

# Distribution Future Energy Scenarios 2022

Local Authority:  
South Staffordshire

## What are Distribution Future Energy Scenarios?

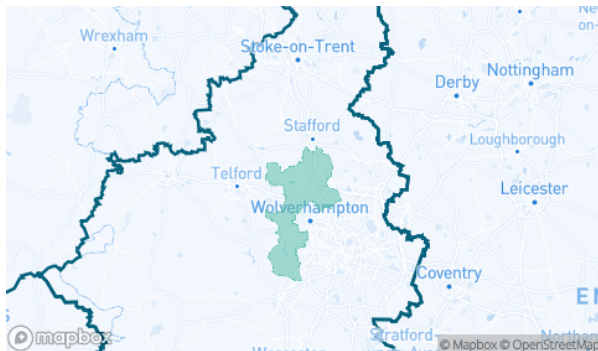
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 South Staffordshire 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 South Staffordshire 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	135	80	80	0	23188	10265	10265	0
Domestic	New dwellings	0	3487	3880	3880	4786	8417	8352	8352	8335
Electric vehicles	Electric vehicles	1294	10728	12992	24095	23932	73564	64631	65229	52452
EV Charge Point	EV charge points	718	5210	7474	14171	15554	43796	41483	43681	44336
Heat pumps	Heat pump installations	642	3576	3820	9660	15400	24342	28942	49121	42682
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	2.5	0.5	1.7	2.9	15.5	10.3	14.1
Non domestic	Floorspace (metres squared) of new I&C developments	0	127029	142794	142794	155686	175606	174742	174742	175606
Other Distributed Generation	MW (installed capacity)	3.0	3.2	3.4	3.7	3.7	3.2	4.1	4.0	4.3
Resistive electric heating	Resistive electric heating units	3900	3455	3267	3464	3362	2811	1254	2506	2606
Solar Generation	MW (installed capacity)	23.6	29.4	37.8	47.0	43.0	75.4	132.3	168.9	160.9
Storage	MW (installed capacity)	0.3	0.7	1.7	3.1	4.4	4.4	10.6	24.6	31.7
Wind	MW (installed capacity)	4.0	4.0	4.1	4.9	4.6	4.7	8.4	16.5	14.7

## 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

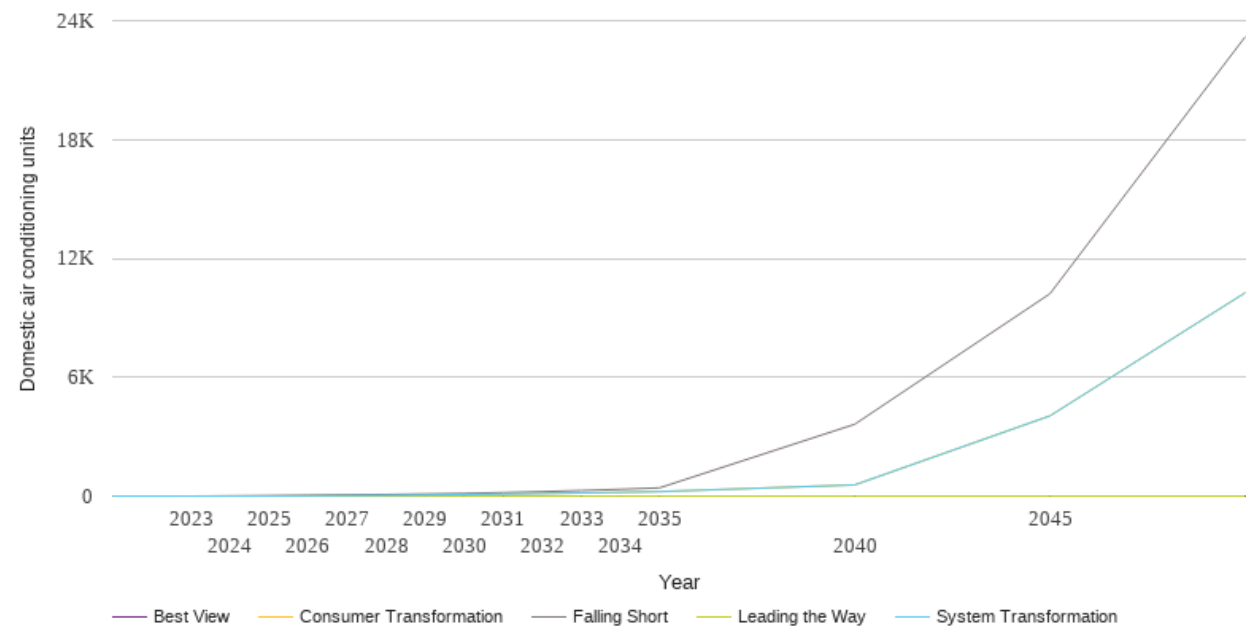
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

If you have any comments or queries regarding these reports, please contact [nged.energyplanning@nationalgrid.co.uk](mailto:nged.energyplanning@nationalgrid.co.uk).

