

Distribution Future Energy Scenarios 2022

Local Authority:
East Staffordshire

What are Distribution Future Energy Scenarios?

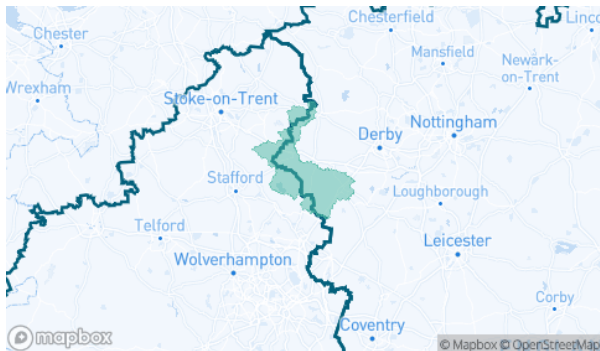
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 East 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 East 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	414	1235	1048	1048	414	28776	14622	14622	414
Domestic	New dwellings	0	4189	4763	4763	5887	7462	7457	7457	7457
Electric vehicles	Electric vehicles	1828	11781	14719	27105	27012	85469	77230	78271	63406
EV Charge Point	EV charge points	889	5274	7781	14671	16107	45624	44794	47478	47227
Heat pumps	Heat pump installations	392	4972	5131	10911	16464	30954	34774	57314	51209
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	0.7	0.0	0.2	2.0	9.8	6.1	7.9
Non domestic	Floorspace (metres squared) of new I&C developments	0	210119	259115	259115	274641	455867	454492	454492	455867
Other Distributed Generation	MW (installed capacity)	13.5	18.0	19.0	20.2	20.6	17.8	18.7	4.5	29.1
Resistive electric heating	Resistive electric heating units	7374	6018	5807	6229	5936	4113	1684	4073	4306
Solar Generation	MW (installed capacity)	24.1	30.3	39.8	50.7	46.6	74.8	147.2	192.5	182.6
Storage	MW (installed capacity)	0.0	0.2	1.4	2.8	3.9	4.1	10.8	25.4	33.4
Wind	MW (installed capacity)	0.7	0.8	1.0	3.4	2.8	3.7	9.9	31.0	24.9

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

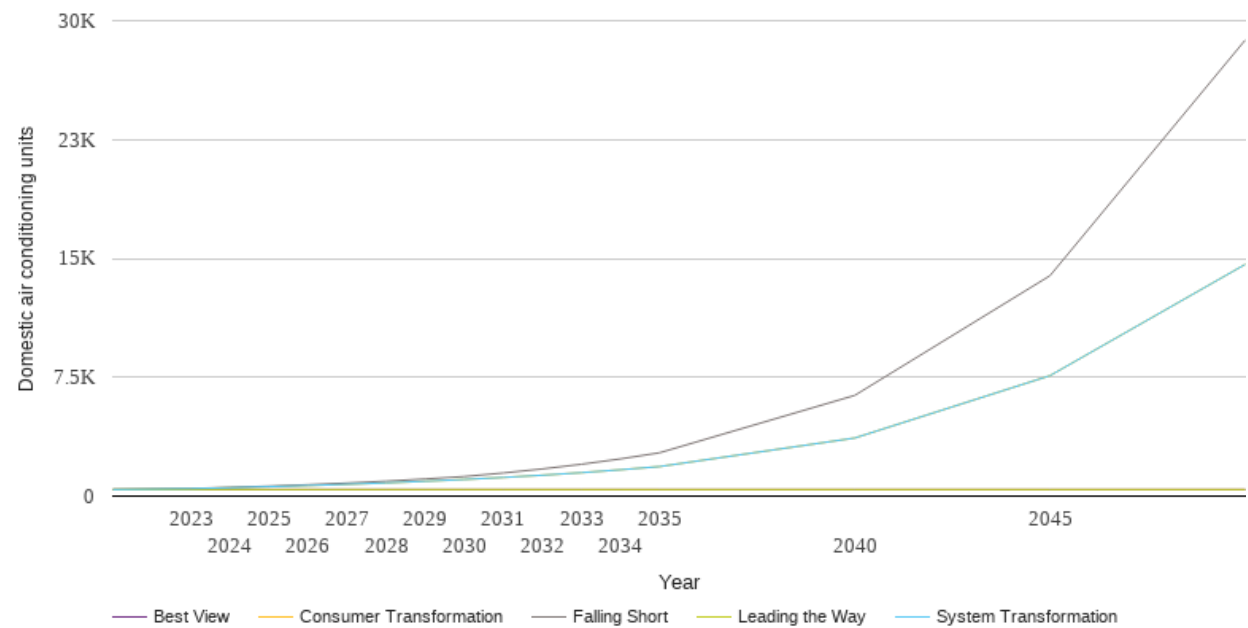
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

