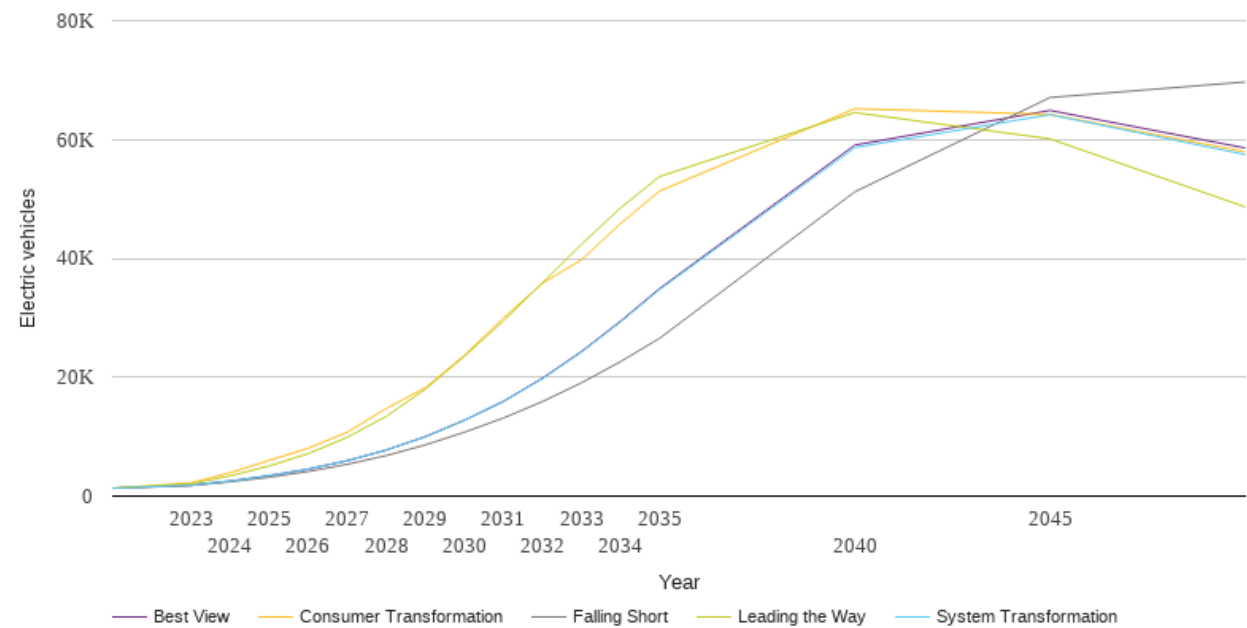
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	404	433	433	525	433
2024	651	716	716	880	716
2025	794	870	870	1017	870
2026	961	1045	1045	1192	1045
2027	1111	1166	1166	1333	1166
2028	1240	1261	1261	1407	1261
2029	1348	1331	1331	1429	1331
2030	1418	1401	1401	1444	1401
2031	1488	1441	1441	1451	1441
2032	1528	1481	1481	1453	1481
2033	1568	1503	1503	1453	1503
2034	1608	1518	1518	1453	1518
2035	1630	1539	1533	1453	1533
2040	1656	1541	1535	1453	1535
2045	1656	1541	1535	1453	1535
2050	1656	1541	1535	1453	1535



