

# Distribution Future Energy Scenarios 2022

Local Authority:  
Rutland

## 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 Rutland 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 Rutland 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	4224	1778	1778	0
Domestic	New dwellings	0	709	796	796	971	1663	1654	1654	1653
Electric vehicles	Electric vehicles	699	4486	5376	9886	9850	29704	23409	24078	21456
EV Charge Point	EV charge points	345	1996	2781	5247	5775	15885	14646	15733	15631
Heat pumps	Heat pump installations	371	1766	1980	3417	5102	9837	11122	17650	15812
Hydrogen electrolysis	MW (installed capacity)	0.0	1.7	0.4	2.4	0.0	5.3	7.2	11.5	5.5
Non domestic	Floorspace (metres squared) of new I&C developments	0	6652 6	9028 6	9028 6	9043 8	14348 7	14348 7	14348 7	14348 7
Other Distributed Generation	MW (installed capacity)	2.5	5.3	2.5	2.5	2.1	5.3	2.0	2.0	2.0
Resistive electric heating	Resistive electric heating units	1528	1267	1217	1305	1242	952	392	891	949
Solar Generation	MW (installed capacity)	8.3	11.0	15.4	18.7	16.0	39.5	74.6	88.0	80.2
Storage	MW (installed capacity)	0.0	0.1	0.5	1.0	1.4	1.9	4.6	10.1	13.3
Wind	MW (installed capacity)	0.1	0.2	0.3	2.0	1.7	3.0	8.3	25.5	20.3

## 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

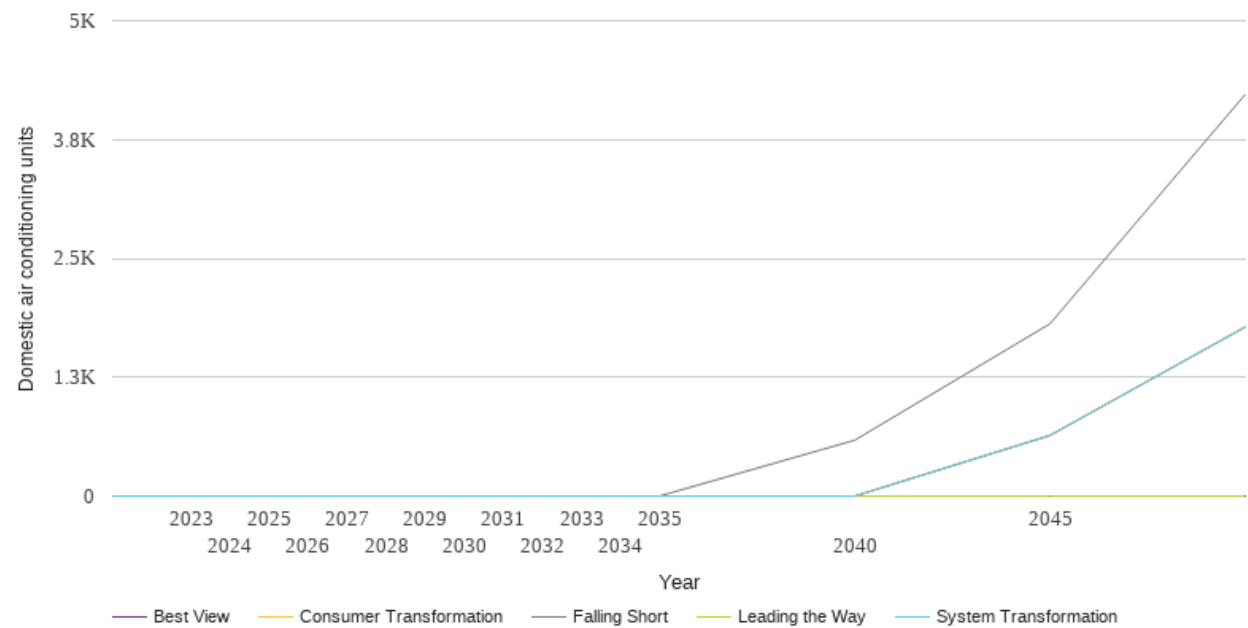
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

