

Distribution Future Energy Scenarios 2022

Local Authority:
South Derbyshire

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 Derbyshire covered by the NGED licence areas.



Scenario Summary

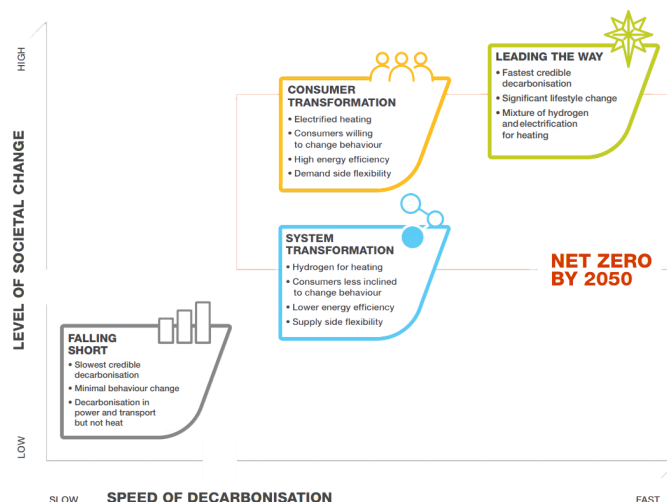
This DFES scenario framework includes three scenarios that are compliant with UK government targets of Net Zero greenhouse gas emissions by 2050. A summary of each scenario is below:

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 Derbyshire 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	253	151	151	0	18979	8691	8691	0
Domestic	New dwellings	0	3555	3744	3744	4208	5810	5651	5651	5535
Electric vehicles	Electric vehicles	1604	10378	12541	23078	22918	69382	61345	61616	49287
EV Charge Point	EV charge points	815	4887	7005	13214	14570	40357	38431	41187	40947
Heat pumps	Heat pump installations	705	3272	3766	8597	13239	24023	28544	50256	45654
Hydrogen electrolysis	MW (installed capacity)	0.0	1.1	11.1	1.8	12.1	1.3	11.8	2.0	13.5
Non domestic	Floorspace (metres squared) of new I&C developments	0	64506	69941	69941	79856	89000	89000	89000	89000
Other Distributed Generation	MW (installed capacity)	3.8	11.6	11.6	11.6	3.8	10.0	2.2	2.2	2.2
Resistive electric heating	Resistive electric heating units	3552	3392	3193	3367	3300	3134	1560	2699	2931
Solar Generation	MW (installed capacity)	23.1	32.3	40.7	50.9	56.8	78.1	134.3	176.9	178.9
Storage	MW (installed capacity)	0.0	0.2	1.2	2.6	3.6	3.4	8.5	21.8	29.1
Wind	MW (installed capacity)	0.2	0.2	0.5	5.0	3.3	2.3	7.9	34.3	27.7

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

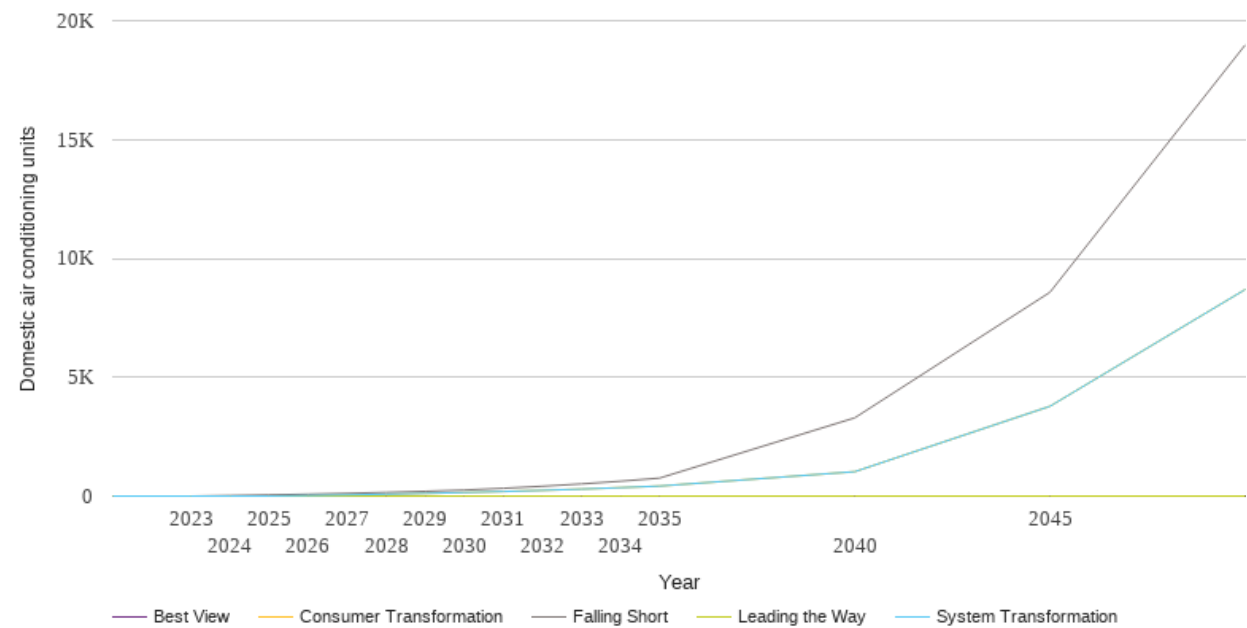
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

If you have any comments or queries regarding these reports, please contact nged.energyplanning@nationalgrid.co.uk.

