

# Distribution Future Energy Scenarios 2022

Local Authority:  
Torfaen

## What are Distribution Future Energy Scenarios?

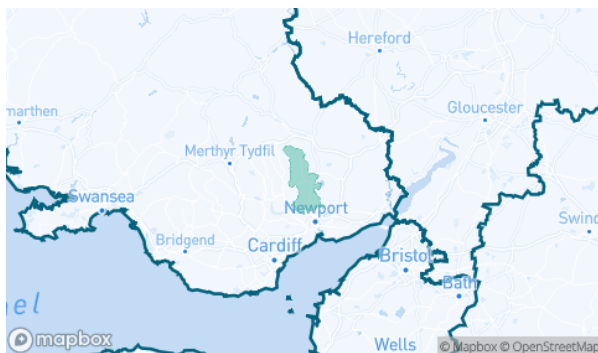
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Torfaen 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 Torfaen 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	114	420	331	331	114	13151	6328	6328	114
Domestic	New dwellings	0	1911	2097	2097	2485	3410	3371	3371	3342
Electric vehicles	Electric vehicles	509	7733	9995	18712	18737	61055	56559	57262	46598
EV Charge Point	EV charge points	269	3409	5188	9856	10803	32040	32126	32248	33588
Heat pumps	Heat pump installations	139	1551	1493	5505	9734	20915	24490	41931	34416
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	0.0	0.0	0.5	0.9	2.3	1.6	3.1
Non domestic	Floorspace (metres squared) of new I&C developments	0	79155	92721	92721	100644	174287	174287	174287	174287
Other Distributed Generation	MW (installed capacity)	0.4	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.0
Resistive electric heating	Resistive electric heating units	1107	1112	1026	1082	1070	1009	499	854	911
Solar Generation	MW (installed capacity)	14.9	17.8	22.9	30.6	30.0	34.8	64.1	95.8	96.4
Storage	MW (installed capacity)	0.0	0.4	1.0	2.2	3.4	3.8	9.4	21.1	25.9
Wind	MW (installed capacity)	0.0	0.1	0.2	1.3	1.1	2.0	5.5	17.1	13.5

## 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

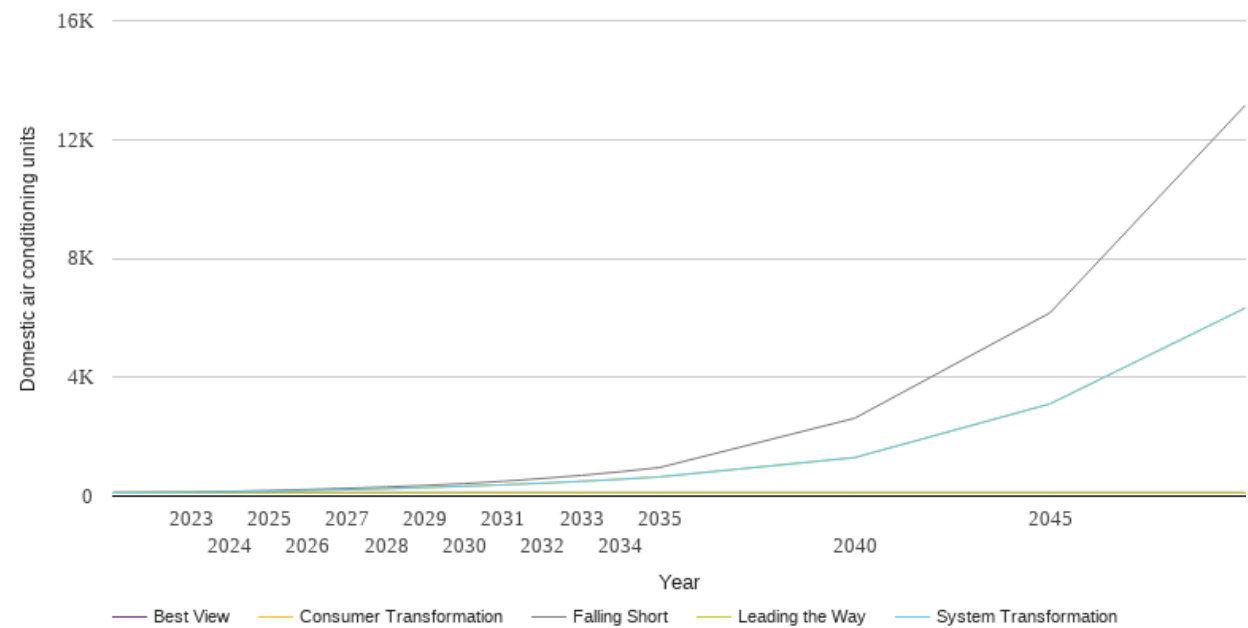
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

If you have any comments or queries regarding these reports, please contact [nged.energyplanning@nationalgrid.co.uk](mailto:nged.energyplanning@nationalgrid.co.uk).