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

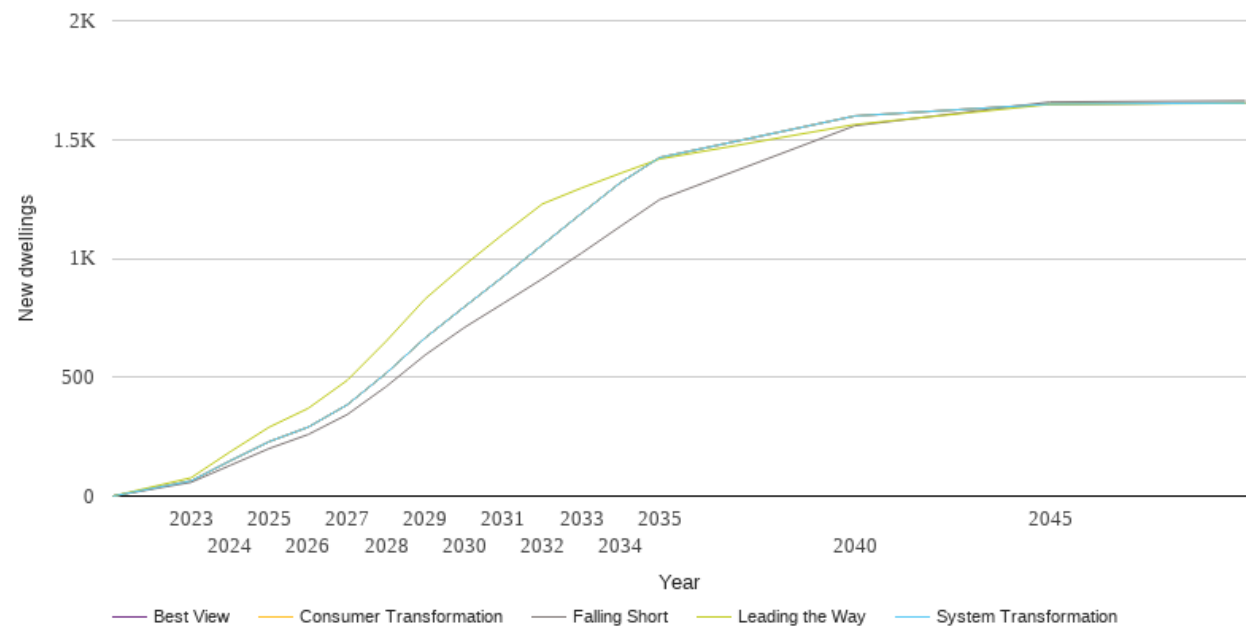
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	0	0	0	0	0
2025	0	0	0	0	0
2026	0	0	0	0	0
2027	0	0	0	0	0
2028	0	0	0	0	0
2029	0	0	0	0	0
2030	0	0	0	0	0
2031	0	0	0	0	0
2032	0	0	0	0	0
2033	0	0	0	0	0
2034	0	0	0	0	0
2035	0	0	0	0	0
2040	588	0	0	0	0
2045	1812	638	638	0	638
2050	4224	1778	1778	0	1778



# Technology Summary: Domestic

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

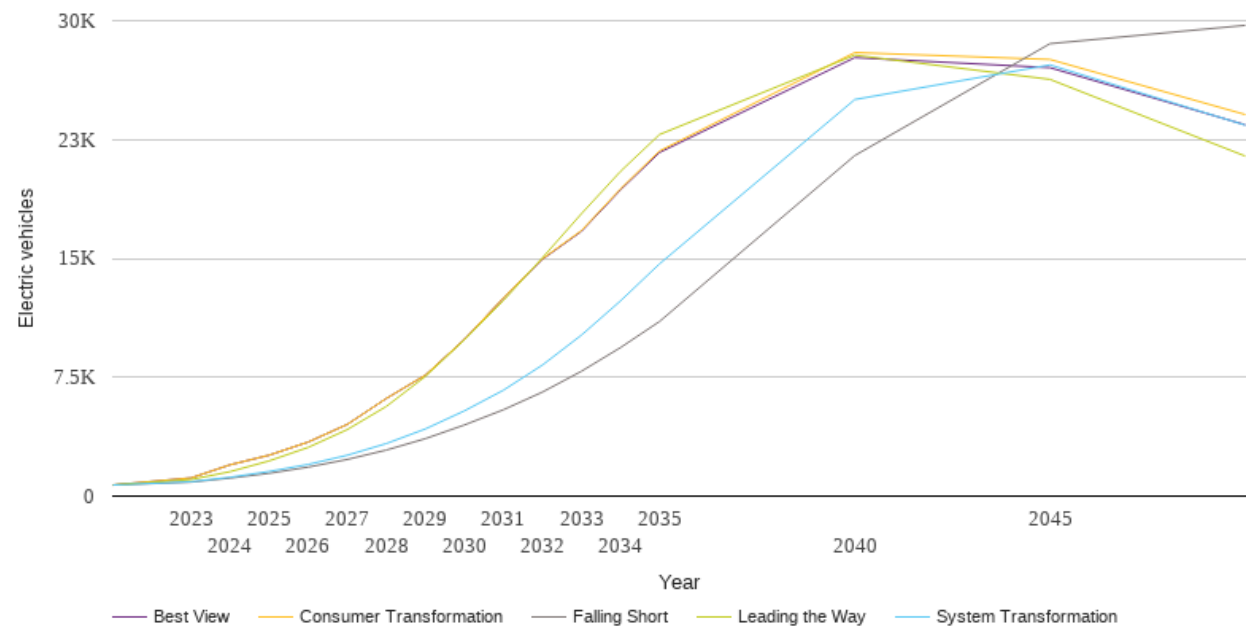
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	58	64	64	77	64
2024	129	148	148	186	148
2025	200	229	229	290	229
2026	259	290	290	369	290
2027	343	384	384	487	384
2028	461	517	517	652	517
2029	594	666	666	830	666
2030	709	796	796	971	796
2031	811	924	924	1103	924
2032	914	1057	1057	1229	1057
2033	1022	1189	1189	1296	1189
2034	1135	1319	1319	1358	1319
2035	1247	1424	1424	1418	1424
2040	1558	1599	1599	1563	1599
2045	1658	1649	1649	1648	1649
2050	1663	1654	1654	1653	1654



