

Distribution Future Energy Scenarios 2022

Local Authority:
Staffordshire Moorlands

What are Distribution Future Energy Scenarios?

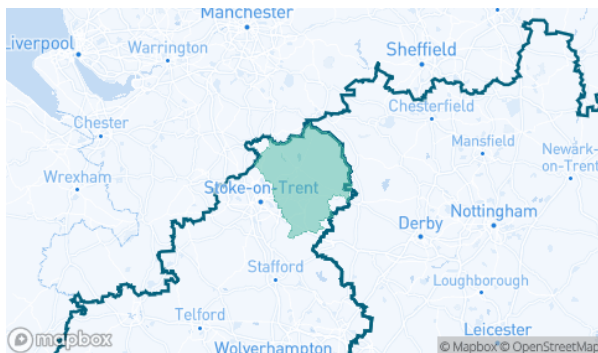
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Staffordshire Moorlands 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 Staffordshire Moorlands 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	158	445	382	382	158	20660	9682	9682	158
Domestic	New dwellings	0	1827	2026	2026	2439	3207	3183	3183	3180
Electric vehicles	Electric vehicles	1144	9334	11647	21588	21493	66303	58353	58077	48230
EV Charge Point	EV charge points	596	4550	6767	12833	14109	40640	39679	41290	41767
Heat pumps	Heat pump installations	729	3386	3454	7787	12390	23956	27285	42901	37823
Hydrogen electrolysis	MW (installed capacity)	0.0	5.7	1.5	0.2	0.9	11.6	13.9	9.6	11.2
Non domestic	Floorspace (metres squared) of new I&C developments	0	31456 6	37196 1	37196 1	39785 1	59678 3	59316 8	59316 8	59678 3
Other Distributed Generation	MW (installed capacity)	12.4	19.4	9.9	11.9	22.2	17.1	16.6	21.6	27.6
Resistive electric heating	Resistive electric heating units	4176	3368	3268	3512	3335	2079	796	2155	2273
Solar Generation	MW (installed capacity)	8.2	12.4	19.6	29.5	25.8	45.4	93.6	134.8	124.9
Storage	MW (installed capacity)	0.0	0.4	1.2	2.4	3.6	3.7	9.4	21.9	27.9
Wind	MW (installed capacity)	1.2	1.2	1.3	2.4	2.0	1.9	4.4	12.2	10.1

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.

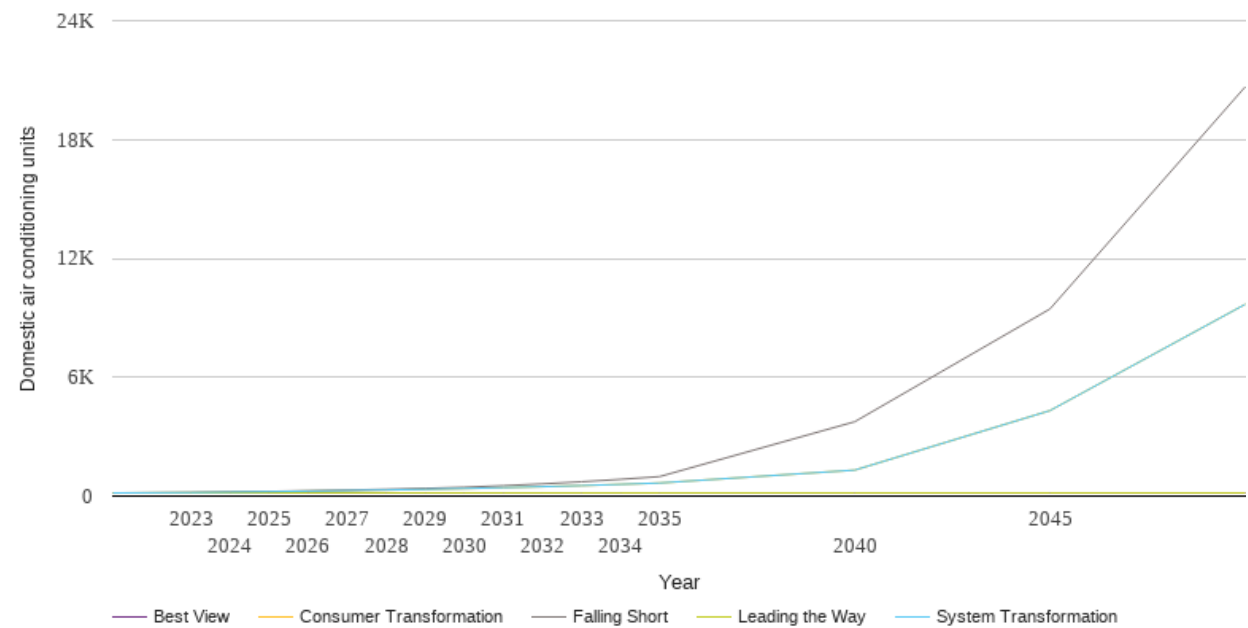
If you have any comments or queries regarding these reports, please contact

nged.energyplanning@nationalgrid.co.uk.