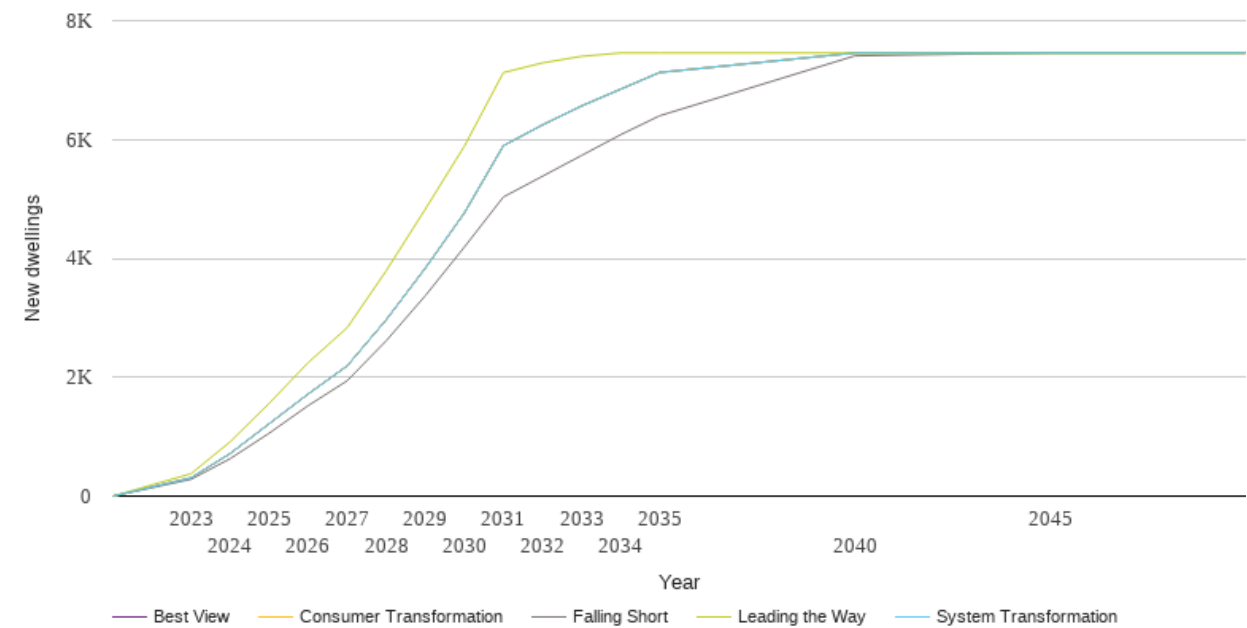
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	414	414	414	414	414
2023	477	470	470	414	414
2024	546	528	528	414	414
2025	626	595	595	414	414
2026	717	665	665	414	414
2027	822	744	744	414	414
2028	940	834	834	414	414
2029	1079	935	935	414	414
2030	1235	1048	1048	414	414
2031	1459	1176	1176	414	414
2032	1715	1318	1318	414	414
2033	2009	1478	1478	414	414
2034	2347	1661	1661	414	414
2035	2733	1863	1863	414	414
2040	6355	3665	3665	414	414
2045	13906	7599	7599	414	414
2050	28776	14622	14622	414	414



Technology Summary: Domestic

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

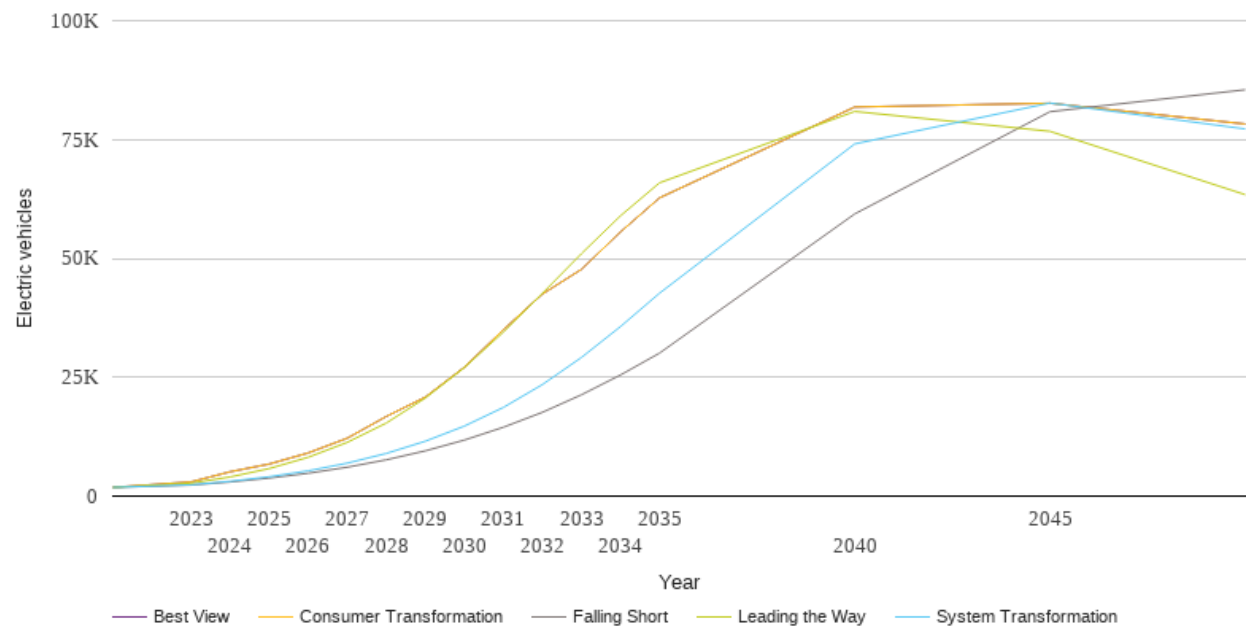
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	283	307	307	377	307
2024	629	715	715	912	715
2025	1058	1217	1217	1560	1217
2026	1522	1718	1718	2245	1718
2027	1941	2192	2192	2834	2192
2028	2614	2968	2968	3793	2968
2029	3372	3836	3836	4829	3836
2030	4189	4763	4763	5887	4763
2031	5033	5896	5896	7126	5896
2032	5382	6245	6245	7289	6245
2033	5731	6564	6564	7400	6564
2034	6080	6846	6846	7457	6846
2035	6399	7128	7128	7457	7128
2040	7408	7457	7457	7457	7457
2045	7462	7457	7457	7457	7457
2050	7462	7457	7457	7457	7457