# Technology Summary: Air conditioning

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

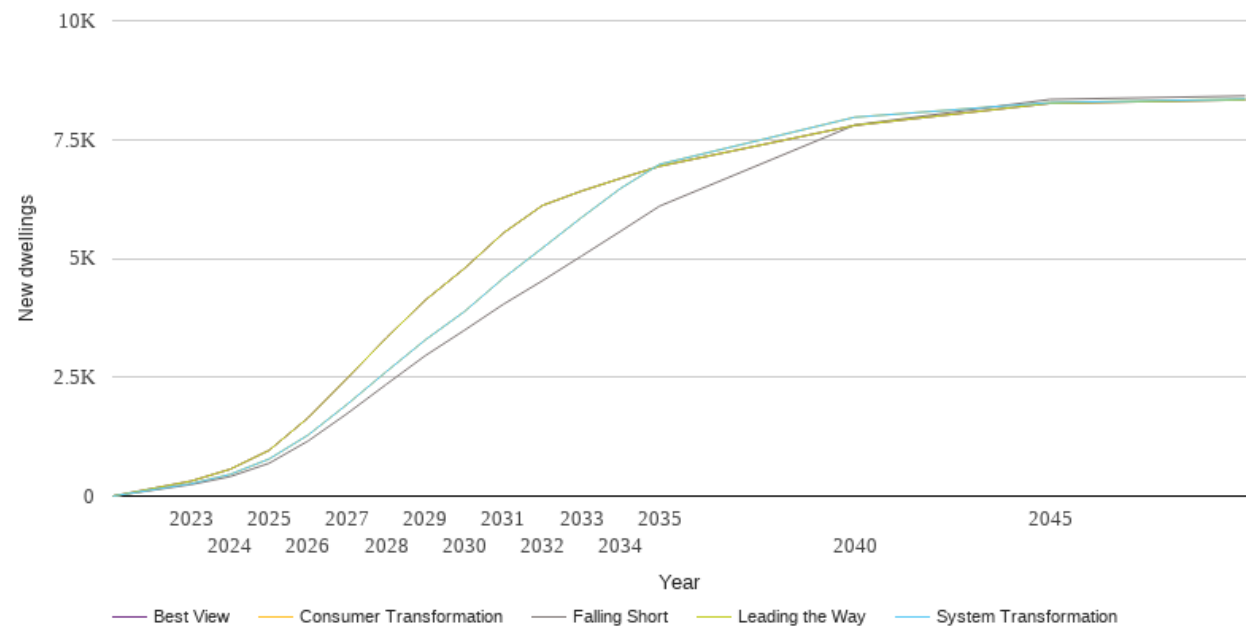
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	12	0	0	0	0
2025	26	0	0	0	0
2026	42	12	12	0	0
2027	61	26	26	0	0
2028	82	42	42	0	0
2029	107	60	60	0	0
2030	135	80	80	0	0
2031	177	103	103	0	0
2032	225	129	129	0	0
2033	280	158	158	0	0
2034	343	191	191	0	0
2035	416	227	227	0	0
2040	3627	565	565	0	0
2045	10216	4051	4051	0	0
2050	23188	10265	10265	0	0



# Technology Summary: Domestic

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

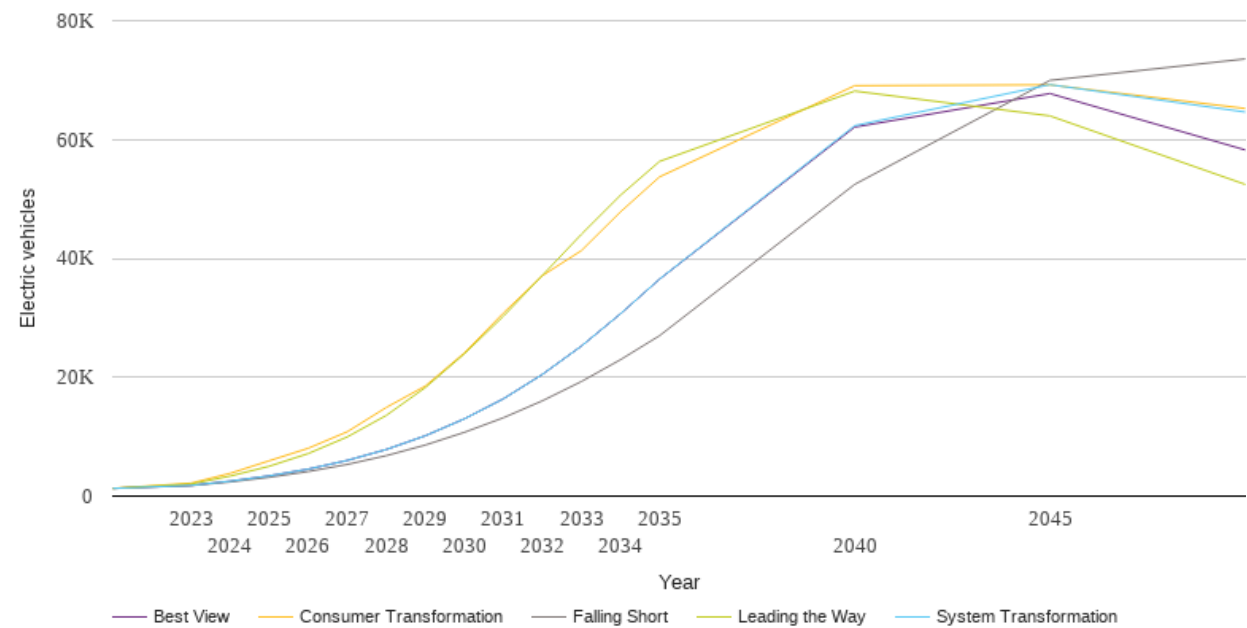
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	242	261	261	316	316
2024	410	456	456	564	564
2025	691	780	780	963	963
2026	1160	1285	1285	1648	1648
2027	1736	1931	1931	2479	2479
2028	2349	2616	2616	3325	3325
2029	2954	3285	3285	4122	4122
2030	3487	3880	3880	4786	4786
2031	4035	4583	4583	5534	5534
2032	4530	5217	5217	6113	6113
2033	5048	5858	5858	6416	6416
2034	5570	6471	6471	6682	6682
2035	6099	6978	6978	6938	6938
2040	7805	7969	7969	7798	7798
2045	8343	8278	8278	8261	8261
2050	8417	8352	8352	8335	8335



