

Distribution Future Energy Scenarios 2022

Local Authority:
Telford and Wrekin

What are Distribution Future Energy Scenarios?

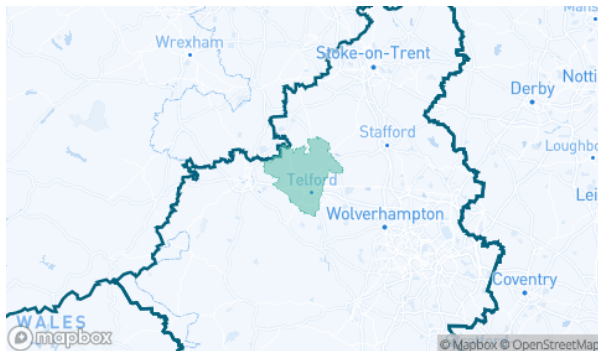
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Telford and Wrekin 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 Telford and Wrekin 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	249	949	751	751	249	41177	19670	19670	249
Domestic	New dwellings	0	2559	2641	2641	2920	4102	3944	3944	3832
Electric vehicles	Electric vehicles	1805	14832	18503	34280	34118	107044	97860	98109	78277
EV Charge Point	EV charge points	859	6557	9699	18501	20227	58238	56909	59518	60325
Heat pumps	Heat pump installations	329	3727	3948	11736	19535	38948	45802	80564	70795
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	1.1	0.0	1.1	0.6	3.5	2.1	4.1
Non domestic	Floorspace (metres squared) of new I&C developments	0	256226	311410	311410	324041	534440	534334	534334	534440
Other Distributed Generation	MW (installed capacity)	17.4	23.0	19.0	19.1	18.0	18.0	7.7	7.6	8.8
Resistive electric heating	Resistive electric heating units	4325	4054	3823	4005	3920	3770	1888	3260	3495
Solar Generation	MW (installed capacity)	37.4	43.4	51.0	63.4	63.1	70.0	112.5	164.2	169.2
Storage	MW (installed capacity)	0.5	1.1	2.0	3.6	5.2	5.7	13.5	31.5	39.6
Wind	MW (installed capacity)	0.0	0.1	0.1	0.5	0.4	0.3	0.9	3.7	3.0

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

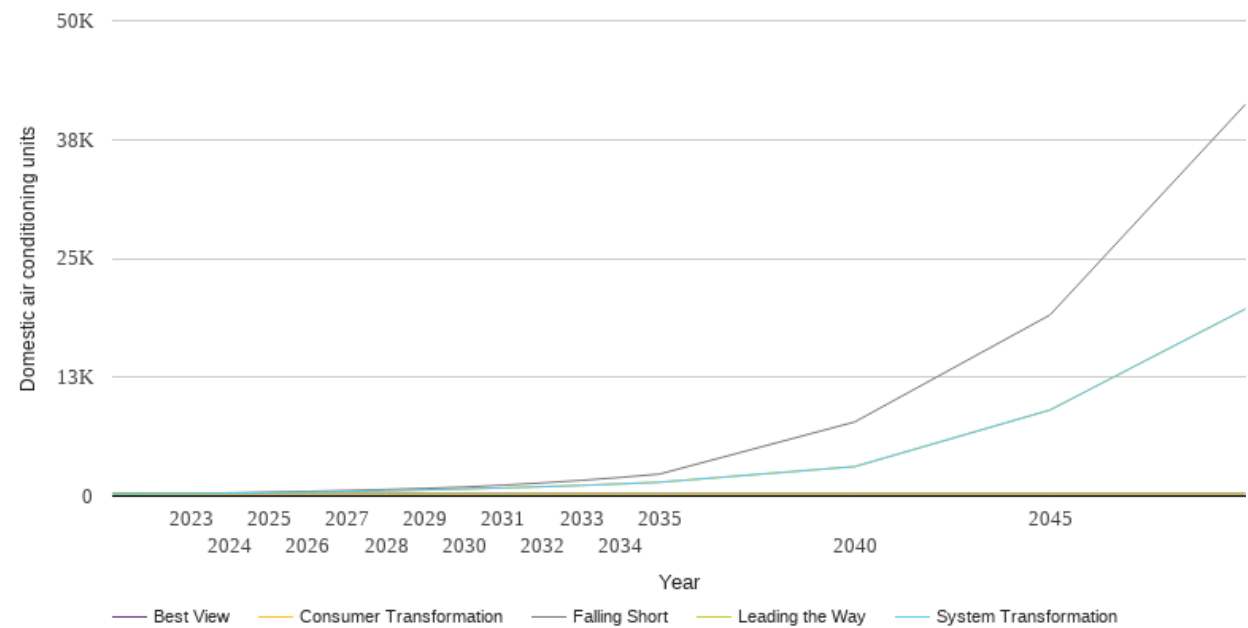
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