Technology Summary: Electric vehicles

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

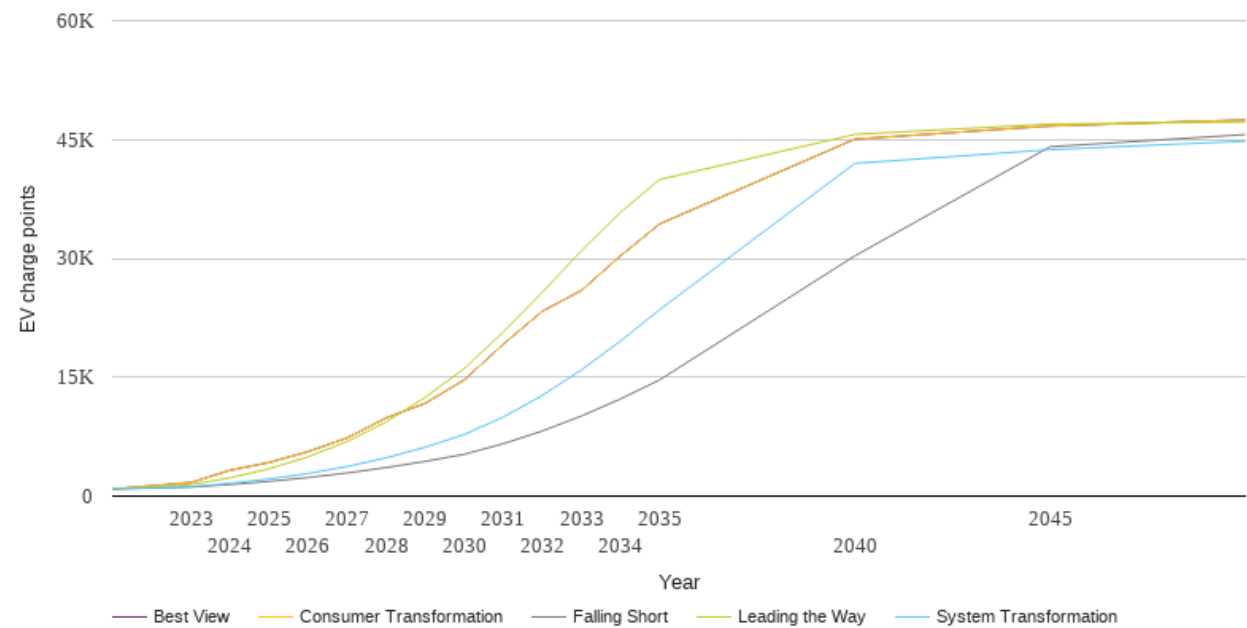
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1828	1828	1828	1828	1828
2023	2324	2368	2979	2713	2979
2024	2969	3109	5112	4023	5112
2025	3783	4064	6741	5782	6741
2026	4799	5310	9076	8161	9076
2027	6074	6925	12176	11297	12176
2028	7628	8972	16741	15357	16741
2029	9513	11540	20823	20614	20823
2030	11781	14719	27105	27012	27105
2031	14481	18650	35017	34498	35017
2032	17626	23461	42495	42655	42495
2033	21311	29162	47696	51001	47696
2034	25473	35658	55565	58955	55565
2035	30079	42683	62730	65898	62730
2040	59357	74084	81836	80909	81836
2045	80853	82679	82644	76727	82644
2050	85469	77230	78271	63406	78271



