

# Distribution Future Energy Scenarios 2022

Local Authority:  
Sheffield

## 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 Sheffield 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 Sheffield 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	3229	1355	1355	0
Domestic	New dwellings	0	193	206	206	245	264	255	255	247
Electric vehicles	Electric vehicles	230	147 2	182 6	336 0	334 6	1131 5	1100 5	1151 1	856 5
EV Charge Point	EV charge points	111	697	101 2	192 3	209 7	5880	5657	6082	606 3
Heat pumps	Heat pump installations	12	285	250	103 2	167 2	3255	3729	6371	571 3
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Non domestic	Floorspace (metres squared) of new I&C developments	0	0	0	0	0	0	0	0	0
Other Distributed Generation	MW (installed capacity)	6.0	6.0	5.8	5.8	5.8	6.0	0.0	0.0	0.0
Resistive electric heating	Resistive electric heating units	287	270	253	263	260	268	134	224	242
Solar Generation	MW (installed capacity)	1.1	1.7	2.4	3.6	3.7	3.1	6.4	11.9	12. 4
Storage	MW (installed capacity)	0.0	0.0	0.1	0.3	0.3	0.5	1.1	2.8	3.5
Wind	MW (installed capacity)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

## 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.

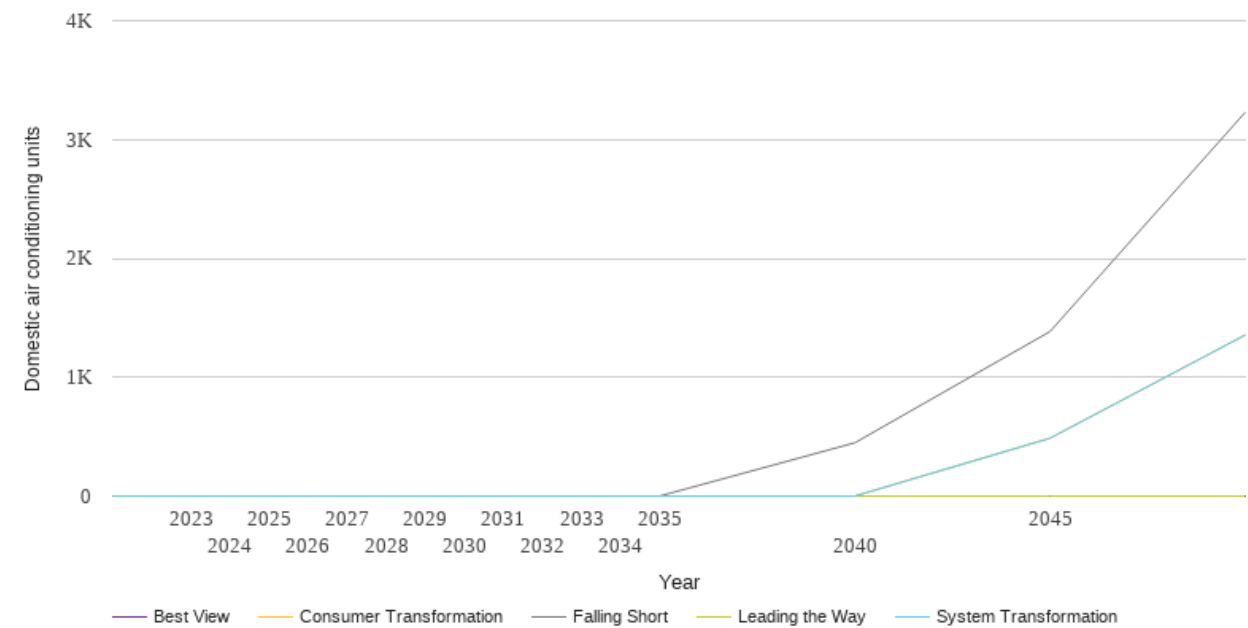
If you have any comments or queries regarding these reports, please contact

[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.