# Technology Summary: Air conditioning

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

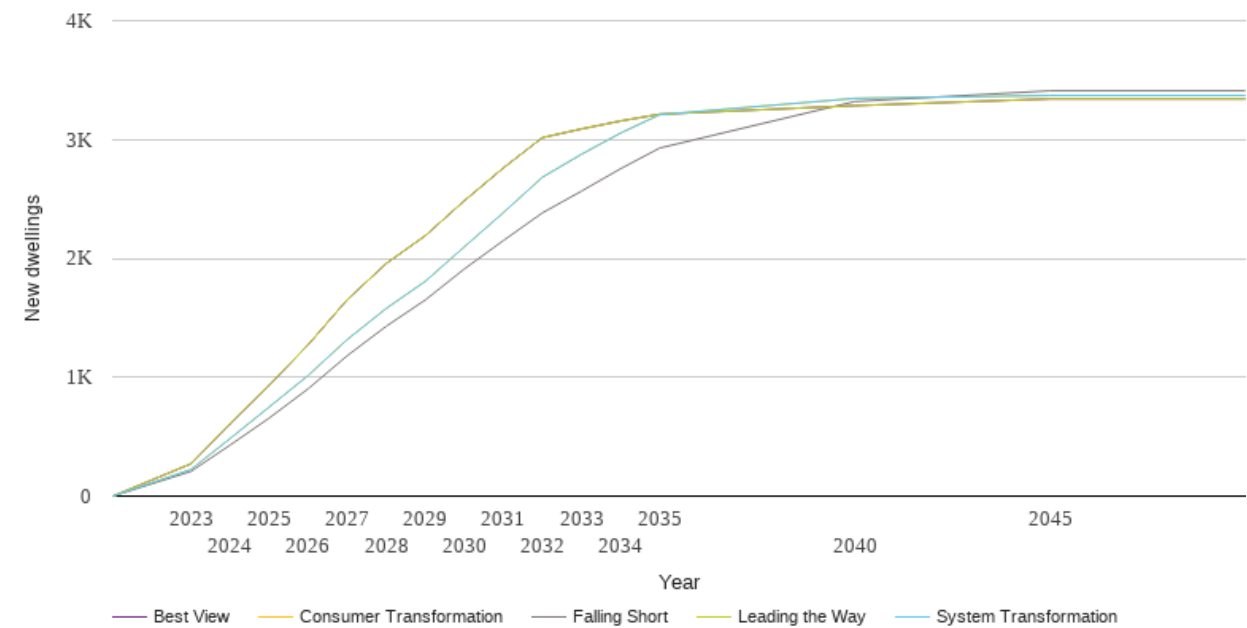
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	114	114	114	114	114
2023	131	128	128	114	114
2024	157	143	143	114	114
2025	188	160	160	114	114
2026	222	186	186	114	114
2027	262	216	216	114	114
2028	306	250	250	114	114
2029	359	289	289	114	114
2030	420	331	331	114	114
2031	500	380	380	114	114
2032	592	434	434	114	114
2033	697	496	496	114	114
2034	820	567	567	114	114
2035	960	646	646	114	114
2040	2622	1297	1297	114	114
2045	6168	3103	3103	114	114
2050	13151	6328	6328	114	114



# Technology Summary: Domestic

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

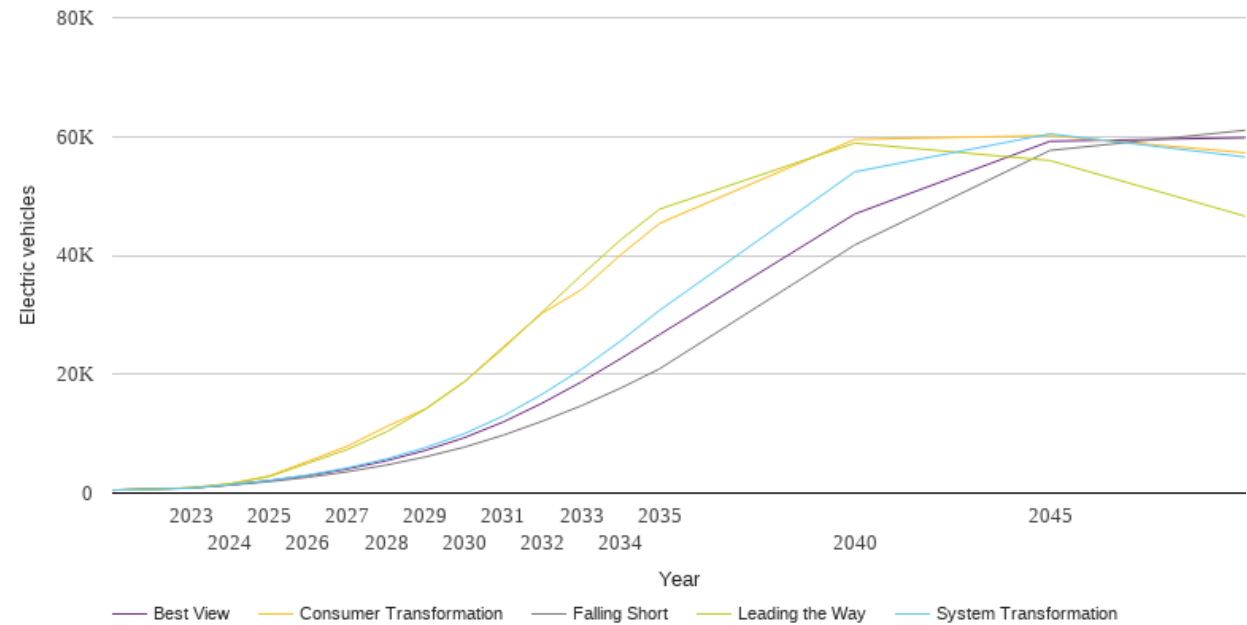
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	208	224	224	272	272
2024	429	484	484	608	608
2025	656	749	749	931	931
2026	903	1015	1015	1273	1273
2027	1181	1317	1317	1652	1652
2028	1429	1579	1579	1957	1957
2029	1650	1807	1807	2191	2191
2030	1911	2097	2097	2485	2485
2031	2150	2385	2385	2761	2761
2032	2383	2683	2683	3016	3016
2033	2566	2876	2876	3089	3089
2034	2754	3054	3054	3156	3156
2035	2928	3209	3209	3213	3213
2040	3320	3346	3346	3285	3285
2045	3410	3371	3371	3342	3342
2050	3410	3371	3371	3342	3342