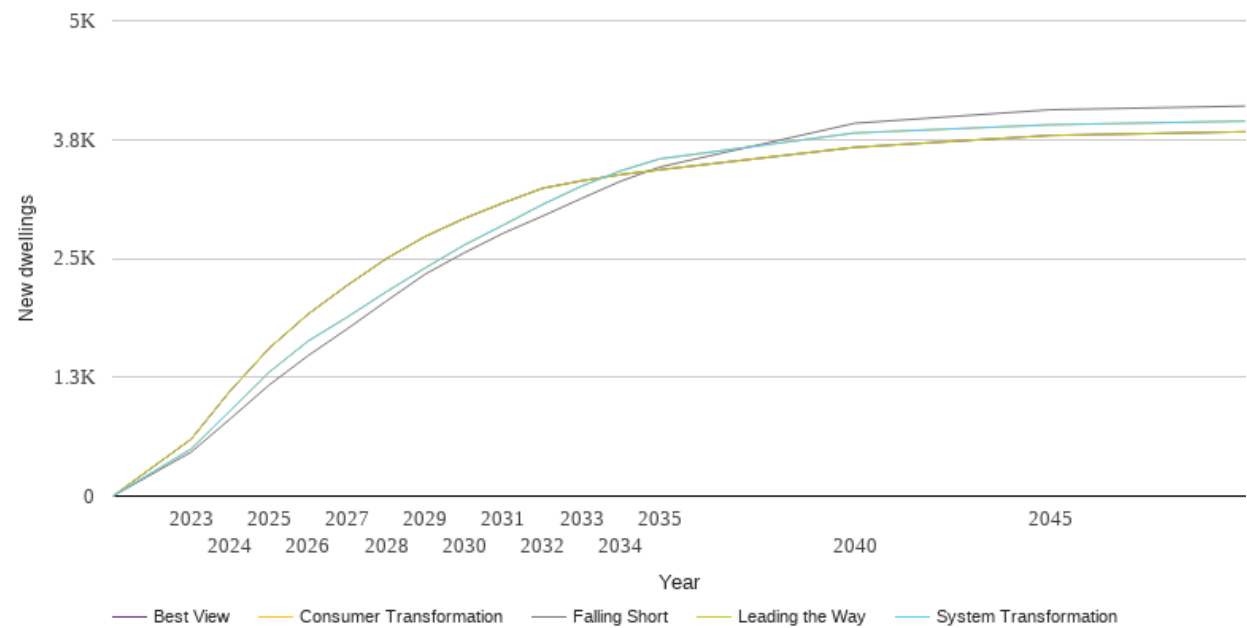
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	249	249	249	249	249
2023	287	282	282	249	249
2024	347	317	317	249	249
2025	417	357	357	249	249
2026	497	418	418	249	249
2027	589	487	487	249	249
2028	692	565	565	249	249
2029	813	653	653	249	249
2030	949	751	751	249	249
2031	1153	863	863	249	249
2032	1387	987	987	249	249
2033	1656	1126	1126	249	249
2034	1964	1284	1284	249	249
2035	2316	1460	1460	249	249
2040	7800	3103	3103	249	249
2045	19047	9056	9056	249	249
2050	41177	19670	19670	249	249



Technology Summary: Domestic

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

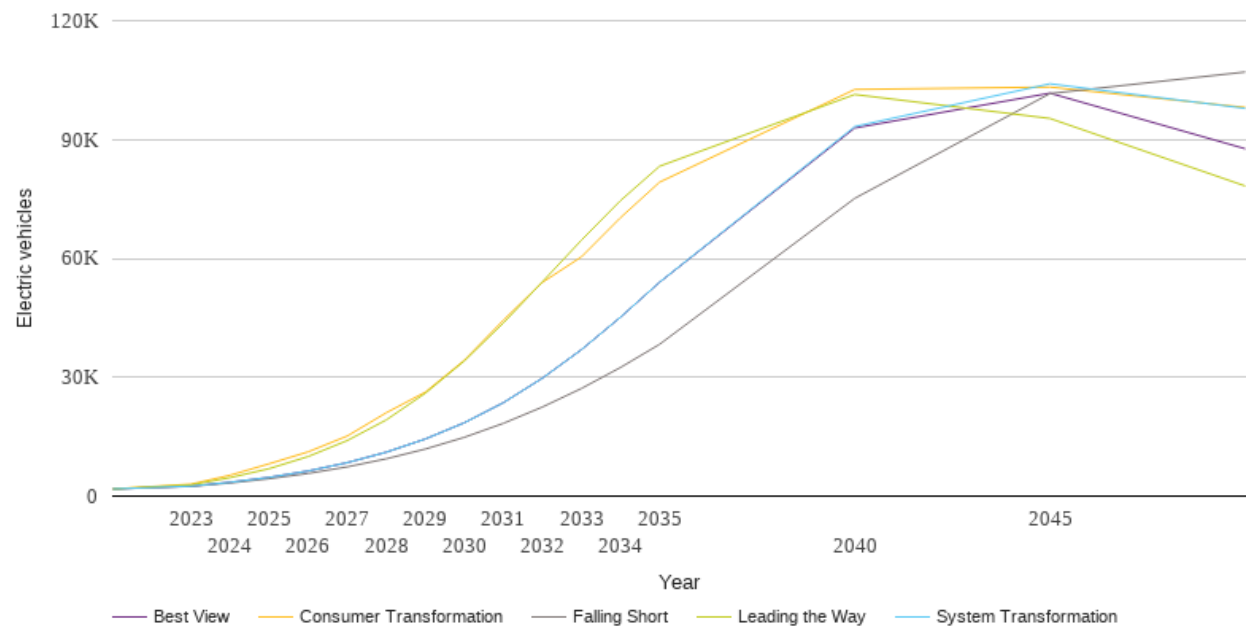
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	462	495	495	598	598
2024	811	897	897	1105	1105
2025	1168	1303	1303	1554	1554
2026	1477	1630	1630	1914	1914
2027	1758	1882	1882	2216	2216
2028	2050	2148	2148	2497	2497
2029	2335	2400	2400	2731	2731
2030	2559	2641	2641	2920	2920
2031	2765	2851	2851	3084	3084
2032	2944	3066	3066	3237	3237
2033	3130	3260	3260	3316	3316
2034	3311	3420	3420	3381	3381
2035	3460	3546	3546	3432	3432
2040	3921	3819	3819	3668	3668
2045	4063	3905	3905	3793	3793
2050	4102	3944	3944	3832	3832



