

Distribution Future Energy Scenarios 2022

Local Authority:
Stafford

What are Distribution Future Energy Scenarios?

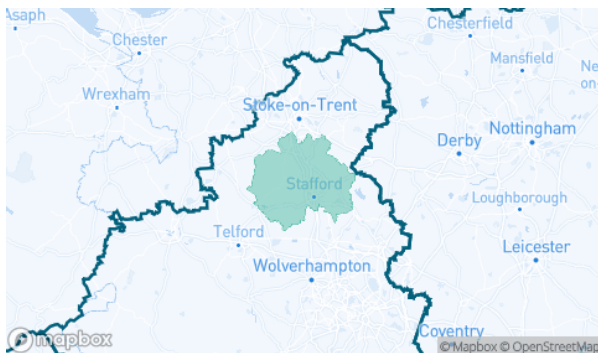
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Stafford 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 Stafford 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	428	257	257	0	28685	13448	13448	0
Domestic	New dwellings	0	3429	3764	3764	4474	4845	4777	4777	4734
Electric vehicles	Electric vehicles	1709	14183	16999	31574	31385	94413	77334	78242	66887
EV Charge Point	EV charge points	930	6674	9390	17722	19455	54565	50809	53476	54108
Heat pumps	Heat pump installations	891	4916	4797	10990	16789	31519	36140	59991	53772
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	0.9	0.0	0.0	9.4	10.3	7.0	8.0
Non domestic	Floorspace (metres squared) of new I&C developments	0	20642 3	24936 6	24936 6	26168 6	45520 3	45456 3	45456 3	45520 3
Other Distributed Generation	MW (installed capacity)	14.9	15.0	12.2	14.0	14.3	7.7	7.9	10.4	12.5
Resistive electric heating	Resistive electric heating units	9183	7530	7296	7773	7425	4927	2079	5040	5287
Solar Generation	MW (installed capacity)	13.5	19.8	29.2	41.3	37.1	62.5	128.0	176.4	163.7
Storage	MW (installed capacity)	0.0	0.5	1.6	3.2	4.8	4.9	12.4	28.7	36.7
Wind	MW (installed capacity)	2.0	2.0	2.1	3.1	2.8	3.0	6.3	15.8	13.2

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.

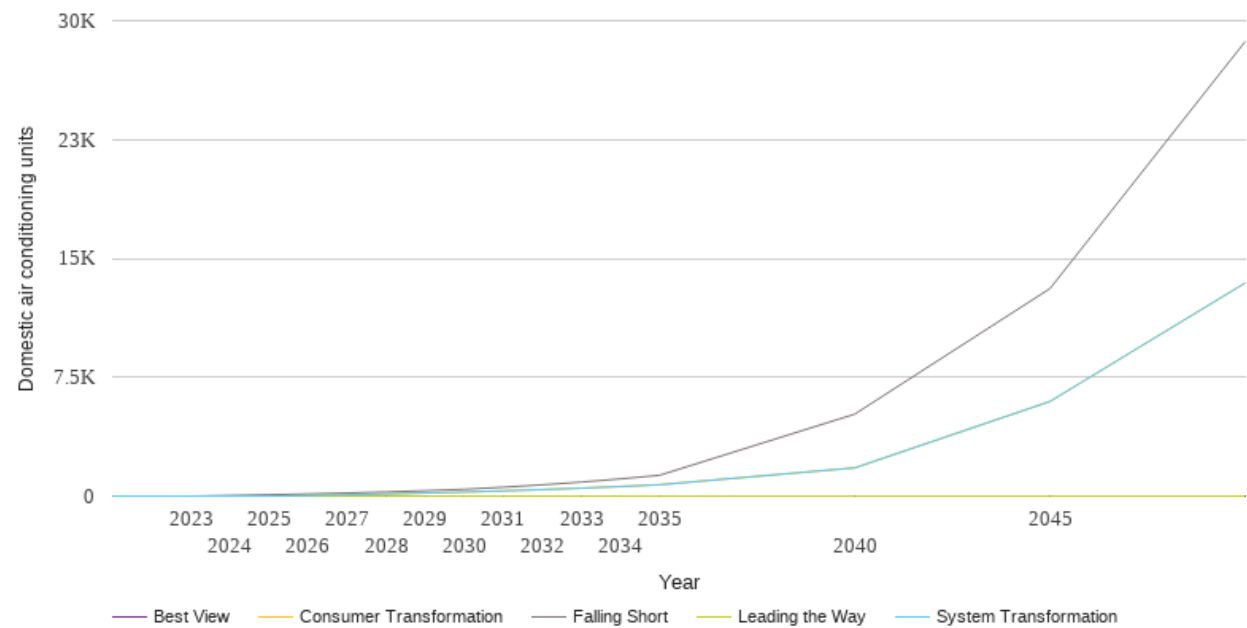
If you have any comments or queries regarding these reports, please contact

nged.energyplanning@nationalgrid.co.uk.