Technology Summary: Air conditioning

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

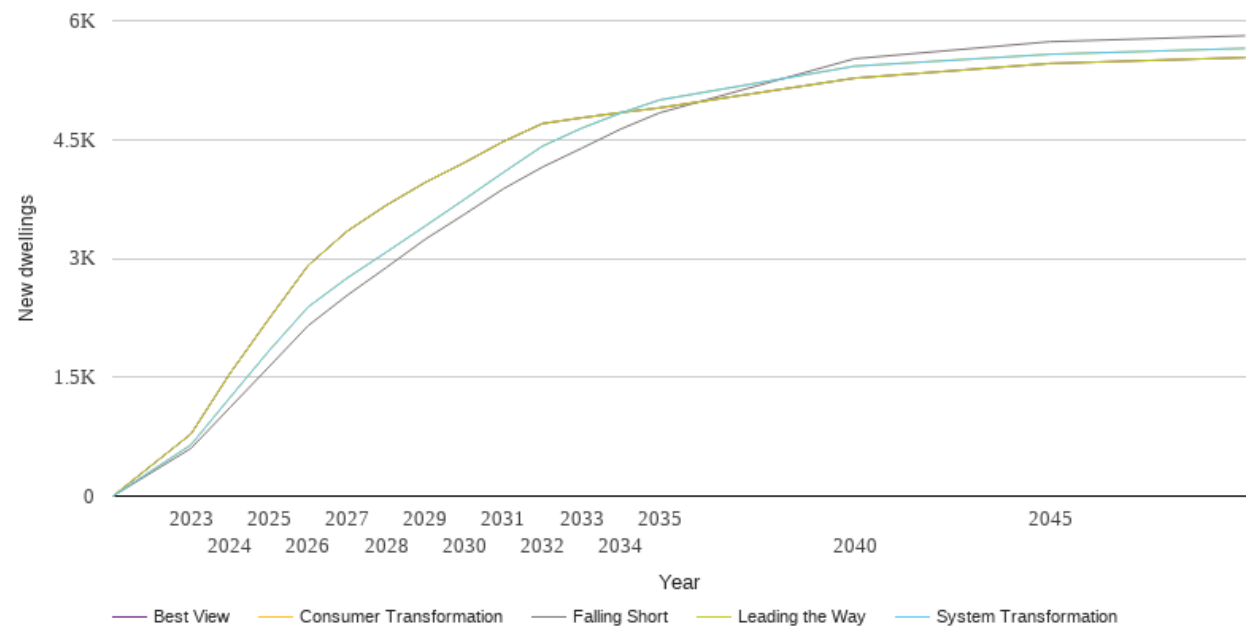
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	23	0	0	0	0
2025	50	0	0	0	0
2026	80	23	23	0	0
2027	115	49	49	0	0
2028	155	79	79	0	0
2029	201	113	113	0	0
2030	253	151	151	0	0
2031	328	193	193	0	0
2032	414	241	241	0	0
2033	513	294	294	0	0
2034	626	355	355	0	0
2035	756	422	422	0	0
2040	3292	1026	1026	0	0
2045	8575	3779	3779	0	0
2050	18979	8691	8691	0	0



Technology Summary: Domestic

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

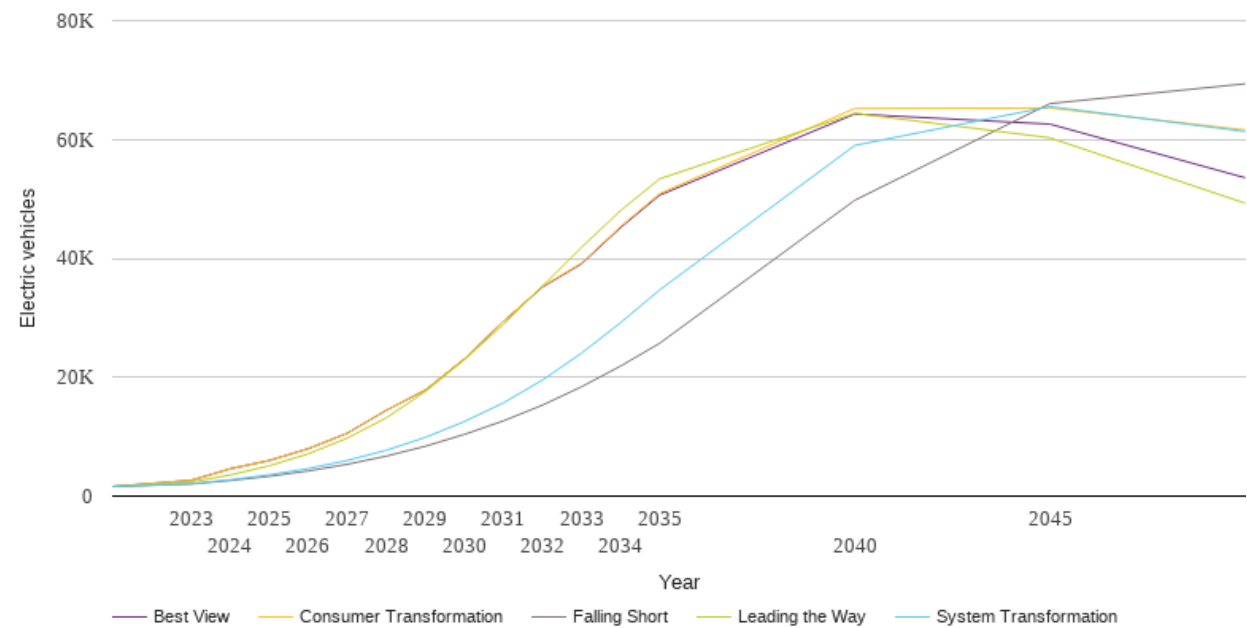
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	603	648	648	785	785
2024	1119	1245	1245	1550	1550
2025	1633	1835	1835	2240	2240
2026	2151	2387	2387	2911	2911
2027	2534	2752	2752	3344	3344
2028	2884	3078	3078	3670	3670
2029	3242	3409	3409	3959	3959
2030	3555	3744	3744	4208	4208
2031	3878	4085	4085	4475	4475
2032	4152	4416	4416	4701	4701
2033	4389	4642	4642	4774	4774
2034	4631	4833	4833	4840	4840
2035	4837	4999	4999	4900	4900
2040	5520	5426	5426	5275	5275
2045	5735	5576	5576	5460	5460
2050	5810	5651	5651	5535	5535