Technology Summary: Electric vehicles

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

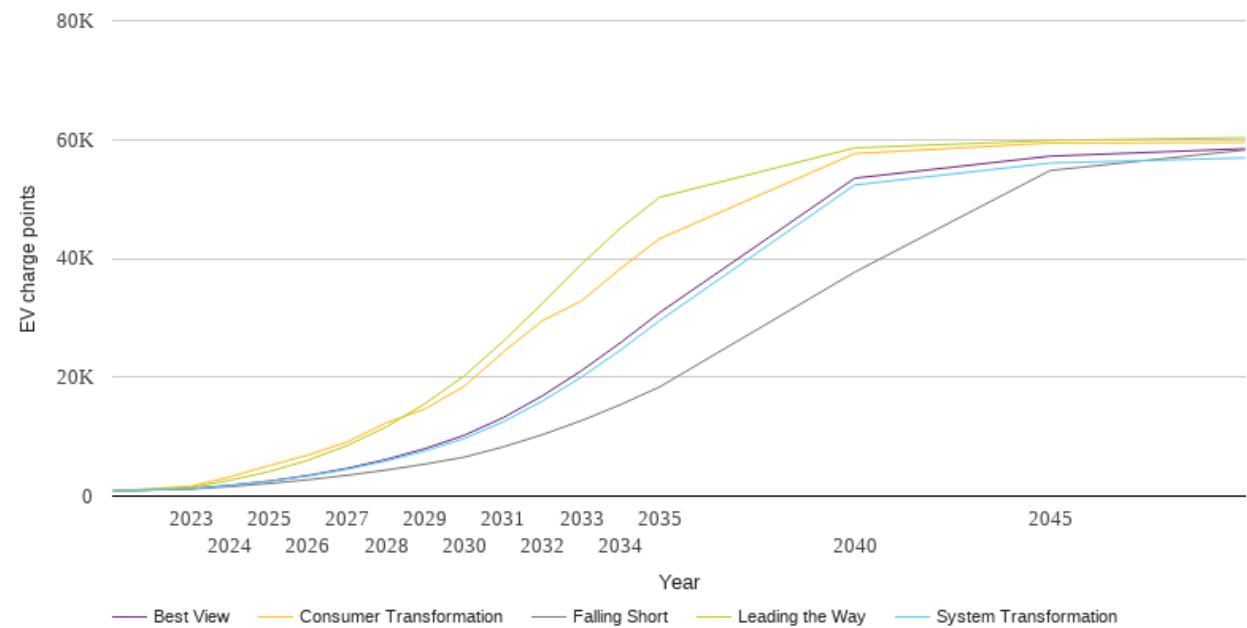
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1805	1805	1805	1805	1805
2023	2461	2514	3011	2833	2514
2024	3310	3476	5265	4655	3476
2025	4380	4714	8156	6917	4714
2026	5714	6336	11169	9986	6339
2027	7380	8434	15163	14012	8437
2028	9409	11080	21030	19221	11083
2029	11875	14406	26243	25957	14412
2030	14832	18503	34280	34118	18513
2031	18367	23569	44421	43686	23584
2032	22482	29763	53944	54082	29772
2033	27167	36968	60388	64610	36971
2034	32459	45162	70279	74592	45149
2035	38305	53994	79234	83254	53964
2040	75152	93279	102638	101372	92911
2045	101612	104076	103247	95320	101704
2050	107044	97860	98109	78277	87677