Technology Summary: Air conditioning

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

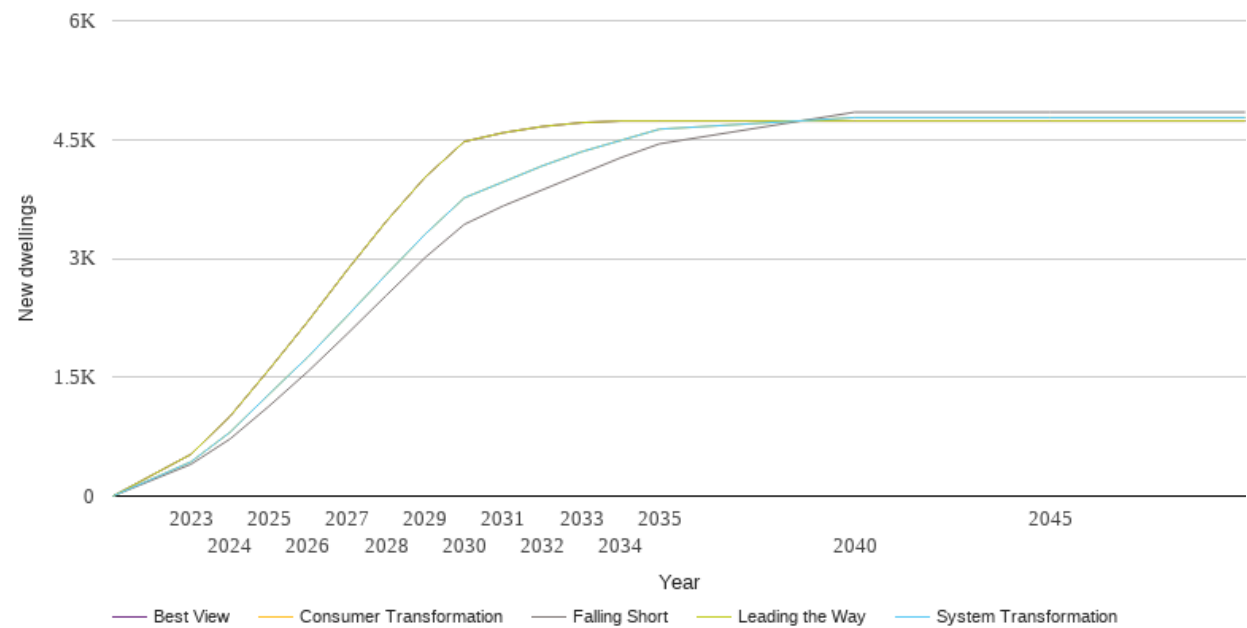
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	39	0	0	0	0
2025	84	0	0	0	0
2026	136	40	40	0	0
2027	195	85	85	0	0
2028	262	136	136	0	0
2029	340	193	193	0	0
2030	428	257	257	0	0
2031	560	329	329	0	0
2032	711	410	410	0	0
2033	885	501	501	0	0
2034	1085	604	604	0	0
2035	1313	718	718	0	0
2040	5173	1781	1781	0	0
2045	13094	5972	5972	0	0
2050	28685	13448	13448	0	0



Technology Summary: Domestic

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

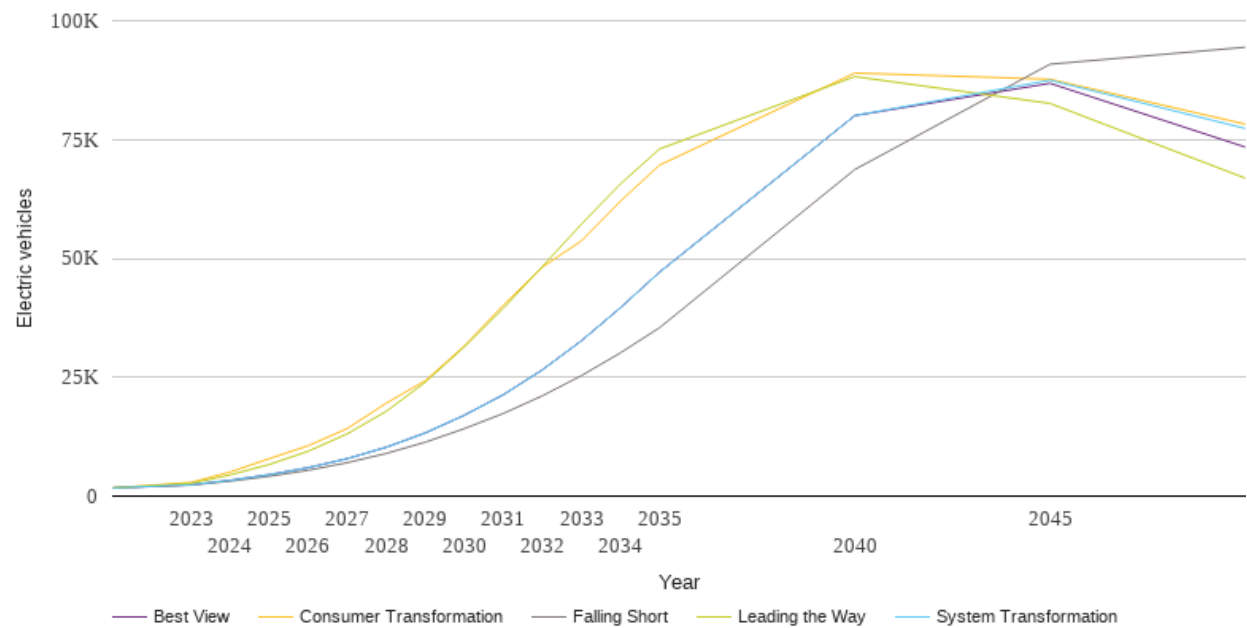
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	402	433	433	528	528
2024	721	806	806	1007	1007
2025	1136	1287	1287	1598	1598
2026	1575	1759	1759	2209	2209
2027	2047	2273	2273	2853	2853
2028	2532	2796	2796	3467	3467
2029	3012	3307	3307	4027	4027
2030	3429	3764	3764	4474	4474
2031	3663	3966	3966	4586	4586
2032	3865	4168	4168	4664	4664
2033	4067	4345	4345	4713	4713
2034	4269	4488	4488	4734	4734
2035	4446	4631	4631	4734	4734
2040	4845	4777	4777	4734	4734
2045	4845	4777	4777	4734	4734
2050	4845	4777	4777	4734	4734