Technology Summary: Air conditioning

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

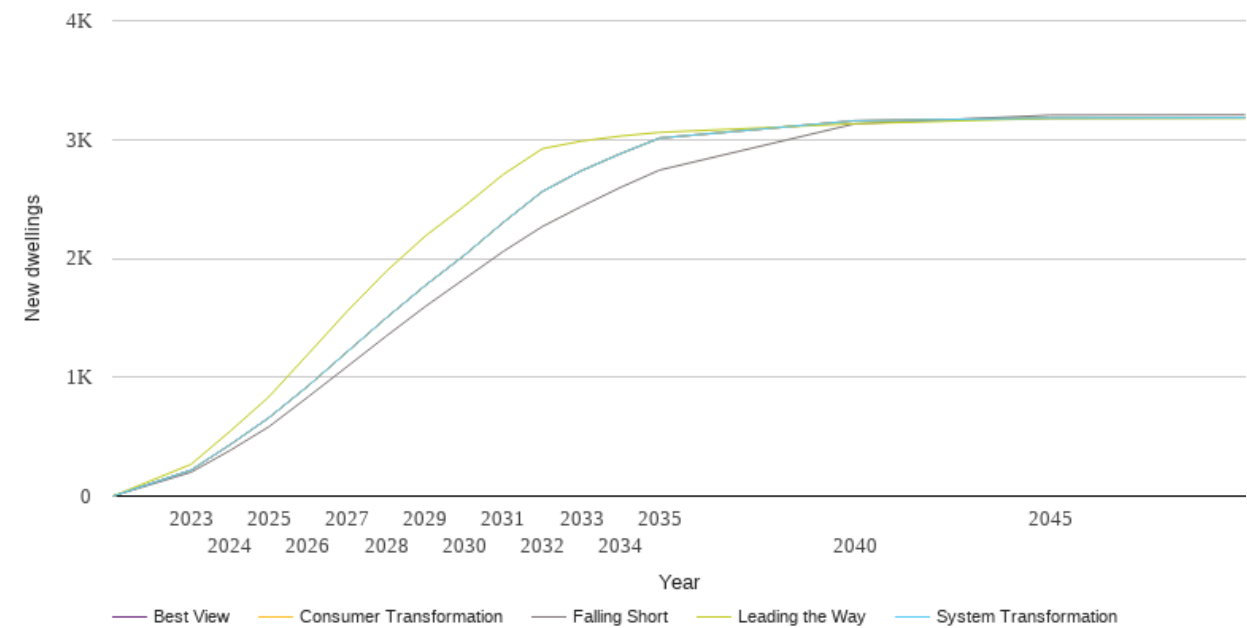
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	158	158	158	158	158
2023	182	179	179	158	158
2024	206	201	201	158	158
2025	234	226	226	158	158
2026	266	250	250	158	158
2027	302	277	277	158	158
2028	343	308	308	158	158
2029	391	343	343	158	158
2030	445	382	382	158	158
2031	525	426	426	158	158
2032	617	475	475	158	158
2033	723	530	530	158	158
2034	845	593	593	158	158
2035	984	662	662	158	158
2040	3755	1311	1311	158	158
2045	9447	4316	4316	158	158
2050	20660	9682	9682	158	158



Technology Summary: Domestic

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

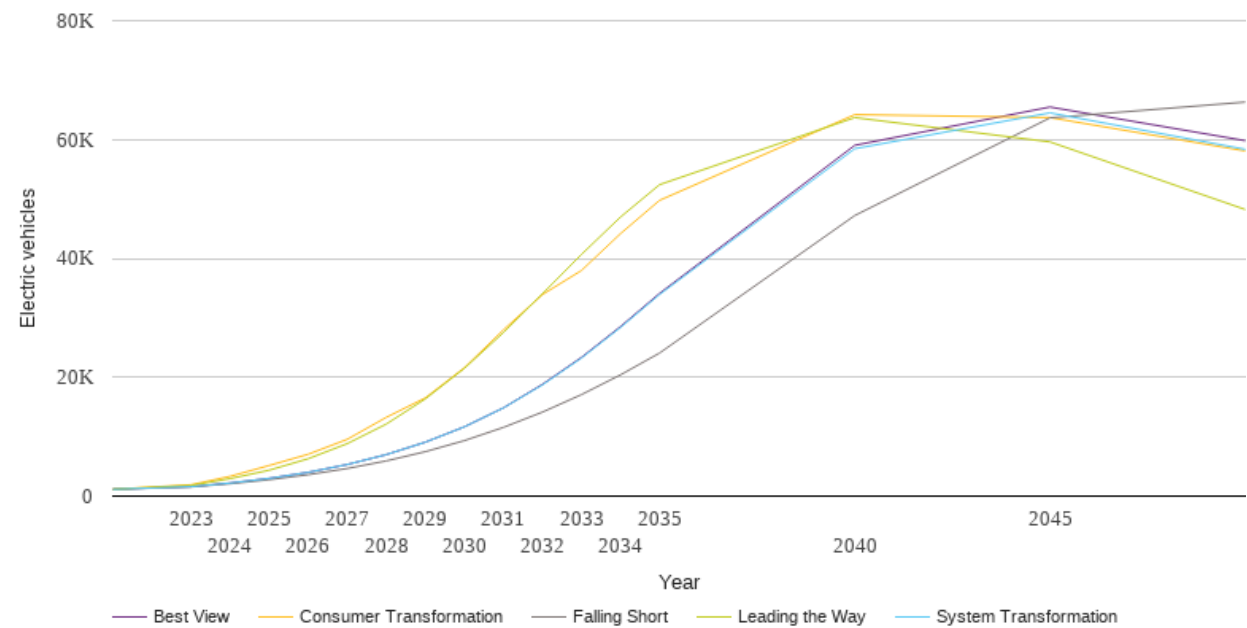
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	201	219	219	267	219
2024	384	432	432	545	432
2025	585	661	661	837	661
2026	835	927	927	1195	927
2027	1090	1214	1214	1555	1214
2028	1346	1499	1499	1891	1499
2029	1595	1772	1772	2188	1772
2030	1827	2026	2026	2439	2026
2031	2059	2303	2303	2707	2303
2032	2268	2563	2563	2923	2563
2033	2437	2738	2738	2987	2738
2034	2597	2881	2881	3029	2881
2035	2743	3012	3012	3060	3012
2040	3132	3158	3158	3133	3158
2045	3205	3181	3181	3178	3181
2050	3207	3183	3183	3180	3183