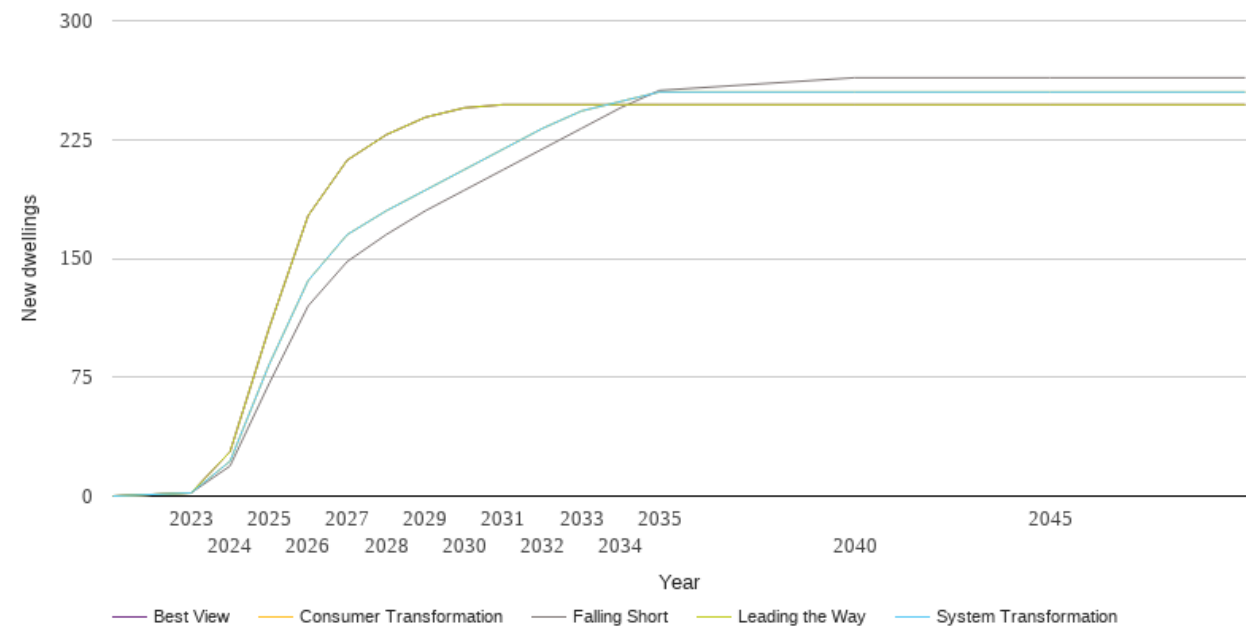
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	0	0	0	0	0
2025	0	0	0	0	0
2026	0	0	0	0	0
2027	0	0	0	0	0
2028	0	0	0	0	0
2029	0	0	0	0	0
2030	0	0	0	0	0
2031	0	0	0	0	0
2032	0	0	0	0	0
2033	0	0	0	0	0
2034	0	0	0	0	0
2035	0	0	0	0	0
2040	448	0	0	0	0
2045	1384	487	487	0	0
2050	3229	1355	1355	0	0



# Technology Summary: Domestic

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

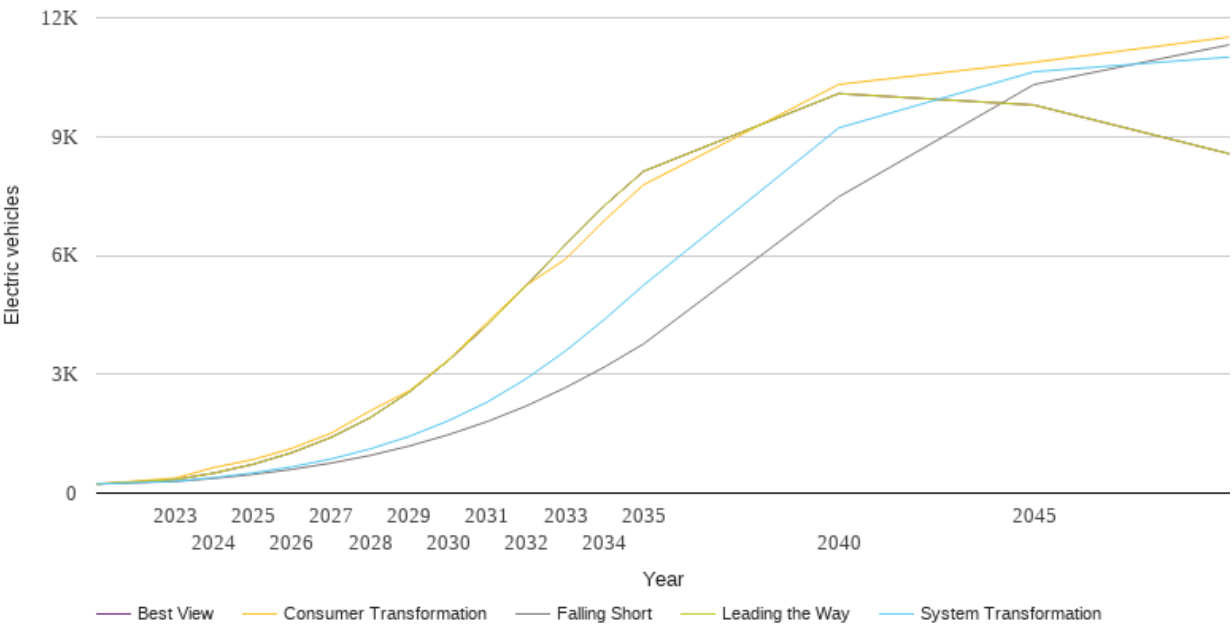
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	2	2	2	2	2
2024	19	22	22	28	28
2025	71	83	83	106	106
2026	120	136	136	177	177
2027	148	165	165	212	212
2028	165	180	180	228	228
2029	180	193	193	239	239
2030	193	206	206	245	245
2031	206	219	219	247	247
2032	219	232	232	247	247
2033	232	243	243	247	247
2034	245	249	249	247	247
2035	256	255	255	247	247
2040	264	255	255	247	247
2045	264	255	255	247	247
2050	264	255	255	247	247