Technology Summary: EV Charge Point

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

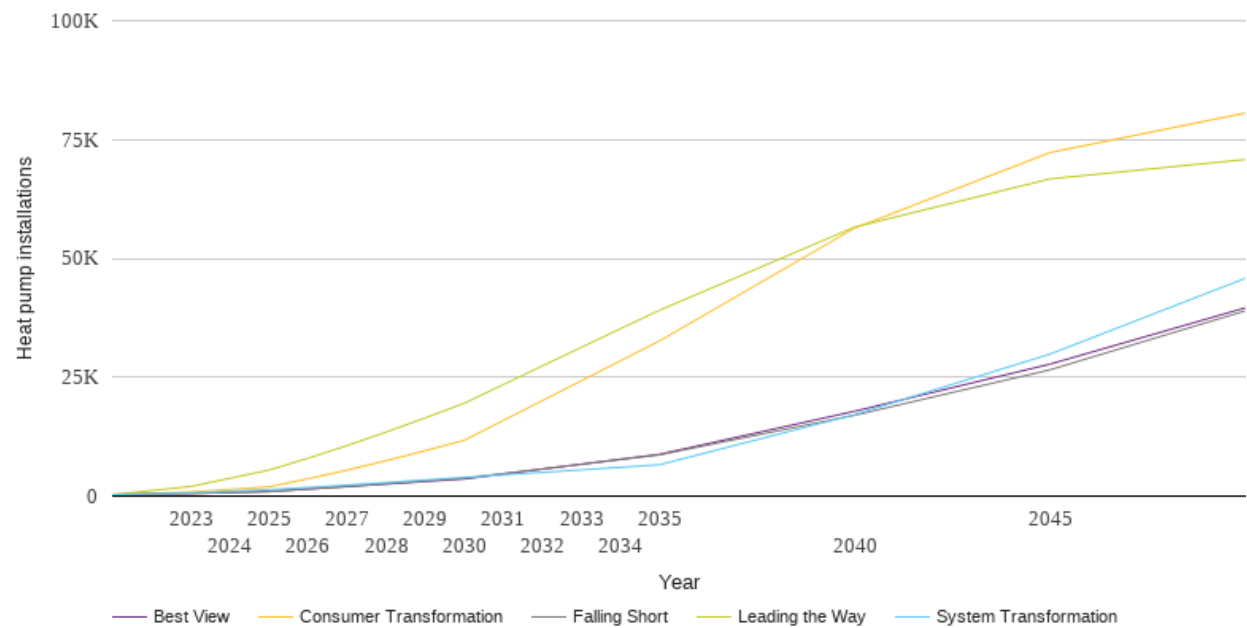
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	859	859	859	859	859
2023	1182	1249	1672	1470	1256
2024	1599	1790	3233	2662	1811
2025	2121	2484	5131	4114	2532
2026	2750	3381	6886	6041	3475
2027	3502	4512	9112	8514	4670
2028	4378	5911	12324	11638	6160
2029	5391	7625	14698	15595	7998
2030	6557	9699	18501	20227	10232
2031	8290	12510	24238	26057	13211
2032	10336	15991	29527	32432	16877
2033	12698	20021	32818	39025	21102
2034	15386	24569	38291	45099	25811
2035	18363	29510	43311	50271	30855
2040	37692	52362	57642	58593	53493
2045	54782	56044	59407	59841	57203
2050	58238	56909	59518	60325	58454



Technology Summary: Heat pumps

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

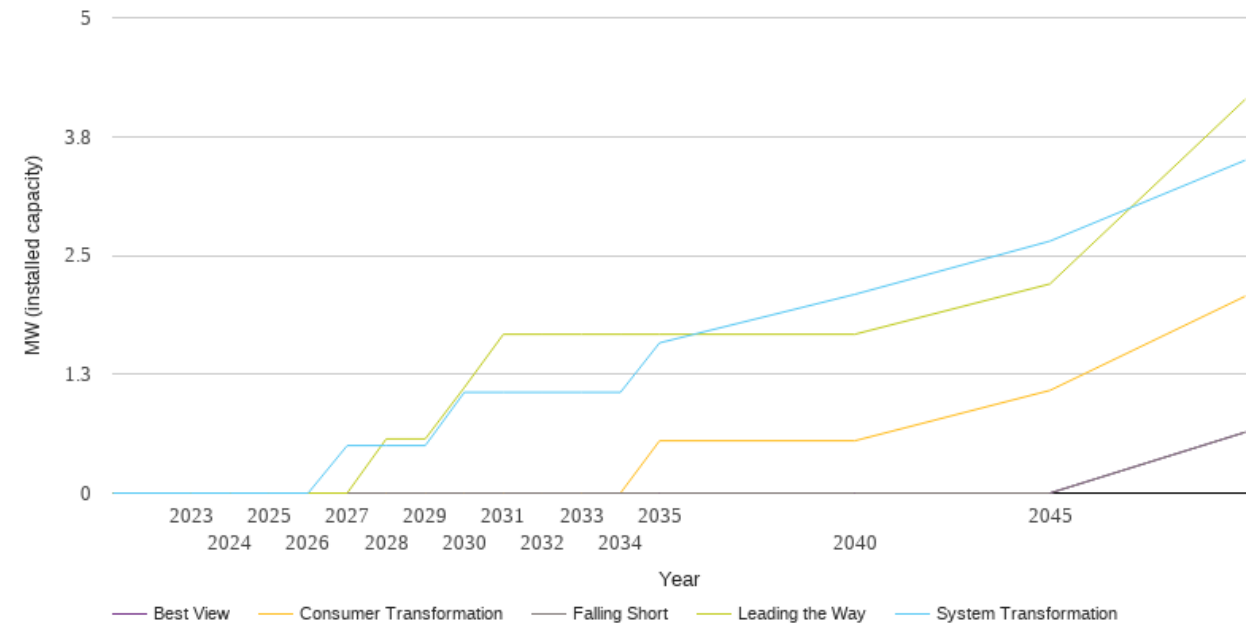
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	329	329	329	329	329
2023	542	671	867	2035	542
2024	760	1019	1404	3751	760
2025	966	1364	1959	5478	966
2026	1502	1824	3651	7978	1478
2027	2048	2323	5474	10637	2000
2028	2607	2853	7461	13484	2537
2029	3171	3403	9554	16461	3077
2030	3727	3948	11736	19535	3608
2031	4721	4472	15921	23463	4649
2032	5710	4993	20098	27385	5684
2033	6694	5523	24271	31289	6719
2034	7682	6053	28457	35202	7751
2035	8670	6590	32626	39090	8787
2040	17018	17158	56395	56599	17856
2045	26553	29856	72259	66721	27755
2050	38948	45802	80564	70795	39587