Technology Summary: Electric vehicles

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

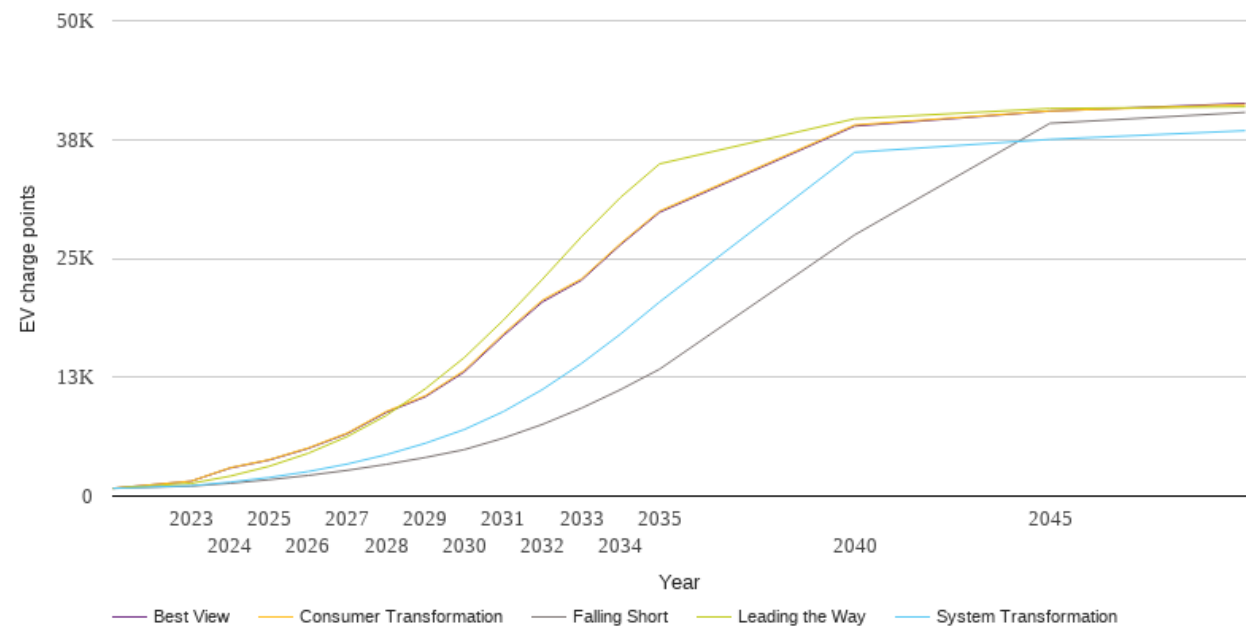
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1604	1604	1604	1604	1604
2023	2039	2080	2652	2394	2652
2024	2613	2736	4589	3543	4589
2025	3330	3574	5989	5095	5989
2026	4233	4631	7965	7106	7966
2027	5355	5989	10578	9752	10579
2028	6723	7715	14435	13161	14435
2029	8387	9876	17828	17576	17828
2030	10378	12541	23078	22918	23080
2031	12657	15685	29389	28871	29390
2032	15305	19520	35271	35317	35165
2033	18392	24043	39214	41858	39081
2034	21872	29171	45350	48037	45160
2035	25701	34680	50891	53372	50630
2040	49786	59006	65233	64411	64293
2045	66051	65549	65309	60287	62594
2050	69382	61345	61616	49287	53566



