

Distribution Future Energy Scenarios 2022

Local Authority:
Tewkesbury

What are Distribution Future Energy Scenarios?

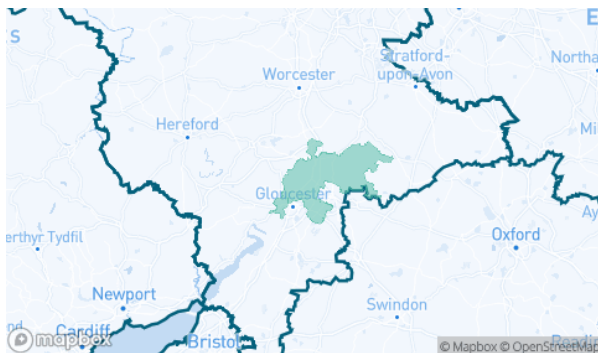
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Tewkesbury 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 Tewkesbury 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	0	0	0	0	15531	6612	6612	0
Domestic	New dwellings	0	3661	3892	3892	4435	6159	6011	6011	5907
Electric vehicles	Electric vehicles	1068	8883	10605	19695	19535	59403	52026	52585	41872
EV Charge Point	EV charge points	578	4296	6031	11468	12561	35155	32700	34569	35116
Heat pumps	Heat pump installations	524	3256	3527	7887	11977	21850	25629	44591	40296
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.2	1.1
Non domestic	Floorspace (metres squared) of new I&C developments	0	441926	520644	520644	553116	726640	725343	725343	726640
Other Distributed Generation	MW (installed capacity)	19.3	19.3	14.1	14.6	14.6	11.4	10.6	4.8	16.2
Resistive electric heating	Resistive electric heating units	4648	4107	3934	4190	4046	3223	1477	2982	3182
Solar Generation	MW (installed capacity)	22.4	29.1	35.9	43.8	41.1	63.3	110.3	141.3	135.0
Storage	MW (installed capacity)	0.0	5.2	6.0	7.1	8.1	7.9	12.4	23.1	28.8
Wind	MW (installed capacity)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.3

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.

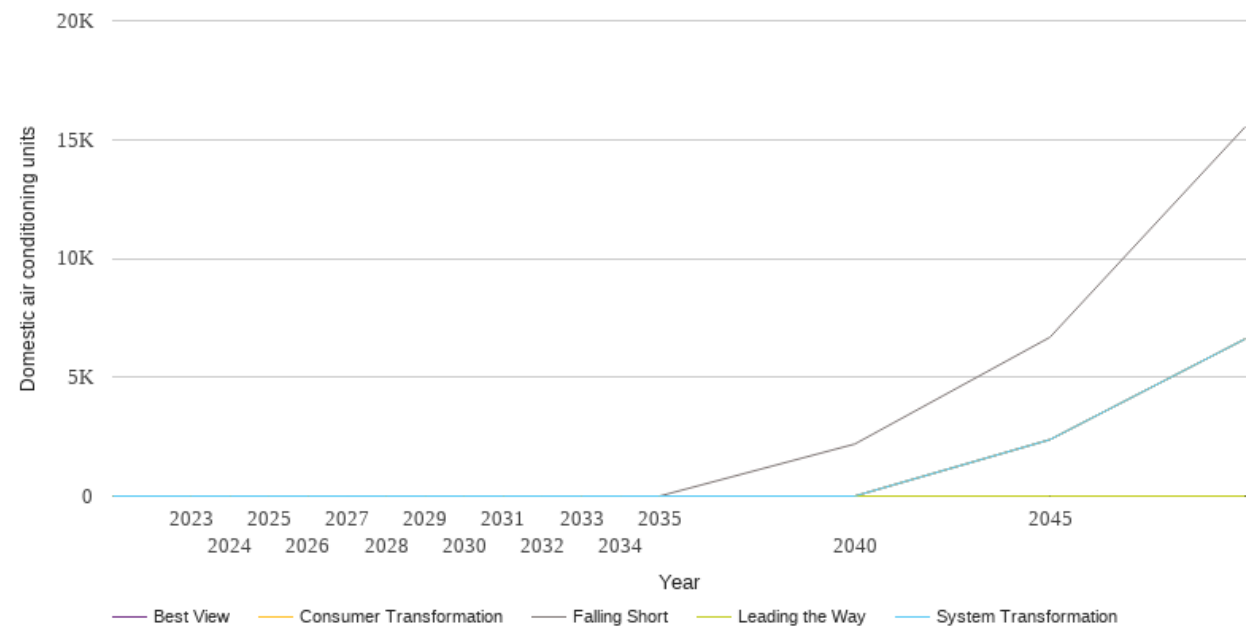
If you have any comments or queries regarding these reports, please contact

nged.energyplanning@nationalgrid.co.uk.