Technology Summary: EV Charge Point

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

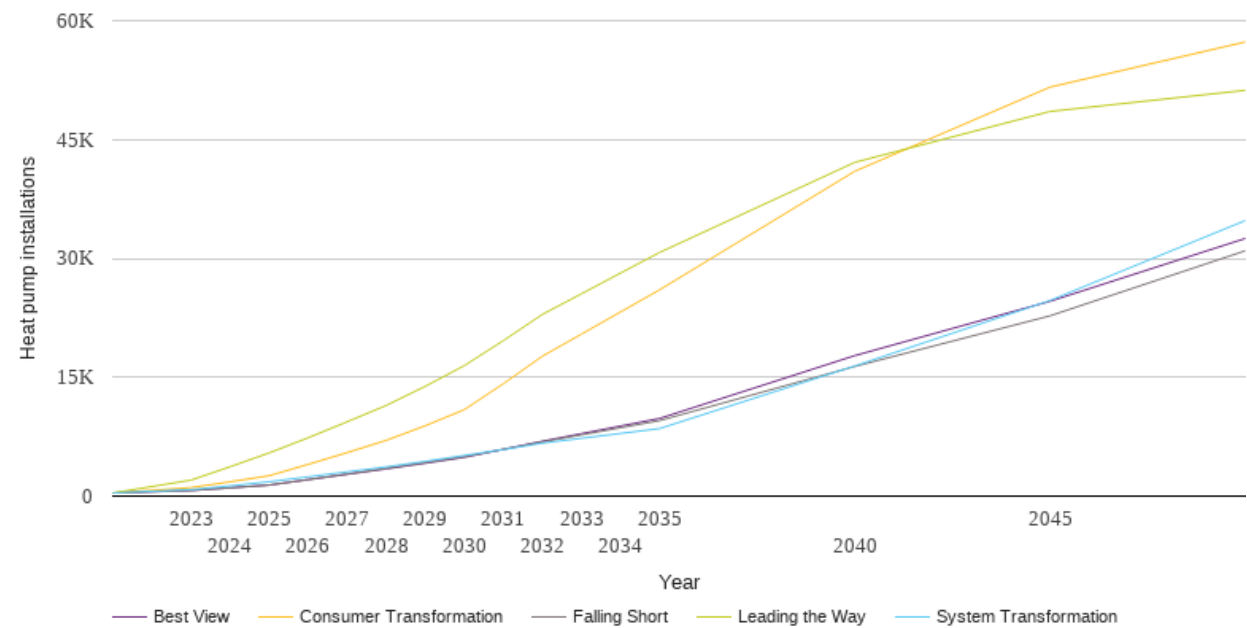
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	889	889	889	889	889
2023	1138	1197	1718	1456	1718
2024	1456	1617	3260	2305	3260
2025	1856	2159	4243	3451	4243
2026	2341	2851	5614	4959	5614
2027	2919	3734	7355	6904	7355
2028	3601	4829	9871	9361	9871
2029	4382	6170	11716	12468	11716
2030	5274	7781	14671	16107	14671
2031	6619	9982	19176	20700	19176
2032	8220	12714	23334	25725	23334
2033	10109	15935	25956	30971	25956
2034	12265	19565	30320	35815	30320
2035	14657	23520	34344	39947	34344
2040	30308	41982	45045	45652	45045
2045	44082	43723	46711	46958	46711
2050	45624	44794	47478	47227	47478



Technology Summary: Heat pumps

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

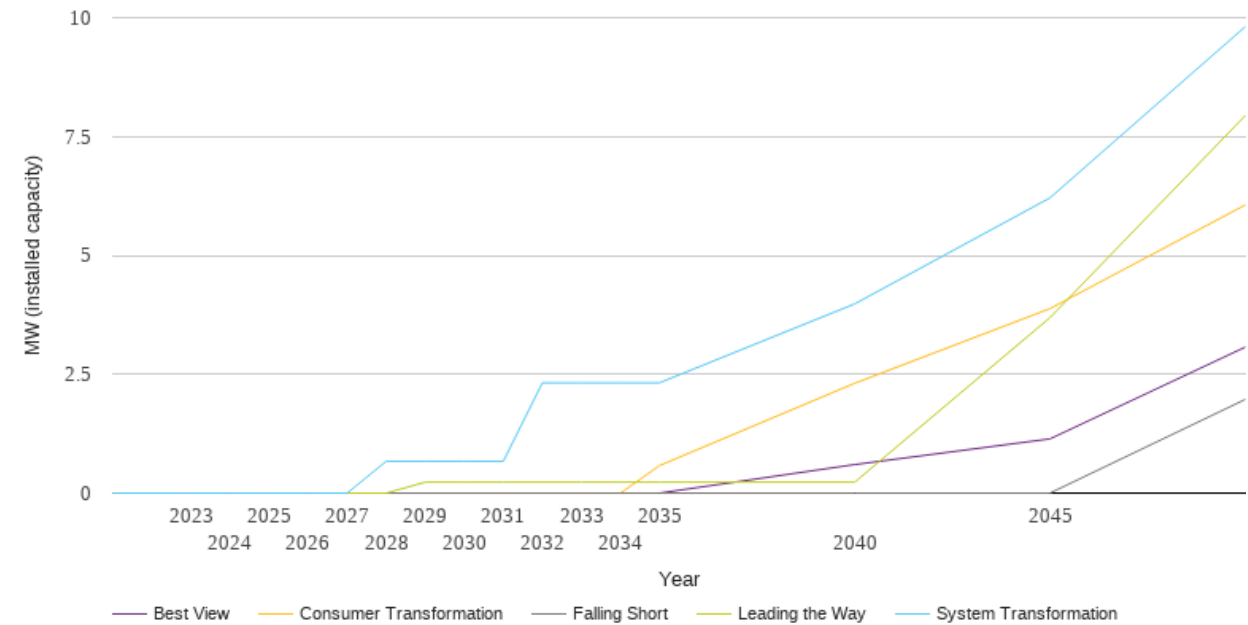
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	392	392	392	392	392
2023	710	820	1070	2015	710
2024	1044	1283	1800	3704	1044
2025	1392	1807	2569	5449	1392
2026	2096	2431	4001	7364	2071
2027	2797	3060	5492	9383	2751
2028	3502	3685	7038	11444	3434
2029	4232	4389	8881	13853	4153
2030	4972	5131	10911	16464	4891
2031	5905	5872	14182	19620	5904
2032	6837	6684	17653	22932	6924
2033	7730	7298	20443	25530	7878
2034	8628	7904	23235	28142	8836
2035	9525	8521	26028	30744	9798
2040	16360	16420	40995	42120	17725
2045	22745	24681	51611	48543	24582
2050	30954	34774	57314	51209	32510