Technology Summary: Electric vehicles

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

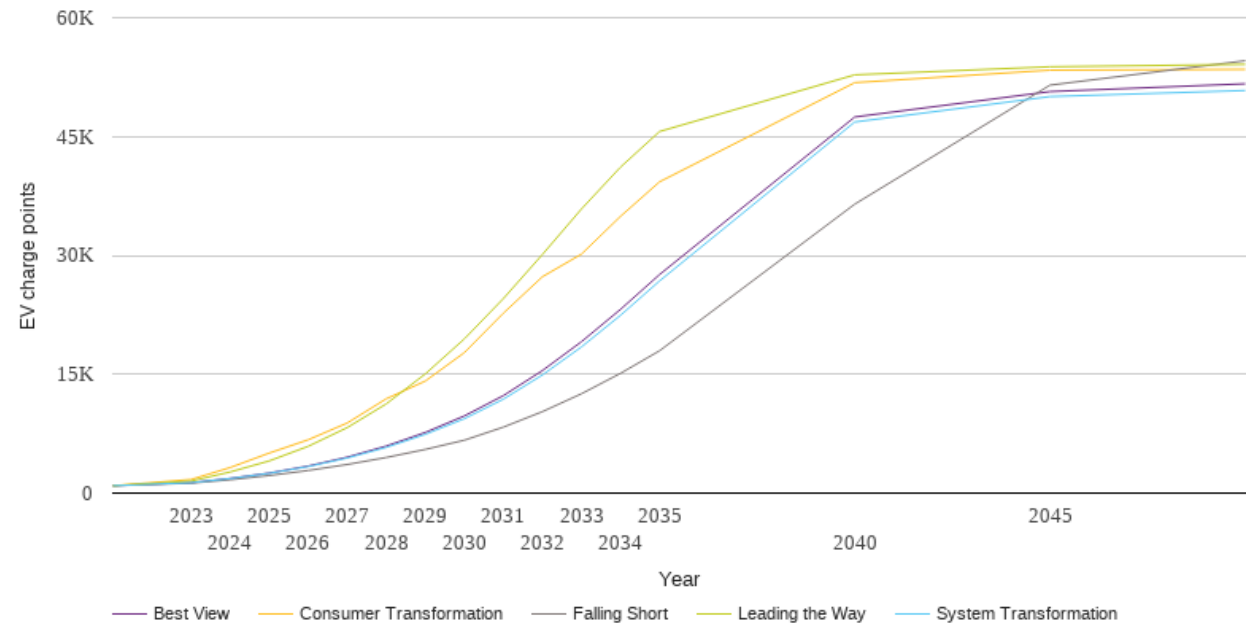
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1709	1709	1709	1709	1709
2023	2329	2385	2873	2693	2386
2024	3136	3306	5058	4453	3307
2025	4156	4495	7864	6645	4496
2026	5427	5967	10594	9432	5971
2027	7027	7869	14214	13093	7874
2028	8971	10269	19540	17826	10275
2029	11342	13285	24275	23954	13294
2030	14183	16999	31574	31385	17014
2031	17385	21311	40173	39508	21331
2032	21100	26548	48171	48312	26566
2033	25343	32661	53684	57216	32686
2034	30129	39605	62052	65675	39631
2035	35416	47083	69619	73018	47111
2040	68692	80032	88986	88242	80023
2045	90843	87476	87687	82598	86827
2050	94413	77334	78242	66887	73414