# Technology Summary: Electric vehicles

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

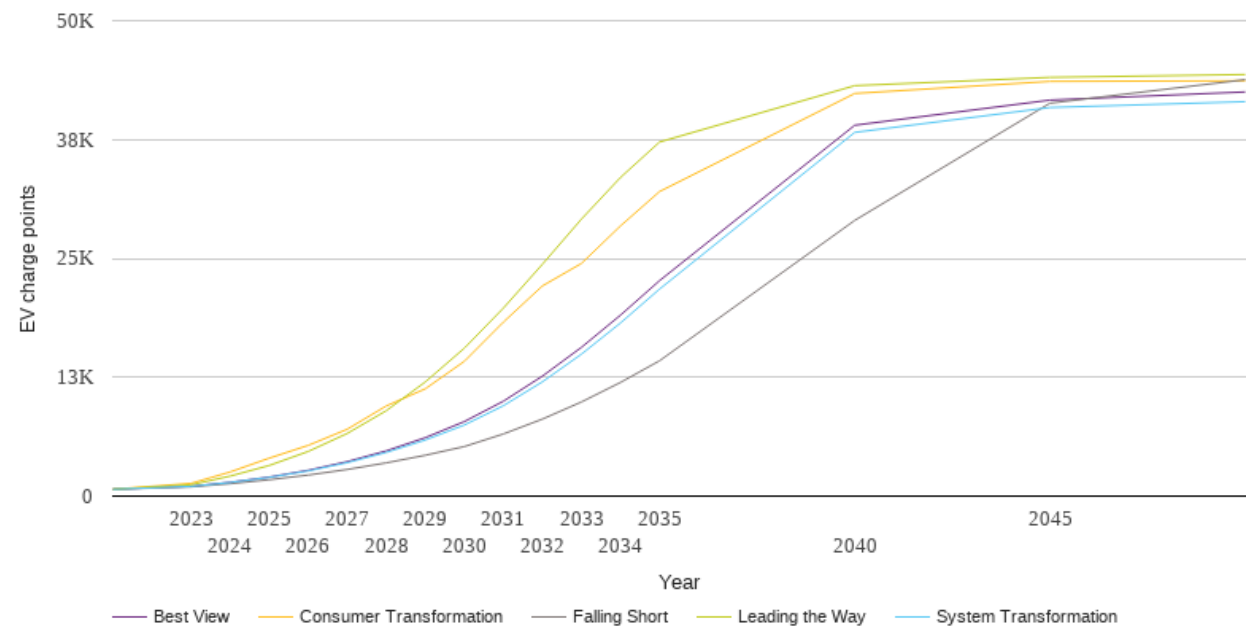
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1294	1294	1294	1294	1294
2023	1769	1806	2175	2036	1806
2024	2381	2502	3823	3364	2502
2025	3159	3403	5939	5013	3403
2026	4127	4537	8040	7152	4540
2027	5330	5995	10821	9954	5998
2028	6801	7837	14909	13573	7840
2029	8587	10147	18519	18258	10152
2030	10728	12992	24095	23932	13000
2031	13181	16364	30813	30271	16375
2032	16037	20479	37098	37138	20481
2033	19286	25254	41318	44066	25251
2034	22954	30682	47829	50629	30672
2035	26992	36523	53720	56318	36502
2040	52461	62338	69065	68156	62096
2045	69954	69232	69205	63976	67736
2050	73564	64631	65229	52452	58249



# 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	974	1017	1336	1189	1023
2024	1305	1432	2534	2100	1443
2025	1717	1965	3987	3214	1995
2026	2211	2649	5331	4691	2710
2027	2801	3516	7030	6587	3622
2028	3495	4592	9480	8978	4754
2029	4293	5898	11285	12006	6144
2030	5210	7474	14171	15554	7837
2031	6534	9505	18296	19770	9981
2032	8098	12019	22104	24381	12617
2033	9902	14928	24472	29134	15647
2034	11956	18209	28416	33511	19030
2035	14232	21772	32029	37237	22659
2040	28996	38251	42346	43167	39004
2045	41325	40867	43615	44038	41647
2050	43796	41483	43681	44336	42504