# Technology Summary: Electric vehicles

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

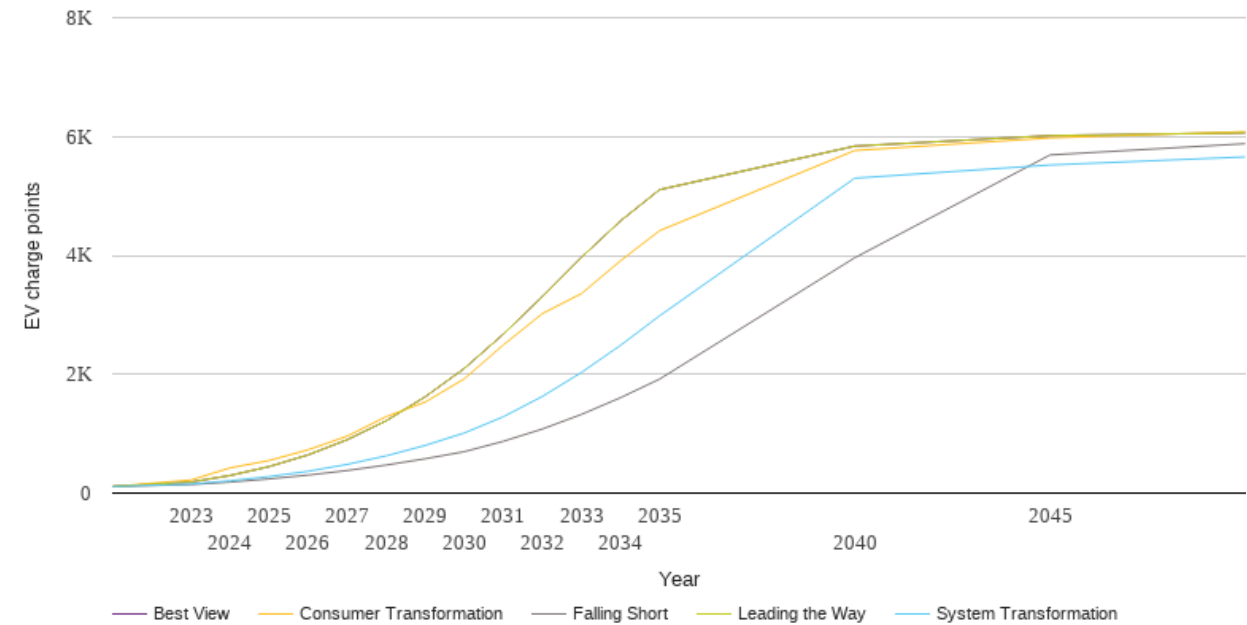
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	230	230	230	230	230
2023	291	299	377	343	343
2024	371	391	647	506	506
2025	472	510	847	728	728
2026	599	663	1133	1023	1023
2027	758	862	1515	1407	1407
2028	951	1116	2076	1905	1905
2029	1188	1432	2581	2553	2553
2030	1472	1826	3360	3346	3346
2031	1806	2299	4315	4245	4245
2032	2199	2888	5246	5244	5244
2033	2661	3587	5904	6271	6271
2034	3182	4384	6886	7258	7258
2035	3765	5247	7781	8123	8123
2040	7479	9218	10315	10084	10084
2045	10313	10634	10875	9795	9795
2050	11315	11005	11511	8565	8565



# 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	111	111	111	111	111
2023	144	152	220	186	186
2024	185	207	424	296	296
2025	239	278	548	446	446
2026	303	367	729	643	643
2027	380	483	959	898	898
2028	472	627	1288	1217	1217
2029	578	803	1532	1622	1622
2030	697	1012	1923	2097	2097
2031	872	1285	2494	2675	2675
2032	1079	1627	3021	3307	3307
2033	1324	2030	3357	3968	3968
2034	1605	2486	3909	4580	4580
2035	1918	2982	4416	5105	5105
2040	3960	5299	5765	5839	5839
2045	5690	5521	5977	6015	6015
2050	5880	5657	6082	6063	6063