Technology Summary: Hydrogen electrolysis

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

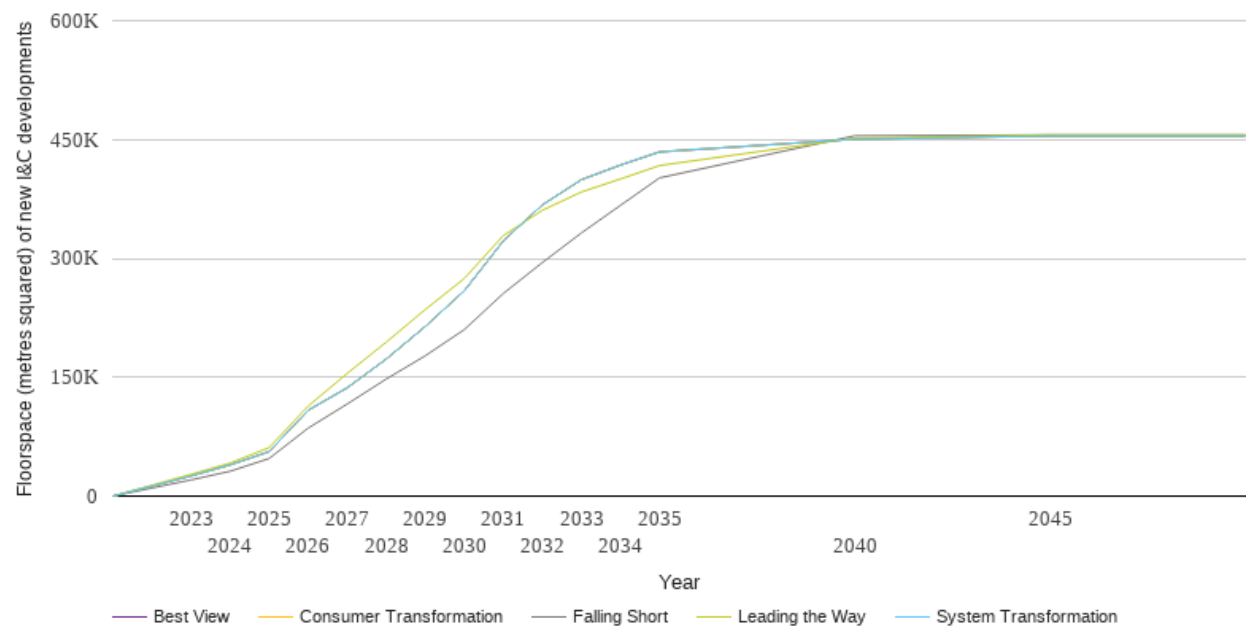
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0	0.0
2028	0.0	0.7	0.0	0.0	0.0
2029	0.0	0.7	0.0	0.2	0.0
2030	0.0	0.7	0.0	0.2	0.0
2031	0.0	0.7	0.0	0.2	0.0
2032	0.0	2.3	0.0	0.2	0.0
2033	0.0	2.3	0.0	0.2	0.0
2034	0.0	2.3	0.0	0.2	0.0
2035	0.0	2.3	0.6	0.2	0.0
2040	0.0	4.0	2.3	0.2	0.6
2045	0.0	6.2	3.9	3.7	1.1
2050	2.0	9.8	6.1	7.9	3.1



Technology Summary: Non domestic

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

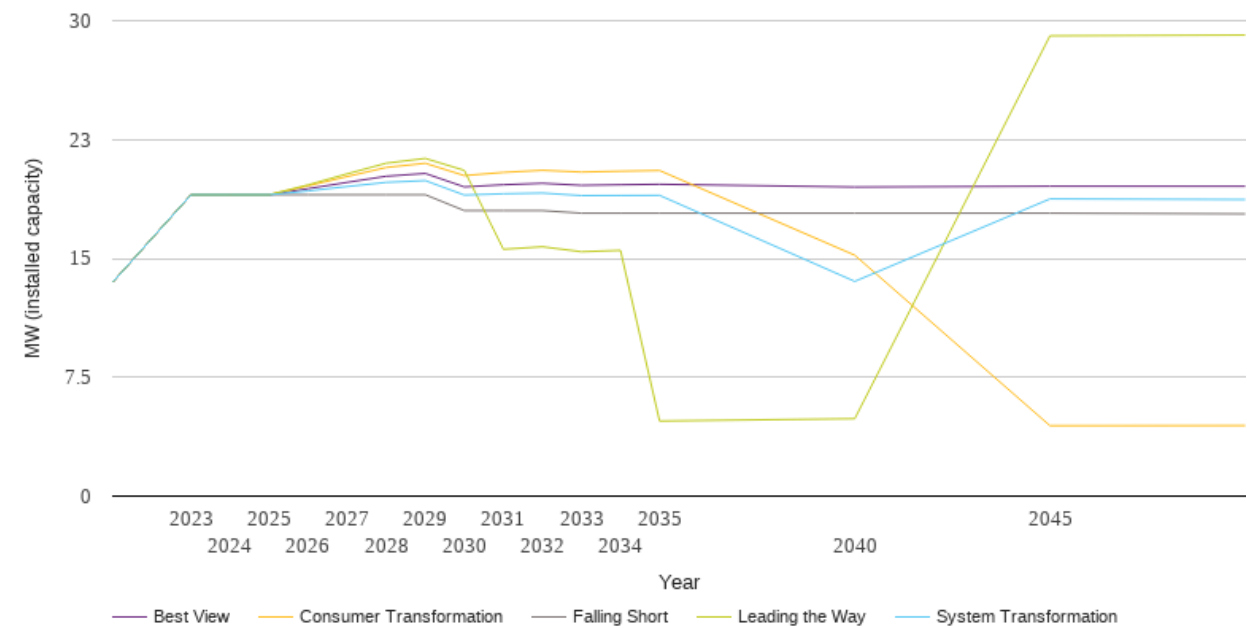
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	20438	25393	25393	27491	25393
2024	31344	39348	39348	41605	39348
2025	47427	56137	56137	61187	56137
2026	85797	108296	108296	113580	108296
2027	116201	136654	136654	154821	136654
2028	147768	172982	172982	194289	172982
2029	177068	214086	214086	235465	214086
2030	210119	259115	259115	274641	259115
2031	255743	322139	322139	328906	322139
2032	294772	367542	367542	360754	367542
2033	332190	399373	399373	383873	399373
2034	366985	417792	417792	400229	417792
2035	401613	434408	434408	417165	434408
2040	454705	450428	450428	451816	450428
2045	455867	454492	454492	455867	454492
2050	455867	454492	454492	455867	454492