Technology Summary: Hydrogen electrolysis

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

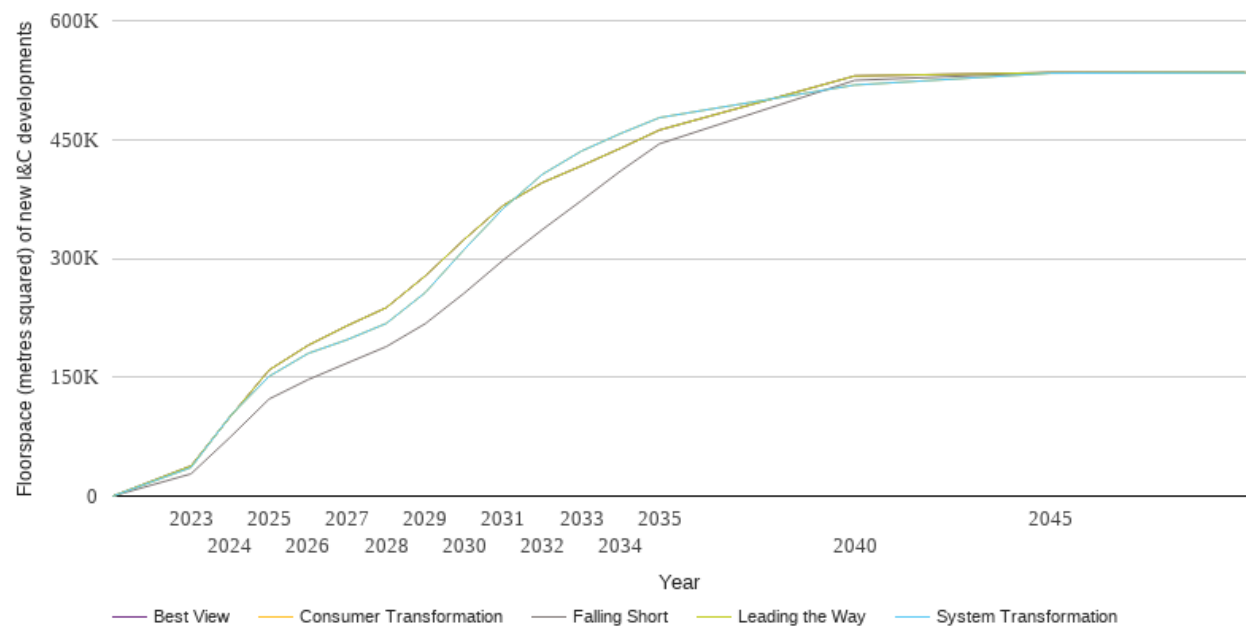
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	0.5	0.0	0.0	0.0
2028	0.0	0.5	0.0	0.6	0.0
2029	0.0	0.5	0.0	0.6	0.0
2030	0.0	1.1	0.0	1.1	0.0
2031	0.0	1.1	0.0	1.7	0.0
2032	0.0	1.1	0.0	1.7	0.0
2033	0.0	1.1	0.0	1.7	0.0
2034	0.0	1.1	0.0	1.7	0.0
2035	0.0	1.6	0.6	1.7	0.0
2040	0.0	2.1	0.6	1.7	0.0
2045	0.0	2.6	1.1	2.2	0.0
2050	0.6	3.5	2.1	4.1	0.6



Technology Summary: Non domestic

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

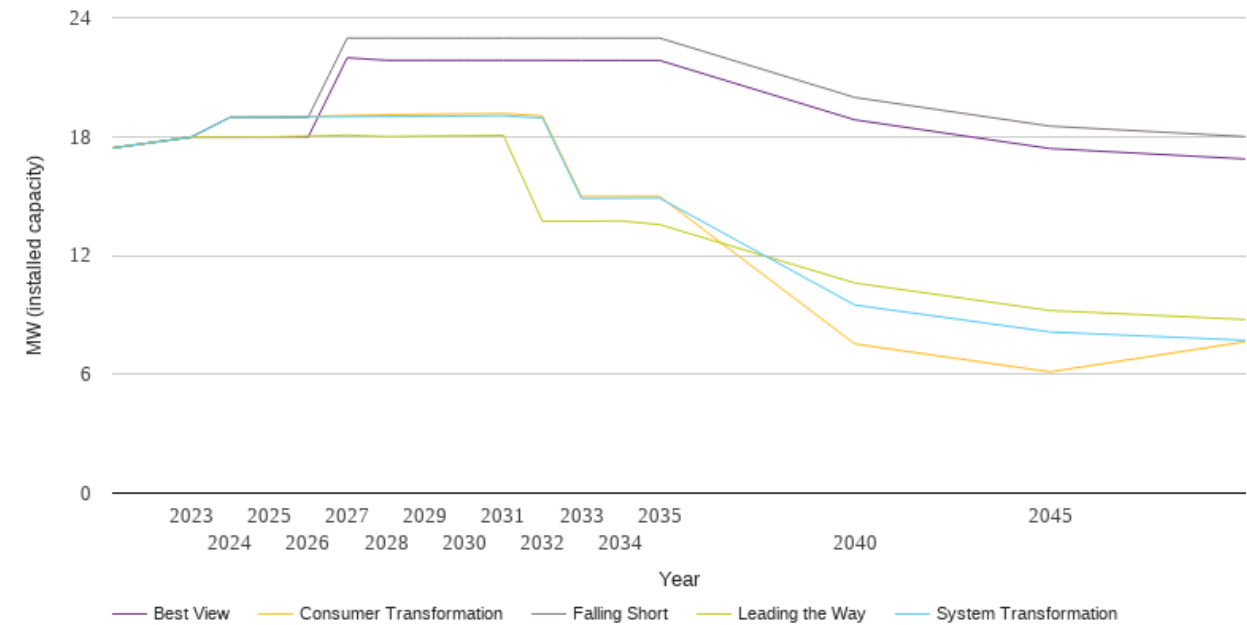
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	28068	36020	36020	38074	38074
2024	74173	100892	100892	99996	99996
2025	122503	151138	151138	159107	159107
2026	146963	180090	180090	190273	190273
2027	167873	197393	197393	215091	215091
2028	188584	217893	217893	237778	237778
2029	217632	256825	256825	277886	277886
2030	256226	311410	311410	324041	324041
2031	297979	363202	363202	366918	366918
2032	336395	406076	406076	395629	395629
2033	372952	435407	435407	416807	416807
2034	410225	457555	457555	438942	438942
2035	444665	477623	477623	462036	462036
2040	524692	518839	518839	530265	530265
2045	534440	533667	533667	534440	534440
2050	534440	534334	534334	534440	534440



