

Distribution Future Energy Scenarios 2022

Local Authority:
North East 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 North East 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 North East 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	0	0	0	0	14845	6240	6240	0
Domestic	New dwellings	0	2441	2781	2781	3445	4731	4727	4727	4723
Electric vehicles	Electric vehicles	1271	8031	10292	18880	18862	59195	52416	52351	44385
EV Charge Point	EV charge points	605	3499	5311	9984	10997	31702	31982	33546	33253
Heat pumps	Heat pump installations	223	1913	2220	6280	10627	19382	23092	39270	34479
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2
Non domestic	Floorspace (metres squared) of new I&C developments	0	9656 9	12539 0	12539 0	13147 3	20994 5	20969 4	20969 4	20994 5
Other Distributed Generation	MW (installed capacity)	0.6	0.6	0.6	0.6	0.4	0.6	0.2	0.2	0.2
Resistive electric heating	Resistive electric heating units	1899	1794	1666	1736	1718	1640	815	1409	1498
Solar Generation	MW (installed capacity)	25.7	31.6	37.7	45.3	43.3	59.8	96.8	129.4	130.3
Storage	MW (installed capacity)	0.0	0.1	0.9	1.9	2.6	3.0	7.9	19.4	25.0
Wind	MW (installed capacity)	0.2	0.2	0.4	2.2	1.5	1.3	3.8	15.1	12.2

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

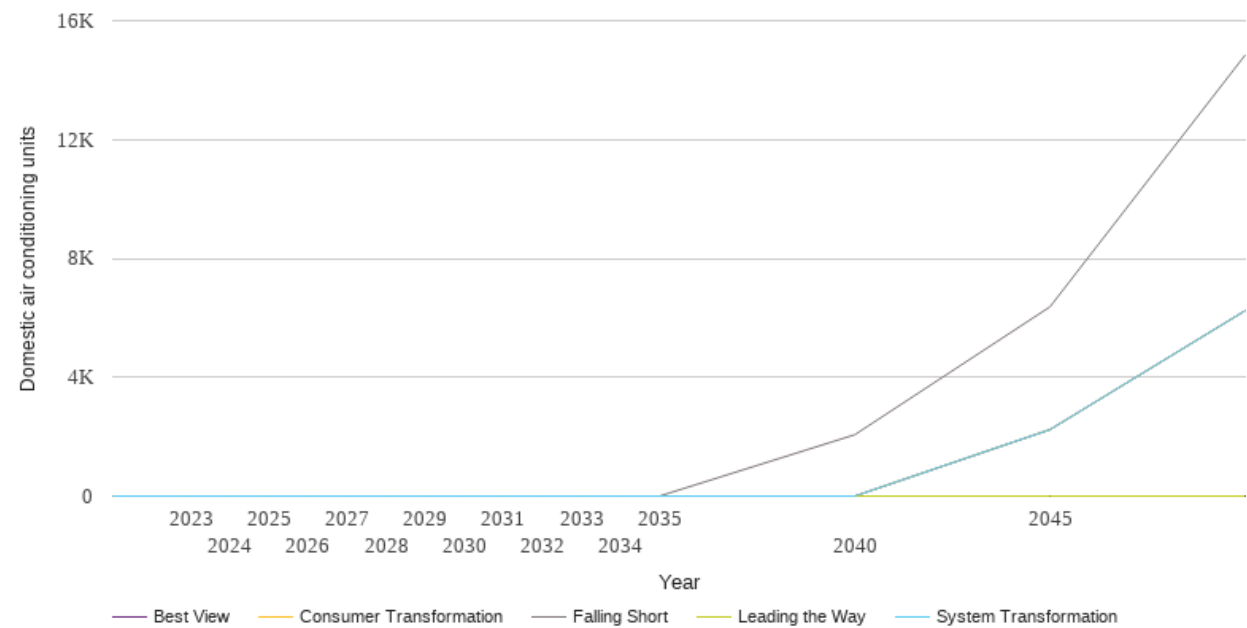
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