Technology Summary: EV Charge Point

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

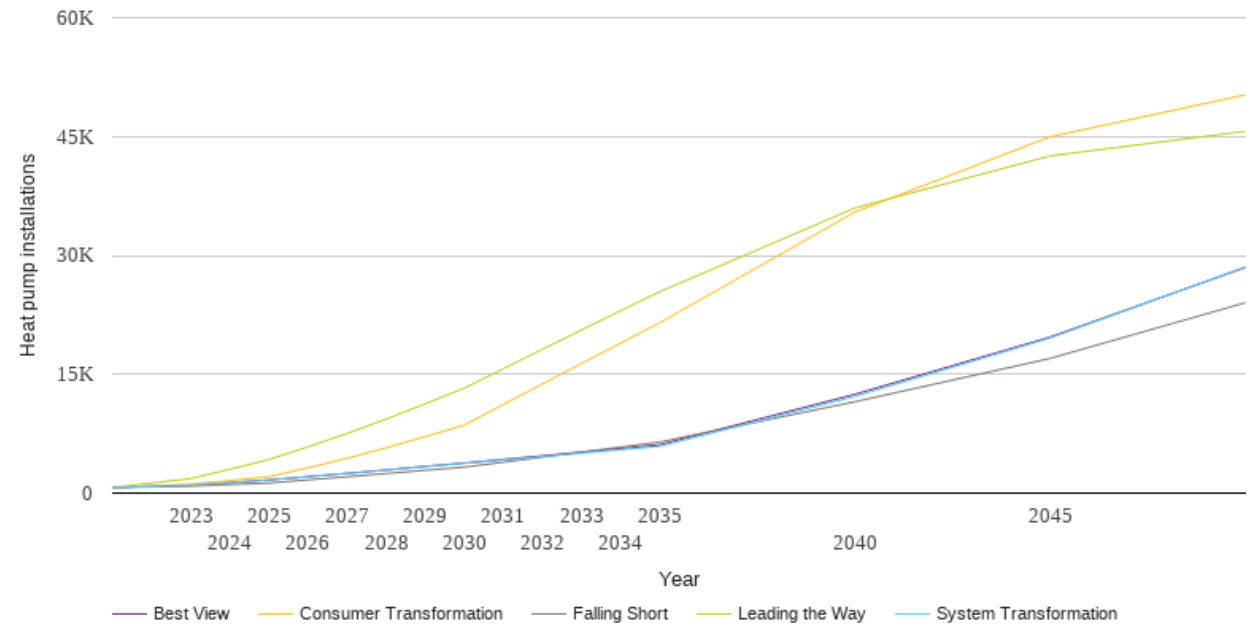
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	815	815	815	815	815
2023	1046	1090	1573	1333	1560
2024	1345	1468	2980	2098	2947
2025	1720	1955	3826	3134	3789
2026	2173	2581	5060	4498	5008
2027	2708	3370	6629	6258	6563
2028	3337	4351	8897	8475	8796
2029	4060	5553	10551	11285	10448
2030	4887	7005	13214	14570	13062
2031	6097	8884	17061	18504	16878
2032	7539	11209	20609	22803	20422
2033	9245	13948	22843	27281	22711
2034	11194	17040	26558	31413	26431
2035	13349	20413	29976	34937	29845
2040	27478	36154	39036	39683	38921
2045	39207	37518	40507	40770	40493
2050	40357	38431	41187	40947	41304



Technology Summary: Heat pumps

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

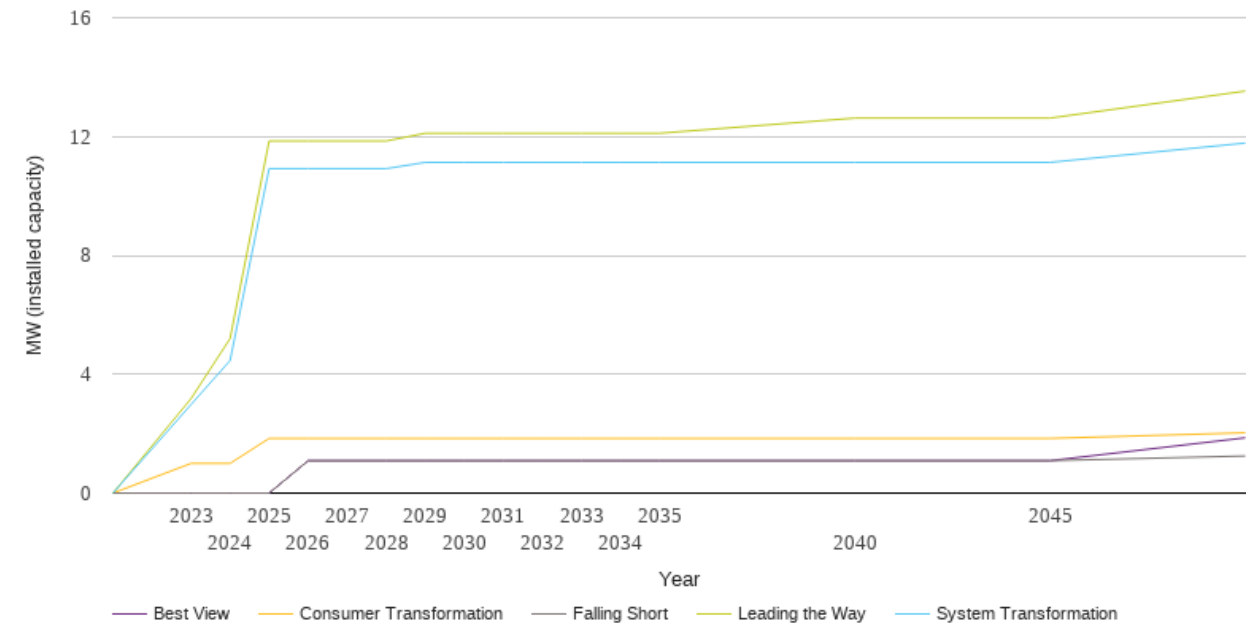
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	705	705	705	705	705
2023	888	992	1127	1844	992
2024	1081	1316	1585	3014	1316
2025	1272	1670	2076	4242	1670
2026	1669	2070	3200	5836	2073
2027	2062	2473	4390	7523	2488
2028	2465	2901	5723	9341	2919
2029	2875	3336	7122	11260	3363
2030	3272	3766	8597	13239	3795
2031	3901	4186	11186	15696	4251
2032	4539	4606	13766	18149	4706
2033	5175	5032	16352	20586	5167
2034	5802	5463	18917	23001	5634
2035	6435	5890	21475	25405	6096
2040	11518	12190	35465	35974	12456
2045	16986	19564	44957	42552	19681
2050	24023	28544	50256	45654	28472