Technology Summary: Electric vehicles

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

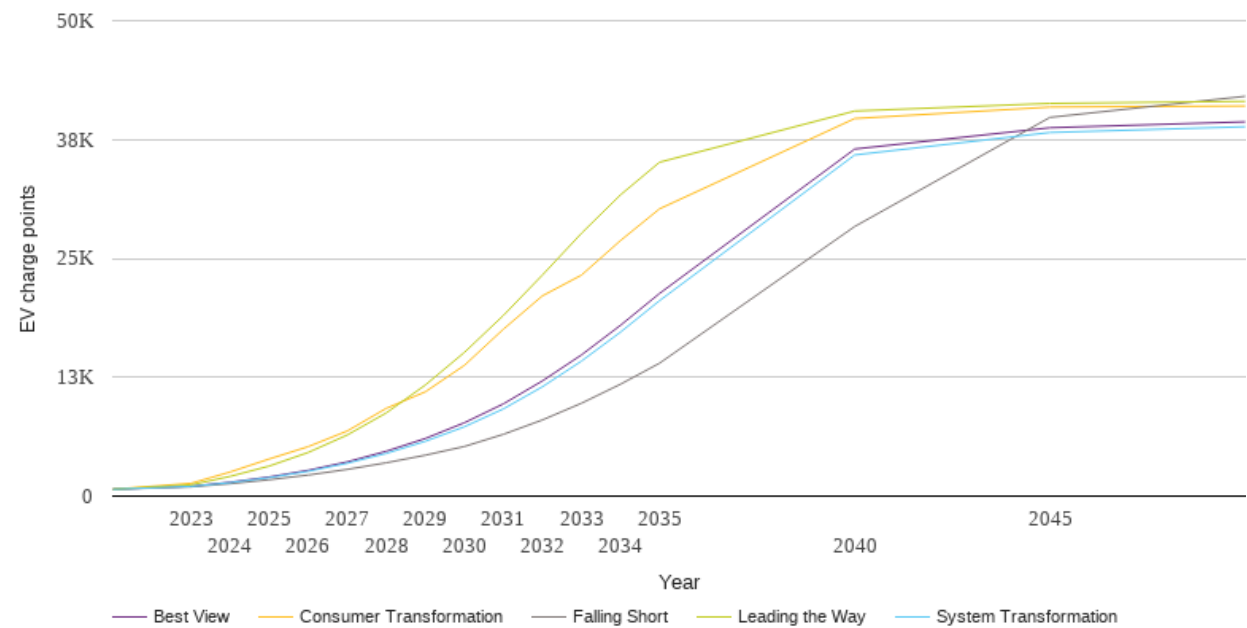
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1324	1324	1324	1324	1324
2023	1793	1835	2226	2077	1835
2024	2403	2532	3922	3403	2532
2025	3175	3434	6005	5062	3435
2026	4141	4532	8044	7142	4534
2027	5349	5953	10753	9880	5955
2028	6819	7747	14730	13413	7750
2029	8604	9993	18247	17979	9998
2030	10750	12758	23675	23511	12763
2031	13134	15919	29964	29459	15925
2032	15904	19756	35806	35891	19834
2033	19061	24226	39768	42363	24321
2034	22622	29303	45845	48490	29427
2035	26546	34750	51328	53776	34913
2040	51196	58636	65187	64537	59064
2045	67066	64191	64224	60116	64902
2050	69685	57475	57930	48667	58575



Technology Summary: EV Charge Point

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

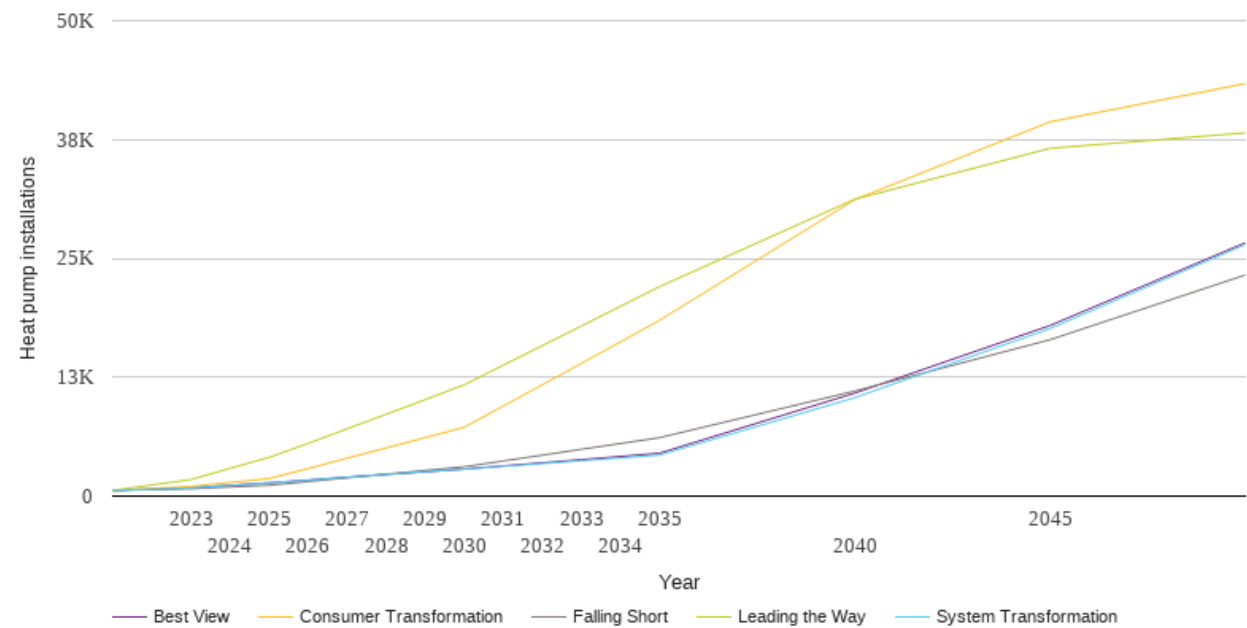
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	718	718	718	718	718
2023	977	1015	1341	1186	1028
2024	1306	1417	2531	2072	1455
2025	1717	1940	3899	3156	2007
2026	2214	2610	5198	4588	2710
2027	2807	3452	6844	6424	3596
2028	3502	4490	9227	8745	4714
2029	4302	5760	10964	11679	6055
2030	5214	7288	13744	15106	7712
2031	6496	9171	17552	18996	9699
2032	8009	11497	21060	23247	12115
2033	9765	14197	23239	27640	14848
2034	11766	17243	26876	31681	17962
2035	13978	20553	30211	35114	21313
2040	28355	35880	39709	40497	36502
2045	39829	38237	40914	41300	38741
2050	42048	38846	41032	41521	39364