Technology Summary: EV Charge Point

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

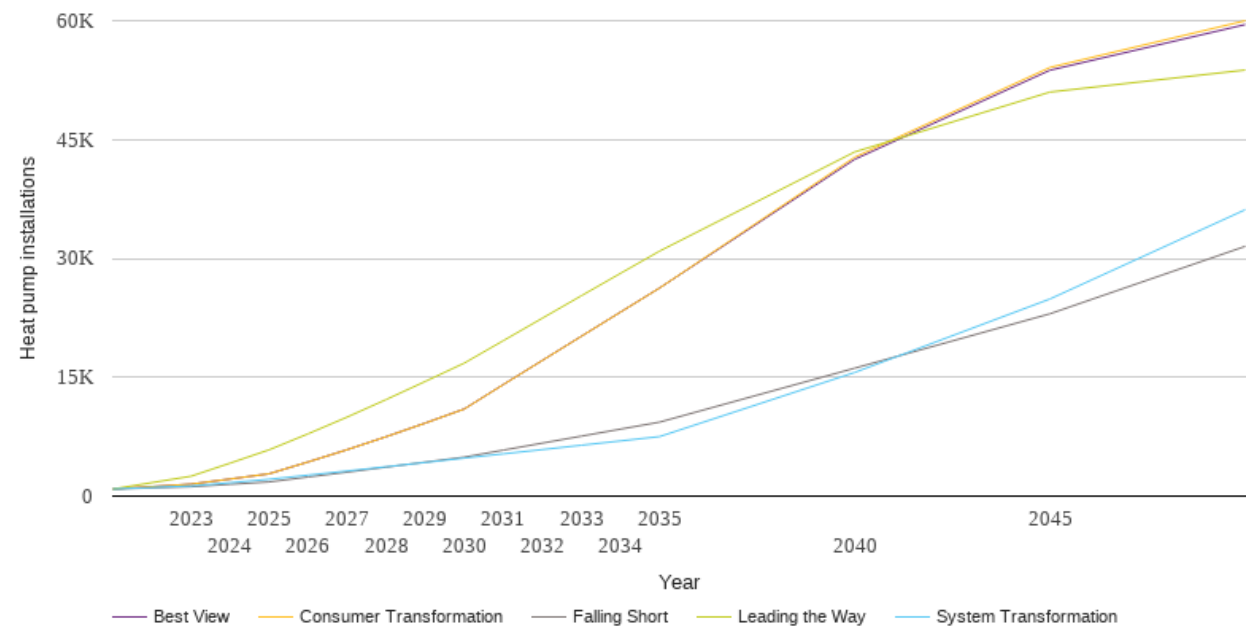
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	930	930	930	930	930
2023	1258	1312	1714	1518	1315
2024	1682	1829	3219	2663	1841
2025	2213	2493	5046	4057	2526
2026	2851	3348	6726	5899	3410
2027	3610	4429	8844	8265	4533
2028	4491	5771	11900	11256	5934
2029	5509	7417	14138	15039	7653
2030	6674	9390	17722	19455	9737
2031	8326	11855	22710	24548	12303
2032	10279	14908	27306	30112	15464
2033	12538	18447	30161	35856	19106
2034	15111	22436	34923	41139	23185
2035	17961	26775	39287	45632	27580
2040	36468	46833	51803	52787	47467
2045	51486	50041	53375	53807	50675
2050	54565	50809	53476	54108	51659



Technology Summary: Heat pumps

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

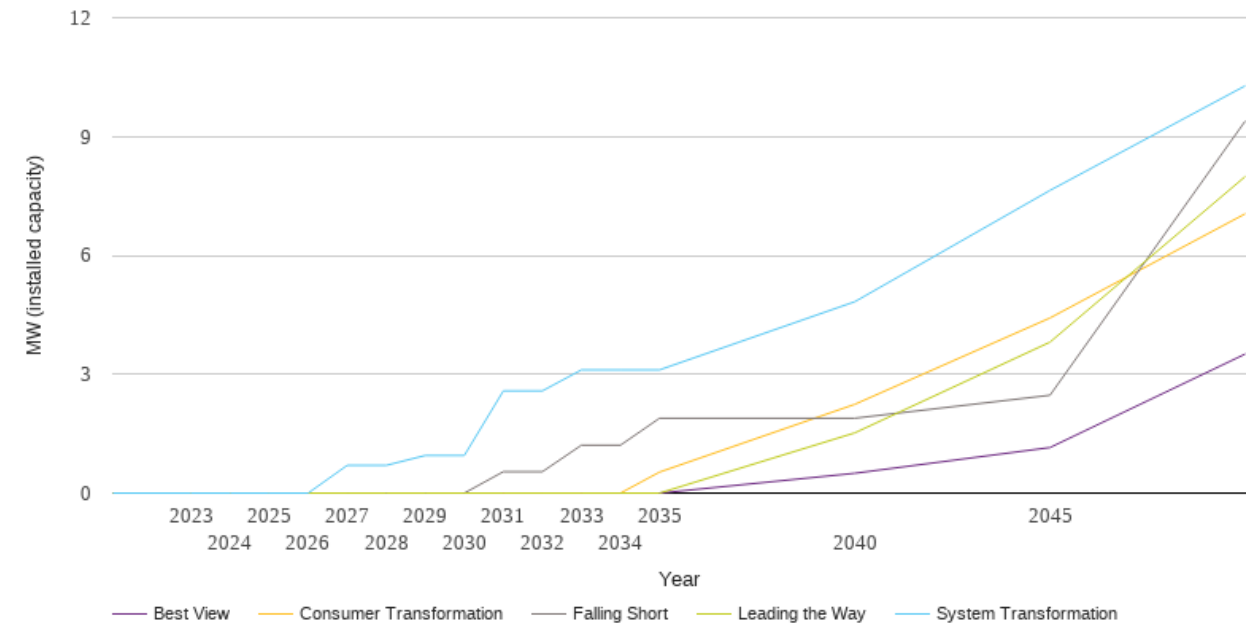
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	891	891	891	891	891
2023	1182	1276	1502	2506	1502
2024	1487	1689	2154	4157	2154
2025	1788	2119	2818	5840	2818
2026	2409	2645	4311	7861	4314
2027	3025	3166	5857	9977	5862
2028	3654	3701	7495	12190	7503
2029	4285	4244	9211	14471	9221
2030	4916	4797	10990	16789	11002
2031	5802	5332	14069	19620	14082
2032	6686	5869	17120	22459	17129
2033	7566	6420	20172	25293	20182
2034	8452	6963	23217	28110	23224
2035	9332	7507	26258	30916	26263
2040	16147	15608	42779	43438	42505
2045	23010	24878	54100	50990	53748
2050	31519	36140	59991	53772	59510