Technology Summary: Other Distributed Generation

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

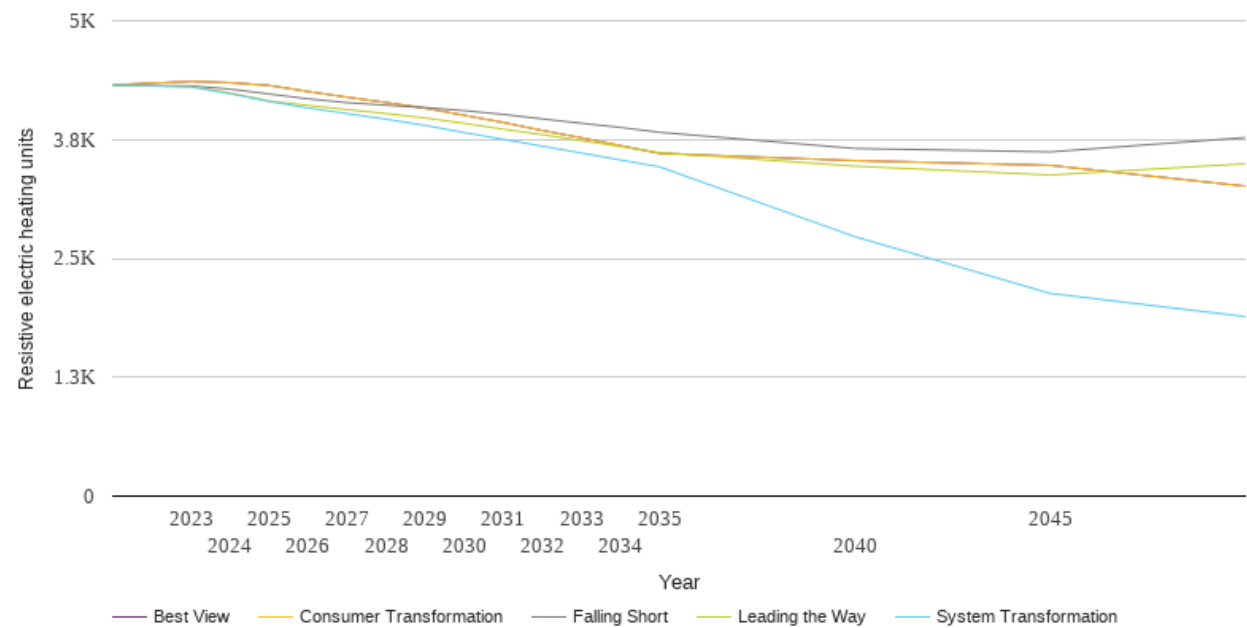
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	17.4	17.4	17.4	17.4	17.4
2023	18.0	18.0	18.0	18.0	18.0
2024	19.0	19.0	19.0	18.0	18.0
2025	19.0	19.0	19.0	18.0	18.0
2026	19.0	19.0	19.0	18.0	18.0
2027	23.0	19.0	19.1	18.1	22.0
2028	23.0	19.0	19.1	18.0	21.9
2029	23.0	19.0	19.1	18.0	21.9
2030	23.0	19.0	19.1	18.0	21.9
2031	23.0	19.0	19.2	18.1	21.9
2032	23.0	18.9	19.0	13.7	21.9
2033	23.0	14.9	15.0	13.7	21.8
2034	23.0	14.9	15.0	13.7	21.8
2035	23.0	14.9	15.0	13.6	21.8
2040	20.0	9.5	7.5	10.6	18.8
2045	18.5	8.1	6.1	9.2	17.4
2050	18.0	7.7	7.6	8.8	16.9