Technology Summary: Heat pumps

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

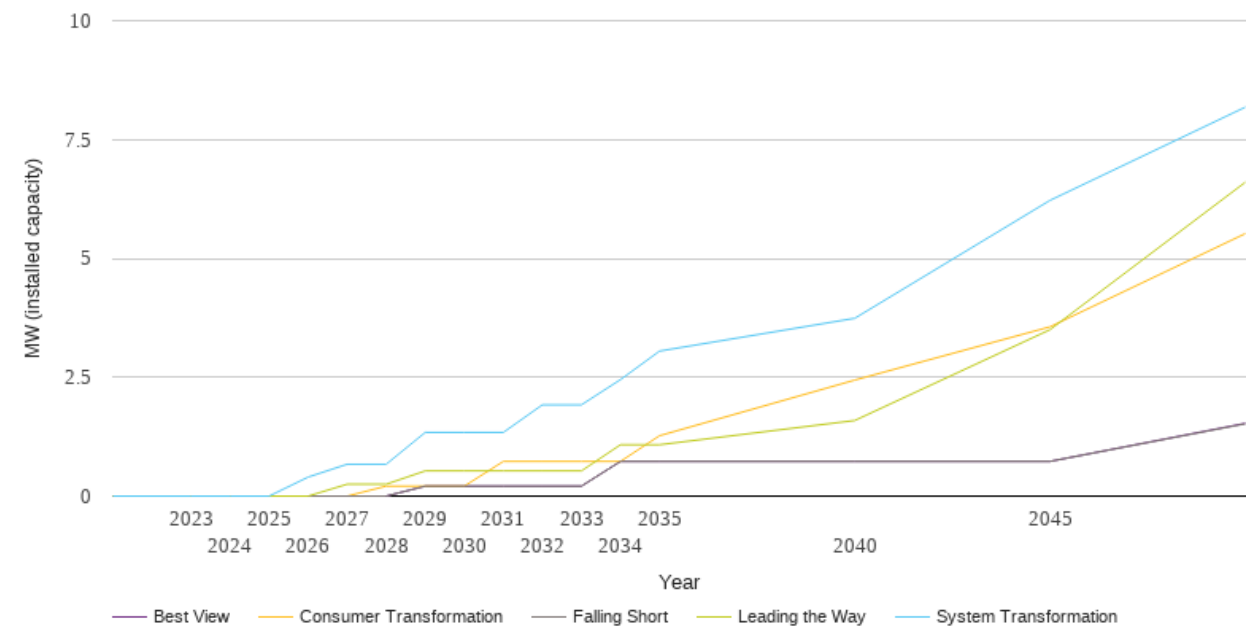
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	595	595	595	595	595
2023	773	855	1008	1744	855
2024	964	1131	1431	2918	1131
2025	1134	1390	1846	4076	1390
2026	1524	1680	2889	5535	1679
2027	1924	1992	3994	7081	1990
2028	2308	2275	5067	8610	2272
2029	2697	2560	6150	10146	2555
2030	3083	2844	7237	11708	2840
2031	3696	3137	9482	13773	3172
2032	4305	3424	11708	15824	3499
2033	4924	3716	13955	17888	3831
2034	5529	4010	16212	19959	4167
2035	6142	4316	18480	22031	4511
2040	11045	10351	31179	31223	10832
2045	16441	17608	39356	36577	17934
2050	23247	26451	43383	38198	26638