# Technology Summary: Electric vehicles

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

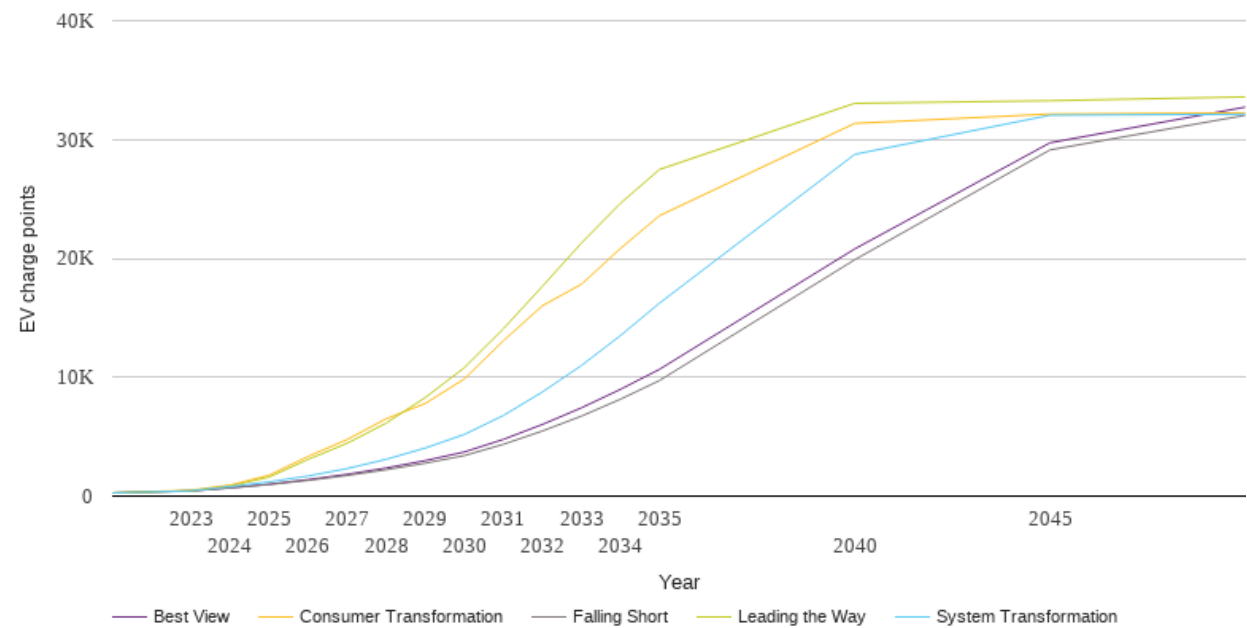
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	509	509	509	509	509
2023	841	839	895	869	850
2024	1340	1431	1593	1554	1394
2025	1930	2119	2880	2776	2088
2026	2668	3044	5357	5048	2944
2027	3593	4239	7884	7339	4048
2028	4719	5751	11168	10281	5435
2029	6091	7645	14154	14097	7180
2030	7733	9995	18712	18737	9320
2031	9748	12989	24640	24358	11980
2032	12110	16656	30287	30496	15151
2033	14707	20825	34229	36688	18711
2034	17650	25585	40078	42599	22609
2035	20913	30746	45396	47777	26679
2040	41749	54056	59519	58895	46967
2045	57662	60453	60164	55955	59198
2050	61055	56559	57262	46598	59806



# 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	269	269	269	269	269
2023	432	441	493	444	434
2024	689	804	924	838	697
2025	974	1193	1752	1605	1001
2026	1322	1690	3338	3089	1386
2027	1734	2315	4762	4447	1833
2028	2218	3095	6508	6144	2364
2029	2769	4046	7795	8291	2983
2030	3409	5188	9856	10803	3712
2031	4358	6783	13066	14073	4772
2032	5480	8760	16015	17650	6030
2033	6730	10991	17825	21295	7428
2034	8154	13507	20839	24641	8983
2035	9725	16238	23599	27484	10670
2040	19888	28755	31357	33047	20797
2045	29128	32043	32146	33267	29726
2050	32040	32126	32248	33588	32728