Technology Summary: Hydrogen electrolysis

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

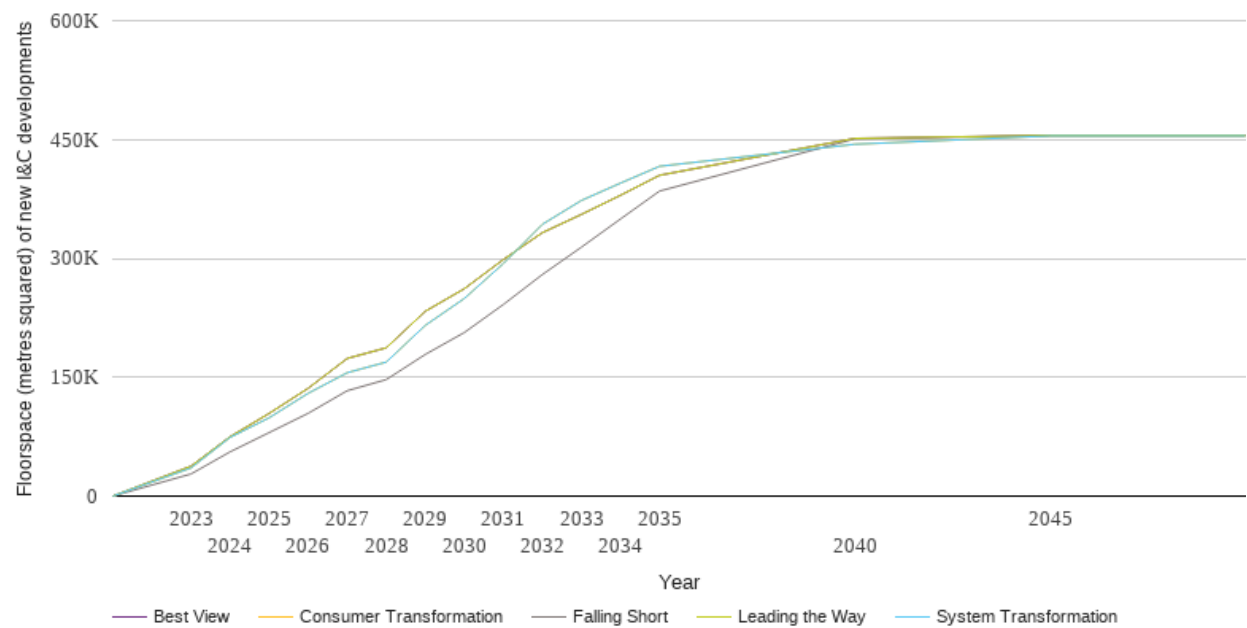
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	0.7	0.0	0.0	0.0
2028	0.0	0.7	0.0	0.0	0.0
2029	0.0	0.9	0.0	0.0	0.0
2030	0.0	0.9	0.0	0.0	0.0
2031	0.5	2.6	0.0	0.0	0.0
2032	0.5	2.6	0.0	0.0	0.0
2033	1.2	3.1	0.0	0.0	0.0
2034	1.2	3.1	0.0	0.0	0.0
2035	1.9	3.1	0.5	0.0	0.0
2040	1.9	4.8	2.2	1.5	0.5
2045	2.5	7.6	4.4	3.8	1.1
2050	9.4	10.3	7.0	8.0	3.5



Technology Summary: Non domestic

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

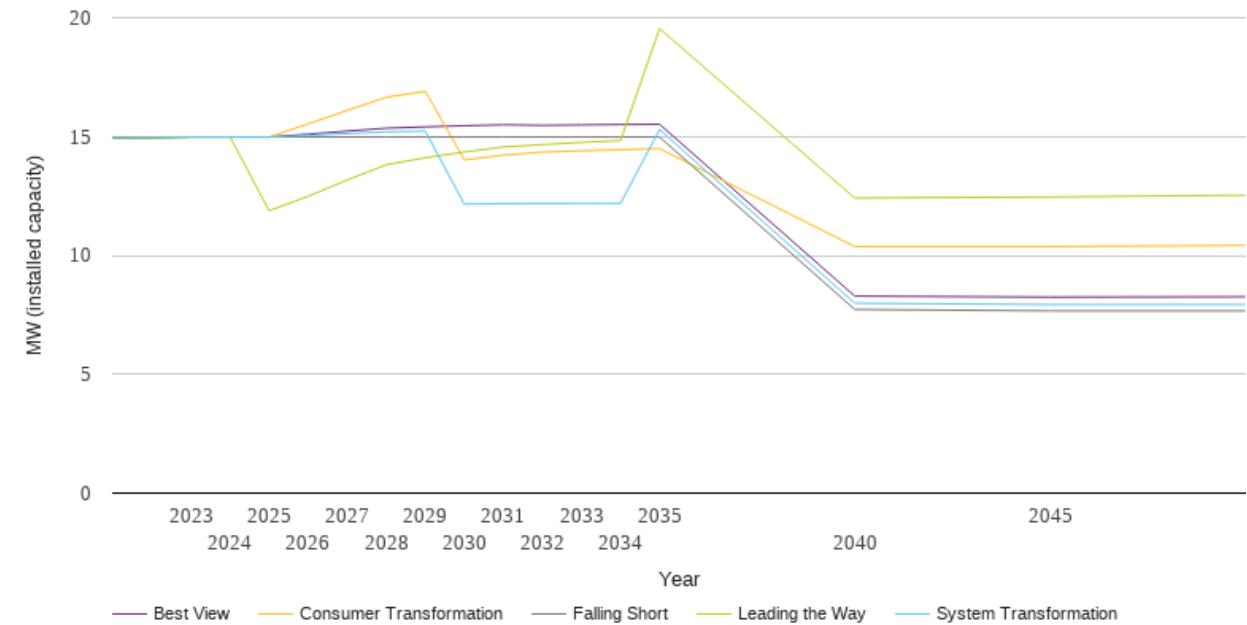
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	27947	35520	35520	37813	37813
2024	55820	73979	73979	74907	74907
2025	80120	98815	98815	104317	104317
2026	104471	129692	129692	136034	136034
2027	132972	155680	155680	173680	173680
2028	146993	169118	169118	187127	187127
2029	178760	215462	215462	233240	233240
2030	206423	249366	249366	261686	261686
2031	241821	293476	293476	298581	298581
2032	279651	343020	343020	332466	332466
2033	314179	373132	373132	355498	355498
2034	349721	395000	395000	379629	379629
2035	384957	416213	416213	404860	404860
2040	450755	444056	444056	451415	451415
2045	455203	454563	454563	455203	455203
2050	455203	454563	454563	455203	455203