Technology Summary: Hydrogen electrolysis

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

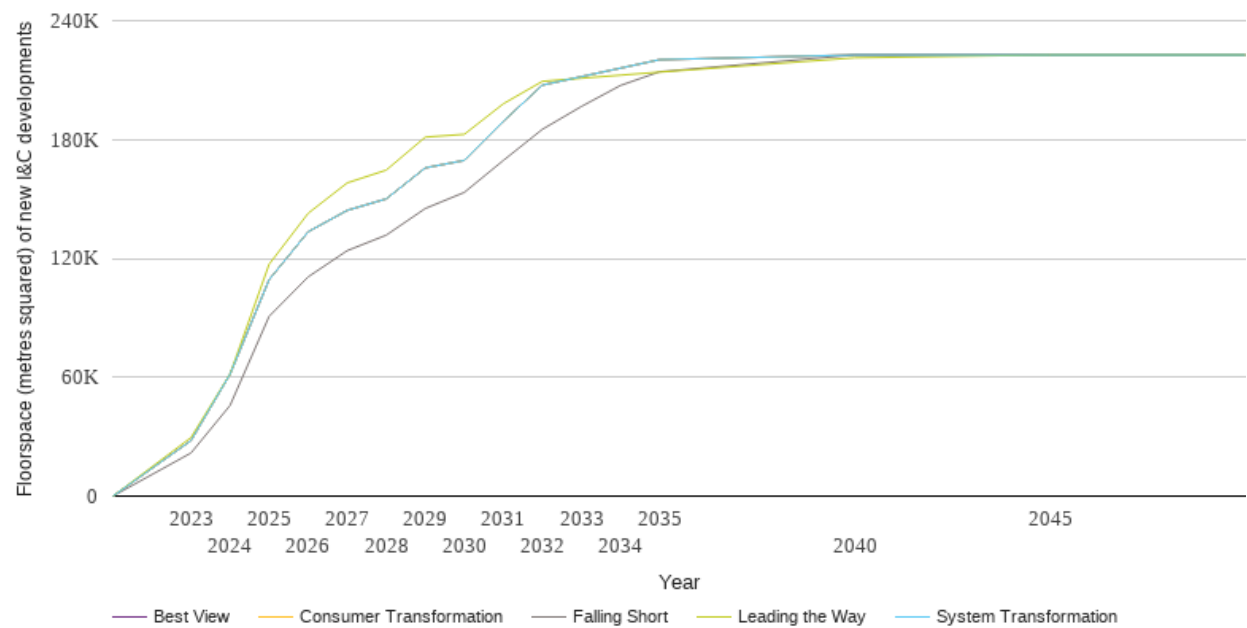
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.4	0.0	0.0	0.0
2027	0.0	0.7	0.0	0.3	0.0
2028	0.0	0.7	0.2	0.3	0.0
2029	0.2	1.3	0.2	0.5	0.2
2030	0.2	1.3	0.2	0.5	0.2
2031	0.2	1.3	0.7	0.5	0.2
2032	0.2	1.9	0.7	0.5	0.2
2033	0.2	1.9	0.7	0.5	0.2
2034	0.7	2.4	0.7	1.1	0.7
2035	0.7	3.0	1.3	1.1	0.7
2040	0.7	3.7	2.4	1.6	0.7
2045	0.7	6.2	3.6	3.5	0.7
2050	1.5	8.2	5.5	6.6	1.5