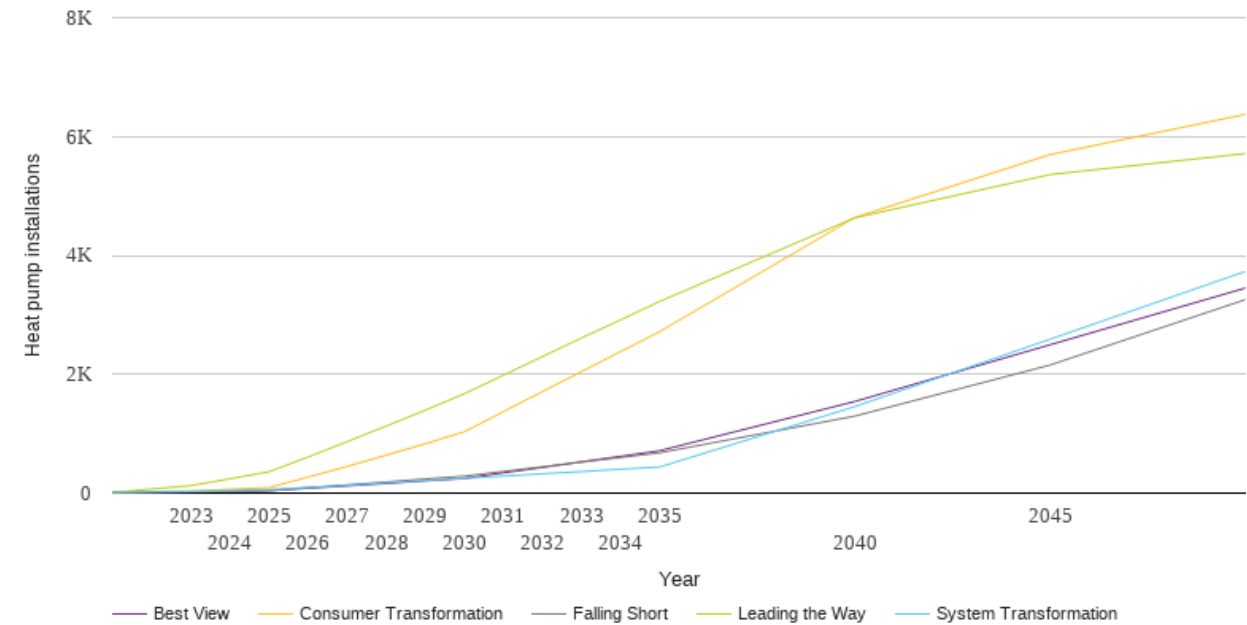




# Technology Summary: Heat pumps

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	12	12	12	12	12
2023	23	27	38	127	23
2024	29	41	64	241	29
2025	41	59	92	359	41
2026	91	96	270	608	83
2027	138	132	449	867	122
2028	187	174	639	1128	163
2029	238	210	830	1395	206
2030	285	250	1032	1672	246
2031	365	285	1369	1983	341
2032	442	325	1708	2296	432
2033	522	362	2044	2609	526
2034	598	402	2379	2914	618
2035	678	438	2715	3224	712
2040	1295	1455	4637	4633	1541
2045	2154	2588	5696	5360	2495
2050	3255	3729	6371	5713	3449