Technology Summary: Other Distributed Generation

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

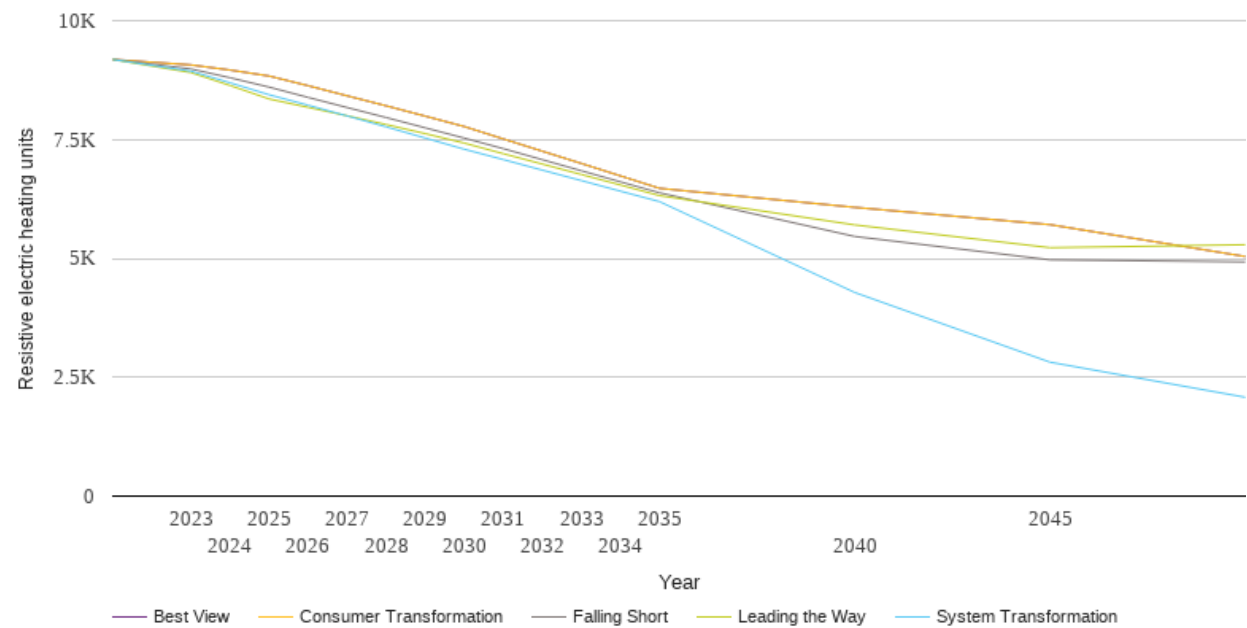
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	14.9	14.9	14.9	14.9	14.9
2023	15.0	15.0	15.0	15.0	15.0
2024	15.0	15.0	15.0	15.0	15.0
2025	15.0	15.0	15.0	11.9	15.0
2026	15.0	15.0	15.5	12.5	15.1
2027	15.0	15.1	16.1	13.2	15.2
2028	15.0	15.2	16.7	13.8	15.4
2029	15.0	15.2	16.9	14.1	15.4
2030	15.0	12.2	14.0	14.3	15.5
2031	15.0	12.2	14.2	14.6	15.5
2032	15.0	12.2	14.3	14.7	15.5
2033	15.0	12.2	14.4	14.8	15.5
2034	15.0	12.2	14.4	14.8	15.5
2035	15.0	15.3	14.5	19.5	15.5
2040	7.7	8.0	10.4	12.4	8.3
2045	7.7	7.9	10.4	12.5	8.2
2050	7.7	7.9	10.4	12.5	8.3