# Technology Summary: Electric vehicles

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

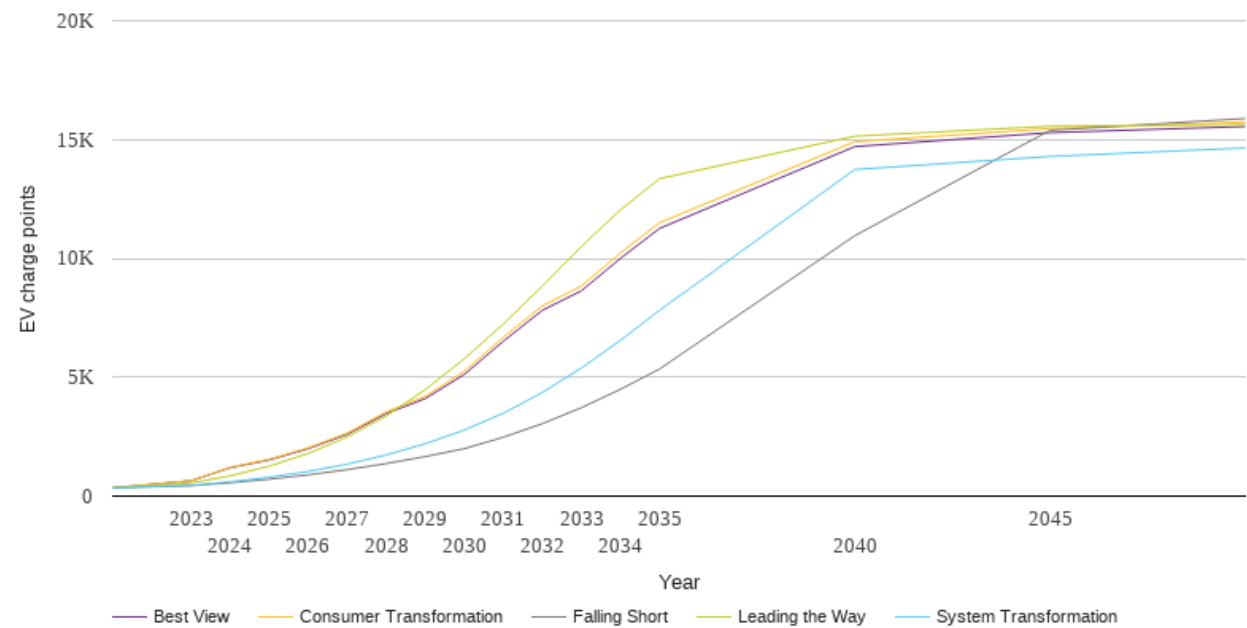
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	699	699	699	699	699
2023	887	907	1146	1043	1146
2024	1134	1188	1975	1542	1975
2025	1439	1554	2581	2220	2581
2026	1829	1998	3410	3072	3411
2027	2311	2577	4521	4194	4523
2028	2903	3313	6157	5654	6158
2029	3622	4235	7632	7544	7630
2030	4486	5376	9886	9850	9882
2031	5447	6681	12504	12335	12495
2032	6563	8269	14972	15038	14941
2033	7878	10159	16753	17820	16708
2034	9371	12319	19387	20490	19321
2035	11018	14656	21779	22818	21682
2040	21488	25023	27988	27827	27670
2045	28549	27209	27553	26297	27035
2050	29704	23409	24078	21456	23430



# 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	345	345	345	345	345
2023	439	454	646	550	643
2024	560	602	1207	851	1193
2025	711	792	1544	1258	1521
2026	894	1035	2031	1795	1997
2027	1113	1345	2649	2491	2602
2028	1368	1729	3544	3369	3471
2029	1663	2204	4200	4480	4104
2030	1996	2781	5247	5775	5116
2031	2478	3486	6680	7238	6516
2032	3048	4362	8002	8838	7816
2033	3721	5390	8840	10504	8639
2034	4493	6551	10225	12045	10001
2035	5345	7815	11501	13355	11262
2040	10955	13738	14910	15142	14702
2045	15387	14289	15461	15562	15289
2050	15885	14646	15733	15631	15549