Technology Summary: Electric vehicles

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

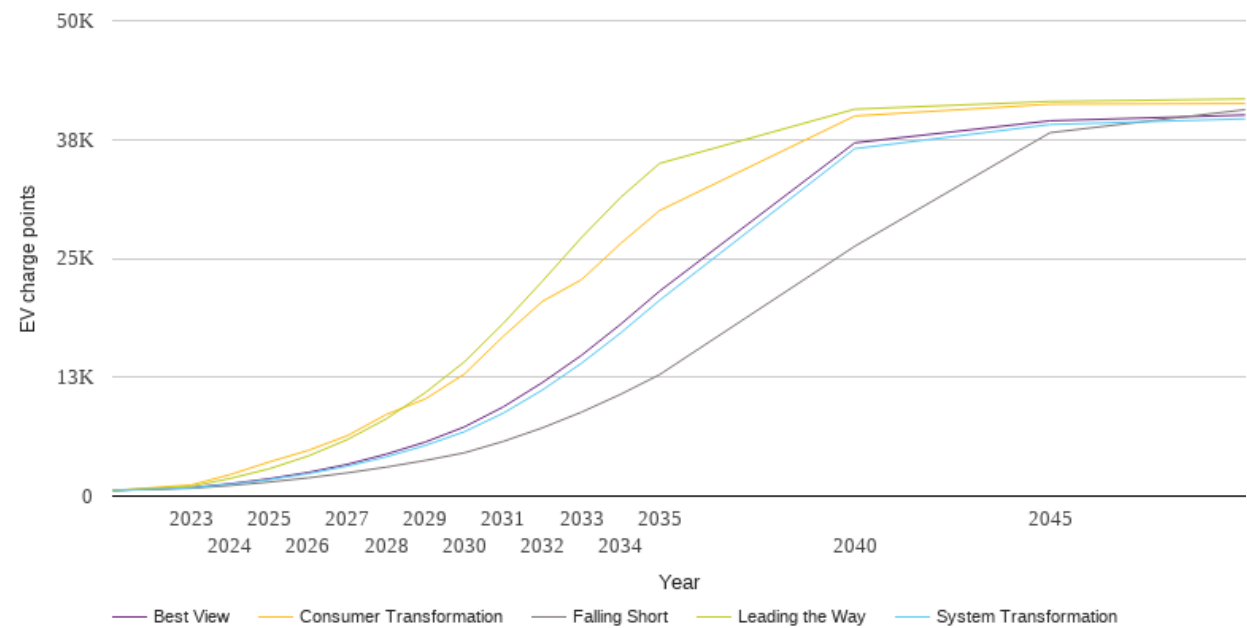
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1144	1144	1144	1144	1144
2023	1550	1588	1906	1791	1588
2024	2083	2192	3323	2937	2192
2025	2756	2972	5143	4355	2973
2026	3599	3990	7038	6287	3993
2027	4644	5310	9551	8824	5313
2028	5918	6978	13246	12112	6981
2029	7472	9066	16525	16352	9072
2030	9334	11647	21588	21493	11656
2031	11556	14832	27966	27511	14845
2032	14132	18709	33911	34039	18802
2033	17076	23227	37962	40667	23344
2034	20400	28372	44161	46955	28522
2035	24069	33918	49763	52408	34109
2040	47210	58457	64189	63695	59028
2045	63647	64486	63698	59599	65471
2050	66303	58353	58077	48230	59809