Technology Summary: Non domestic

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

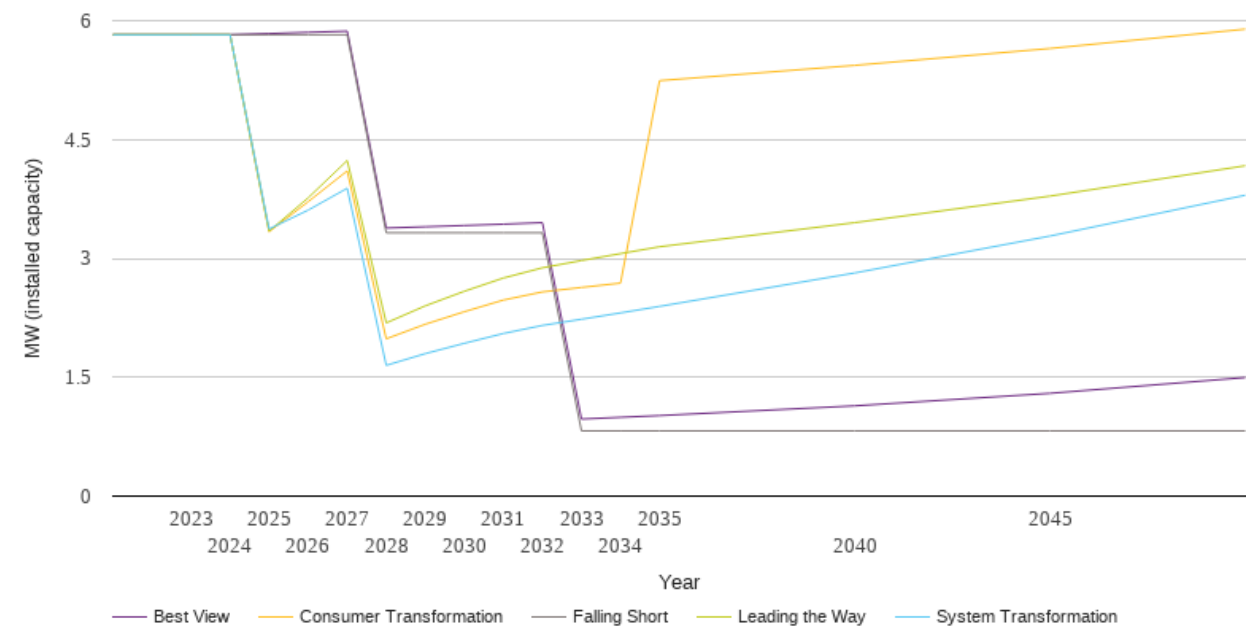
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	21784	28008	28008	29564	28008
2024	45772	61565	61565	61630	61565
2025	90731	109260	109260	117029	109260
2026	110662	133443	133443	142757	133443
2027	123905	144235	144235	158109	144235
2028	131736	150059	150059	164566	150059
2029	145187	165699	165699	181227	165699
2030	153317	169456	169456	182641	169456
2031	169456	189229	189229	198071	189229
2032	185178	207483	207483	209390	207483
2033	196707	211762	211762	210942	211762
2034	207303	216040	216040	212494	216040
2035	214221	220319	220319	214046	220319
2040	222713	222713	222713	222713	222713
2045	222713	222713	222713	222713	222713
2050	222713	222713	222713	222713	222713



Technology Summary: Other Distributed Generation

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

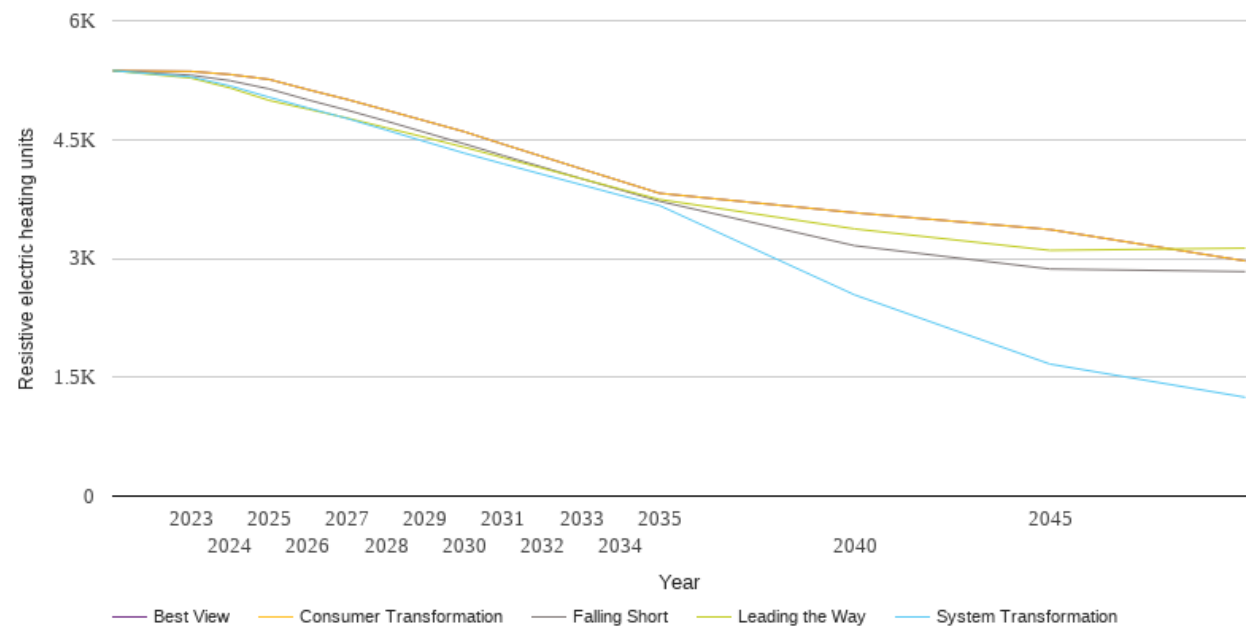
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	5.8	5.8	5.8	5.8	5.8
2023	5.8	5.8	5.8	5.8	5.8
2024	5.8	5.8	5.8	5.8	5.8
2025	5.8	3.4	3.3	3.3	5.8
2026	5.8	3.6	3.7	3.8	5.9
2027	5.8	3.9	4.1	4.2	5.9
2028	3.3	1.7	2.0	2.2	3.4
2029	3.3	1.8	2.2	2.4	3.4
2030	3.3	1.9	2.3	2.6	3.4
2031	3.3	2.1	2.5	2.8	3.4
2032	3.3	2.2	2.6	2.9	3.5
2033	0.8	2.2	2.6	3.0	1.0
2034	0.8	2.3	2.7	3.1	1.0
2035	0.8	2.4	5.2	3.1	1.0
2040	0.8	2.8	5.4	3.5	1.1
2045	0.8	3.3	5.6	3.8	1.3
2050	0.8	3.8	5.9	4.2	1.5