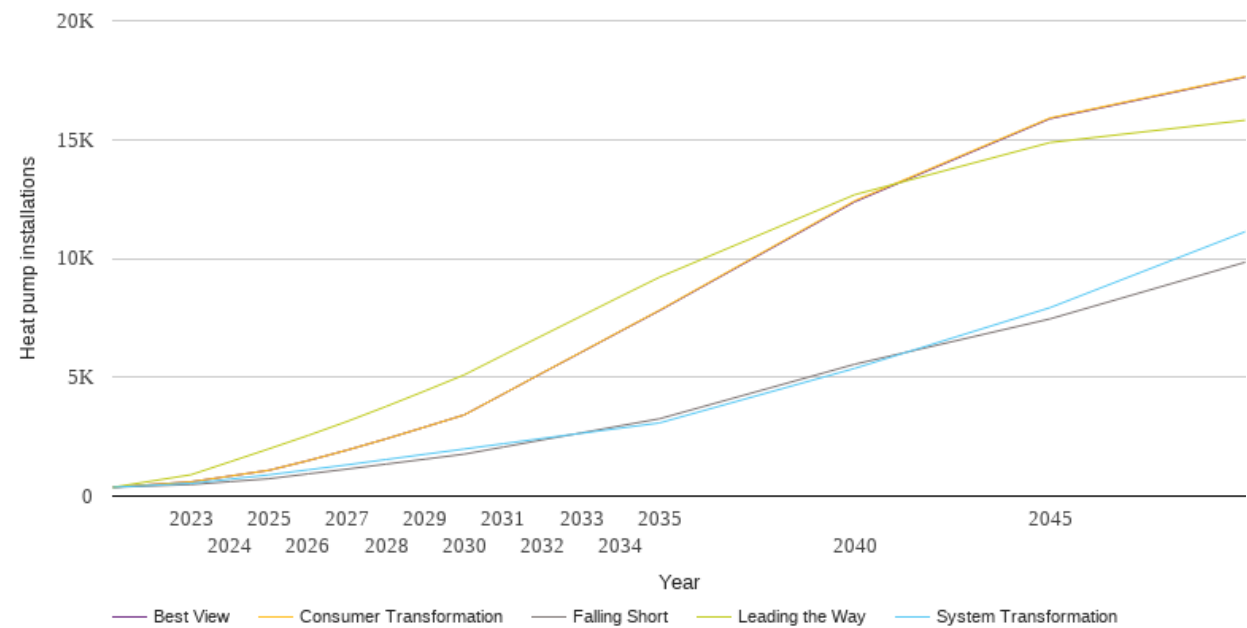




# Technology Summary: Heat pumps

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

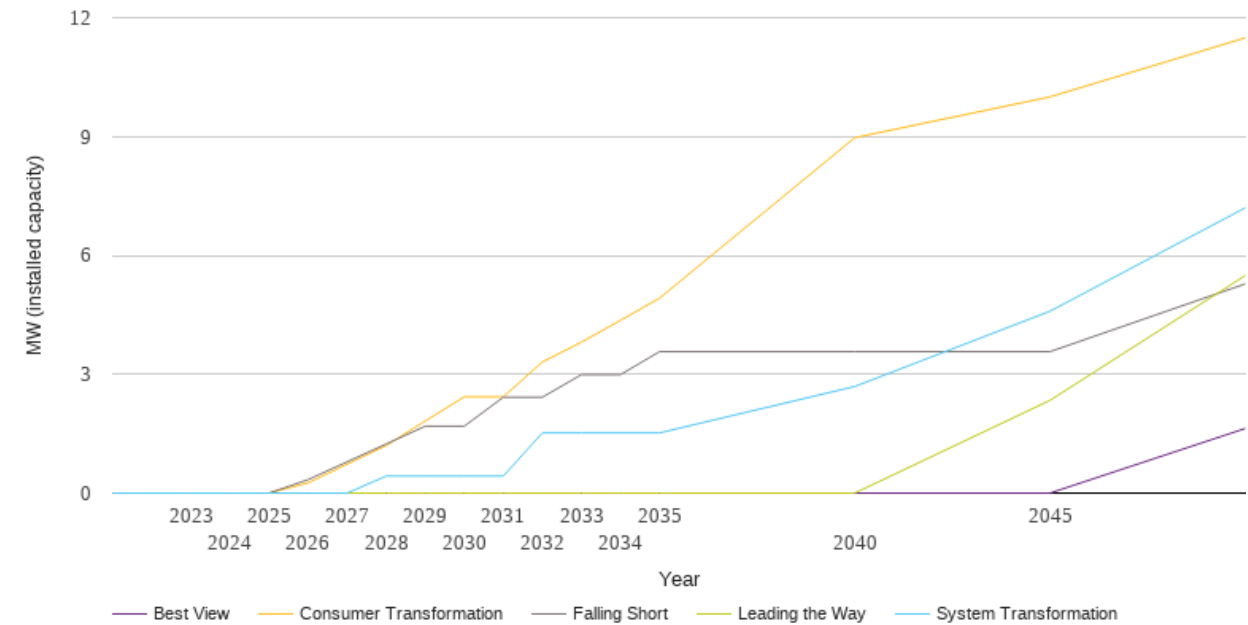
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	371	371	371	371	371
2023	485	535	599	898	599
2024	608	713	842	1443	842
2025	731	895	1086	1991	1086
2026	935	1104	1493	2550	1493
2027	1137	1315	1936	3141	1936
2028	1347	1539	2409	3772	2410
2029	1555	1762	2910	4429	2910
2030	1766	1980	3417	5102	3418
2031	2064	2204	4299	5933	4295
2032	2365	2426	5187	6754	5180
2033	2659	2644	6064	7576	6052
2034	2958	2860	6947	8398	6932
2035	3253	3079	7823	9209	7803
2040	5547	5374	12426	12679	12381
2045	7454	7926	15908	14873	15876
2050	9837	11122	17650	15812	17626