# Technology Summary: Hydrogen electrolysis

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

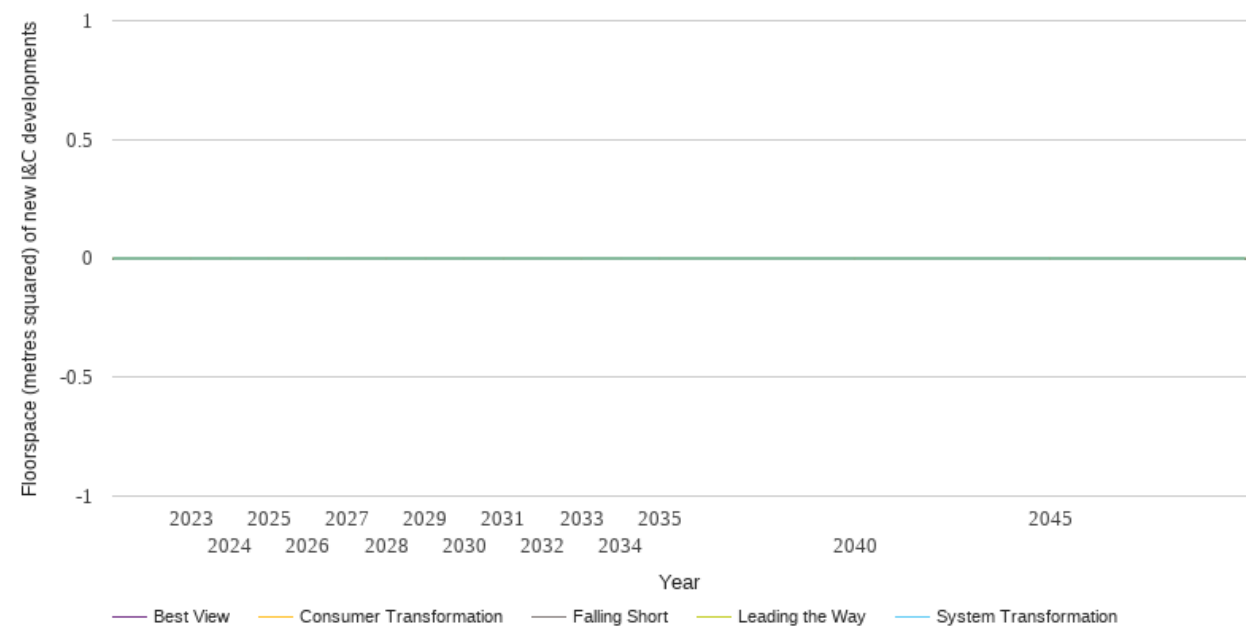
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0	0.0
2028	0.0	0.0	0.0	0.0	0.0
2029	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0



# Technology Summary: Non domestic

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

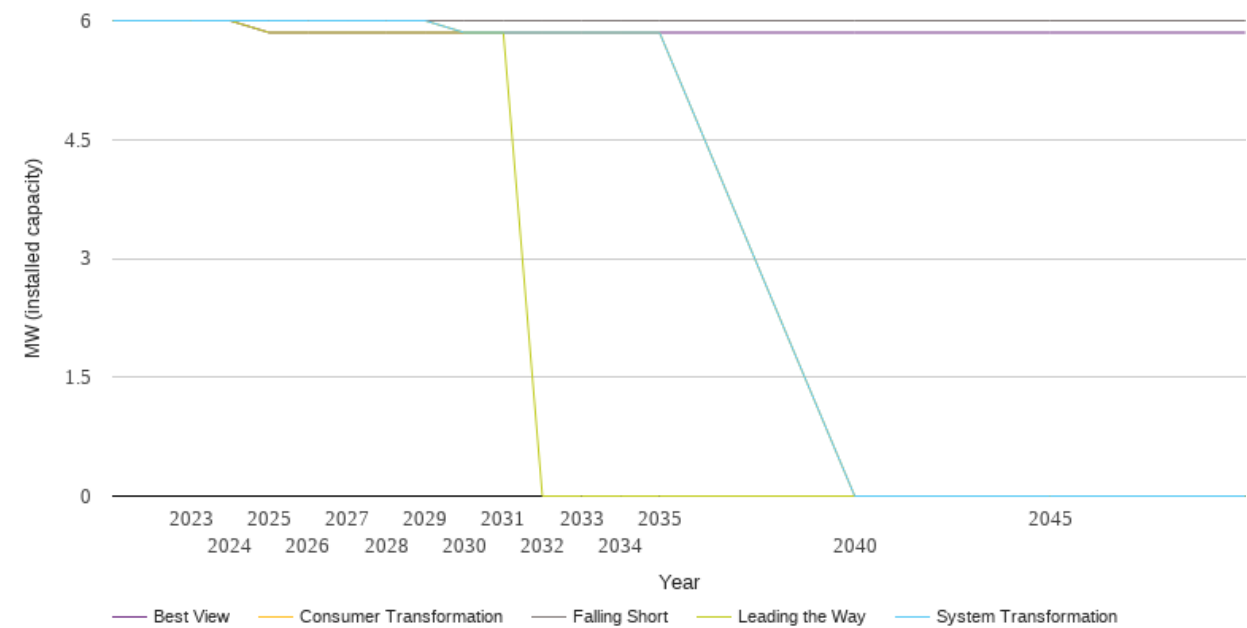
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	0	0	0	0	0
2025	0	0	0	0	0
2026	0	0	0	0	0
2027	0	0	0	0	0
2028	0	0	0	0	0
2029	0	0	0	0	0
2030	0	0	0	0	0
2031	0	0	0	0	0
2032	0	0	0	0	0
2033	0	0	0	0	0
2034	0	0	0	0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