Technology Summary: Resistive electric heating

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

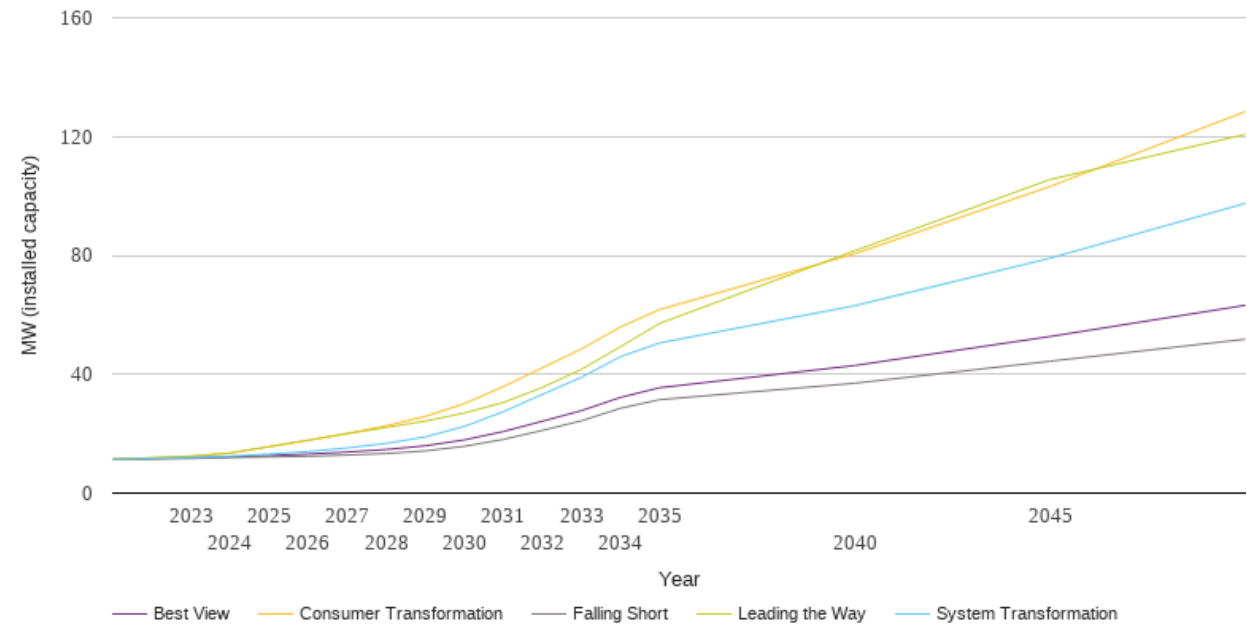
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	5369	5369	5369	5369	5369
2023	5312	5291	5360	5276	5360
2024	5243	5177	5321	5151	5321
2025	5139	5034	5259	4994	5259
2026	5000	4898	5129	4883	5129
2027	4870	4765	5006	4771	5006
2028	4733	4620	4871	4648	4871
2029	4589	4473	4735	4527	4735
2030	4445	4328	4599	4403	4599
2031	4297	4193	4440	4270	4440
2032	4152	4060	4285	4138	4285
2033	4006	3929	4130	4005	4130
2034	3864	3796	3976	3874	3976
2035	3721	3667	3822	3744	3822
2040	3160	2539	3576	3372	3576
2045	2866	1666	3364	3101	3364
2050	2833	1247	2968	3129	2968