# Technology Summary: Hydrogen electrolysis

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

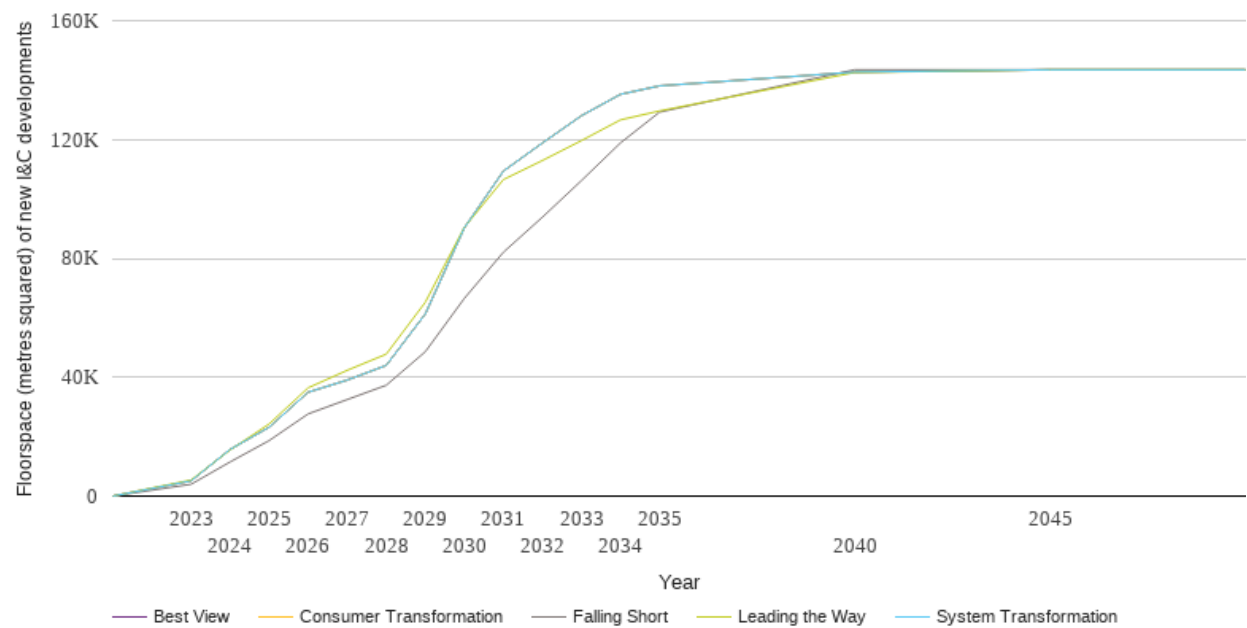
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.3	0.0	0.3	0.0	0.0
2027	0.8	0.0	0.7	0.0	0.0
2028	1.2	0.4	1.2	0.0	0.0
2029	1.7	0.4	1.8	0.0	0.0
2030	1.7	0.4	2.4	0.0	0.0
2031	2.4	0.4	2.4	0.0	0.0
2032	2.4	1.5	3.3	0.0	0.0
2033	3.0	1.5	3.8	0.0	0.0
2034	3.0	1.5	4.4	0.0	0.0
2035	3.6	1.5	4.9	0.0	0.0
2040	3.6	2.7	9.0	0.0	0.0
2045	3.6	4.6	10.0	2.3	0.0
2050	5.3	7.2	11.5	5.5	1.6



# Technology Summary: Non domestic

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

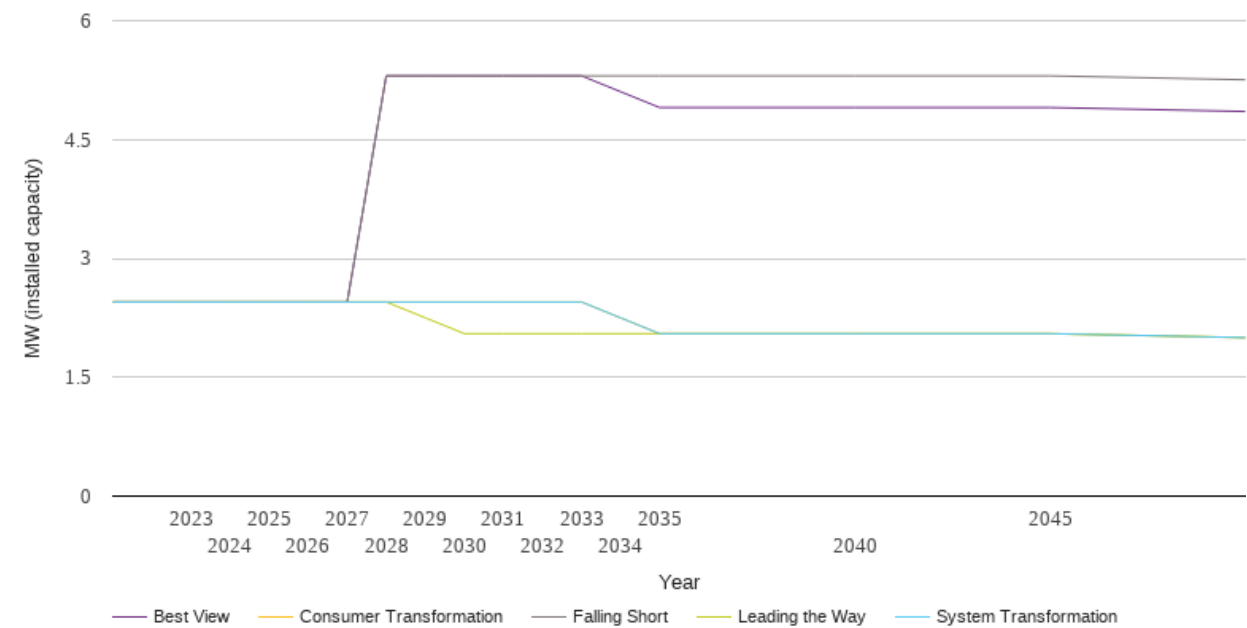
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	3977	5114	5114	5398	5114
2024	11483	15706	15706	15494	15706
2025	18674	23154	23154	24281	23154
2026	27665	34955	34955	36440	34955
2027	32484	39045	39045	42330	39045
2028	37302	43987	43987	47766	43987
2029	48586	61295	61295	65226	61295
2030	66526	90286	90286	90438	90286
2031	82073	109377	109377	106517	109377
2032	93865	118831	118831	112935	118831
2033	106188	128019	128019	119645	128019
2034	118871	135219	135219	126620	135219
2035	129230	138063	138063	129617	138063
2040	143487	142692	142692	142582	142692
2045	143487	143487	143487	143487	143487
2050	143487	143487	143487	143487	143487