# Technology Summary: Other Distributed Generation

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

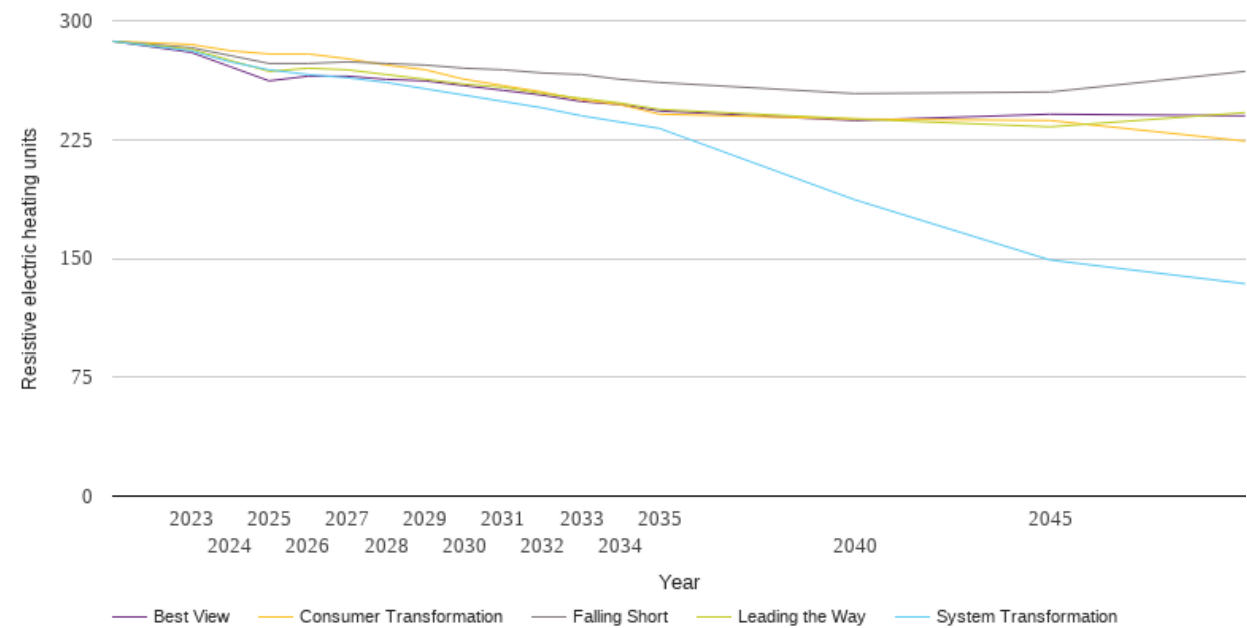
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	6.0	6.0	6.0	6.0	6.0
2023	6.0	6.0	6.0	6.0	6.0
2024	6.0	6.0	6.0	6.0	6.0
2025	6.0	6.0	6.0	5.8	5.8
2026	6.0	6.0	6.0	5.8	5.8
2027	6.0	6.0	6.0	5.8	5.8
2028	6.0	6.0	6.0	5.8	5.8
2029	6.0	6.0	6.0	5.8	5.8
2030	6.0	5.8	5.8	5.8	5.8
2031	6.0	5.8	5.8	5.8	5.8
2032	6.0	5.8	5.8	0.0	5.8
2033	6.0	5.8	5.8	0.0	5.8
2034	6.0	5.8	5.8	0.0	5.8
2035	6.0	5.8	5.8	0.0	5.8
2040	6.0	0.0	0.0	0.0	5.8
2045	6.0	0.0	0.0	0.0	5.8
2050	6.0	0.0	0.0	0.0	5.8