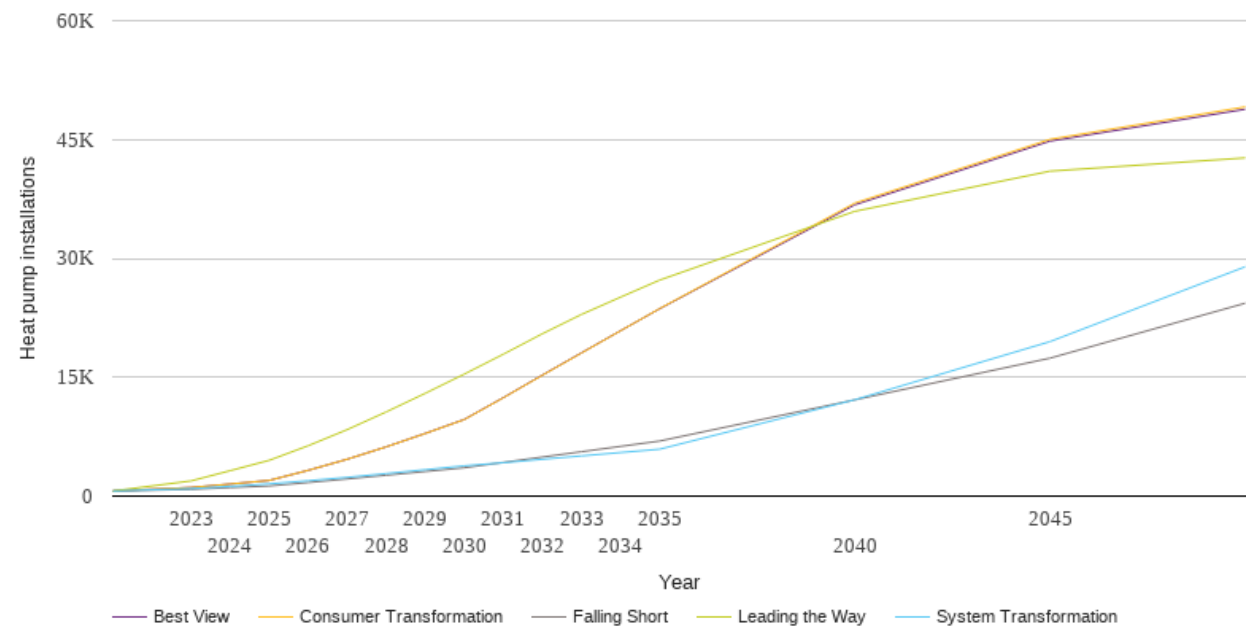




# Technology Summary: Heat pumps

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

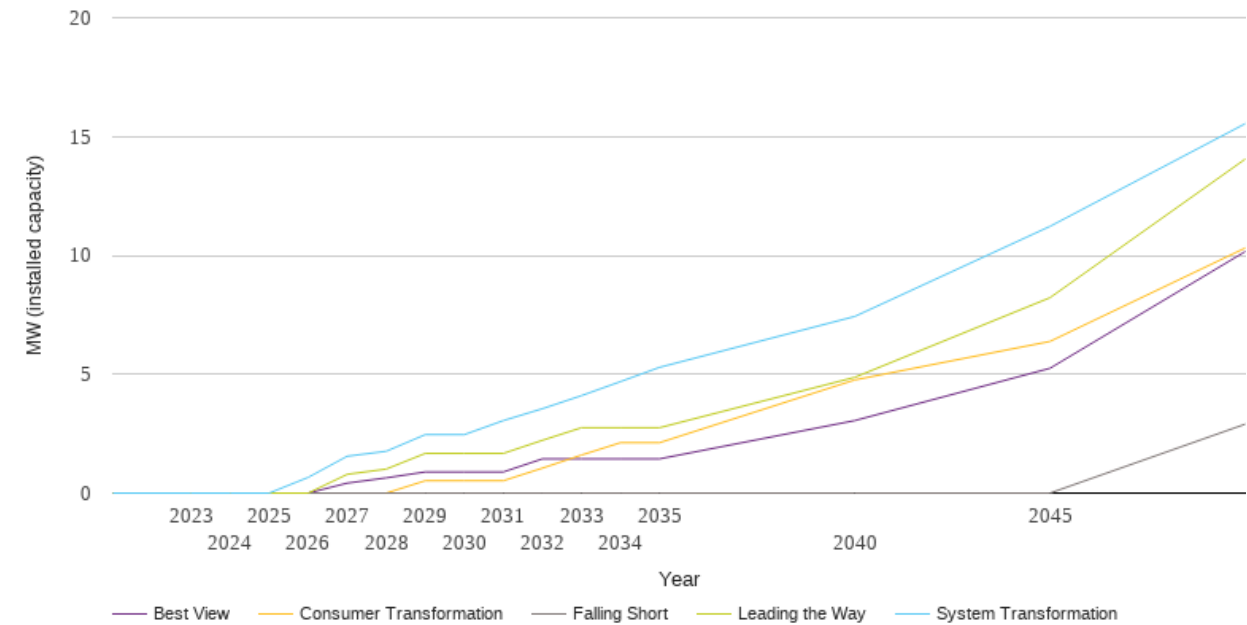
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	642	642	642	642	642
2023	852	935	1077	1915	1077
2024	1070	1232	1517	3203	1517
2025	1278	1543	1974	4509	1974
2026	1715	1935	3246	6354	3249
2027	2166	2366	4650	8390	4650
2028	2634	2841	6213	10624	6220
2029	3106	3330	7900	12972	7911
2030	3576	3820	9660	15400	9678
2031	4251	4214	12408	17907	12430
2032	4926	4645	15253	20492	15278
2033	5601	5071	18051	22925	18081
2034	6273	5494	20860	25103	20867
2035	6948	5916	23656	27255	23638
2040	12145	12157	36974	35937	36761
2045	17408	19495	45024	41008	44798
2050	24342	28942	49121	42682	48824