Technology Summary: Air conditioning

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

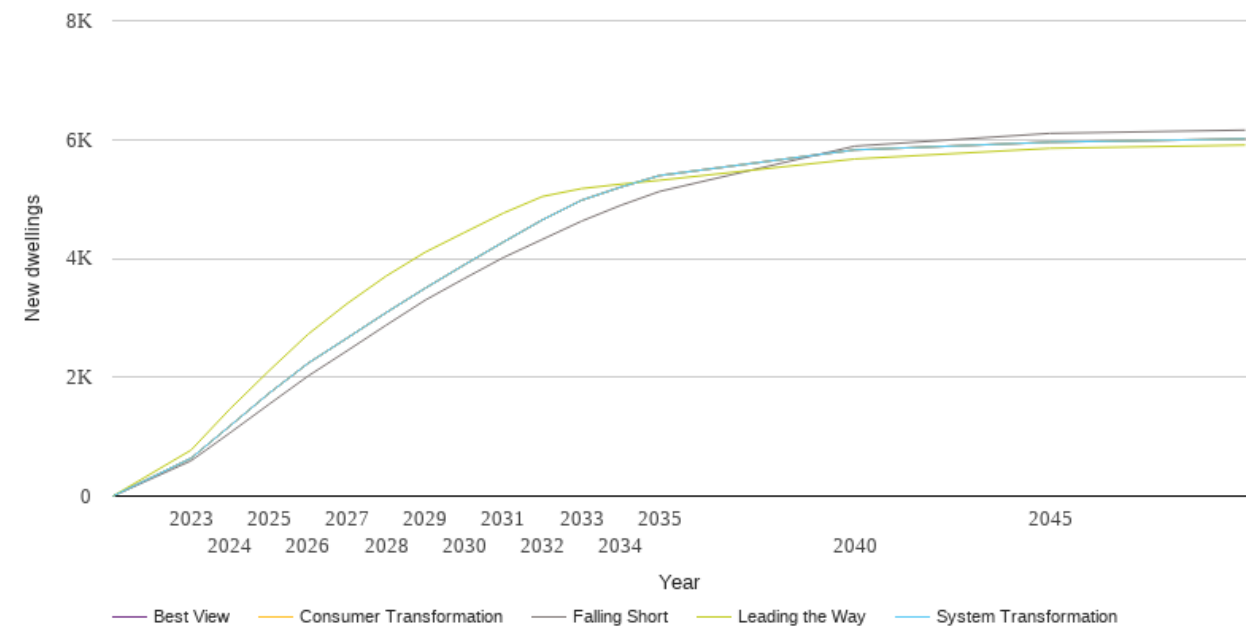
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	0	0	0	0	0
2025	0	0	0	0	0
2026	0	0	0	0	0
2027	0	0	0	0	0
2028	0	0	0	0	0
2029	0	0	0	0	0
2030	0	0	0	0	0
2031	0	0	0	0	0
2032	0	0	0	0	0
2033	0	0	0	0	0
2034	0	0	0	0	0
2035	0	0	0	0	0
2040	2189	0	0	0	0
2045	6682	2375	2375	0	2375
2050	15531	6612	6612	0	6612



Technology Summary: Domestic

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

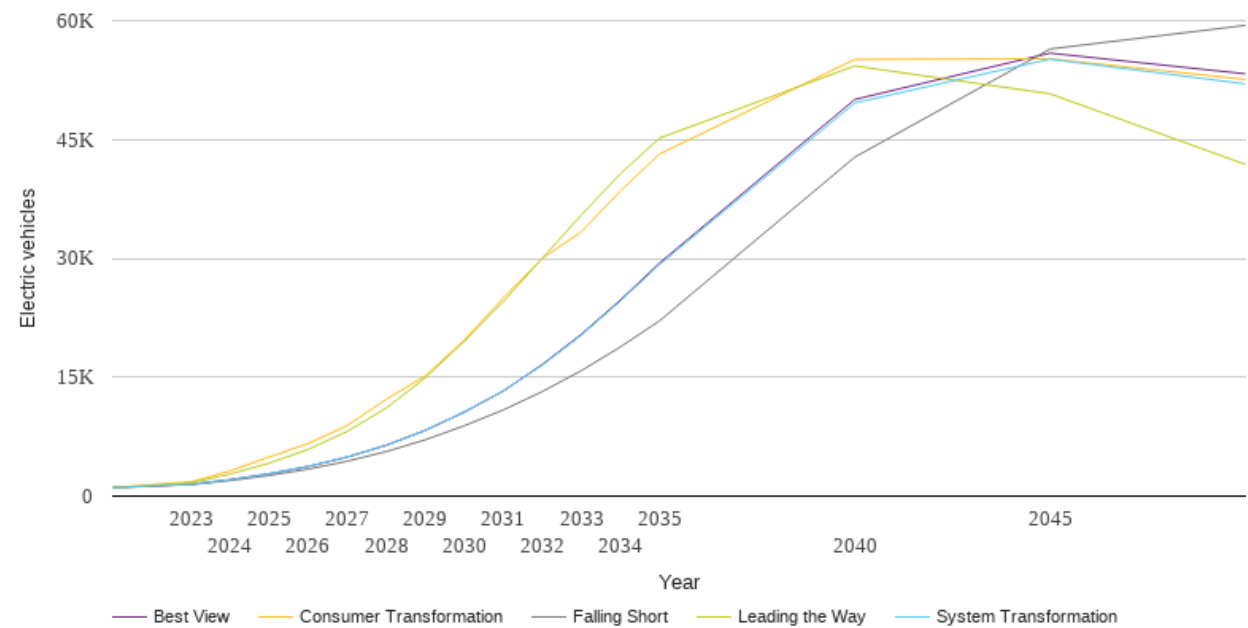
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	594	637	637	773	637
2024	1065	1182	1182	1468	1182
2025	1546	1731	1731	2110	1731
2026	2021	2236	2236	2725	2236
2027	2446	2660	2660	3240	2660
2028	2877	3088	3088	3704	3088
2029	3298	3499	3499	4105	3499
2030	3661	3892	3892	4435	3892
2031	4014	4275	4275	4762	4275
2032	4320	4648	4648	5041	4648
2033	4626	4978	4978	5174	4978
2034	4891	5198	5198	5249	5198
2035	5126	5394	5394	5314	5394
2040	5889	5826	5826	5673	5826
2045	6104	5956	5956	5852	5956
2050	6159	6011	6011	5907	6011