Technology Summary: Other Distributed Generation

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

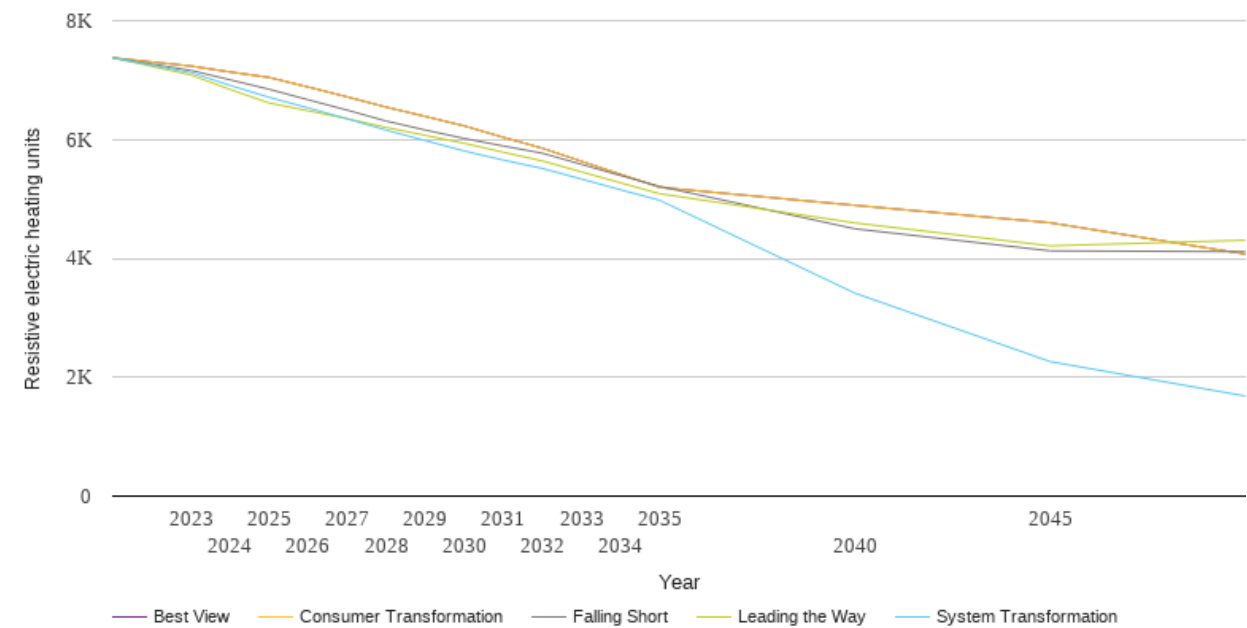
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	13.5	13.5	13.5	13.5	13.5
2023	19.0	19.0	19.0	19.0	19.0
2024	19.0	19.0	19.0	19.0	19.0
2025	19.0	19.0	19.0	19.0	19.0
2026	19.0	19.3	19.6	19.6	19.4
2027	19.0	19.5	20.2	20.3	19.8
2028	19.0	19.8	20.7	21.0	20.2
2029	19.0	19.9	21.0	21.3	20.4
2030	18.0	19.0	20.2	20.6	19.5
2031	18.0	19.1	20.4	15.6	19.6
2032	18.0	19.1	20.6	15.7	19.7
2033	17.9	19.0	20.4	15.4	19.6
2034	17.9	19.0	20.5	15.5	19.6
2035	17.9	19.0	20.5	4.7	19.7
2040	17.9	13.5	15.2	4.9	19.5
2045	17.9	18.8	4.4	29.0	19.6
2050	17.8	18.7	4.5	29.1	19.5