Technology Summary: Solar Generation

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

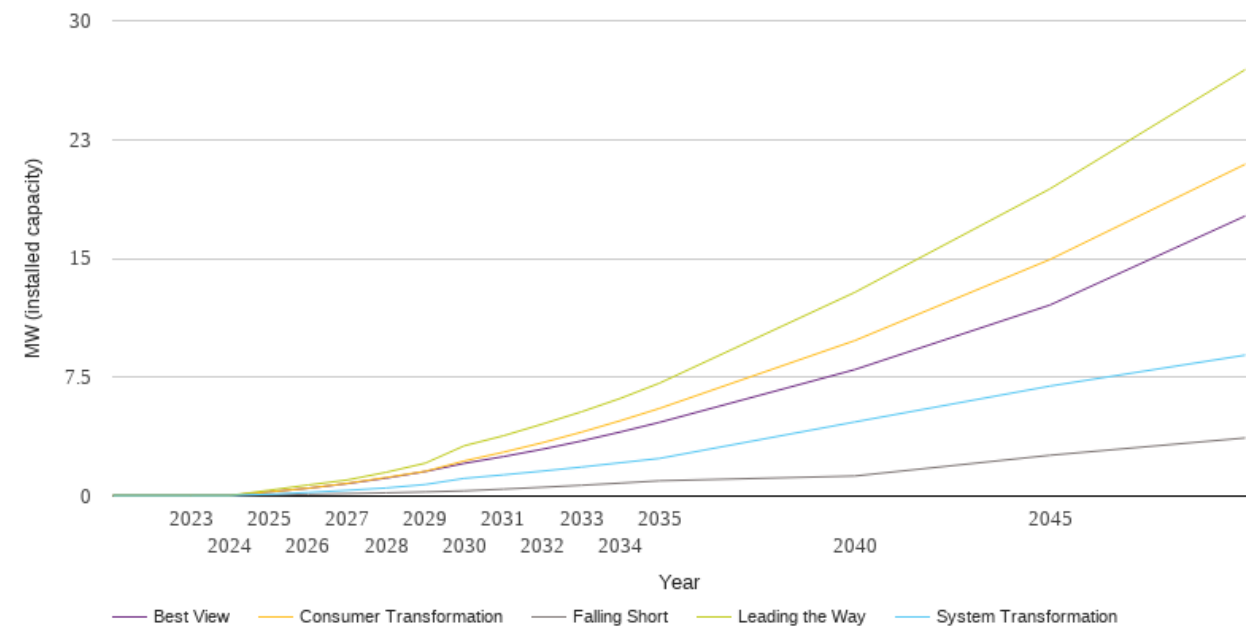
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	11.4	11.4	11.4	11.4	11.4
2023	11.6	12.0	12.4	12.4	11.9
2024	12.0	12.4	13.5	13.5	12.1
2025	12.2	13.1	15.6	15.6	12.6
2026	12.4	14.0	17.8	17.8	13.1
2027	12.8	15.2	20.1	20.0	13.8
2028	13.3	16.7	22.7	22.1	14.7
2029	14.2	18.9	25.8	24.2	15.9
2030	15.7	22.4	30.1	26.9	17.9
2031	18.1	27.4	35.8	30.5	20.7
2032	21.1	33.2	42.2	35.6	24.2
2033	24.3	39.0	48.5	41.7	27.8
2034	28.5	45.9	55.9	49.3	32.2
2035	31.4	50.5	61.7	57.1	35.5
2040	37.0	63.1	80.6	81.6	42.9
2045	44.4	79.1	103.2	105.5	52.7
2050	51.8	97.5	128.4	120.7	63.2