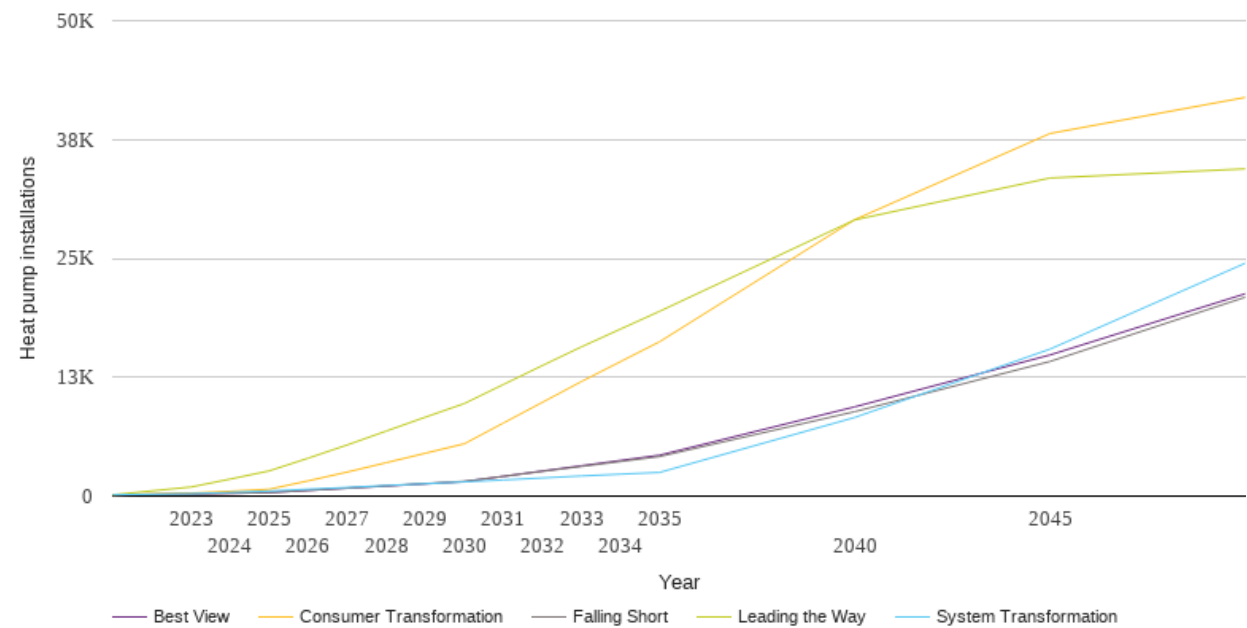




# Technology Summary: Heat pumps

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

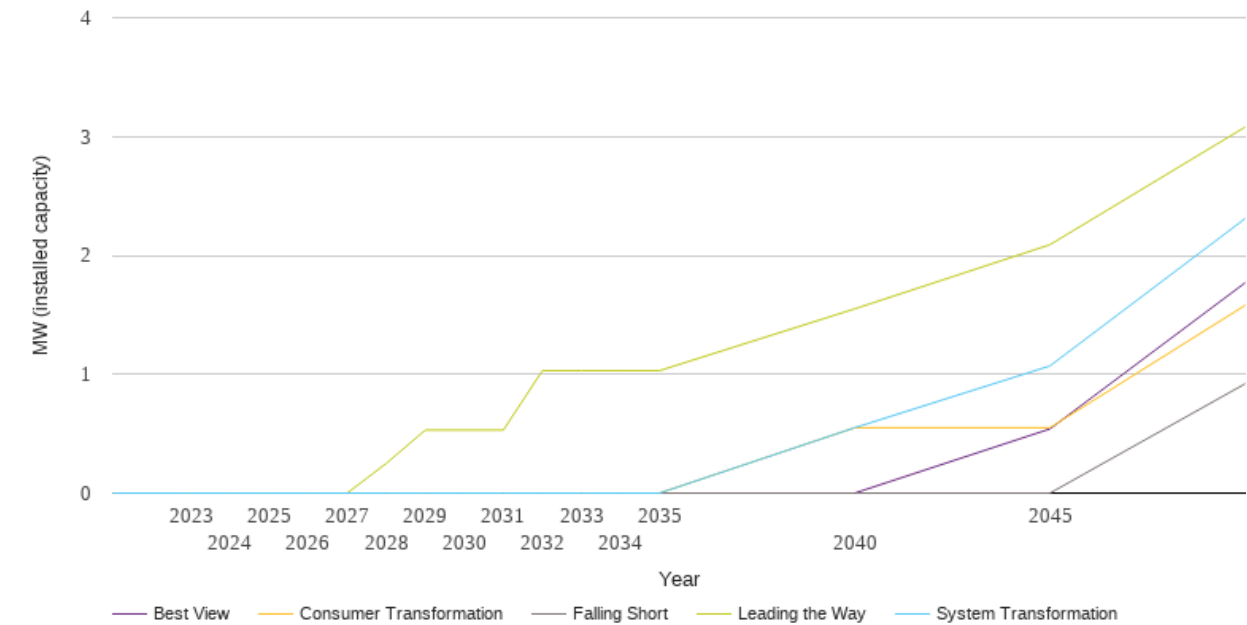
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	139	139	139	139	139
2023	212	255	316	955	212
2024	292	386	506	1786	292
2025	373	534	718	2647	373
2026	605	723	1603	3986	598
2027	842	909	2527	5378	830
2028	1078	1115	3514	6840	1060
2029	1317	1302	4505	8299	1290
2030	1551	1493	5505	9734	1519
2031	2074	1698	7684	11737	2075
2032	2602	1906	9863	13731	2640
2033	3120	2119	12050	15698	3190
2034	3638	2306	14143	17565	3745
2035	4158	2489	16230	19430	4300
2040	8883	8272	29076	29051	9388
2045	14157	15456	38134	33454	14843
2050	20915	24490	41931	34416	21277