Technology Summary: EV Charge Point

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

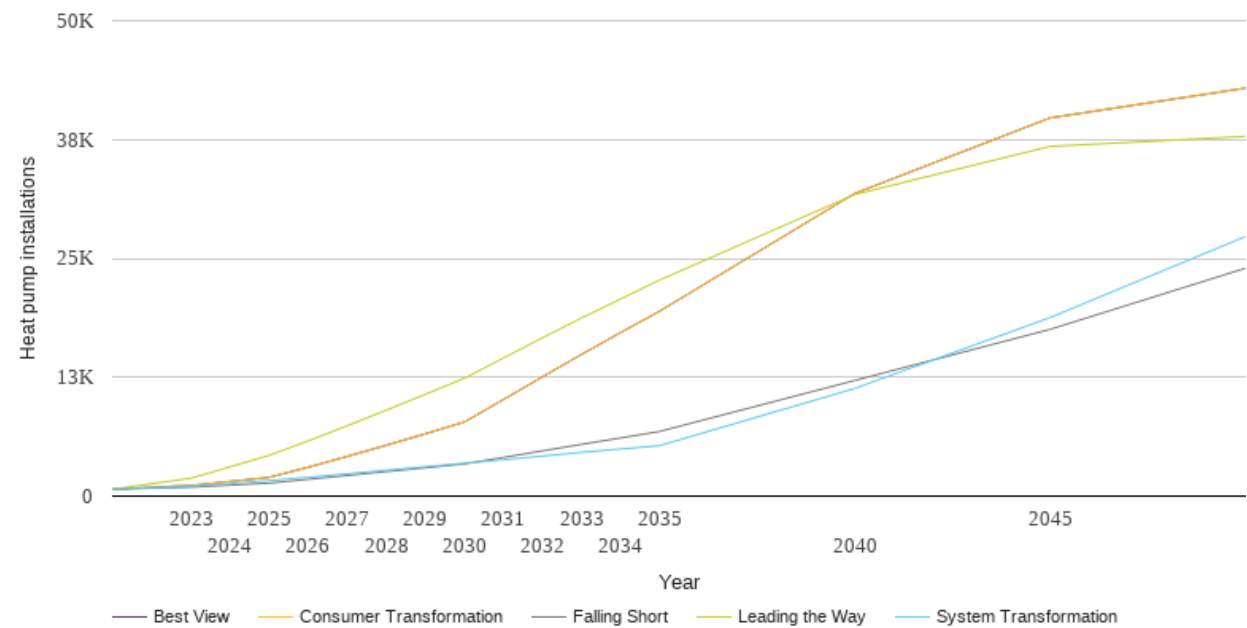
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	596	596	596	596	596
2023	820	866	1168	1019	888
2024	1113	1245	2260	1850	1296
2025	1478	1733	3585	2868	1825
2026	1916	2358	4805	4213	2491
2027	2438	3147	6349	5940	3336
2028	3047	4129	8580	8122	4408
2029	3749	5326	10217	10879	5685
2030	4550	6767	12833	14109	7273
2031	5754	8731	16811	18166	9387
2032	7180	11159	20478	22606	11941
2033	8827	13971	22758	27188	14802
2034	10699	17140	26552	31404	18059
2035	12770	20587	30030	34987	21550
2040	26275	36538	39979	40694	37150
2045	38216	39076	41218	41505	39471
2050	40640	39679	41290	41767	40081



Technology Summary: Heat pumps

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

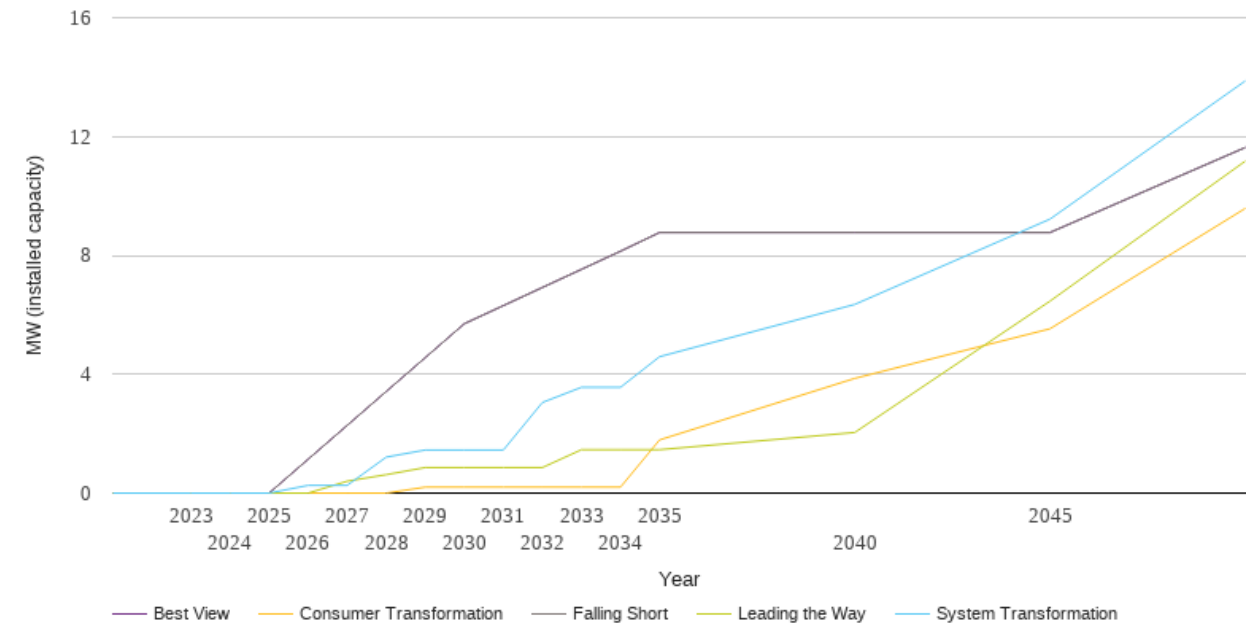
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	729	729	729	729	729
2023	935	1005	1114	1881	1114
2024	1150	1311	1534	3072	1534
2025	1363	1627	1965	4283	1965
2026	1765	1982	3037	5804	3037
2027	2168	2344	4171	7393	4171
2028	2572	2718	5343	9039	5343
2029	2976	3087	6551	10704	6551
2030	3386	3454	7787	12390	7787
2031	4065	3824	10150	14507	10150
2032	4753	4211	12534	16643	12534
2033	5441	4598	14895	18727	14895
2034	6110	4950	17186	20723	17186
2035	6797	5306	19442	22719	19442
2040	12159	11319	31832	31722	31832
2045	17530	18769	39768	36777	39768
2050	23956	27285	42901	37823	42901