Technology Summary: Hydrogen electrolysis

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

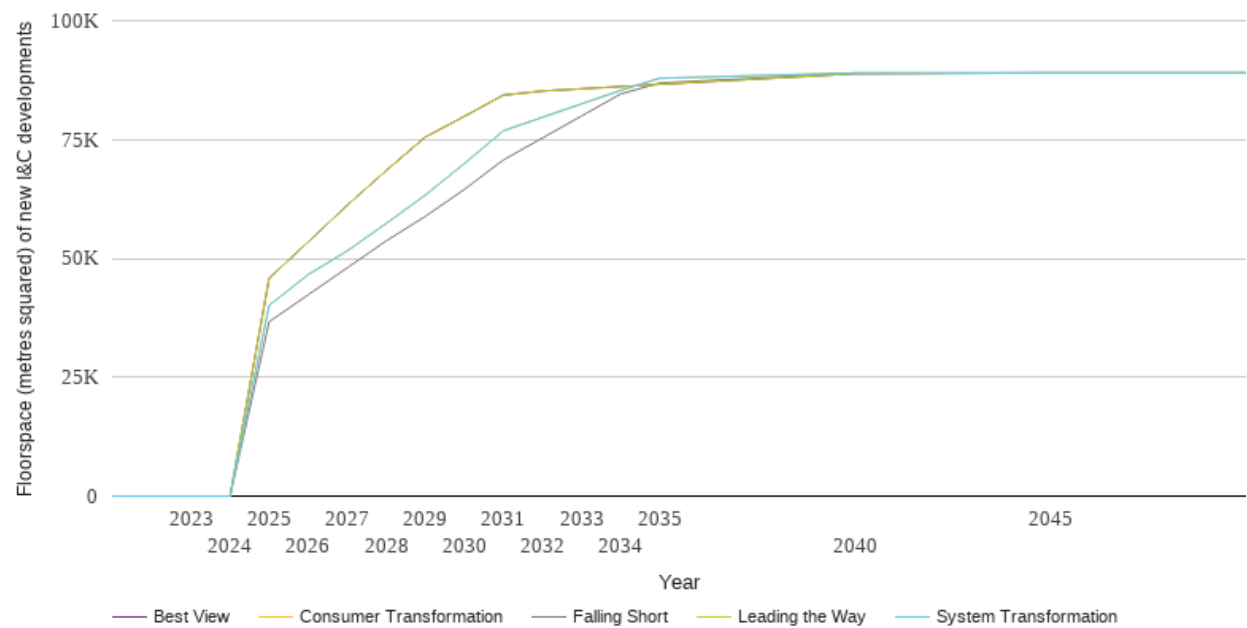
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	3.0	1.0	3.2	0.0
2024	0.0	4.5	1.0	5.2	0.0
2025	0.0	10.9	1.8	11.9	0.0
2026	1.1	10.9	1.8	11.9	1.1
2027	1.1	10.9	1.8	11.9	1.1
2028	1.1	10.9	1.8	11.9	1.1
2029	1.1	11.1	1.8	12.1	1.1
2030	1.1	11.1	1.8	12.1	1.1
2031	1.1	11.1	1.8	12.1	1.1
2032	1.1	11.1	1.8	12.1	1.1
2033	1.1	11.1	1.8	12.1	1.1
2034	1.1	11.1	1.8	12.1	1.1
2035	1.1	11.1	1.8	12.1	1.1
2040	1.1	11.1	1.8	12.6	1.1
2045	1.1	11.1	1.8	12.6	1.1
2050	1.3	11.8	2.0	13.5	1.9



Technology Summary: Non domestic

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

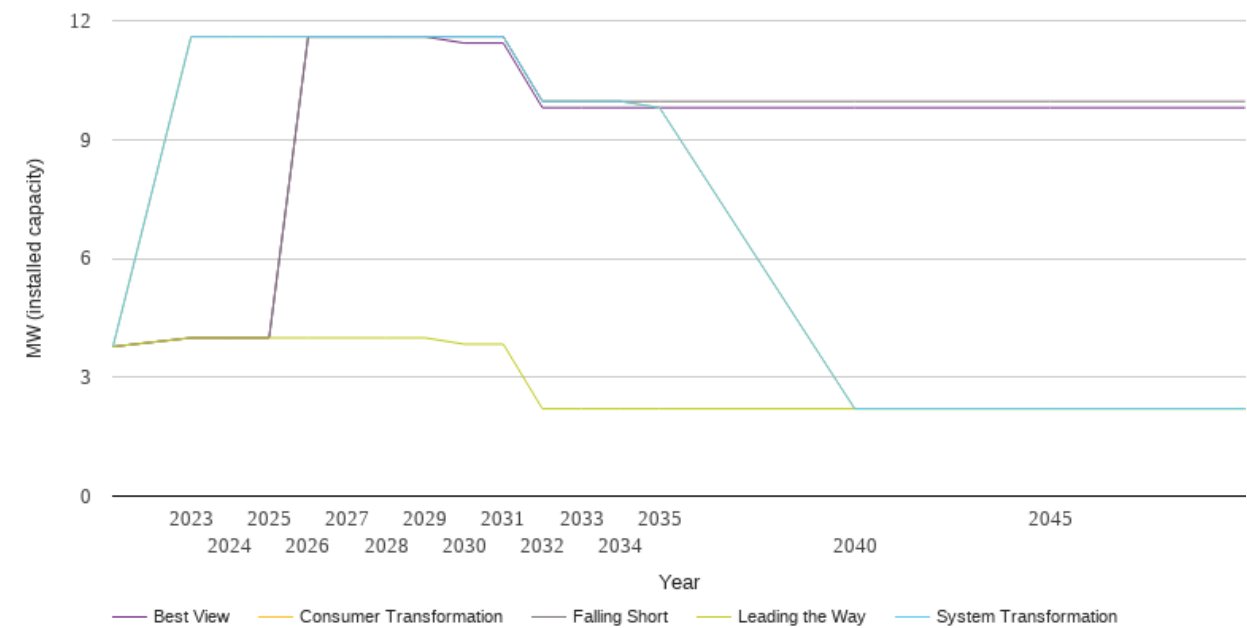
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	0	0	0	0	0
2025	36663	40100	40100	45829	45829
2026	42337	46576	46576	53450	53450
2027	48011	51571	51571	61177	61177
2028	53686	57360	57360	68481	68481
2029	58831	63307	63307	75521	75521
2030	64506	69941	69941	79856	79856
2031	70709	76840	76840	84349	84349
2032	75326	79669	79669	85194	85194
2033	79943	82497	82497	85670	85670
2034	84560	85326	85326	86146	86146
2035	86886	87890	87890	86621	86621
2040	89000	89000	89000	88841	88841
2045	89000	89000	89000	89000	89000
2050	89000	89000	89000	89000	89000