Technology Summary: Electric vehicles

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

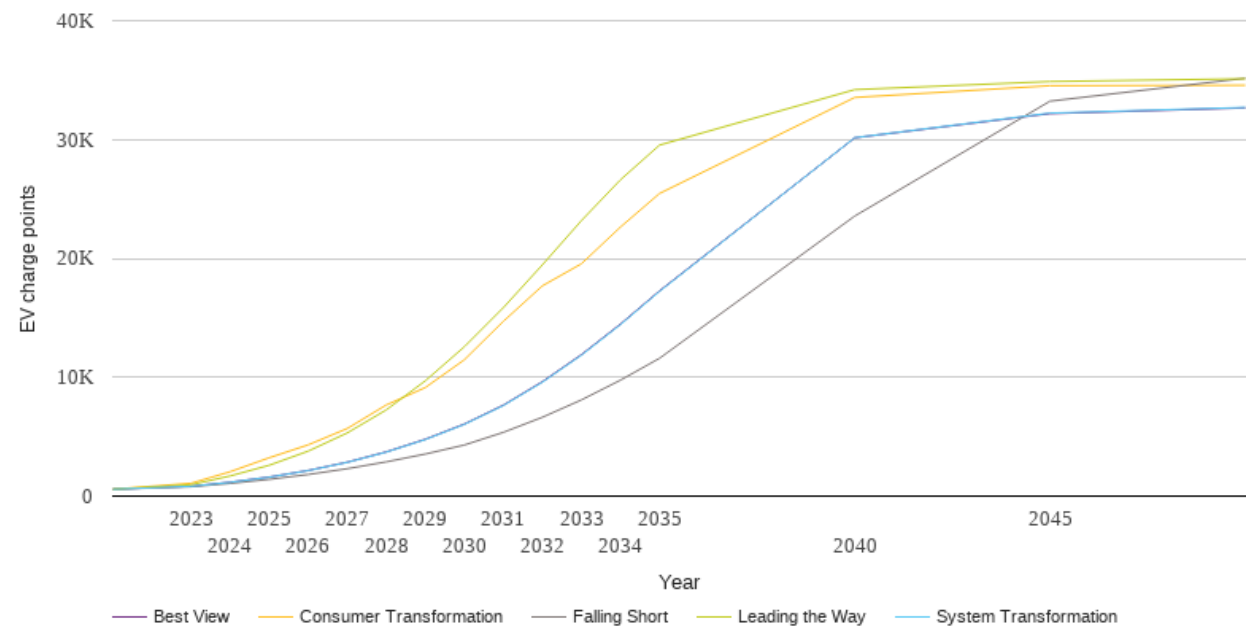
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1068	1068	1068	1068	1068
2023	1460	1492	1799	1678	1492
2024	1962	2067	3171	2783	2067
2025	2603	2813	4929	4157	2813
2026	3401	3732	6633	5891	3732
2027	4401	4923	8896	8172	4923
2028	5621	6420	12223	11119	6420
2029	7105	8296	15161	14925	8296
2030	8883	10605	19695	19535	10605
2031	10878	13272	25015	24562	13272
2032	13201	16535	30011	30011	16621
2033	15843	20320	33364	35504	20425
2034	18826	24618	38524	40694	24756
2035	22116	29231	43175	45181	29408
2040	42780	49618	55106	54289	50057
2045	56425	55147	55184	50773	55908
2050	59403	52026	52585	41872	53295