# Technology Summary: Other Distributed Generation

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

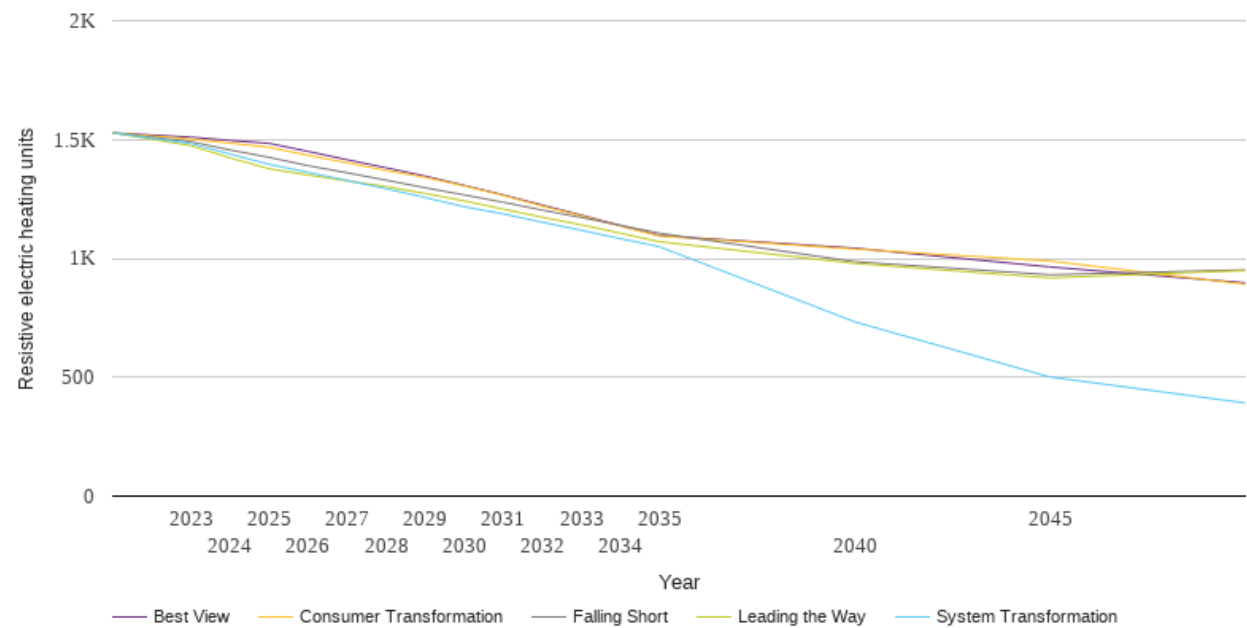
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	2.5	2.5	2.5	2.5	2.5
2023	2.5	2.5	2.5	2.5	2.5
2024	2.5	2.5	2.5	2.5	2.5
2025	2.5	2.5	2.5	2.5	2.5
2026	2.5	2.5	2.5	2.5	2.5
2027	2.5	2.5	2.5	2.5	2.5
2028	5.3	2.5	2.5	2.5	5.3
2029	5.3	2.5	2.5	2.3	5.3
2030	5.3	2.5	2.5	2.1	5.3
2031	5.3	2.5	2.5	2.1	5.3
2032	5.3	2.5	2.5	2.1	5.3
2033	5.3	2.5	2.5	2.1	5.3
2034	5.3	2.3	2.3	2.1	5.1
2035	5.3	2.1	2.1	2.1	4.9
2040	5.3	2.1	2.1	2.1	4.9
2045	5.3	2.1	2.1	2.1	4.9
2050	5.3	2.0	2.0	2.0	4.9