Technology Summary: Other Distributed Generation

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

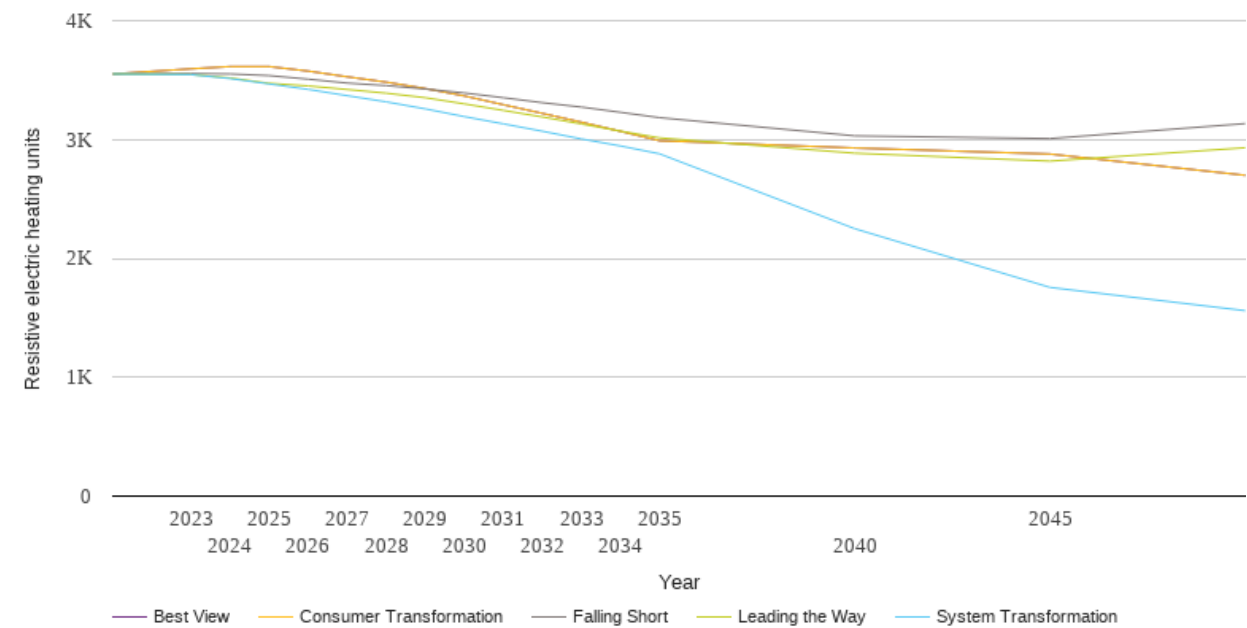
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	3.8	3.8	3.8	3.8	3.8
2023	4.0	11.6	11.6	4.0	4.0
2024	4.0	11.6	11.6	4.0	4.0
2025	4.0	11.6	11.6	4.0	4.0
2026	11.6	11.6	11.6	4.0	11.6
2027	11.6	11.6	11.6	4.0	11.6
2028	11.6	11.6	11.6	4.0	11.6
2029	11.6	11.6	11.6	4.0	11.6
2030	11.6	11.6	11.6	3.8	11.4
2031	11.6	11.6	11.6	3.8	11.4
2032	10.0	10.0	10.0	2.2	9.8
2033	10.0	10.0	10.0	2.2	9.8
2034	10.0	10.0	10.0	2.2	9.8
2035	10.0	9.8	9.8	2.2	9.8
2040	10.0	2.2	2.2	2.2	9.8
2045	10.0	2.2	2.2	2.2	9.8
2050	10.0	2.2	2.2	2.2	9.8