# Technology Summary: Hydrogen electrolysis

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

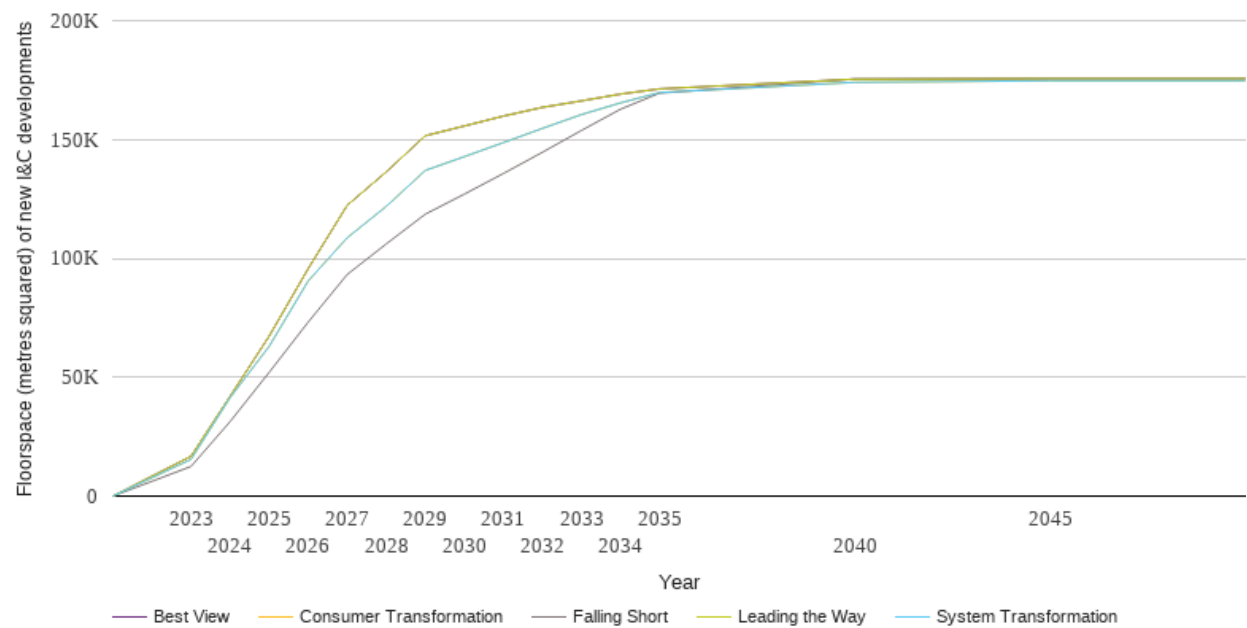
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.7	0.0	0.0	0.0
2027	0.0	1.6	0.0	0.8	0.4
2028	0.0	1.8	0.0	1.0	0.6
2029	0.0	2.5	0.5	1.7	0.9
2030	0.0	2.5	0.5	1.7	0.9
2031	0.0	3.0	0.5	1.7	0.9
2032	0.0	3.5	1.1	2.2	1.4
2033	0.0	4.1	1.6	2.8	1.4
2034	0.0	4.7	2.1	2.8	1.4
2035	0.0	5.3	2.1	2.8	1.4
2040	0.0	7.4	4.8	4.9	3.0
2045	0.0	11.2	6.4	8.2	5.2
2050	2.9	15.5	10.3	14.1	10.2



# Technology Summary: Non domestic

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

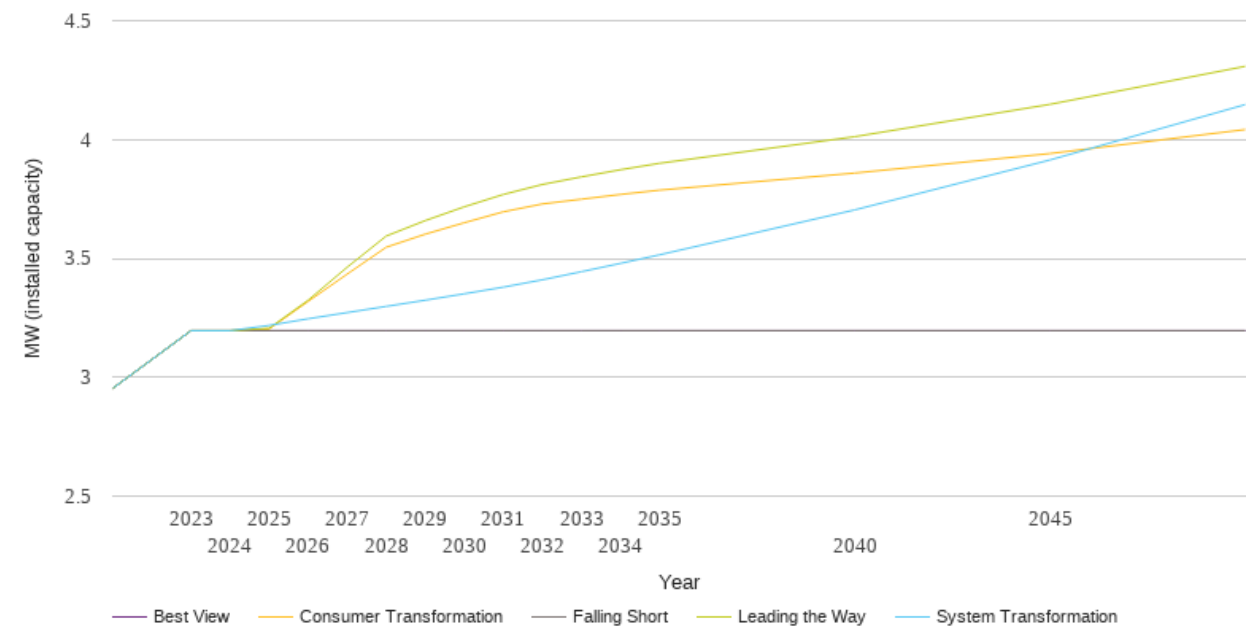
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	12469	15477	15477	16768	16768
2024	31333	41415	41415	41945	41945
2025	52014	62975	62975	67261	67261
2026	73167	90463	90463	95652	95652
2027	93219	108690	108690	122336	122336
2028	106087	121870	121870	136384	136384
2029	118596	137000	137000	151586	151586
2030	127029	142794	142794	155686	155686
2031	135711	148712	148712	159861	159861
2032	144644	154672	154672	163527	163527
2033	153827	160508	160508	166260	166260
2034	162744	165406	165406	169118	169118
2035	169530	169753	169753	171300	171300
2040	175456	174067	174067	175381	175381
2045	175606	174742	174742	175606	175606
2050	175606	174742	174742	175606	175606