# Technology Summary: Resistive electric heating

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

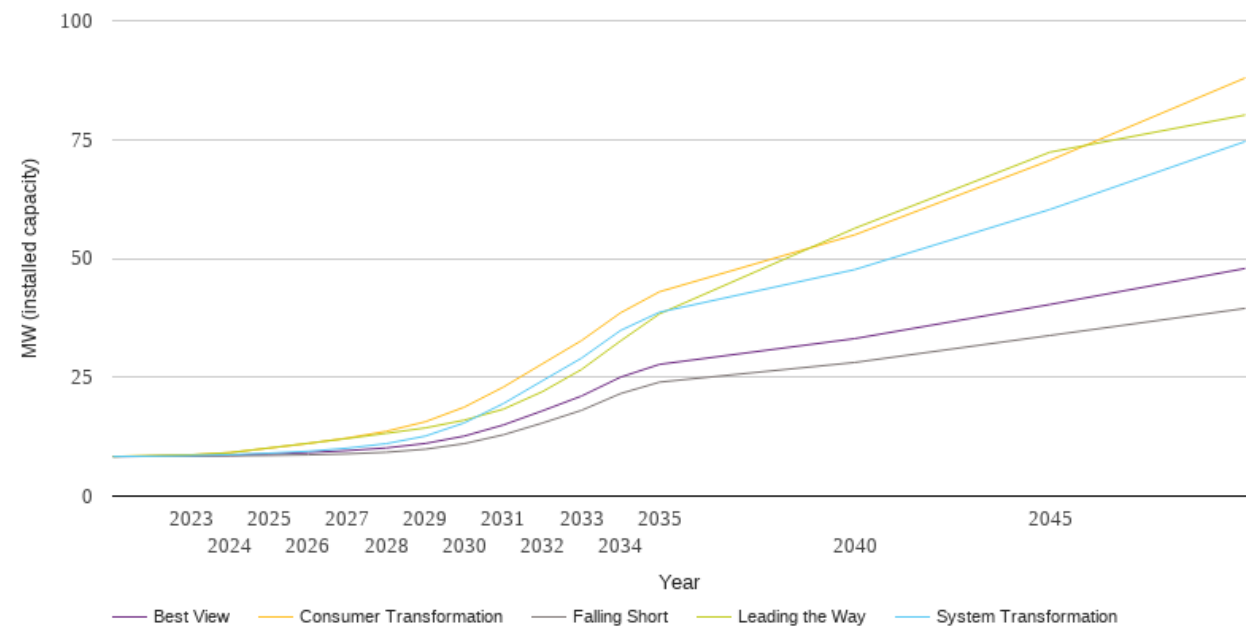
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1528	1528	1528	1528	1528
2023	1491	1483	1502	1474	1510
2024	1456	1439	1485	1423	1496
2025	1425	1396	1467	1377	1484
2026	1390	1362	1434	1351	1450
2027	1360	1328	1402	1326	1415
2028	1329	1293	1370	1302	1381
2029	1297	1256	1341	1273	1346
2030	1267	1217	1305	1242	1307
2031	1236	1187	1265	1207	1267
2032	1203	1152	1220	1173	1224
2033	1172	1118	1179	1141	1182
2034	1139	1083	1136	1106	1138
2035	1106	1049	1094	1070	1096
2040	986	733	1039	979	1043
2045	931	501	989	918	964
2050	952	392	891	949	897



# Technology Summary: Solar Generation

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

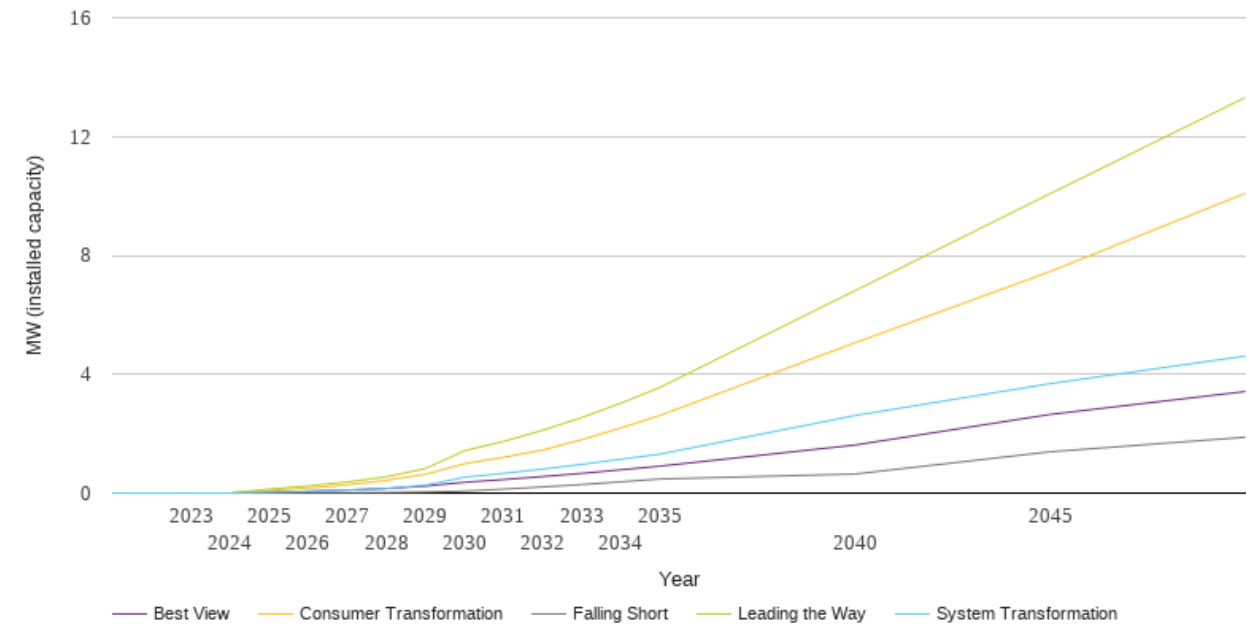
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	8.3	8.3	8.3	8.3	8.3
2023	8.4	8.5	8.7	8.7	8.4
2024	8.5	8.7	9.1	9.1	8.6
2025	8.6	9.0	10.1	10.1	8.8
2026	8.7	9.4	11.1	11.1	9.1
2027	8.9	10.1	12.2	12.1	9.6
2028	9.2	11.0	13.6	13.2	10.1
2029	9.9	12.6	15.6	14.3	11.1
2030	11.0	15.4	18.7	16.0	12.6
2031	12.9	19.5	22.9	18.3	15.0
2032	15.4	24.3	27.8	22.0	17.9
2033	18.0	29.0	32.7	26.6	21.0
2034	21.6	34.8	38.5	32.6	25.0
2035	24.0	38.7	43.0	38.3	27.7
2040	28.1	47.6	55.0	56.3	33.1
2045	33.8	60.3	70.6	72.3	40.3
2050	39.5	74.6	88.0	80.2	47.9