Technology Summary: EV Charge Point

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

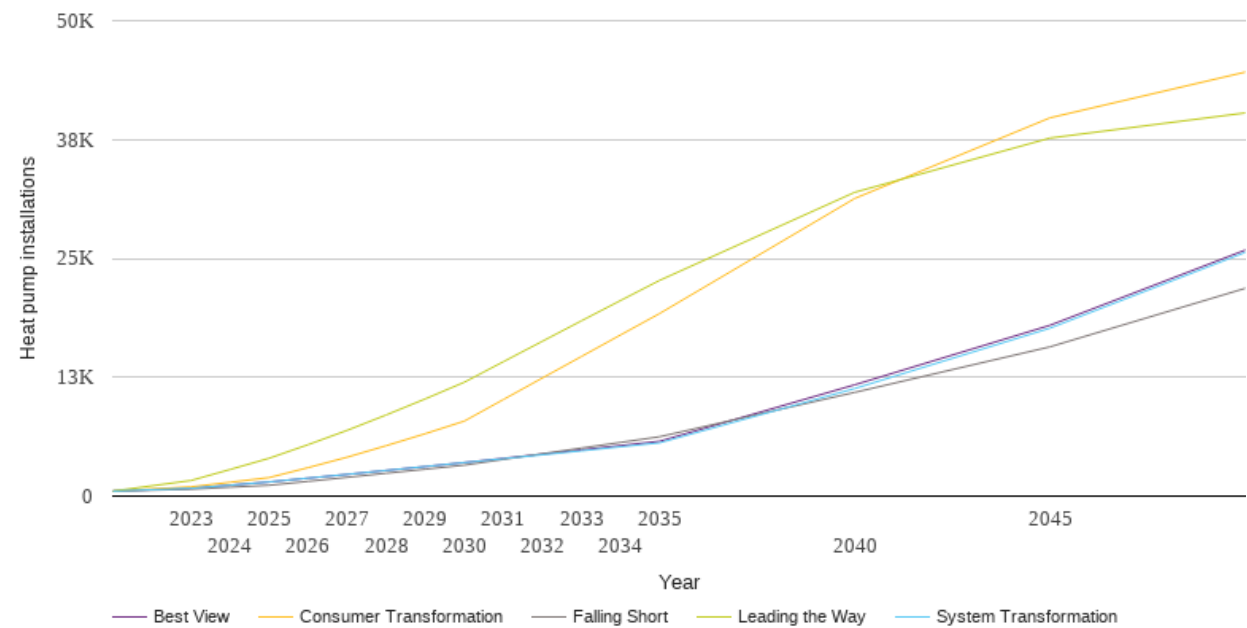
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	578	578	578	578	578
2023	790	820	1078	958	823
2024	1064	1156	2048	1693	1163
2025	1406	1587	3223	2591	1598
2026	1816	2141	4309	3780	2155
2027	2305	2836	5684	5312	2853
2028	2879	3698	7666	7250	3719
2029	3537	4754	9131	9697	4781
2030	4296	6031	11468	12561	6061
2031	5364	7619	14706	15856	7654
2032	6633	9582	17692	19459	9626
2033	8094	11856	19549	23183	11906
2034	9757	14426	22640	26617	14477
2035	11595	17224	25464	29533	17270
2040	23562	30154	33540	34199	30145
2045	33226	32223	34528	34880	32185
2050	35155	32700	34569	35116	32665



Technology Summary: Heat pumps

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

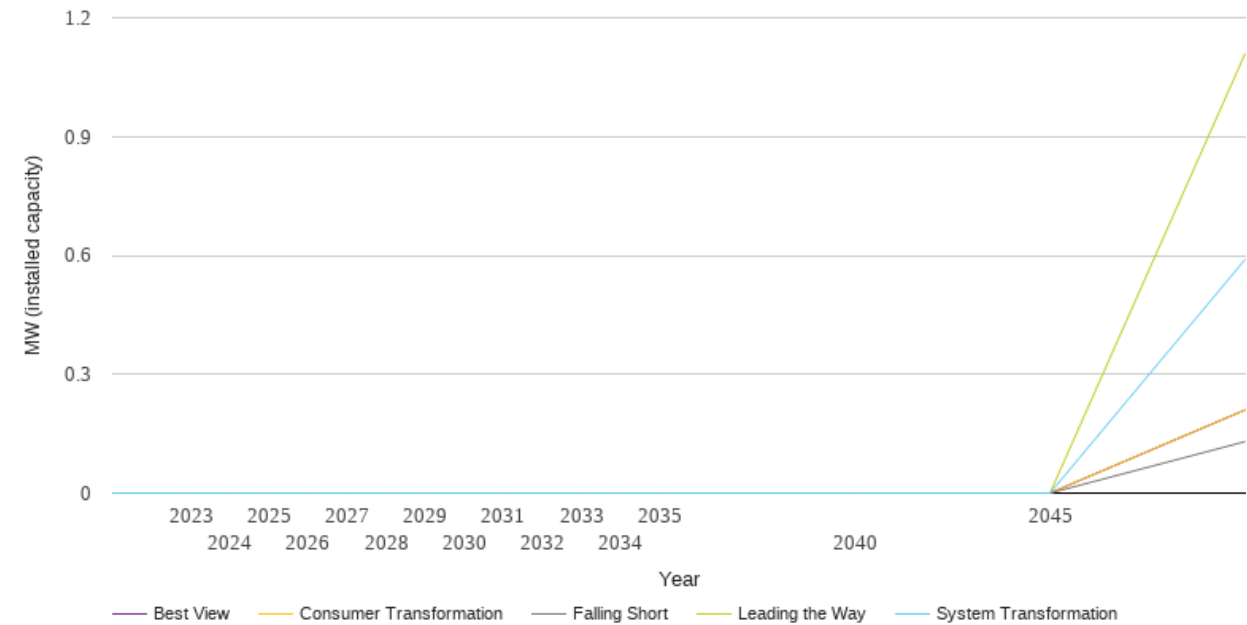
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	524	524	524	524	524
2023	724	819	974	1640	819
2024	933	1151	1451	2796	1151
2025	1137	1485	1945	3977	1485
2026	1548	1887	2992	5409	1884
2027	1974	2282	4094	6917	2282
2028	2404	2698	5302	8536	2697
2029	2829	3106	6563	10223	3105
2030	3256	3527	7887	11977	3526
2031	3859	3936	10154	14135	3967
2032	4453	4345	12422	16284	4412
2033	5050	4761	14684	18435	4860
2034	5643	5183	16947	20567	5314
2035	6241	5602	19199	22684	5766
2040	10908	11312	31303	31952	11707
2045	15696	17660	39783	37656	17964
2050	21850	25629	44591	40296	25871