Technology Summary: Resistive electric heating

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

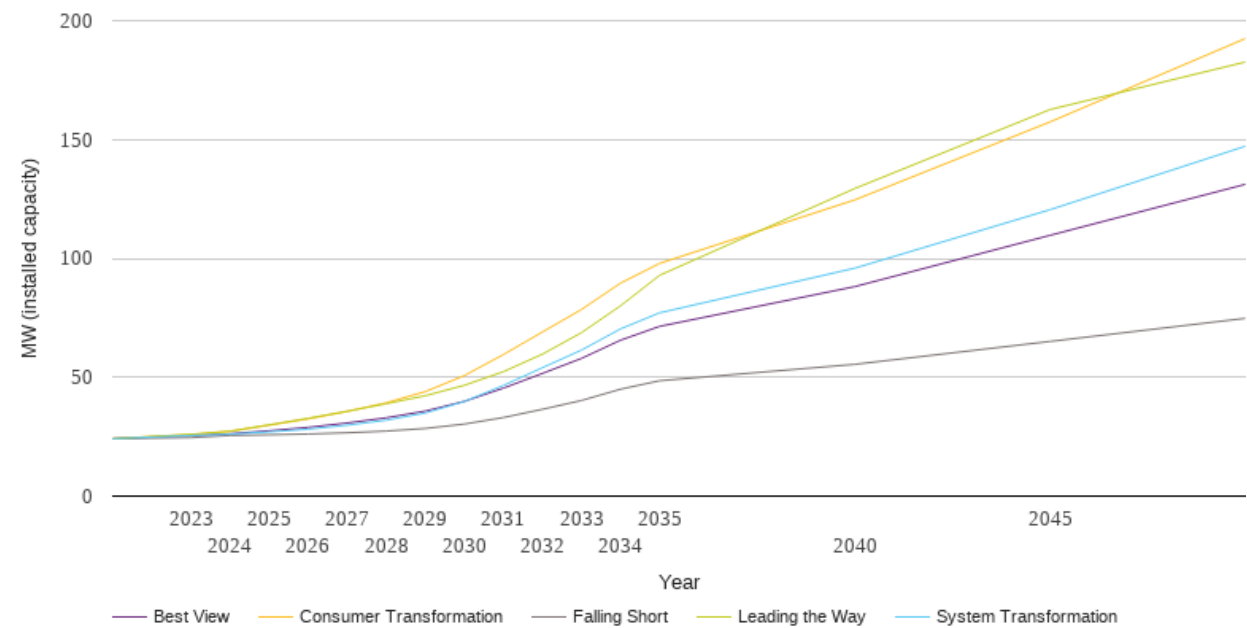
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	7374	7374	7374	7374	7374
2023	7163	7126	7236	7086	7236
2024	7005	6911	7137	6842	7137
2025	6846	6711	7045	6615	7045
2026	6669	6532	6884	6484	6884
2027	6495	6348	6718	6352	6718
2028	6311	6158	6545	6203	6545
2029	6160	5983	6389	6071	6389
2030	6018	5807	6229	5936	6229
2031	5891	5654	6036	5786	6036
2032	5770	5514	5854	5640	5854
2033	5582	5335	5634	5456	5634
2034	5395	5155	5415	5272	5415
2035	5213	4979	5196	5089	5196
2040	4498	3416	4893	4597	4893
2045	4127	2264	4600	4211	4600
2050	4113	1684	4073	4306	4073



Technology Summary: Solar Generation

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

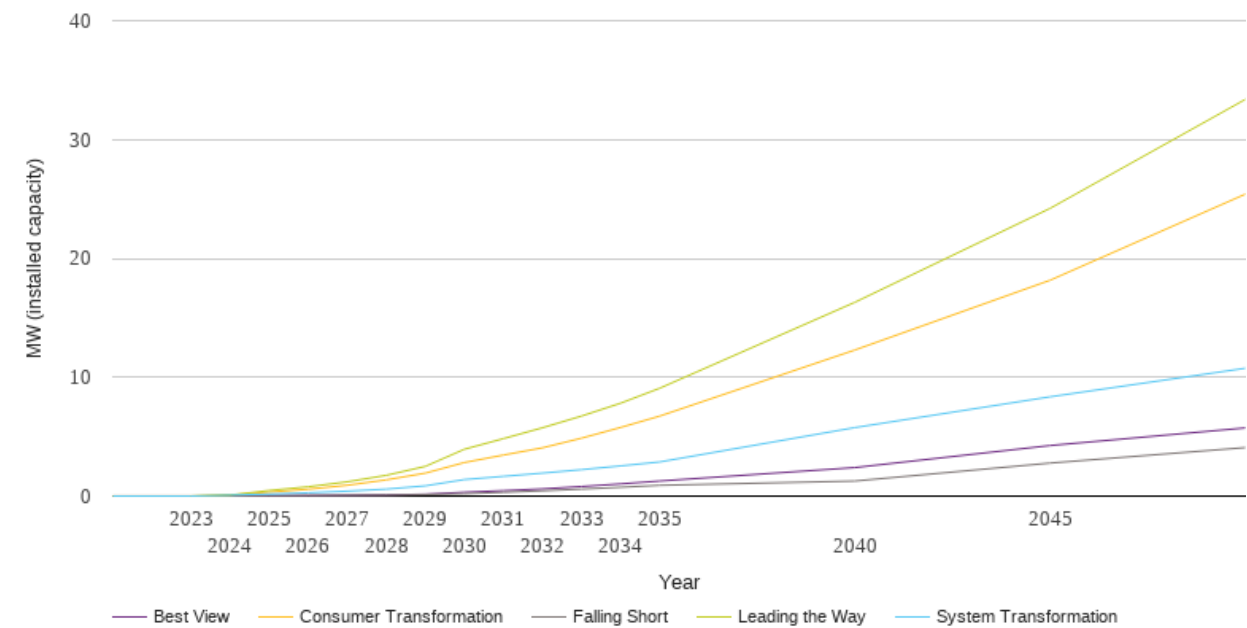
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	24.1	24.1	24.1	24.1	24.1
2023	24.6	25.5	25.9	26.0	25.5
2024	25.5	26.1	27.2	27.3	26.2
2025	25.8	27.0	29.8	30.0	27.5
2026	26.1	28.1	32.5	32.7	28.9
2027	26.6	29.8	35.6	35.7	30.8
2028	27.3	31.9	39.3	38.9	32.9
2029	28.5	35.0	44.0	42.2	35.8
2030	30.3	39.8	50.7	46.6	39.8
2031	33.0	46.5	59.5	52.3	45.4
2032	36.5	54.0	69.0	59.7	51.6
2033	40.2	61.4	78.5	68.7	57.9
2034	45.0	70.3	89.6	80.0	65.6
2035	48.5	77.1	97.9	92.9	71.4
2040	55.4	95.9	124.6	129.4	88.1
2045	65.1	120.5	157.4	162.6	109.7
2050	74.8	147.2	192.5	182.6	131.1