# Technology Summary: Resistive electric heating

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

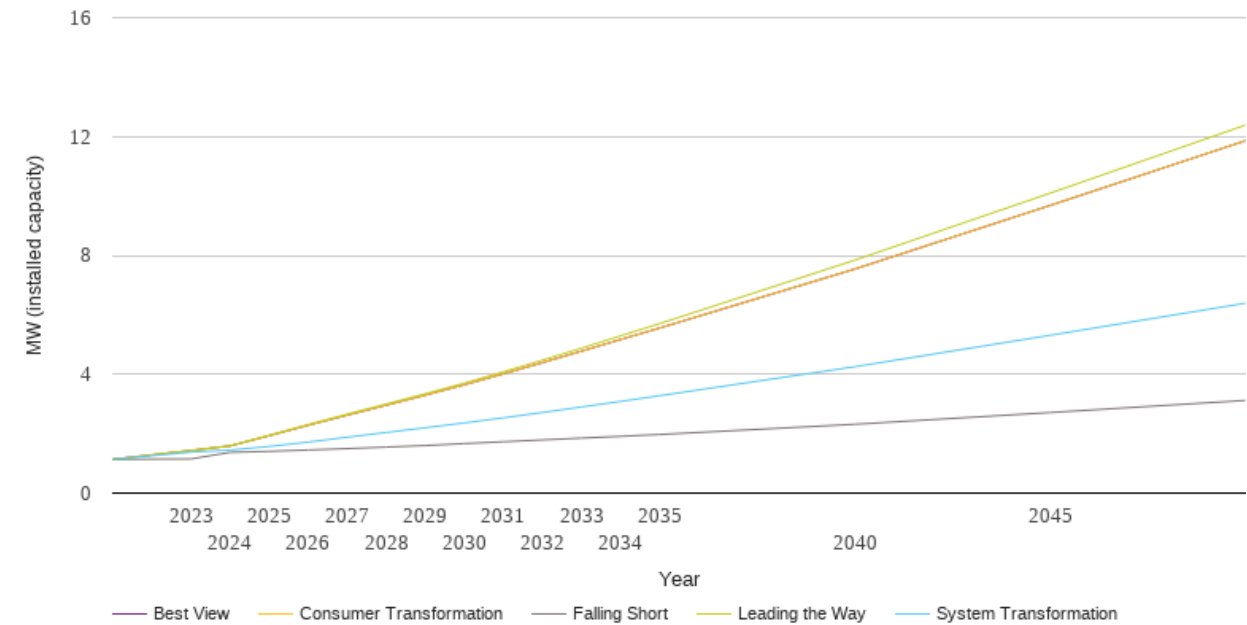
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	287	287	287	287	287
2023	283	281	285	282	280
2024	278	274	281	275	271
2025	273	269	279	268	262
2026	273	266	279	270	265
2027	274	264	276	269	265
2028	273	261	272	266	263
2029	272	257	269	263	262
2030	270	253	263	260	259
2031	269	249	259	258	256
2032	267	245	255	254	253
2033	266	240	250	251	249
2034	263	236	247	248	247
2035	261	232	241	244	243
2040	254	187	238	238	237
2045	255	149	237	233	241
2050	268	134	224	242	240



# Technology Summary: Solar Generation

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

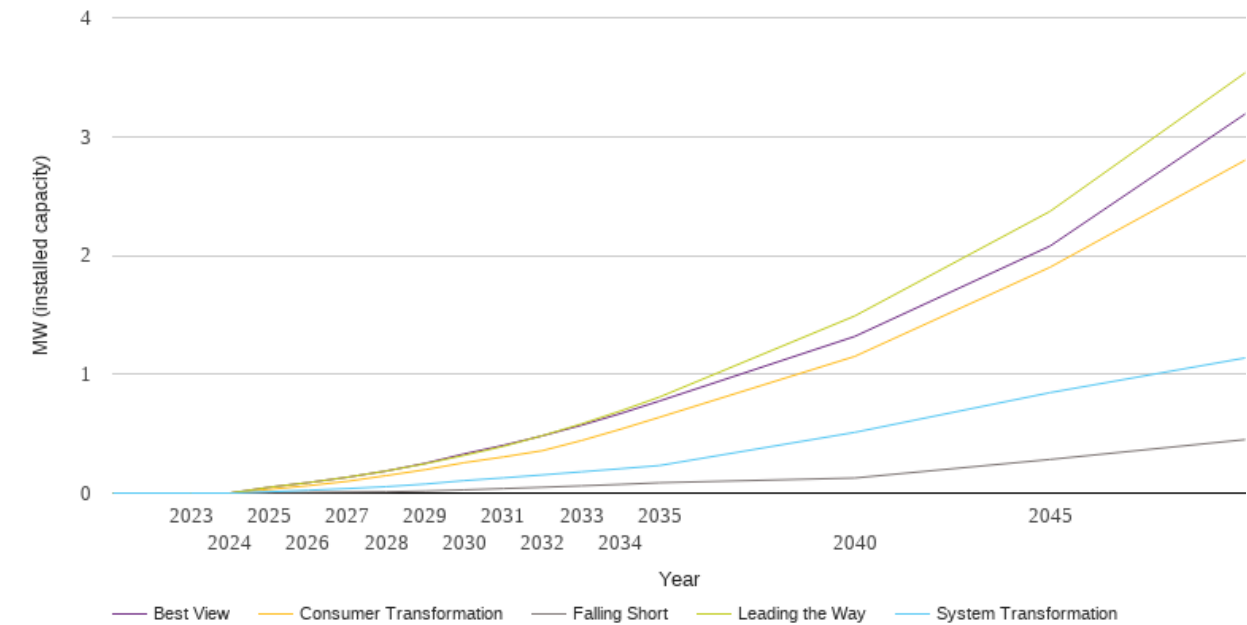
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1.1	1.1	1.1	1.1	1.1
2023	1.2	1.4	1.4	1.4	1.4
2024	1.4	1.4	1.6	1.6	1.6
2025	1.4	1.6	1.9	1.9	1.9
2026	1.5	1.7	2.3	2.3	2.3
2027	1.5	1.9	2.6	2.7	2.6
2028	1.5	2.0	3.0	3.0	3.0
2029	1.6	2.2	3.3	3.3	3.3
2030	1.7	2.4	3.6	3.7	3.6
2031	1.7	2.5	4.0	4.1	4.0
2032	1.8	2.7	4.4	4.5	4.4
2033	1.9	2.9	4.8	4.9	4.8
2034	1.9	3.1	5.2	5.3	5.2
2035	2.0	3.3	5.6	5.7	5.6
2040	2.3	4.3	7.5	7.8	7.5
2045	2.7	5.3	9.7	10.1	9.7
2050	3.1	6.4	11.9	12.4	11.9