Technology Summary: Hydrogen electrolysis

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

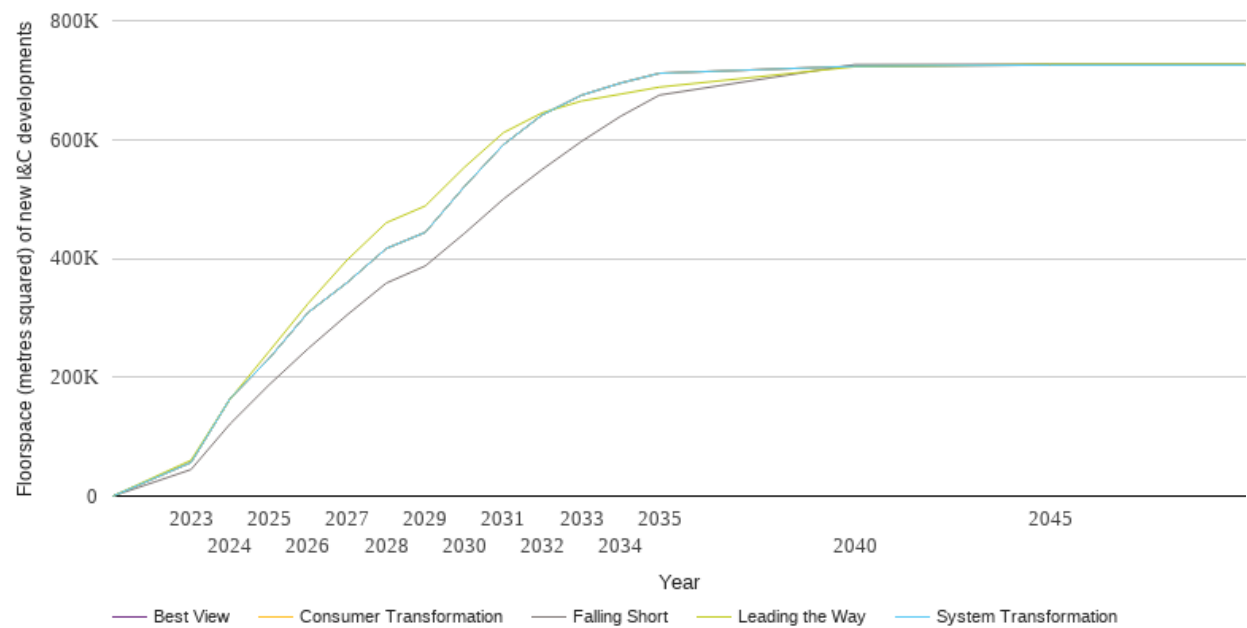
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0	0.0
2028	0.0	0.0	0.0	0.0	0.0
2029	0.0	0.0	0.0	0.0	0.0
2030	0.0	0.0	0.0	0.0	0.0
2031	0.0	0.0	0.0	0.0	0.0
2032	0.0	0.0	0.0	0.0	0.0
2033	0.0	0.0	0.0	0.0	0.0
2034	0.0	0.0	0.0	0.0	0.0
2035	0.0	0.0	0.0	0.0	0.0
2040	0.0	0.0	0.0	0.0	0.0
2045	0.0	0.0	0.0	0.0	0.0
2050	0.1	0.6	0.2	1.1	0.2



Technology Summary: Non domestic

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

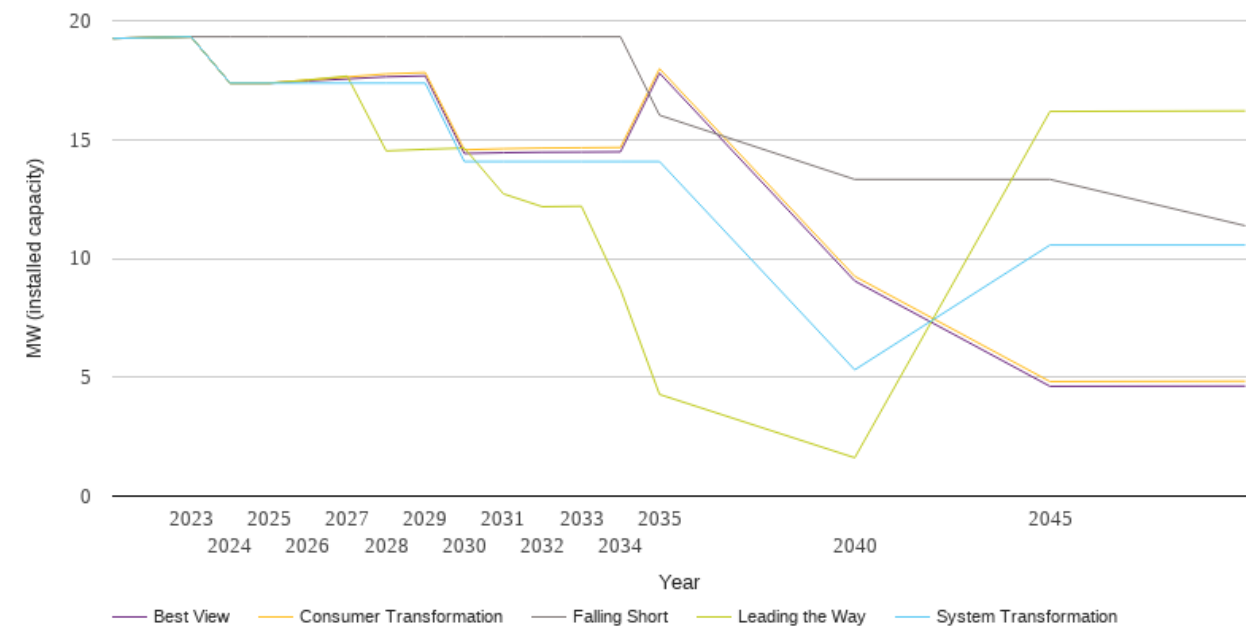
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	44652	56576	56576	60367	56576
2024	121467	163948	163948	163397	163948
2025	187236	231595	231595	243495	231595
2026	248200	308965	308965	324158	308965
2027	304989	359365	359365	397533	359365
2028	358322	416534	416534	459924	416534
2029	387320	443835	443835	488251	443835
2030	441926	520644	520644	553116	520644
2031	499666	591377	591377	611532	591377
2032	549889	641689	641689	645078	641689
2033	596795	674528	674528	664758	674528
2034	639025	694952	694952	676347	694952
2035	674836	711541	711541	688215	711541
2040	726082	723390	723390	722551	723390
2045	726640	725343	725343	726640	725343
2050	726640	725343	725343	726640	725343