Technology Summary: Resistive electric heating

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

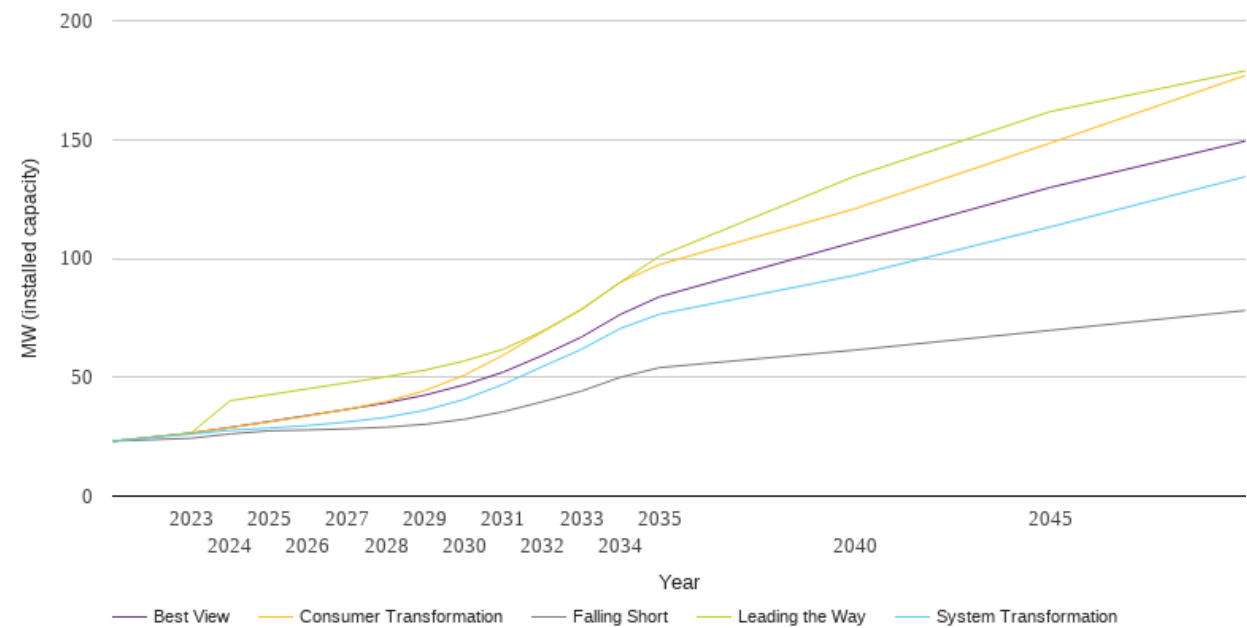
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	3552	3552	3552	3552	3552
2023	3555	3546	3595	3547	3595
2024	3552	3513	3614	3518	3614
2025	3538	3468	3614	3473	3614
2026	3508	3422	3576	3451	3576
2027	3475	3369	3528	3421	3528
2028	3454	3317	3483	3390	3483
2029	3425	3258	3429	3352	3429
2030	3392	3193	3367	3300	3367
2031	3352	3132	3293	3245	3293
2032	3310	3070	3220	3190	3220
2033	3273	3005	3146	3131	3146
2034	3229	2946	3069	3071	3069
2035	3184	2880	2990	3014	2990
2040	3031	2250	2929	2885	2929
2045	3008	1756	2878	2818	2878
2050	3134	1560	2699	2931	2699



Technology Summary: Solar Generation

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

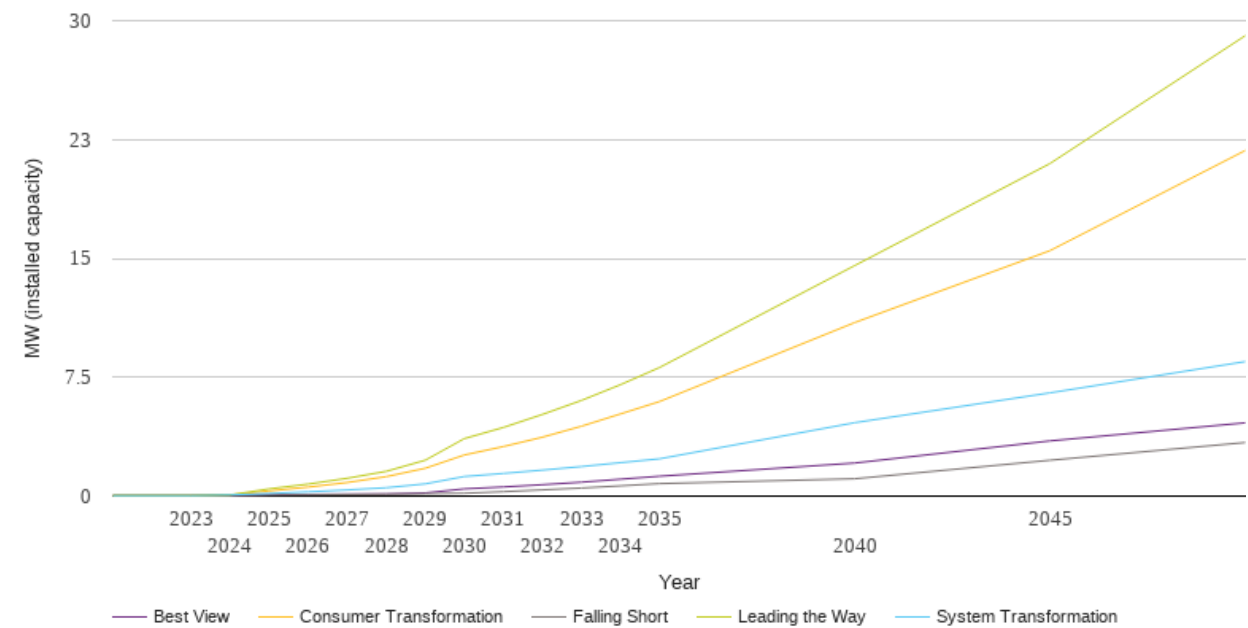
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	23.1	23.1	23.1	23.1	23.1
2023	24.3	26.1	26.5	26.6	26.6
2024	26.2	27.7	28.8	40.1	28.9
2025	27.5	28.6	31.2	42.6	31.4
2026	27.8	29.7	33.7	45.2	33.9
2027	28.3	31.2	36.5	47.7	36.5
2028	29.0	33.1	39.8	50.2	39.2
2029	30.2	36.2	44.4	53.0	42.5
2030	32.3	40.7	50.9	56.8	46.8
2031	35.5	47.1	59.3	61.8	52.2
2032	39.7	54.5	69.0	69.3	59.2
2033	44.2	61.7	78.6	78.4	66.9
2034	50.0	70.5	90.0	90.0	76.5
2035	54.1	76.5	97.4	101.0	83.9
2040	61.4	92.9	120.9	134.6	106.9
2045	69.7	113.2	148.5	161.7	129.8
2050	78.1	134.3	176.9	178.9	149.3