Technology Summary: Resistive electric heating

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

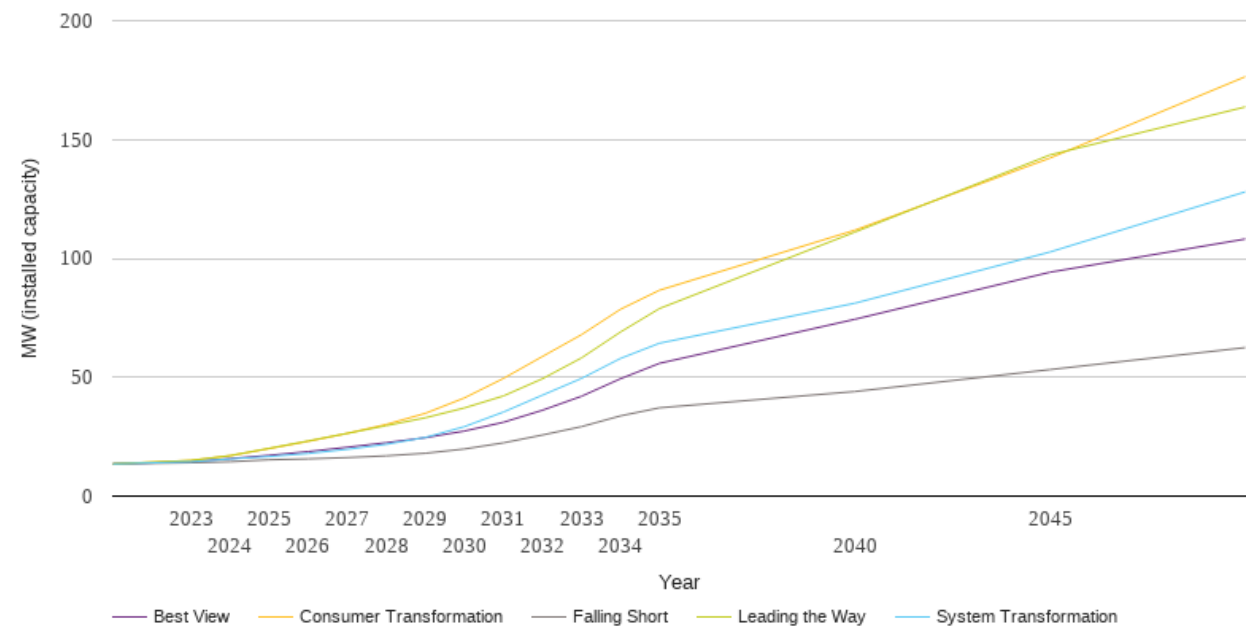
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	9183	9183	9183	9183	9183
2023	8985	8938	9069	8908	9069
2024	8800	8694	8962	8637	8962
2025	8603	8442	8836	8353	8836
2026	8386	8222	8632	8177	8632
2027	8173	7996	8419	8000	8419
2028	7962	7766	8209	7815	8209
2029	7746	7531	7992	7624	7992
2030	7530	7296	7773	7425	7773
2031	7308	7078	7513	7202	7513
2032	7076	6856	7254	6984	7254
2033	6843	6636	6996	6764	6996
2034	6610	6414	6735	6544	6735
2035	6380	6194	6474	6320	6474
2040	5461	4283	6073	5704	6073
2045	4970	2817	5710	5225	5710
2050	4927	2079	5040	5287	5040



Technology Summary: Solar Generation

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

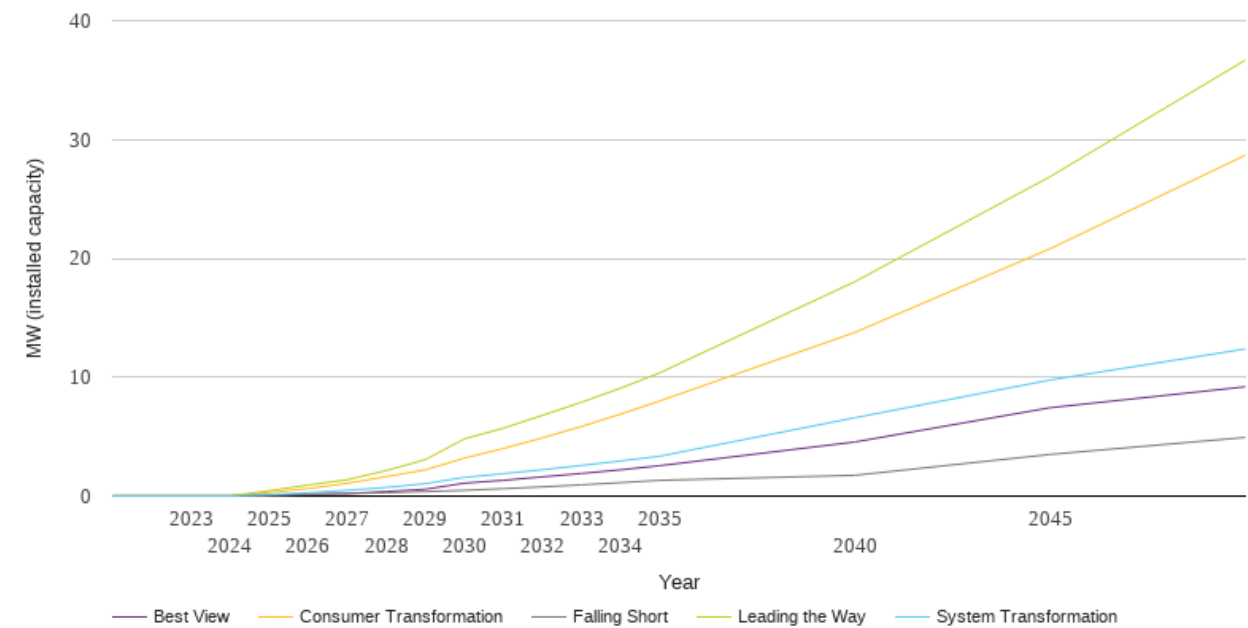
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	13.5	13.5	13.5	13.5	13.5
2023	14.0	14.5	15.0	15.0	14.5
2024	14.5	15.6	17.0	17.0	15.8
2025	15.3	16.7	20.0	20.1	17.1
2026	15.7	17.9	23.0	23.2	18.7
2027	16.2	19.7	26.4	26.4	20.5
2028	16.9	21.8	30.1	29.6	22.5
2029	18.0	24.7	34.8	32.9	24.6
2030	19.8	29.2	41.3	37.1	27.4
2031	22.4	35.3	49.5	42.1	31.0
2032	25.7	42.5	58.7	49.4	36.1
2033	29.2	49.5	67.9	58.1	42.0
2034	33.7	57.9	78.6	69.0	49.4
2035	37.1	64.3	86.6	78.9	55.9
2040	44.0	81.1	111.8	111.0	74.4
2045	53.2	102.7	142.2	143.5	94.2
2050	62.5	128.0	176.4	163.7	108.1