Technology Summary: Other Distributed Generation

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

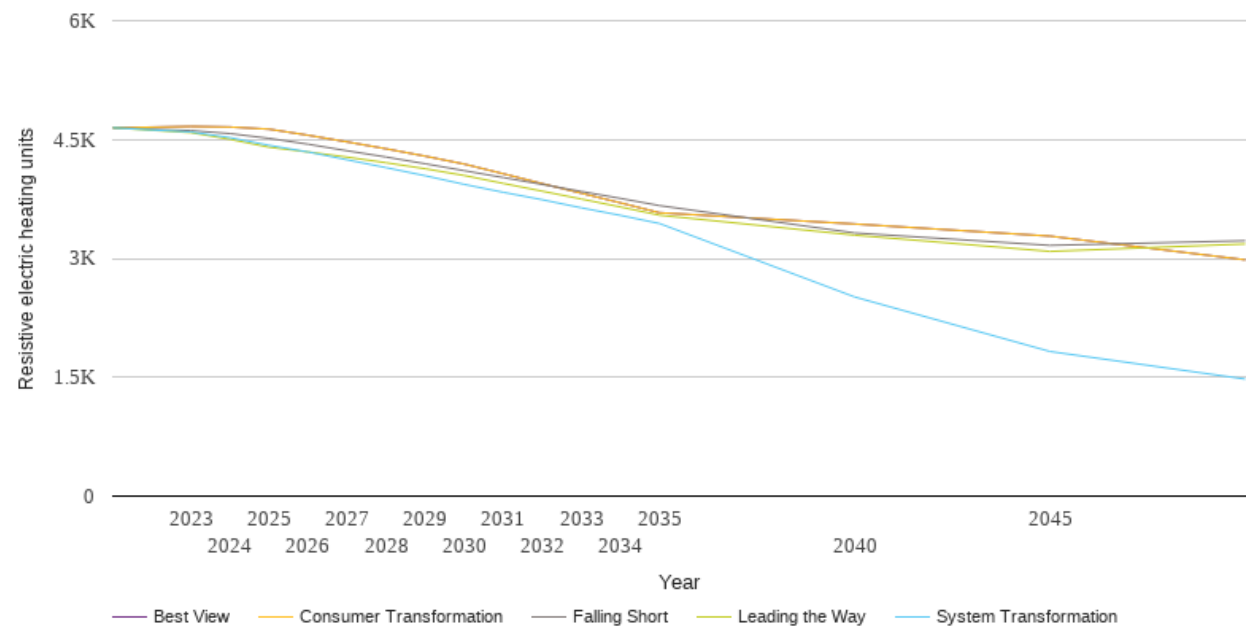
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	19.3	19.3	19.3	19.3	19.3
2023	19.3	19.3	19.3	19.3	19.3
2024	19.3	17.4	17.4	17.4	17.4
2025	19.3	17.4	17.4	17.4	17.4
2026	19.3	17.4	17.5	17.5	17.5
2027	19.3	17.4	17.6	17.7	17.6
2028	19.3	17.4	17.8	14.5	17.6
2029	19.3	17.4	17.8	14.6	17.7
2030	19.3	14.1	14.6	14.6	14.4
2031	19.3	14.1	14.6	12.7	14.4
2032	19.3	14.1	14.6	12.2	14.5
2033	19.3	14.1	14.7	12.2	14.5
2034	19.3	14.1	14.7	8.7	14.5
2035	16.0	14.1	18.0	4.3	17.8
2040	13.3	5.3	9.2	1.6	9.0
2045	13.3	10.6	4.8	16.2	4.6
2050	11.4	10.6	4.8	16.2	4.6