# Technology Summary: Hydrogen electrolysis

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

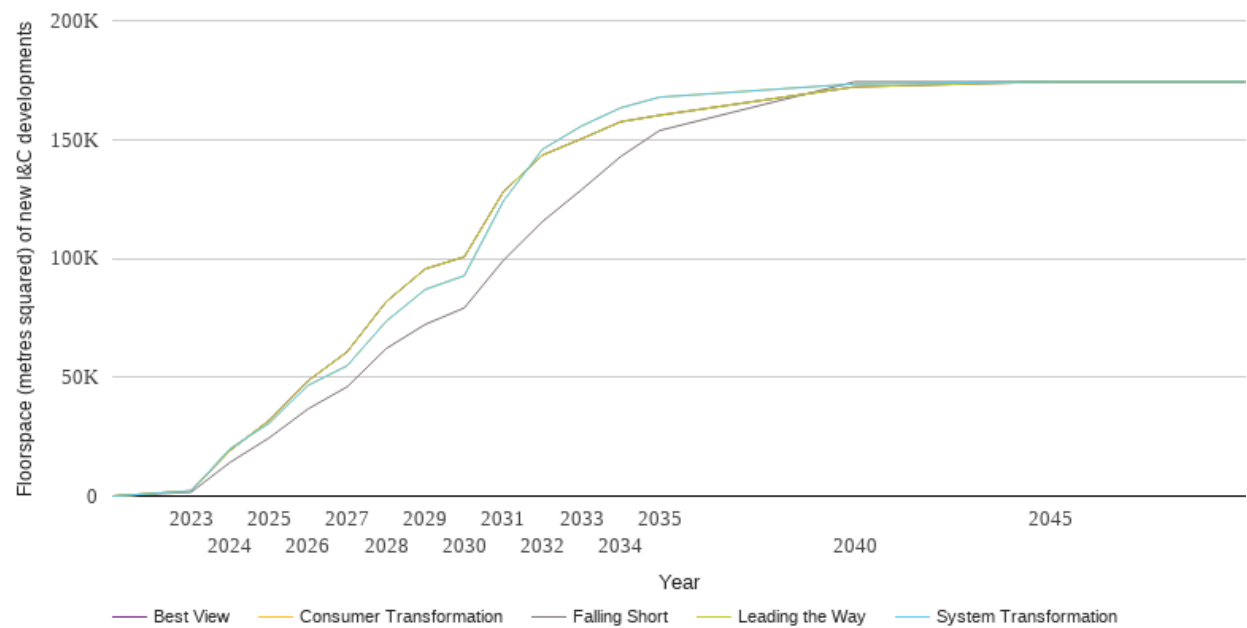
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0	0.0
2028	0.0	0.0	0.0	0.3	0.0
2029	0.0	0.0	0.0	0.5	0.0
2030	0.0	0.0	0.0	0.5	0.0
2031	0.0	0.0	0.0	0.5	0.0
2032	0.0	0.0	0.0	1.0	0.0
2033	0.0	0.0	0.0	1.0	0.0
2034	0.0	0.0	0.0	1.0	0.0
2035	0.0	0.0	0.0	1.0	0.0
2040	0.0	0.6	0.6	1.6	0.0
2045	0.0	1.1	0.6	2.1	0.5
2050	0.9	2.3	1.6	3.1	1.8



# Technology Summary: Non domestic

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

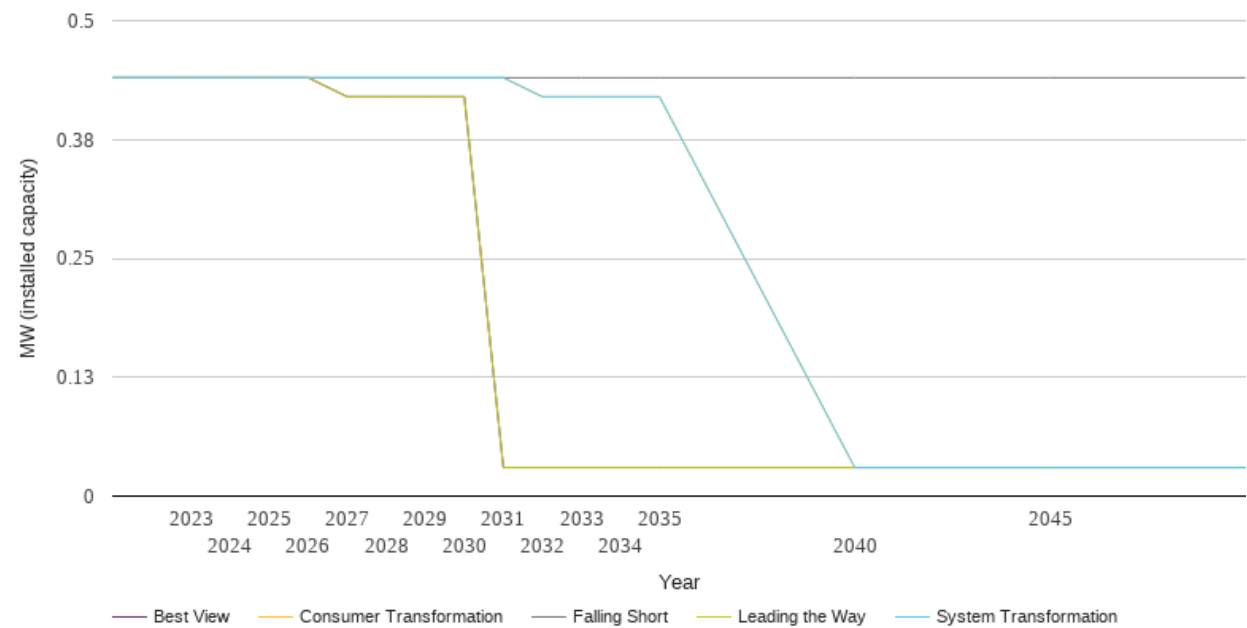
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	1633	2100	2100	2217	2217
2024	14187	19980	19980	19217	19217
2025	24498	30643	30643	31854	31854
2026	36697	46595	46595	48508	48508
2027	45995	54840	54840	60710	60710
2028	62077	73568	73568	81792	81792
2029	72225	86923	86923	95573	95573
2030	79155	92721	92721	100644	100644
2031	99165	124087	124087	128033	128033
2032	115475	145860	145860	143431	143431
2033	128869	155674	155674	150291	150291
2034	142776	163301	163301	157443	157443
2035	153791	167813	167813	160220	160220
2040	174287	173412	173412	172167	172167
2045	174287	174287	174287	174287	174287