Technology Summary: Storage

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

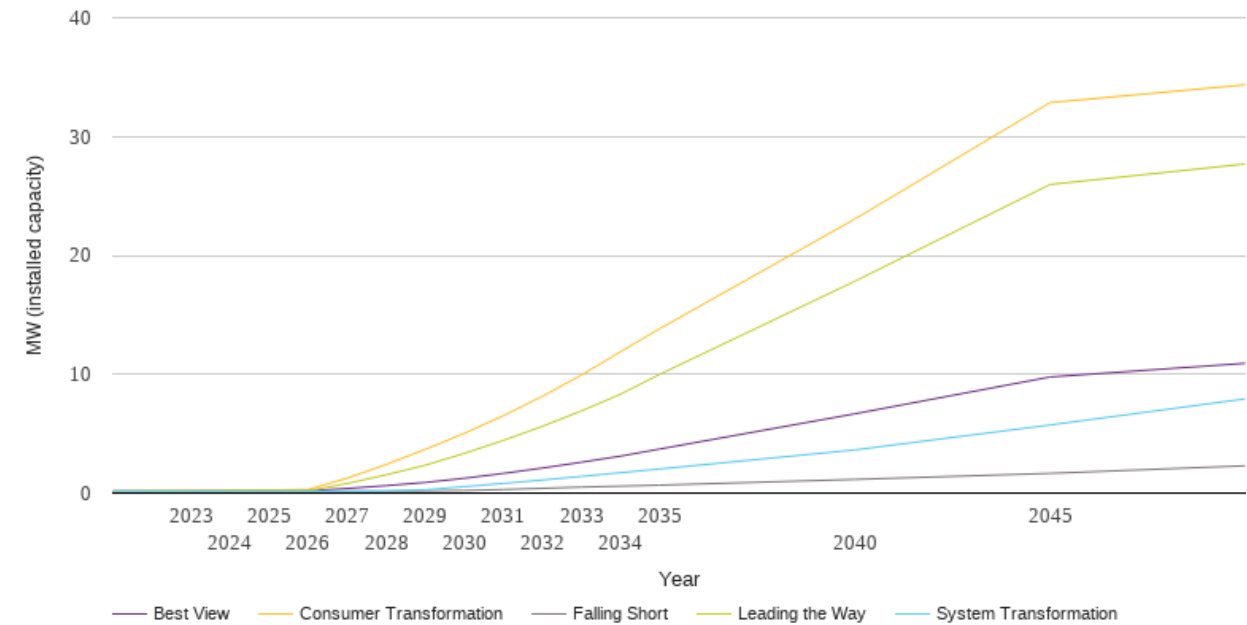
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.1	0.1	0.1	0.0
2025	0.1	0.2	0.3	0.5	0.1
2026	0.1	0.3	0.6	0.8	0.1
2027	0.1	0.4	0.9	1.1	0.1
2028	0.1	0.5	1.2	1.6	0.1
2029	0.1	0.8	1.8	2.3	0.2
2030	0.2	1.2	2.6	3.6	0.5
2031	0.3	1.4	3.1	4.3	0.6
2032	0.4	1.6	3.7	5.2	0.7
2033	0.5	1.9	4.4	6.0	0.9
2034	0.6	2.1	5.2	7.0	1.1
2035	0.8	2.4	6.0	8.1	1.3
2040	1.1	4.6	11.0	14.5	2.1
2045	2.3	6.5	15.5	21.0	3.5
2050	3.4	8.5	21.8	29.1	4.6



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	0.2	0.2	0.2	0.2	0.2
2023	0.2	0.2	0.2	0.2	0.2
2024	0.2	0.2	0.2	0.2	0.2
2025	0.2	0.2	0.3	0.2	0.2
2026	0.2	0.2	0.3	0.2	0.2
2027	0.2	0.2	1.3	0.8	0.4
2028	0.2	0.2	2.4	1.5	0.6
2029	0.2	0.3	3.7	2.3	0.9
2030	0.2	0.5	5.0	3.3	1.2
2031	0.3	0.8	6.5	4.4	1.7
2032	0.4	1.1	8.1	5.6	2.1
2033	0.5	1.4	9.9	6.9	2.6
2034	0.6	1.7	11.9	8.3	3.1
2035	0.7	2.0	13.8	10.0	3.7
2040	1.2	3.6	23.1	17.8	6.7
2045	1.7	5.7	32.9	26.0	9.8
2050	2.3	7.9	34.3	27.7	10.9



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))
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