Technology Summary: Resistive electric heating

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

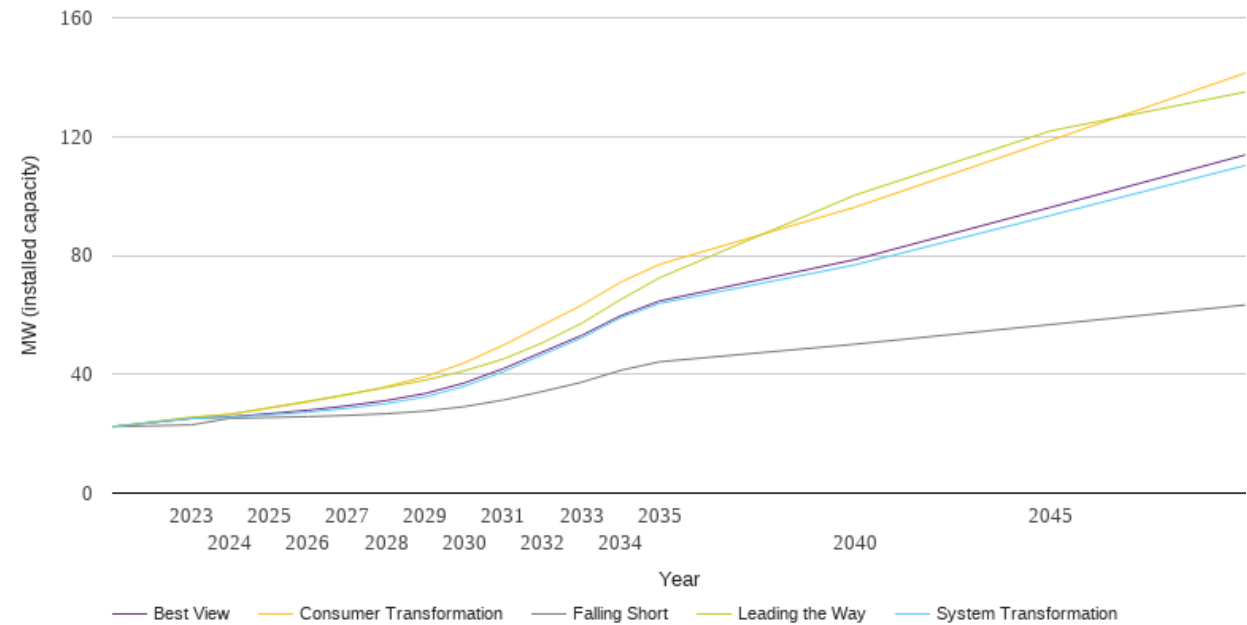
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	4648	4648	4648	4648	4648
2023	4613	4595	4665	4587	4665
2024	4575	4524	4658	4503	4658
2025	4515	4427	4631	4403	4631
2026	4441	4343	4554	4343	4554
2027	4358	4244	4470	4278	4470
2028	4279	4145	4383	4207	4383
2029	4194	4043	4290	4131	4290
2030	4107	3934	4190	4046	4190
2031	4020	3834	4068	3946	4068
2032	3933	3740	3943	3848	3943
2033	3845	3638	3822	3749	3822
2034	3757	3543	3701	3649	3701
2035	3666	3440	3576	3545	3576
2040	3321	2513	3434	3293	3434
2045	3164	1825	3281	3088	3281
2050	3223	1477	2982	3182	2982



Technology Summary: Solar Generation

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

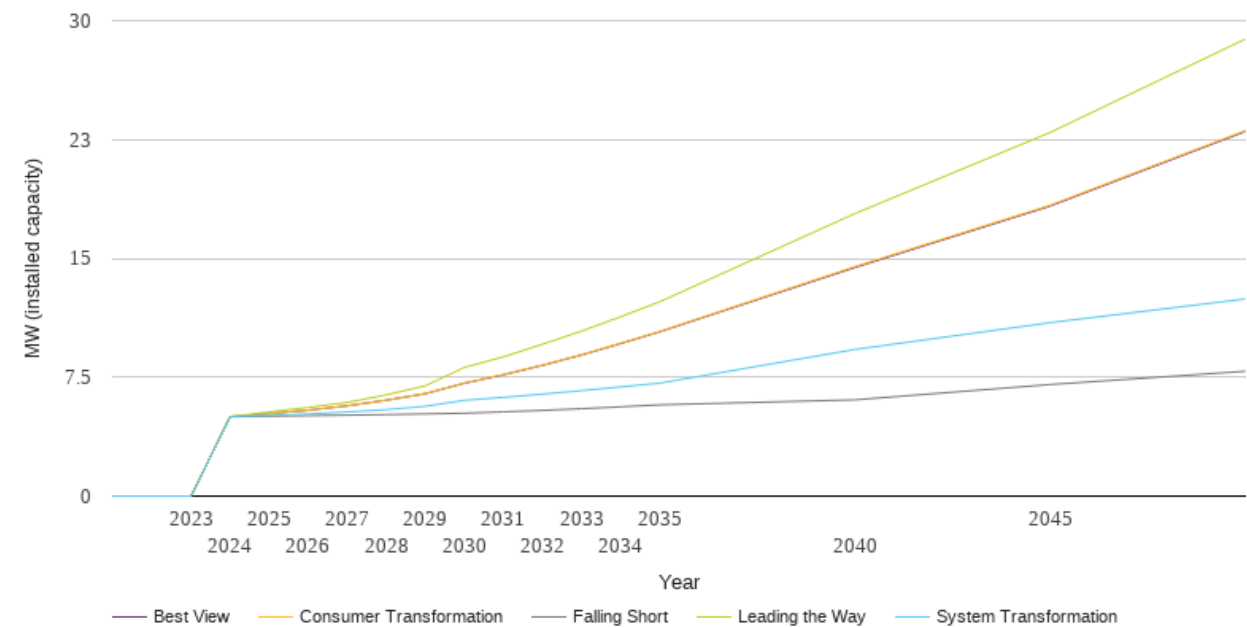
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	22.4	22.4	22.4	22.4	22.4
2023	22.9	25.1	25.4	25.5	25.1
2024	25.2	25.6	26.5	26.6	25.7
2025	25.4	26.3	28.6	28.7	26.7
2026	25.7	27.2	30.7	30.9	27.9
2027	26.1	28.5	33.1	33.2	29.4
2028	26.7	30.1	35.8	35.6	31.1
2029	27.6	32.4	39.2	38.0	33.5
2030	29.1	35.9	43.8	41.1	37.1
2031	31.3	40.9	49.8	45.1	41.9
2032	34.2	46.5	56.5	50.6	47.5
2033	37.3	52.2	63.2	57.1	53.0
2034	41.3	59.0	71.0	65.1	59.7
2035	44.2	63.8	77.0	72.4	64.6
2040	50.1	76.8	96.2	100.3	78.6
2045	56.7	93.4	118.6	121.8	96.1
2050	63.3	110.3	141.3	135.0	113.8