Technology Summary: Hydrogen electrolysis

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

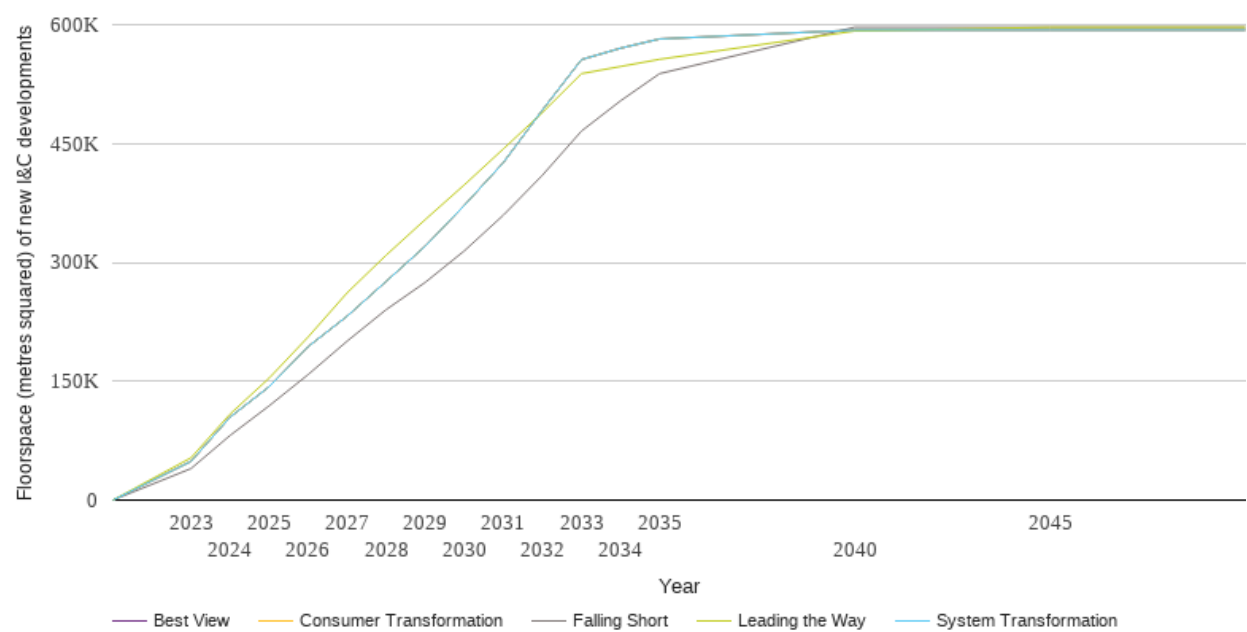
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	1.1	0.3	0.0	0.0	1.1
2027	2.3	0.3	0.0	0.4	2.3
2028	3.4	1.2	0.0	0.6	3.4
2029	4.6	1.5	0.2	0.9	4.6
2030	5.7	1.5	0.2	0.9	5.7
2031	6.3	1.5	0.2	0.9	6.3
2032	6.9	3.0	0.2	0.9	6.9
2033	7.5	3.6	0.2	1.5	7.5
2034	8.1	3.6	0.2	1.5	8.1
2035	8.8	4.6	1.8	1.5	8.8
2040	8.8	6.4	3.9	2.0	8.8
2045	8.8	9.2	5.5	6.5	8.8
2050	11.6	13.9	9.6	11.2	11.6



Technology Summary: Non domestic

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

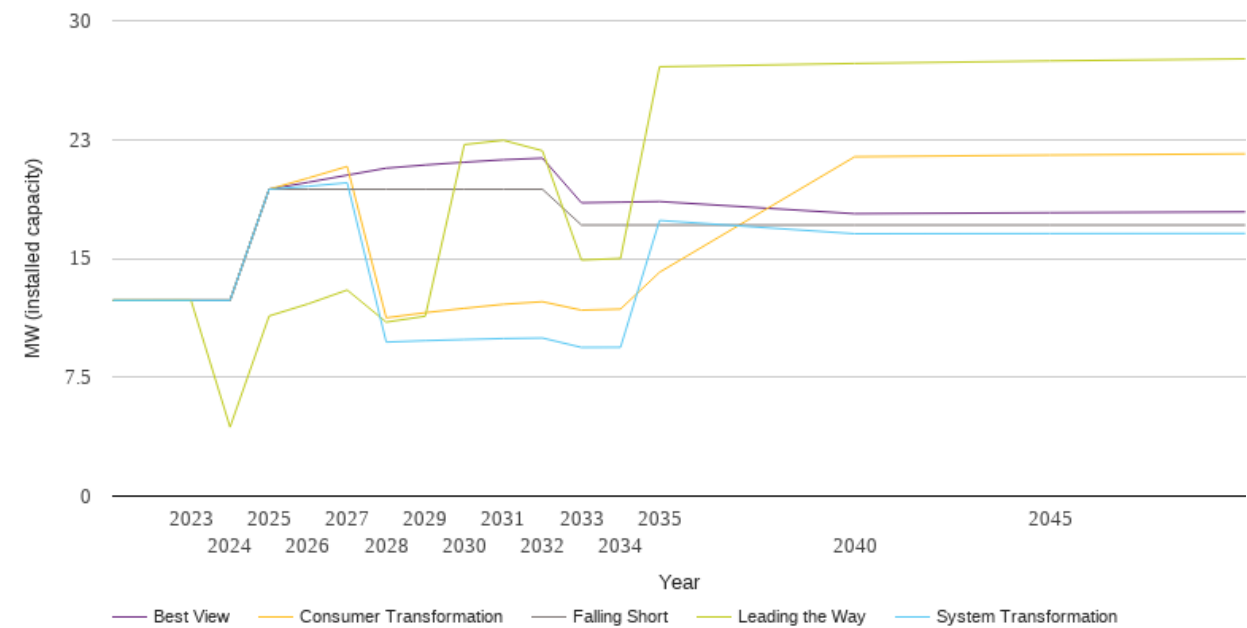
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	39815	48867	48867	53390	48867
2024	81565	104687	104687	108551	104687
2025	118938	143072	143072	153904	143072
2026	158442	193712	193712	205892	193712
2027	200695	232182	232182	261702	232182
2028	240429	276124	276124	309217	276124
2029	274833	320579	320579	354067	320579
2030	314566	371961	371961	397851	371961
2031	359628	426006	426006	443234	426006
2032	410018	492307	492307	489150	492307
2033	465736	555944	555944	538171	555944
2034	503840	570294	570294	547229	570294
2035	538171	581979	581979	556287	581979
2040	596783	593168	593168	591987	593168
2045	596783	593168	593168	596783	593168
2050	596783	593168	593168	596783	593168