Technology Summary: Resistive electric heating

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

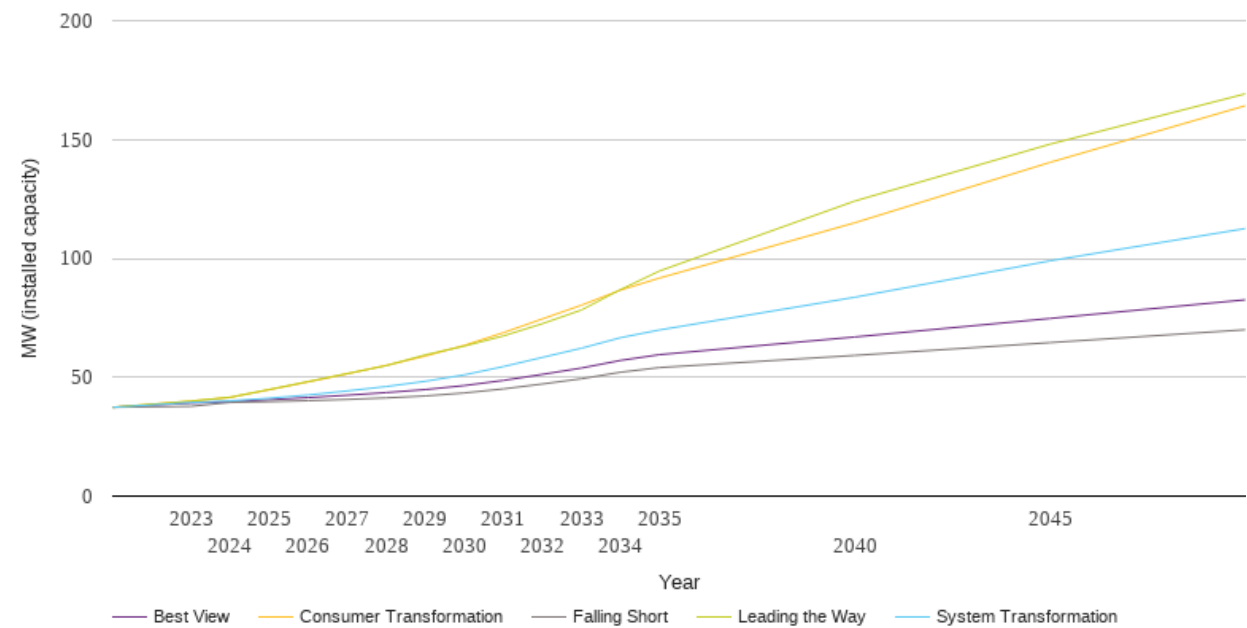
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	4325	4325	4325	4325	4325
2023	4315	4302	4361	4307	4361
2024	4280	4232	4348	4239	4348
2025	4229	4151	4319	4156	4319
2026	4178	4081	4255	4108	4255
2027	4138	4023	4195	4065	4195
2028	4111	3963	4140	4023	4140
2029	4086	3898	4079	3977	4079
2030	4054	3823	4005	3920	4005
2031	4014	3752	3929	3858	3929
2032	3967	3680	3845	3801	3845
2033	3921	3608	3768	3738	3768
2034	3877	3535	3686	3677	3686
2035	3826	3463	3604	3613	3604
2040	3656	2729	3528	3470	3528
2045	3620	2132	3479	3377	3479
2050	3770	1888	3260	3495	3260



Technology Summary: Solar Generation

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

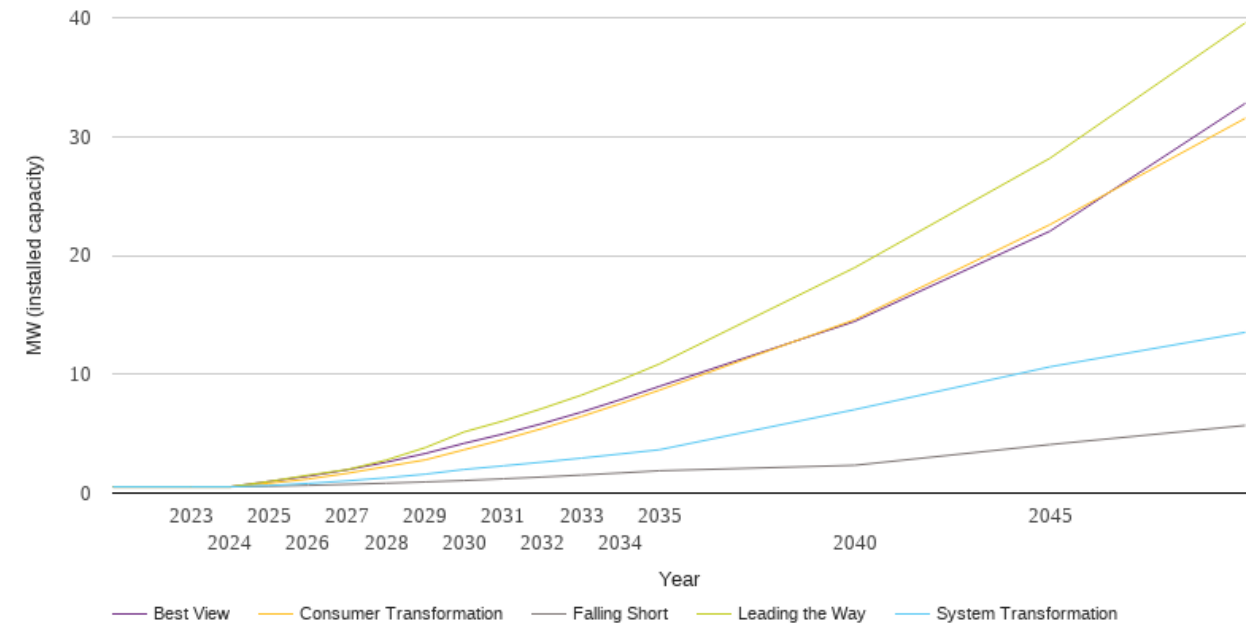
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	37.4	37.4	37.4	37.4	37.4
2023	37.8	39.4	39.9	40.0	39.2
2024	39.4	40.1	41.5	41.6	39.7
2025	39.7	41.2	44.7	44.8	40.5
2026	40.1	42.5	48.0	48.2	41.4
2027	40.7	44.2	51.4	51.5	42.4
2028	41.3	46.1	55.0	54.9	43.5
2029	42.1	48.3	58.9	59.4	44.8
2030	43.4	51.0	63.4	63.1	46.5
2031	45.1	54.5	68.8	67.4	48.7
2032	47.2	58.3	74.5	72.5	51.2
2033	49.4	62.2	80.3	78.3	53.9
2034	52.1	66.6	86.7	86.9	57.1
2035	54.1	69.9	91.7	94.7	59.5
2040	59.2	83.6	115.0	124.1	66.9
2045	64.6	99.0	140.4	148.0	74.7
2050	70.0	112.5	164.2	169.2	82.6