# Technology Summary: Storage

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

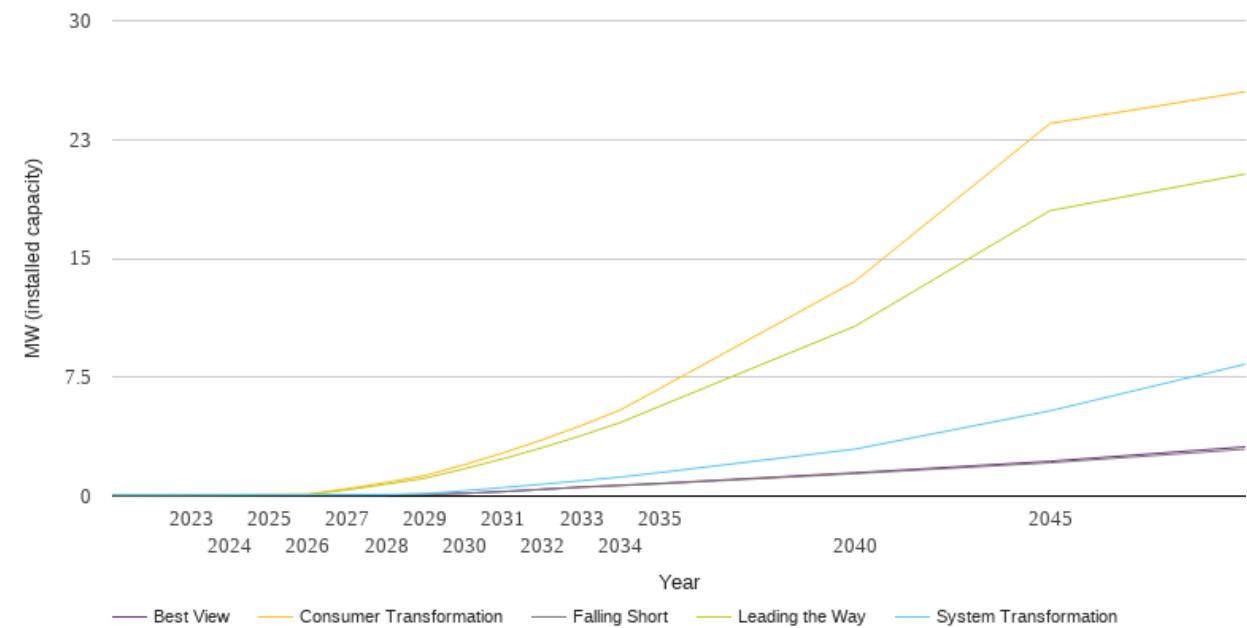
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.1	0.1	0.0
2026	0.0	0.1	0.2	0.2	0.1
2027	0.0	0.1	0.3	0.4	0.1
2028	0.0	0.2	0.4	0.5	0.2
2029	0.0	0.3	0.6	0.8	0.2
2030	0.1	0.5	1.0	1.4	0.4
2031	0.1	0.7	1.2	1.7	0.5
2032	0.2	0.8	1.4	2.1	0.6
2033	0.3	1.0	1.8	2.5	0.7
2034	0.4	1.1	2.2	3.0	0.8
2035	0.5	1.3	2.6	3.5	0.9
2040	0.6	2.6	5.1	6.8	1.6
2045	1.4	3.7	7.5	10.1	2.6
2050	1.9	4.6	10.1	13.3	3.4



# 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	0.1	0.1	0.1	0.1	0.1
2023	0.1	0.1	0.1	0.1	0.1
2024	0.1	0.1	0.1	0.1	0.1
2025	0.1	0.1	0.1	0.1	0.1
2026	0.1	0.1	0.1	0.1	0.1
2027	0.1	0.1	0.5	0.4	0.1
2028	0.1	0.1	0.9	0.7	0.1
2029	0.1	0.1	1.3	1.1	0.1
2030	0.2	0.3	2.0	1.7	0.2
2031	0.3	0.5	2.7	2.4	0.3
2032	0.4	0.8	3.6	3.1	0.4
2033	0.6	1.0	4.5	3.8	0.6
2034	0.7	1.2	5.4	4.6	0.7
2035	0.8	1.5	6.8	5.7	0.8
2040	1.4	3.0	13.5	10.7	1.5
2045	2.1	5.4	23.5	18.0	2.2
2050	3.0	8.3	25.5	20.3	3.1





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National Grid Electricity Distribution (West Midlands) Plc (company number 03600574))  
National Grid Electricity Distribution (South West) Plc (company number 02366894))  
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