# Technology Summary: Other Distributed Generation

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

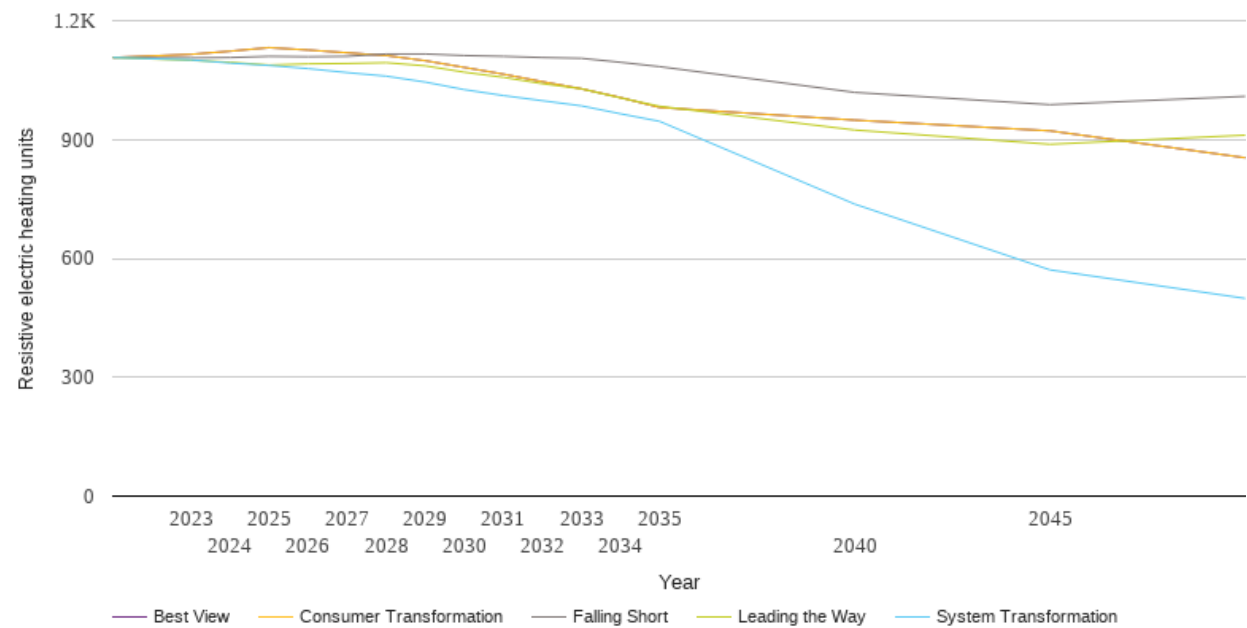
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.4	0.4	0.4	0.4	0.4
2023	0.4	0.4	0.4	0.4	0.4
2024	0.4	0.4	0.4	0.4	0.4
2025	0.4	0.4	0.4	0.4	0.4
2026	0.4	0.4	0.4	0.4	0.4
2027	0.4	0.4	0.4	0.4	0.4
2028	0.4	0.4	0.4	0.4	0.4
2029	0.4	0.4	0.4	0.4	0.4
2030	0.4	0.4	0.4	0.4	0.4
2031	0.4	0.4	0.4	0.0	0.0
2032	0.4	0.4	0.4	0.0	0.0
2033	0.4	0.4	0.4	0.0	0.0
2034	0.4	0.4	0.4	0.0	0.0
2035	0.4	0.4	0.4	0.0	0.0
2040	0.4	0.0	0.0	0.0	0.0
2045	0.4	0.0	0.0	0.0	0.0
2050	0.4	0.0	0.0	0.0	0.0