# Technology Summary: Other Distributed Generation

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

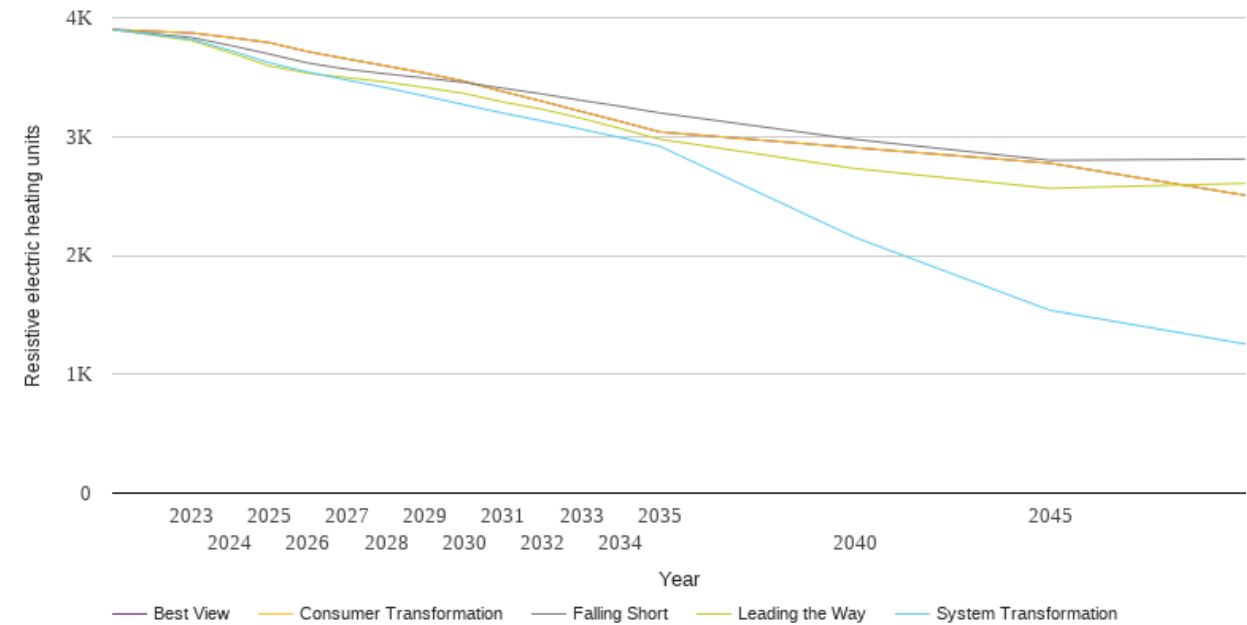
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	3.0	3.0	3.0	3.0	3.0
2023	3.2	3.2	3.2	3.2	3.2
2024	3.2	3.2	3.2	3.2	3.2
2025	3.2	3.2	3.2	3.2	3.2
2026	3.2	3.2	3.3	3.3	3.2
2027	3.2	3.3	3.4	3.5	3.2
2028	3.2	3.3	3.5	3.6	3.2
2029	3.2	3.3	3.6	3.7	3.2
2030	3.2	3.4	3.7	3.7	3.2
2031	3.2	3.4	3.7	3.8	3.2
2032	3.2	3.4	3.7	3.8	3.2
2033	3.2	3.4	3.7	3.8	3.2
2034	3.2	3.5	3.8	3.9	3.2
2035	3.2	3.5	3.8	3.9	3.2
2040	3.2	3.7	3.9	4.0	3.2
2045	3.2	3.9	3.9	4.1	3.2
2050	3.2	4.1	4.0	4.3	3.2