Technology Summary: Other Distributed Generation

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

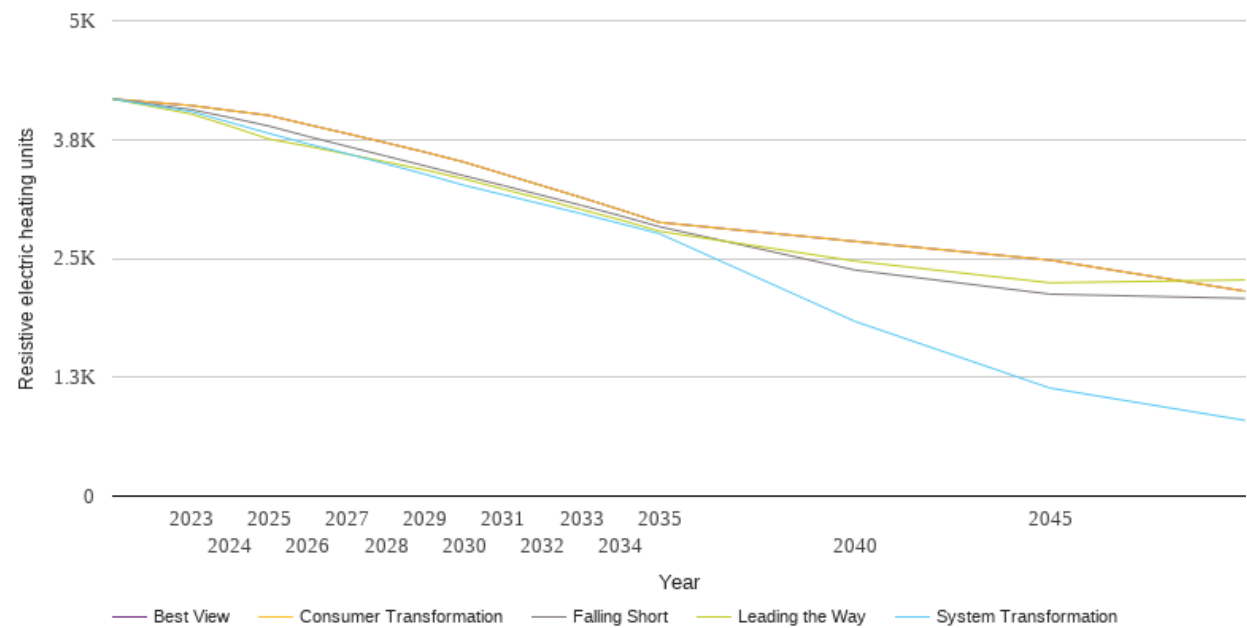
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	12.4	12.4	12.4	12.4	12.4
2023	12.4	12.4	12.4	12.4	12.4
2024	12.4	12.4	12.4	4.4	12.4
2025	19.4	19.4	19.4	11.4	19.4
2026	19.4	19.5	20.1	12.1	19.8
2027	19.4	19.8	20.8	13.0	20.3
2028	19.4	9.7	11.2	11.0	20.7
2029	19.4	9.8	11.6	11.4	20.9
2030	19.4	9.9	11.9	22.2	21.1
2031	19.4	9.9	12.1	22.5	21.2
2032	19.4	10.0	12.3	21.8	21.3
2033	17.1	9.4	11.7	14.9	18.5
2034	17.1	9.4	11.8	15.0	18.5
2035	17.1	17.4	14.1	27.1	18.6
2040	17.1	16.6	21.4	27.3	17.8
2045	17.1	16.6	21.5	27.5	17.9
2050	17.1	16.6	21.6	27.6	17.9