Technology Summary: Storage

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

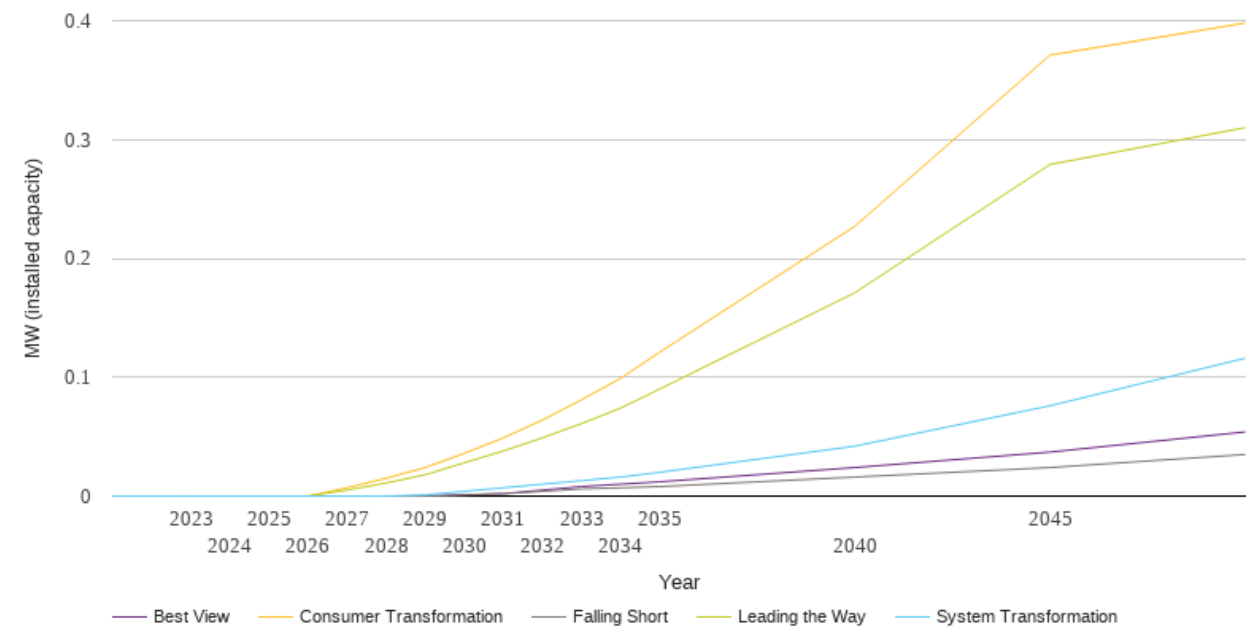
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	5.0	5.0	5.0	5.0	5.0
2025	5.0	5.1	5.2	5.3	5.2
2026	5.1	5.2	5.4	5.6	5.4
2027	5.1	5.3	5.7	5.9	5.7
2028	5.1	5.5	6.1	6.4	6.1
2029	5.2	5.7	6.5	7.0	6.5
2030	5.2	6.0	7.1	8.1	7.1
2031	5.3	6.2	7.7	8.8	7.7
2032	5.4	6.4	8.3	9.6	8.3
2033	5.5	6.7	8.9	10.4	8.9
2034	5.6	6.9	9.6	11.3	9.6
2035	5.8	7.1	10.4	12.3	10.4
2040	6.1	9.3	14.5	17.8	14.4
2045	7.0	10.9	18.4	22.9	18.3
2050	7.9	12.4	23.1	28.8	23.0



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	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	0.0	0.0	0.0	0.0
2028	0.0	0.0	0.0	0.0	0.0
2029	0.0	0.0	0.0	0.0	0.0
2030	0.0	0.0	0.0	0.0	0.0
2031	0.0	0.0	0.0	0.0	0.0
2032	0.0	0.0	0.1	0.0	0.0
2033	0.0	0.0	0.1	0.1	0.0
2034	0.0	0.0	0.1	0.1	0.0
2035	0.0	0.0	0.1	0.1	0.0
2040	0.0	0.0	0.2	0.2	0.0
2045	0.0	0.1	0.4	0.3	0.0
2050	0.0	0.1	0.4	0.3	0.1



National Grid Electricity Distribution PLC 09223384)
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