# Technology Summary: Resistive electric heating

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

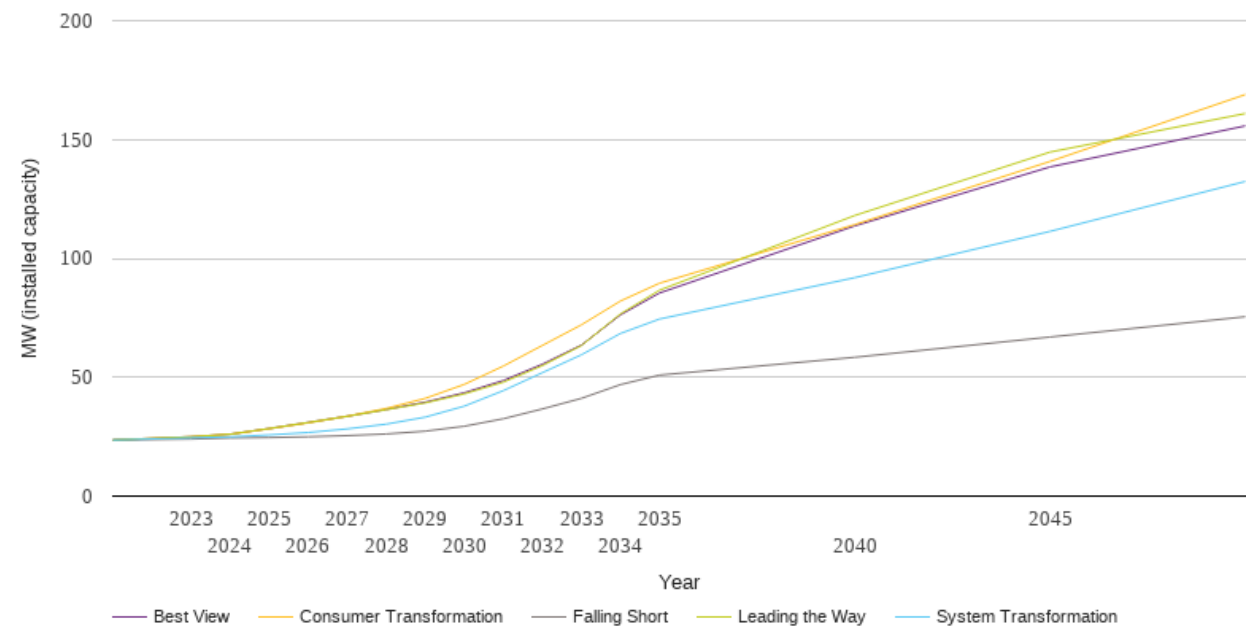
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	3900	3900	3900	3900	3900
2023	3834	3819	3872	3808	3872
2024	3767	3725	3834	3705	3834
2025	3694	3621	3790	3594	3790
2026	3618	3541	3714	3533	3714
2027	3566	3475	3653	3495	3653
2028	3527	3410	3594	3458	3594
2029	3492	3340	3533	3412	3533
2030	3455	3267	3464	3362	3464
2031	3406	3196	3377	3290	3377
2032	3358	3131	3296	3229	3296
2033	3304	3062	3210	3153	3210
2034	3254	2991	3126	3067	3126
2035	3199	2919	3039	2978	3039
2040	2976	2152	2906	2731	2906
2045	2800	1538	2776	2564	2776
2050	2811	1254	2506	2606	2506



# Technology Summary: Solar Generation

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

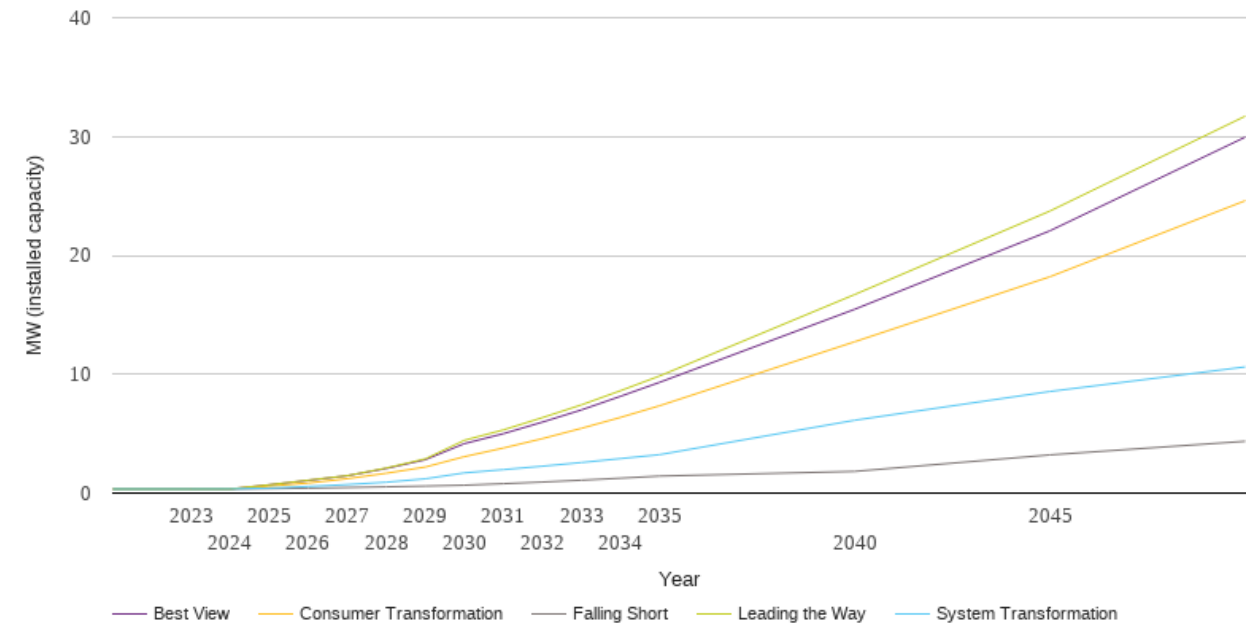
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	23.6	23.6	23.6	23.6	23.6
2023	24.0	24.5	24.9	24.9	24.9
2024	24.4	24.9	26.0	26.0	26.0
2025	24.6	25.7	28.3	28.4	28.4
2026	24.9	26.8	30.8	31.0	31.0
2027	25.4	28.3	33.6	33.6	33.6
2028	26.1	30.3	36.9	36.4	36.5
2029	27.3	33.2	41.1	39.2	39.5
2030	29.4	37.8	47.0	43.0	43.5
2031	32.5	44.4	54.7	47.9	48.6
2032	36.7	51.9	63.4	54.9	55.5
2033	41.1	59.5	72.1	63.3	63.5
2034	46.9	68.4	82.1	76.6	76.3
2035	50.9	74.5	89.6	86.6	85.4
2040	58.4	91.9	114.2	118.0	113.7
2045	66.9	111.4	140.8	144.7	138.5
2050	75.4	132.3	168.9	160.9	155.7