Technology Summary: Resistive electric heating

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

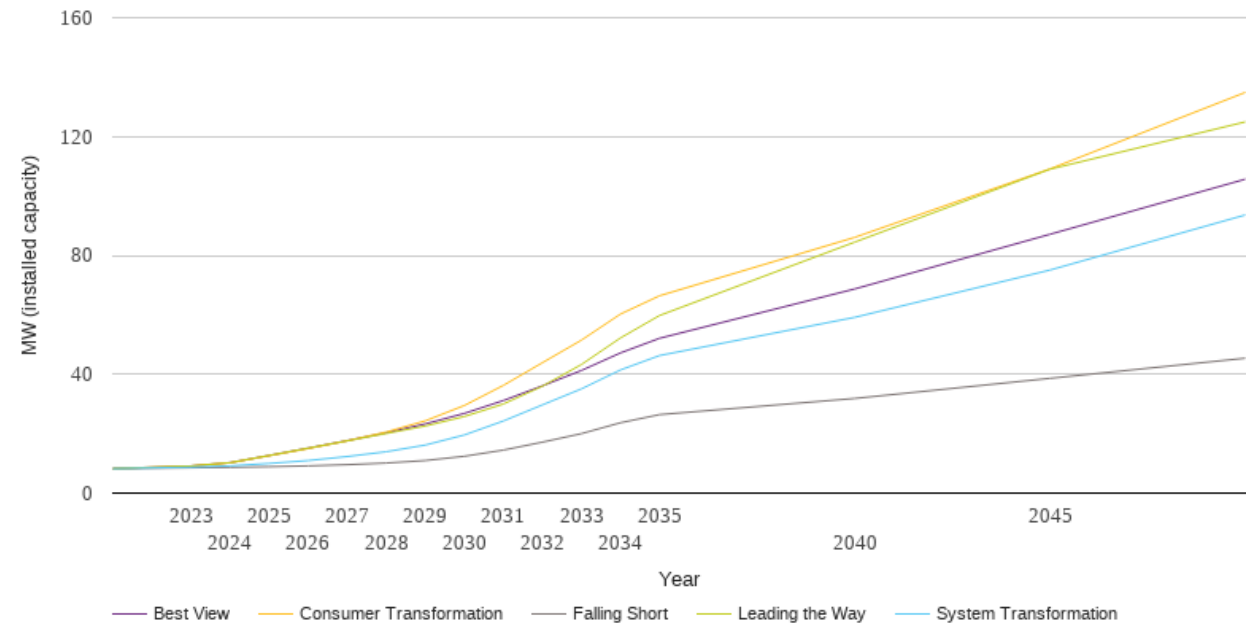
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	4176	4176	4176	4176	4176
2023	4065	4044	4108	4019	4108
2024	3981	3930	4055	3891	4055
2025	3891	3814	4003	3754	4003
2026	3782	3704	3906	3679	3906
2027	3678	3601	3812	3597	3812
2028	3575	3494	3715	3514	3715
2029	3472	3384	3617	3430	3617
2030	3368	3268	3512	3335	3512
2031	3266	3169	3388	3229	3388
2032	3162	3070	3264	3123	3264
2033	3058	2970	3140	3013	3140
2034	2948	2866	3011	2905	3011
2035	2833	2760	2879	2785	2879
2040	2378	1838	2679	2472	2679
2045	2124	1136	2482	2243	2482
2050	2079	796	2155	2273	2155



Technology Summary: Solar Generation

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

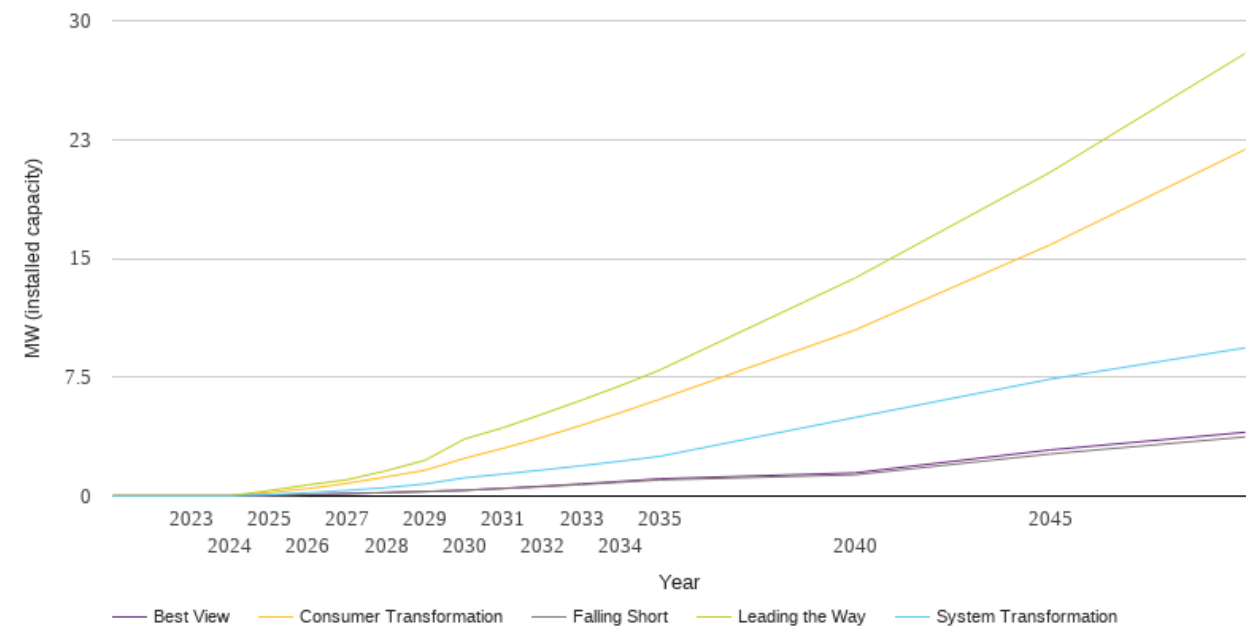
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	8.2	8.2	8.2	8.2	8.2
2023	8.5	8.7	9.1	9.1	9.1
2024	8.7	9.2	10.2	10.2	10.2
2025	8.9	10.0	12.6	12.7	12.7
2026	9.2	11.0	15.0	15.1	15.1
2027	9.6	12.3	17.6	17.6	17.7
2028	10.1	13.9	20.6	20.1	20.3
2029	11.0	16.2	24.3	22.6	23.3
2030	12.4	19.6	29.5	25.8	26.8
2031	14.5	24.3	36.2	30.0	31.2
2032	17.1	29.7	43.9	36.0	36.1
2033	20.0	35.1	51.5	43.3	41.3
2034	23.7	41.4	60.3	52.2	47.2
2035	26.4	46.3	66.4	59.8	52.1
2040	31.9	59.2	86.1	84.5	68.7
2045	38.6	75.1	109.1	109.0	87.1
2050	45.4	93.6	134.8	124.9	105.6