# Technology Summary: Resistive electric heating

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

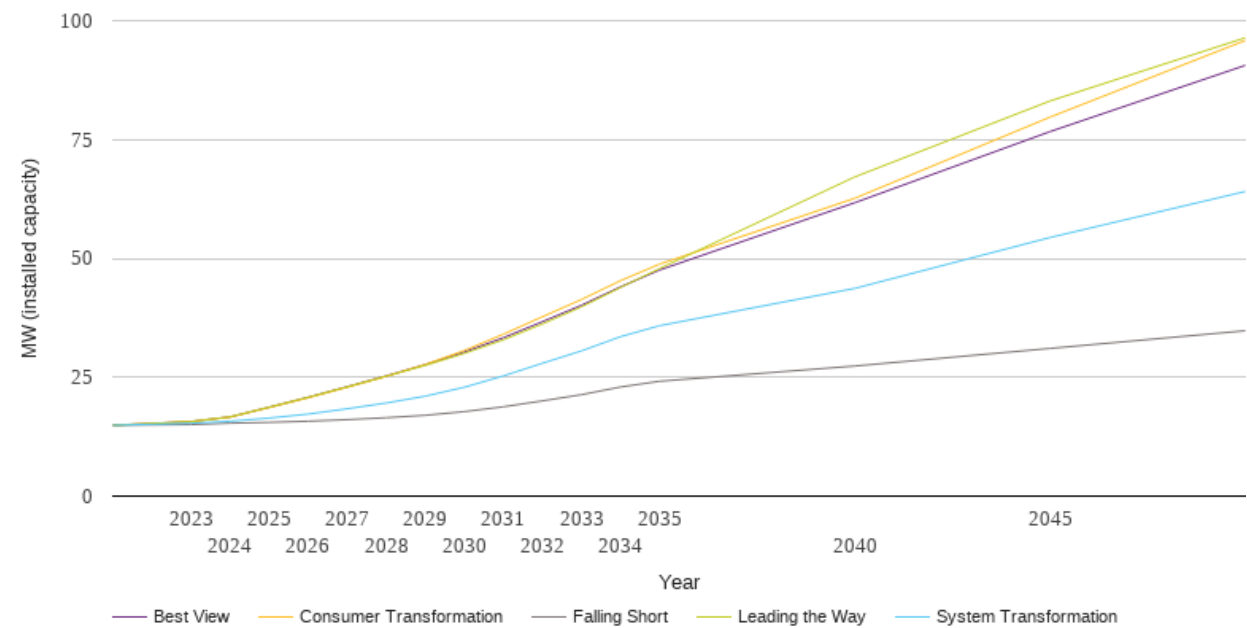
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1107	1107	1107	1107	1107
2023	1106	1101	1115	1100	1115
2024	1107	1093	1123	1095	1123
2025	1110	1087	1132	1088	1132
2026	1109	1079	1126	1091	1126
2027	1110	1069	1119	1092	1119
2028	1116	1060	1112	1094	1112
2029	1116	1045	1099	1086	1099
2030	1112	1026	1082	1070	1082
2031	1110	1011	1065	1057	1065
2032	1107	998	1046	1041	1046
2033	1105	985	1028	1028	1028
2034	1095	965	1006	1005	1006
2035	1084	946	981	984	981
2040	1019	737	949	924	949
2045	988	571	922	888	922
2050	1009	499	854	911	854



# Technology Summary: Solar Generation

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

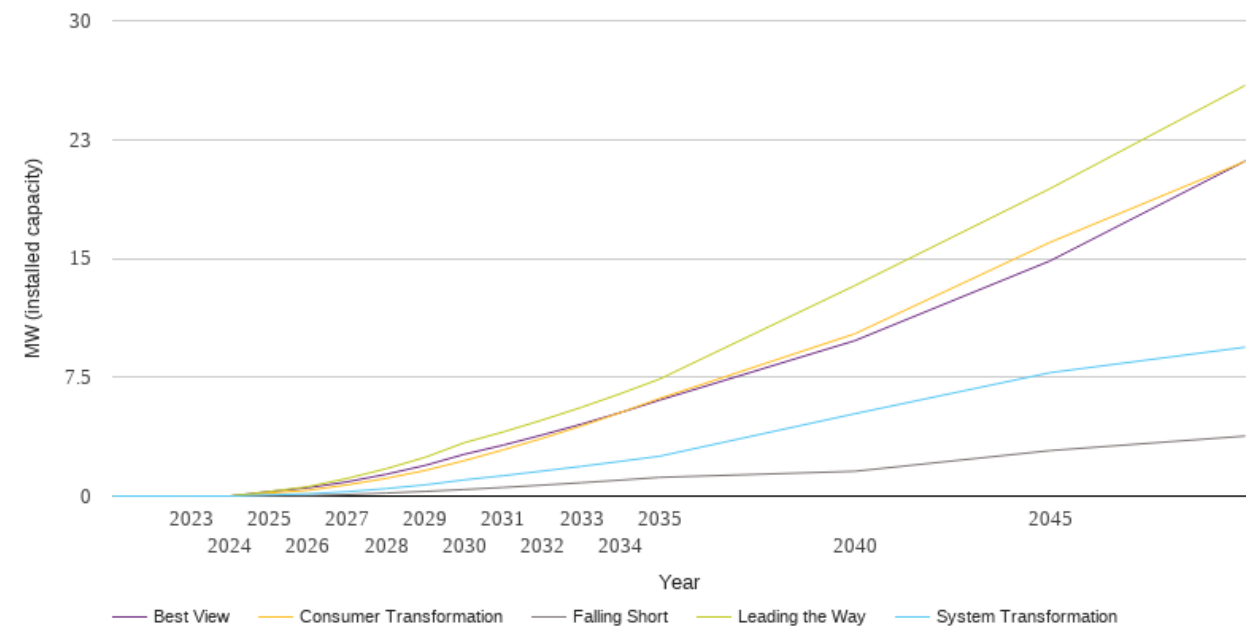
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	14.9	14.9	14.9	14.9	14.9
2023	15.0	15.3	15.7	15.7	15.7
2024	15.3	15.7	16.6	16.7	16.7
2025	15.5	16.4	18.6	18.7	18.7
2026	15.8	17.3	20.7	20.8	20.8
2027	16.1	18.4	22.9	23.0	23.0
2028	16.5	19.6	25.2	25.2	25.3
2029	17.0	21.0	27.7	27.5	27.7
2030	17.8	22.9	30.6	30.0	30.3
2031	18.8	25.3	34.0	32.9	33.3
2032	20.0	27.9	37.7	36.2	36.7
2033	21.3	30.5	41.3	39.8	40.1
2034	22.9	33.5	45.3	43.9	44.0
2035	24.2	35.8	48.8	47.8	47.6
2040	27.4	43.7	62.6	67.1	61.7
2045	31.1	54.4	79.7	83.1	76.7
2050	34.8	64.1	95.8	96.4	90.6