Technology Summary: Storage

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

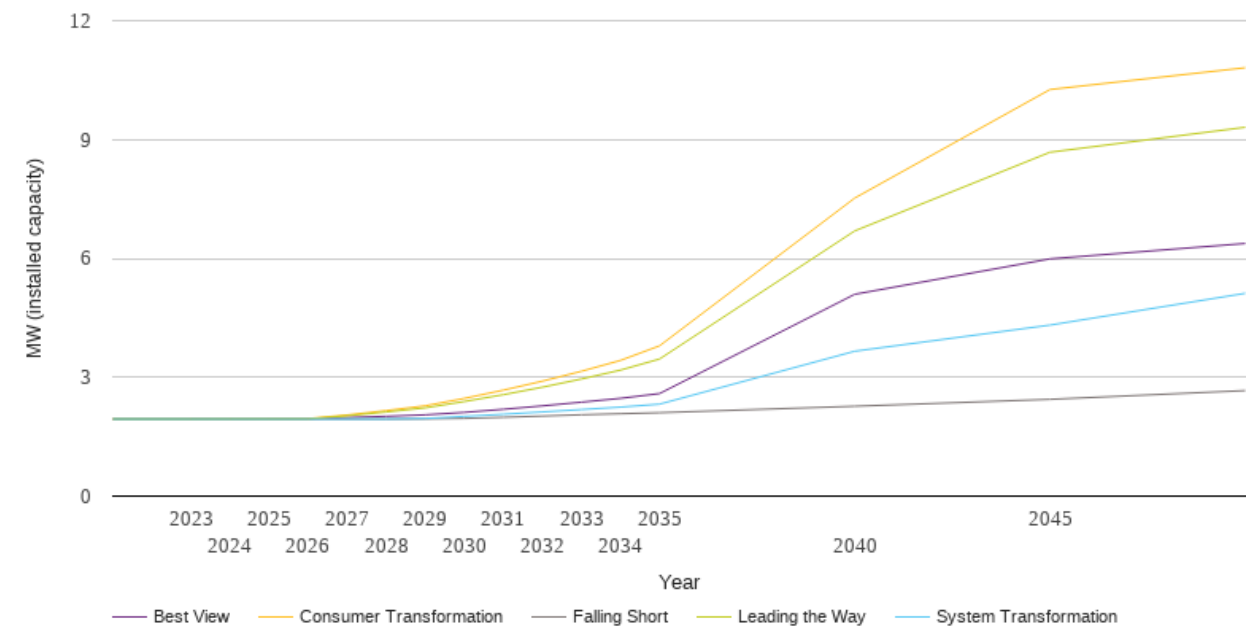
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.1	0.1	0.3	0.4	0.3
2026	0.1	0.2	0.5	0.7	0.5
2027	0.2	0.4	0.8	1.0	0.8
2028	0.2	0.5	1.2	1.5	1.1
2029	0.3	0.7	1.6	2.1	1.5
2030	0.3	1.1	2.2	3.2	2.1
2031	0.4	1.3	2.8	3.8	2.5
2032	0.6	1.6	3.4	4.5	3.0
2033	0.7	1.8	4.0	5.3	3.5
2034	0.8	2.1	4.8	6.2	4.0
2035	1.0	2.4	5.5	7.1	4.7
2040	1.3	4.7	9.8	12.9	8.0
2045	2.6	6.9	14.9	19.4	12.1
2050	3.7	8.9	20.9	26.9	17.7



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	1.9	1.9	1.9	1.9	1.9
2023	1.9	1.9	1.9	1.9	1.9
2024	1.9	1.9	1.9	1.9	1.9
2025	1.9	1.9	2.0	1.9	2.0
2026	1.9	1.9	2.0	1.9	2.0
2027	1.9	1.9	2.0	2.0	2.0
2028	1.9	1.9	2.2	2.1	2.0
2029	1.9	2.0	2.3	2.2	2.1
2030	2.0	2.0	2.5	2.4	2.1
2031	2.0	2.1	2.7	2.6	2.2
2032	2.0	2.1	2.9	2.7	2.3
2033	2.1	2.2	3.2	3.0	2.4
2034	2.1	2.2	3.4	3.2	2.5
2035	2.1	2.3	3.8	3.5	2.6
2040	2.3	3.7	7.5	6.7	5.1
2045	2.4	4.3	10.3	8.7	6.0
2050	2.7	5.1	10.8	9.3	6.4



National Grid Electricity Distribution PLC 09223384)
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