# Technology Summary: Storage

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

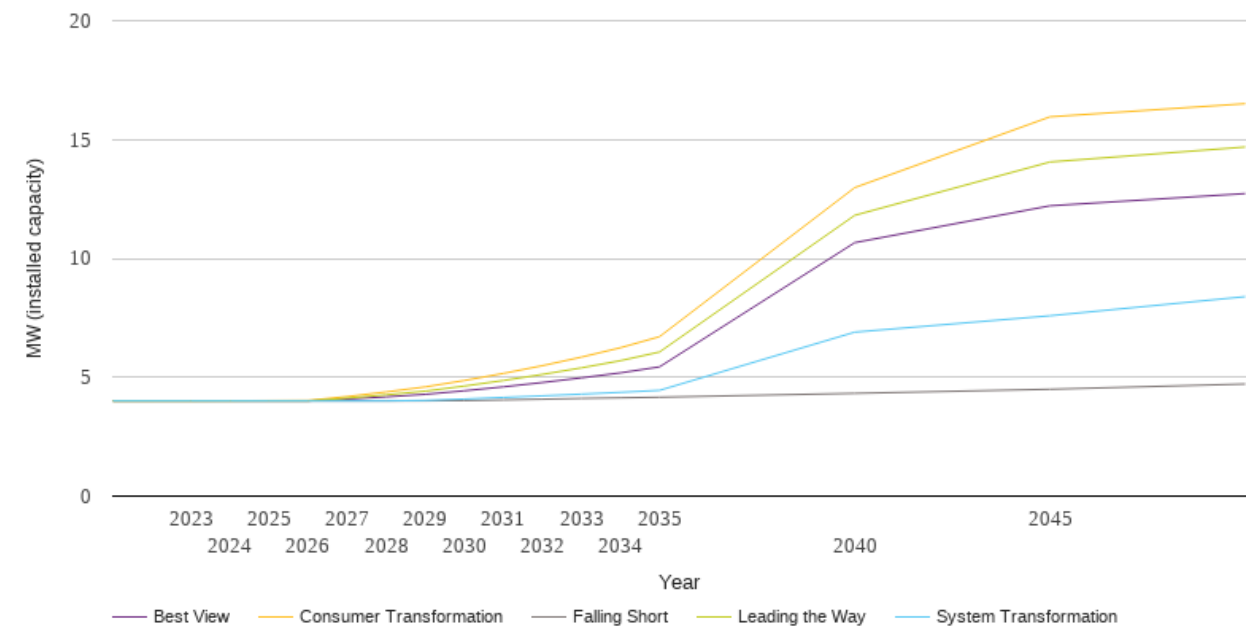
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.3	0.3	0.3	0.3	0.3
2023	0.3	0.3	0.3	0.3	0.3
2024	0.3	0.3	0.3	0.3	0.3
2025	0.4	0.4	0.6	0.7	0.7
2026	0.4	0.6	0.8	1.1	1.1
2027	0.5	0.7	1.2	1.5	1.5
2028	0.5	0.9	1.7	2.1	2.1
2029	0.6	1.2	2.2	2.9	2.8
2030	0.7	1.7	3.1	4.4	4.2
2031	0.8	2.0	3.8	5.3	5.0
2032	0.9	2.3	4.6	6.4	6.0
2033	1.1	2.6	5.4	7.4	7.0
2034	1.3	2.9	6.4	8.6	8.1
2035	1.4	3.2	7.3	9.9	9.3
2040	1.8	6.1	12.7	16.7	15.5
2045	3.2	8.6	18.2	23.7	22.1
2050	4.4	10.6	24.6	31.7	29.9



# 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	4.0	4.0	4.0	4.0	4.0
2023	4.0	4.0	4.0	4.0	4.0
2024	4.0	4.0	4.0	4.0	4.0
2025	4.0	4.0	4.0	4.0	4.0
2026	4.0	4.0	4.0	4.0	4.0
2027	4.0	4.0	4.2	4.1	4.1
2028	4.0	4.0	4.4	4.3	4.2
2029	4.0	4.0	4.6	4.4	4.3
2030	4.0	4.1	4.9	4.6	4.4
2031	4.0	4.2	5.2	4.9	4.6
2032	4.1	4.2	5.5	5.1	4.8
2033	4.1	4.3	5.8	5.4	5.0
2034	4.1	4.4	6.2	5.7	5.2
2035	4.2	4.4	6.7	6.1	5.4
2040	4.3	6.9	13.0	11.8	10.7
2045	4.5	7.6	16.0	14.1	12.2
2050	4.7	8.4	16.5	14.7	12.7





National Grid Electricity Distribution PLC 09223384)  
National Grid Electricity Distribution (East Midlands) Plc (company number 02366923))  
National Grid Electricity Distribution (West Midlands) Plc (company number 03600574))  
National Grid Electricity Distribution (South West) Plc (company number 02366894))  
National Grid Electricity Distribution (South Wales) Plc (company number 02366985))  
(collectively, “NGED”)

[nged.networkstrategy@nationalgrid.co.uk](mailto:nged.networkstrategy@nationalgrid.co.uk)