# Technology Summary: Storage

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

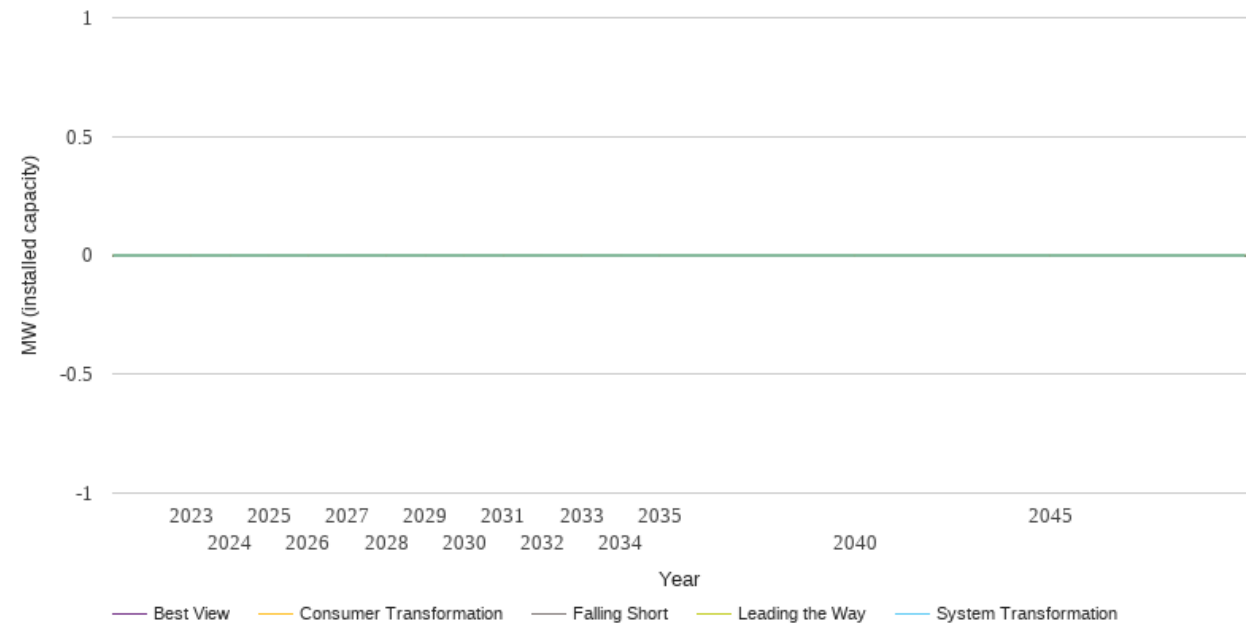
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.1	0.1	0.1
2027	0.0	0.0	0.1	0.1	0.1
2028	0.0	0.1	0.1	0.2	0.2
2029	0.0	0.1	0.2	0.2	0.3
2030	0.0	0.1	0.3	0.3	0.3
2031	0.0	0.1	0.3	0.4	0.4
2032	0.0	0.2	0.4	0.5	0.5
2033	0.1	0.2	0.4	0.6	0.6
2034	0.1	0.2	0.5	0.7	0.7
2035	0.1	0.2	0.6	0.8	0.8
2040	0.1	0.5	1.2	1.5	1.3
2045	0.3	0.8	1.9	2.4	2.1
2050	0.5	1.1	2.8	3.5	3.2



# 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	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	0.0	0.0	0.0	0.0	0.0





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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