Technology Summary: Storage

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

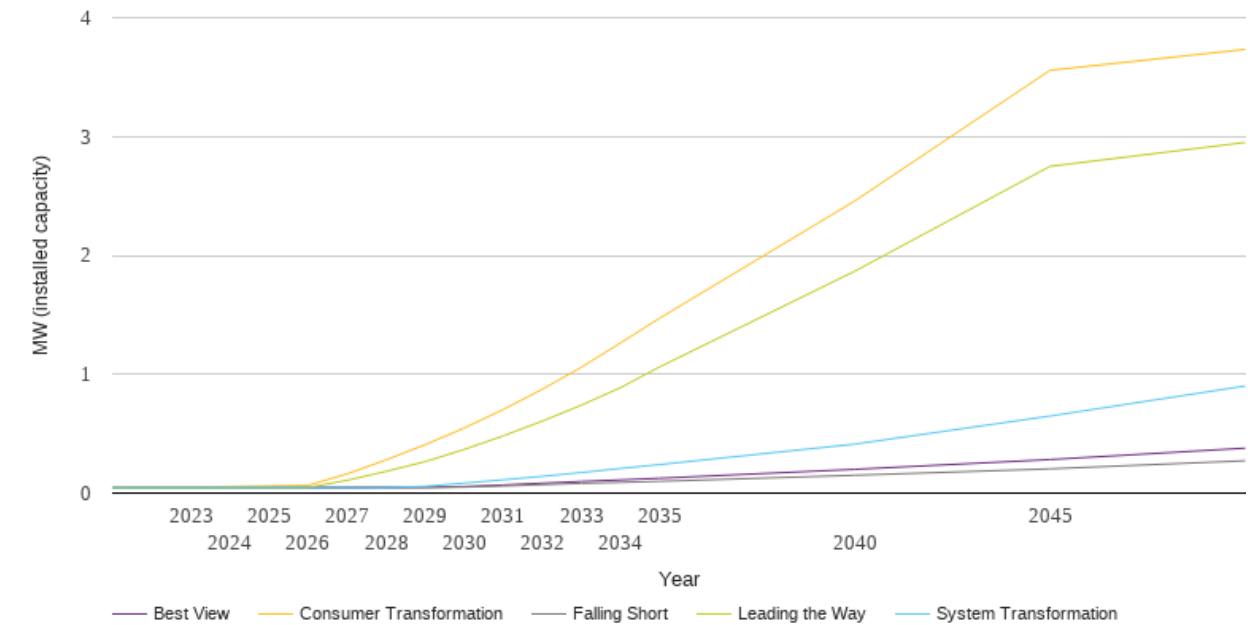
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.5	0.5	0.5	0.5	0.5
2023	0.5	0.5	0.5	0.5	0.5
2024	0.5	0.5	0.5	0.5	0.5
2025	0.6	0.6	0.8	1.0	1.0
2026	0.7	0.8	1.2	1.5	1.4
2027	0.7	1.0	1.7	2.0	2.0
2028	0.8	1.3	2.2	2.8	2.6
2029	0.9	1.6	2.8	3.8	3.3
2030	1.1	2.0	3.6	5.2	4.2
2031	1.2	2.3	4.5	6.1	5.0
2032	1.4	2.6	5.4	7.1	5.9
2033	1.5	2.9	6.4	8.2	6.8
2034	1.7	3.3	7.5	9.5	7.9
2035	1.9	3.6	8.7	10.9	9.0
2040	2.3	7.0	14.6	19.0	14.4
2045	4.1	10.6	22.6	28.2	22.0
2050	5.7	13.5	31.5	39.6	32.8



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	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.1	0.0	0.0
2024	0.0	0.0	0.1	0.0	0.0
2025	0.0	0.0	0.1	0.0	0.0
2026	0.0	0.0	0.1	0.0	0.0
2027	0.0	0.0	0.2	0.1	0.0
2028	0.0	0.0	0.3	0.2	0.0
2029	0.0	0.1	0.4	0.3	0.0
2030	0.1	0.1	0.5	0.4	0.1
2031	0.1	0.1	0.7	0.5	0.1
2032	0.1	0.1	0.9	0.6	0.1
2033	0.1	0.2	1.1	0.7	0.1
2034	0.1	0.2	1.3	0.9	0.1
2035	0.1	0.2	1.5	1.1	0.1
2040	0.1	0.4	2.5	1.9	0.2
2045	0.2	0.6	3.6	2.7	0.3
2050	0.3	0.9	3.7	3.0	0.4



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