Technology Summary: Storage

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

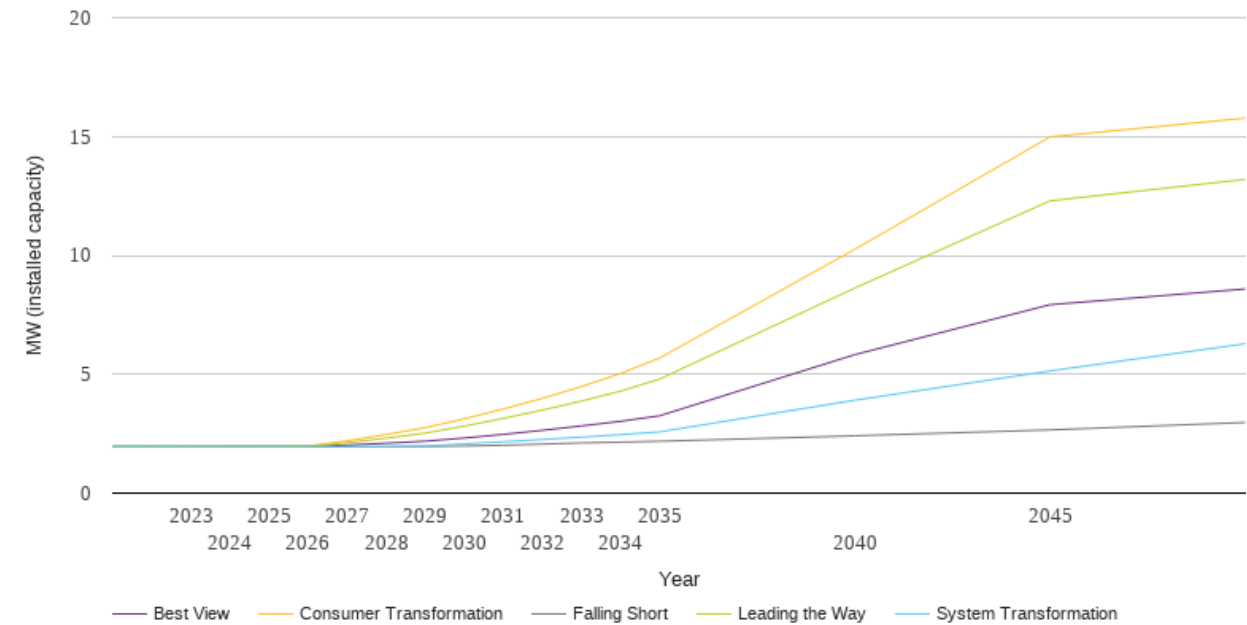
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.1	0.1	0.3	0.4	0.1
2026	0.1	0.3	0.6	0.9	0.2
2027	0.2	0.5	1.1	1.4	0.2
2028	0.3	0.7	1.6	2.1	0.4
2029	0.4	1.0	2.2	3.1	0.6
2030	0.5	1.6	3.2	4.8	1.1
2031	0.6	1.9	4.0	5.7	1.3
2032	0.8	2.2	4.9	6.8	1.6
2033	0.9	2.6	5.9	7.9	1.9
2034	1.1	3.0	6.9	9.1	2.2
2035	1.3	3.4	8.0	10.4	2.6
2040	1.7	6.6	13.8	18.0	4.6
2045	3.5	9.8	20.8	26.9	7.4
2050	4.9	12.4	28.7	36.7	9.2



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	2.0	2.0	2.0	2.0	2.0
2023	2.0	2.0	2.0	2.0	2.0
2024	2.0	2.0	2.0	2.0	2.0
2025	2.0	2.0	2.0	2.0	2.0
2026	2.0	2.0	2.0	2.0	2.0
2027	2.0	2.0	2.2	2.1	2.0
2028	2.0	2.0	2.5	2.3	2.1
2029	2.0	2.0	2.8	2.5	2.2
2030	2.0	2.1	3.1	2.8	2.3
2031	2.0	2.2	3.5	3.1	2.5
2032	2.1	2.3	4.0	3.5	2.6
2033	2.1	2.4	4.5	3.9	2.8
2034	2.1	2.5	5.0	4.3	3.0
2035	2.2	2.6	5.7	4.8	3.3
2040	2.4	3.9	10.3	8.6	5.8
2045	2.7	5.1	15.0	12.3	7.9
2050	3.0	6.3	15.8	13.2	8.6



National Grid Electricity Distribution PLC 09223384)
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National Grid Electricity Distribution (South West) Plc (company number 02366894))
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