Technology Summary: Storage

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

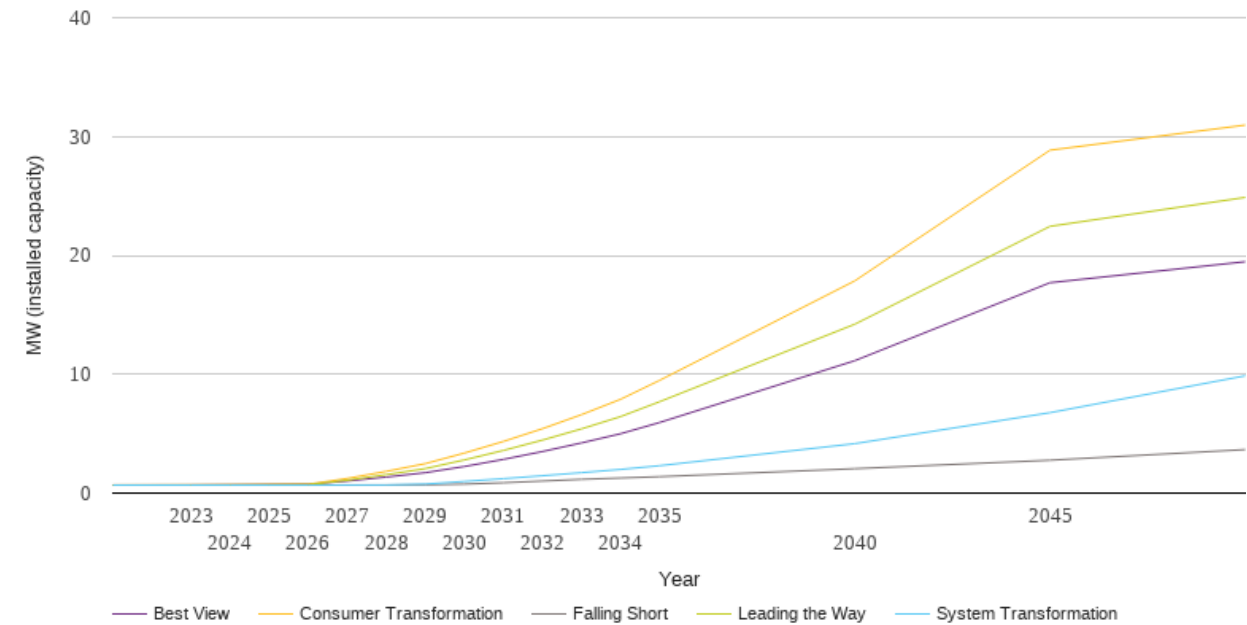
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.1	0.1	0.1	0.0
2025	0.0	0.2	0.3	0.5	0.0
2026	0.1	0.3	0.6	0.8	0.1
2027	0.1	0.4	0.9	1.2	0.1
2028	0.1	0.6	1.4	1.7	0.1
2029	0.1	0.9	1.9	2.5	0.2
2030	0.2	1.4	2.8	3.9	0.3
2031	0.3	1.7	3.5	4.8	0.5
2032	0.4	1.9	4.1	5.7	0.6
2033	0.6	2.2	4.9	6.7	0.8
2034	0.7	2.5	5.8	7.8	1.0
2035	0.9	2.9	6.7	9.1	1.3
2040	1.3	5.8	12.3	16.3	2.4
2045	2.8	8.4	18.2	24.2	4.3
2050	4.1	10.8	25.4	33.4	5.7



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	0.7	0.7	0.7	0.7	0.7
2023	0.7	0.7	0.7	0.7	0.7
2024	0.7	0.7	0.7	0.7	0.7
2025	0.7	0.7	0.7	0.7	0.7
2026	0.7	0.7	0.7	0.7	0.7
2027	0.7	0.7	1.2	1.1	1.0
2028	0.7	0.7	1.8	1.5	1.3
2029	0.7	0.8	2.5	2.1	1.7
2030	0.8	1.0	3.4	2.8	2.2
2031	0.9	1.2	4.3	3.6	2.8
2032	1.0	1.5	5.4	4.5	3.5
2033	1.2	1.7	6.6	5.4	4.2
2034	1.3	2.0	7.9	6.4	5.0
2035	1.4	2.3	9.5	7.7	5.9
2040	2.1	4.2	17.9	14.2	11.1
2045	2.8	6.8	28.8	22.4	17.7
2050	3.7	9.9	31.0	24.9	19.5



National Grid Electricity Distribution PLC 09223384)
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