Technology Summary: Storage

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

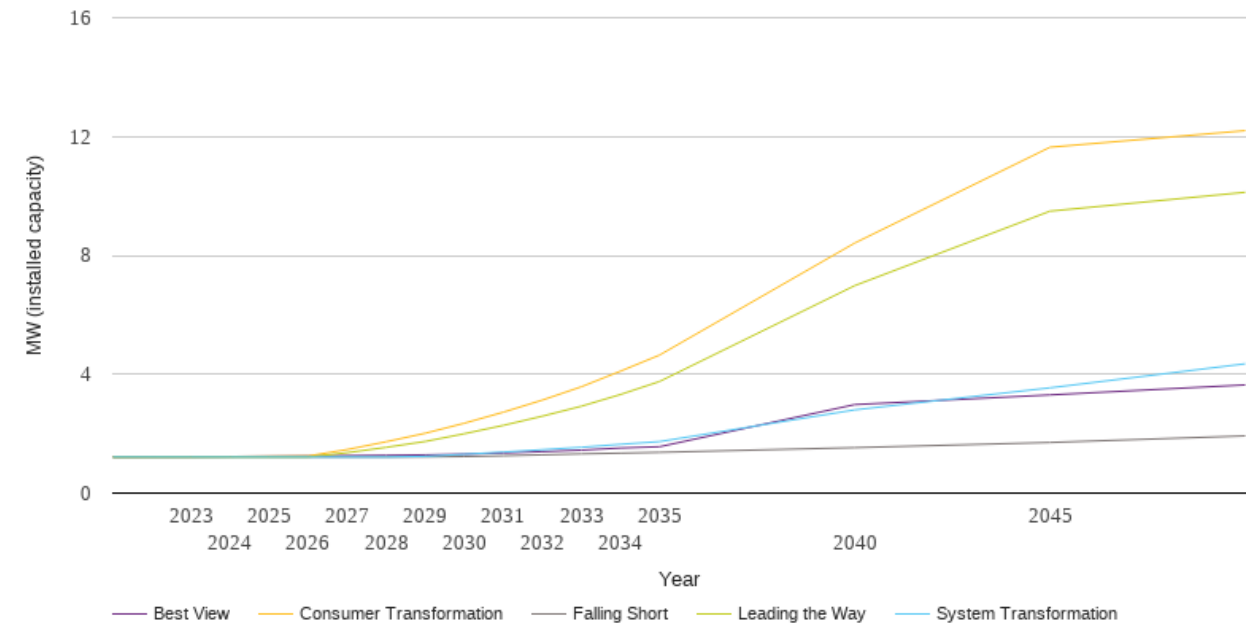
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.1	0.2	0.3	0.0
2026	0.1	0.2	0.5	0.7	0.1
2027	0.2	0.4	0.8	1.0	0.2
2028	0.2	0.5	1.2	1.6	0.2
2029	0.3	0.8	1.6	2.3	0.3
2030	0.4	1.2	2.4	3.6	0.4
2031	0.5	1.4	3.0	4.3	0.5
2032	0.6	1.6	3.7	5.2	0.6
2033	0.7	1.9	4.5	6.0	0.8
2034	0.9	2.2	5.3	7.0	0.9
2035	1.0	2.5	6.1	7.9	1.1
2040	1.3	5.0	10.5	13.7	1.5
2045	2.7	7.4	15.9	20.4	2.9
2050	3.7	9.4	21.9	27.9	4.0



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	1.2	1.2	1.2	1.2	1.2
2023	1.2	1.2	1.2	1.2	1.2
2024	1.2	1.2	1.2	1.2	1.2
2025	1.2	1.2	1.2	1.2	1.2
2026	1.2	1.2	1.2	1.2	1.2
2027	1.2	1.2	1.5	1.4	1.3
2028	1.2	1.2	1.7	1.5	1.3
2029	1.2	1.2	2.0	1.7	1.3
2030	1.2	1.3	2.4	2.0	1.3
2031	1.3	1.4	2.7	2.3	1.4
2032	1.3	1.5	3.1	2.6	1.4
2033	1.3	1.5	3.6	2.9	1.4
2034	1.3	1.6	4.1	3.3	1.5
2035	1.4	1.7	4.6	3.8	1.6
2040	1.5	2.8	8.4	7.0	3.0
2045	1.7	3.5	11.6	9.5	3.3
2050	1.9	4.4	12.2	10.1	3.6



National Grid Electricity Distribution PLC 09223384)
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