# Technology Summary: Storage

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

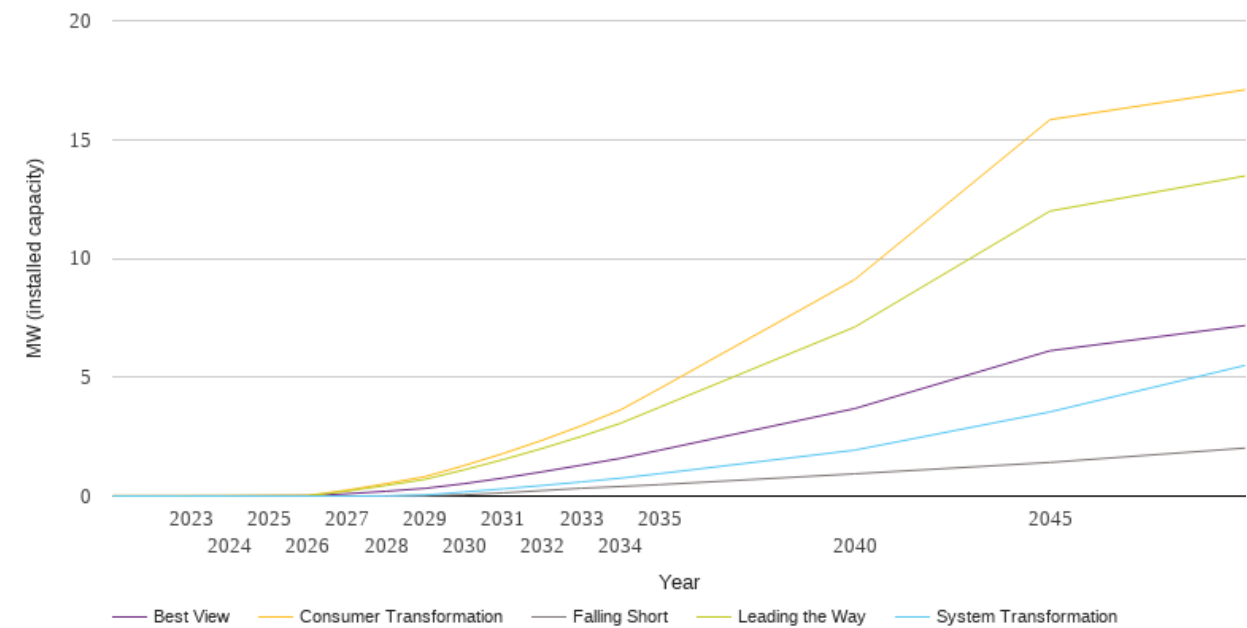
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.1	0.2	0.3	0.3
2026	0.0	0.1	0.4	0.6	0.5
2027	0.1	0.3	0.7	1.1	0.9
2028	0.2	0.5	1.1	1.7	1.4
2029	0.3	0.7	1.6	2.4	1.9
2030	0.4	1.0	2.2	3.4	2.6
2031	0.5	1.3	2.9	4.1	3.2
2032	0.7	1.6	3.6	4.8	3.9
2033	0.8	1.9	4.4	5.6	4.5
2034	1.0	2.2	5.3	6.5	5.3
2035	1.2	2.5	6.2	7.4	6.1
2040	1.6	5.2	10.2	13.3	9.8
2045	2.9	7.8	16.0	19.4	14.8
2050	3.8	9.4	21.1	25.9	21.1



# 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	0.3	0.2	0.1
2028	0.0	0.0	0.5	0.4	0.2
2029	0.0	0.0	0.8	0.7	0.3
2030	0.1	0.2	1.3	1.1	0.5
2031	0.1	0.3	1.8	1.5	0.8
2032	0.2	0.4	2.4	2.0	1.0
2033	0.3	0.6	3.0	2.5	1.3
2034	0.4	0.8	3.6	3.1	1.6
2035	0.5	0.9	4.5	3.7	1.9
2040	0.9	1.9	9.1	7.1	3.7
2045	1.4	3.5	15.8	12.0	6.1
2050	2.0	5.5	17.1	13.5	7.2





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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