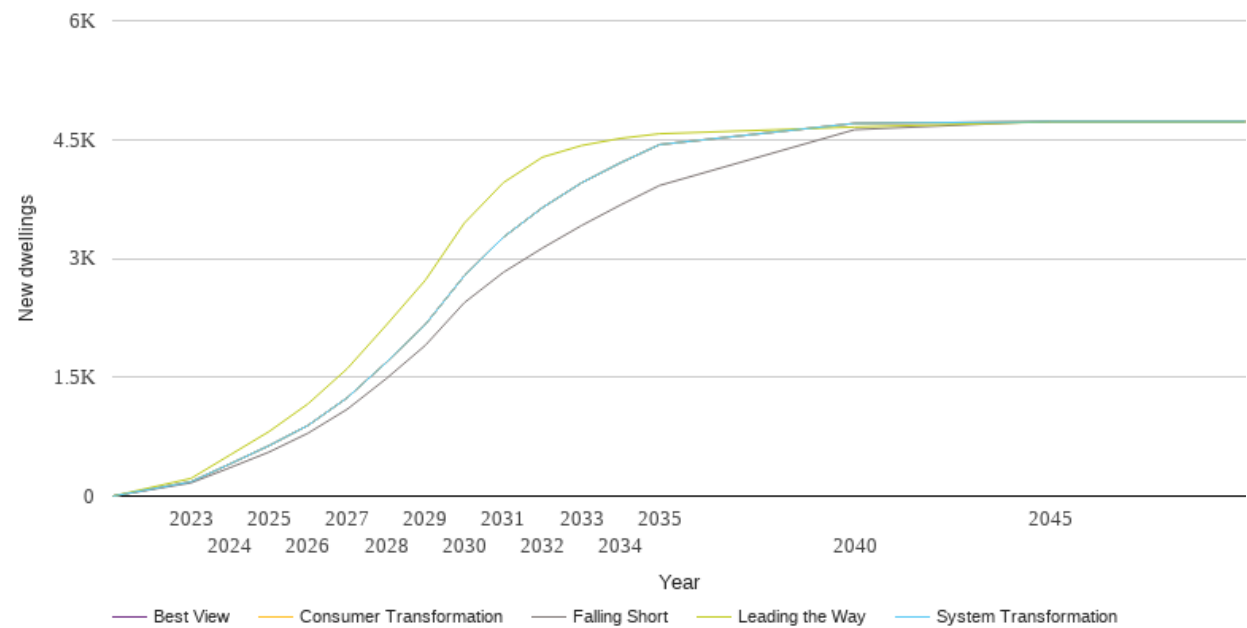
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	0	0	0	0	0
2025	0	0	0	0	0
2026	0	0	0	0	0
2027	0	0	0	0	0
2028	0	0	0	0	0
2029	0	0	0	0	0
2030	0	0	0	0	0
2031	0	0	0	0	0
2032	0	0	0	0	0
2033	0	0	0	0	0
2034	0	0	0	0	0
2035	0	0	0	0	0
2040	2065	0	0	0	0
2045	6369	2238	2238	0	2238
2050	14845	6240	6240	0	6240



Technology Summary: Domestic

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

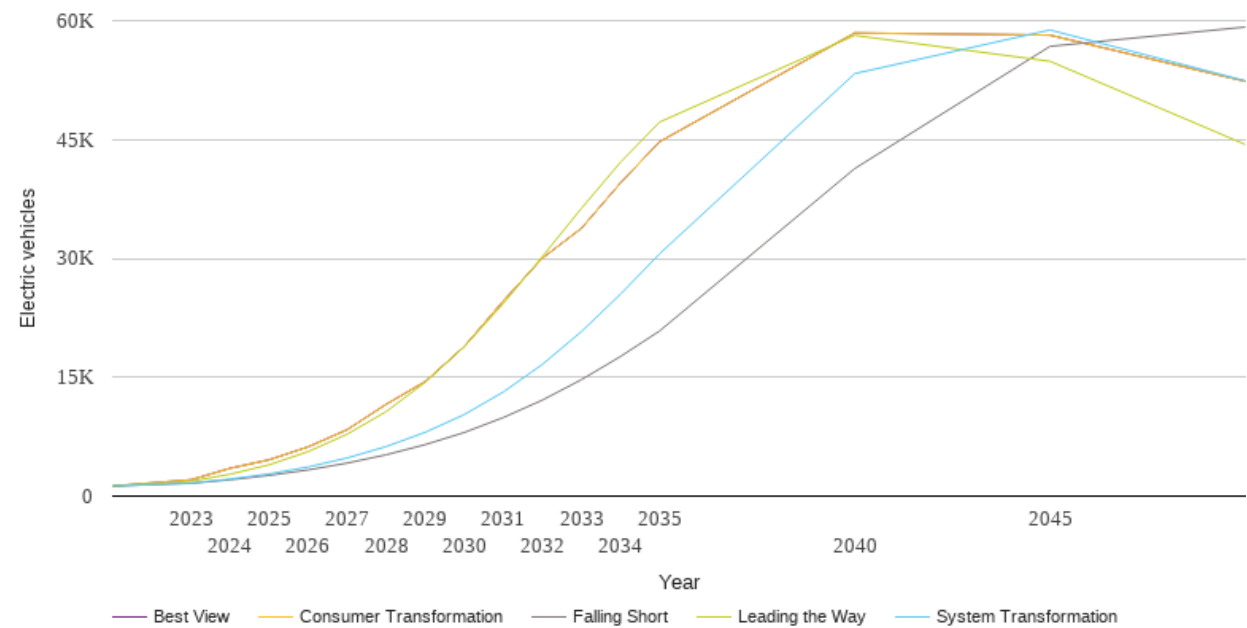
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	167	181	181	223	181
2024	359	406	406	519	406
2025	556	637	637	815	637
2026	795	893	893	1166	893
2027	1096	1241	1241	1608	1241
2028	1482	1686	1686	2157	1686
2029	1902	2165	2165	2724	2165
2030	2441	2781	2781	3445	2781
2031	2824	3267	3267	3956	3267
2032	3130	3640	3640	4277	3640
2033	3414	3953	3953	4424	3953
2034	3674	4206	4206	4515	4206
2035	3920	4436	4436	4573	4436
2040	4625	4704	4704	4658	4704
2045	4731	4727	4727	4723	4727
2050	4731	4727	4727	4723	4727



Technology Summary: Electric vehicles

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

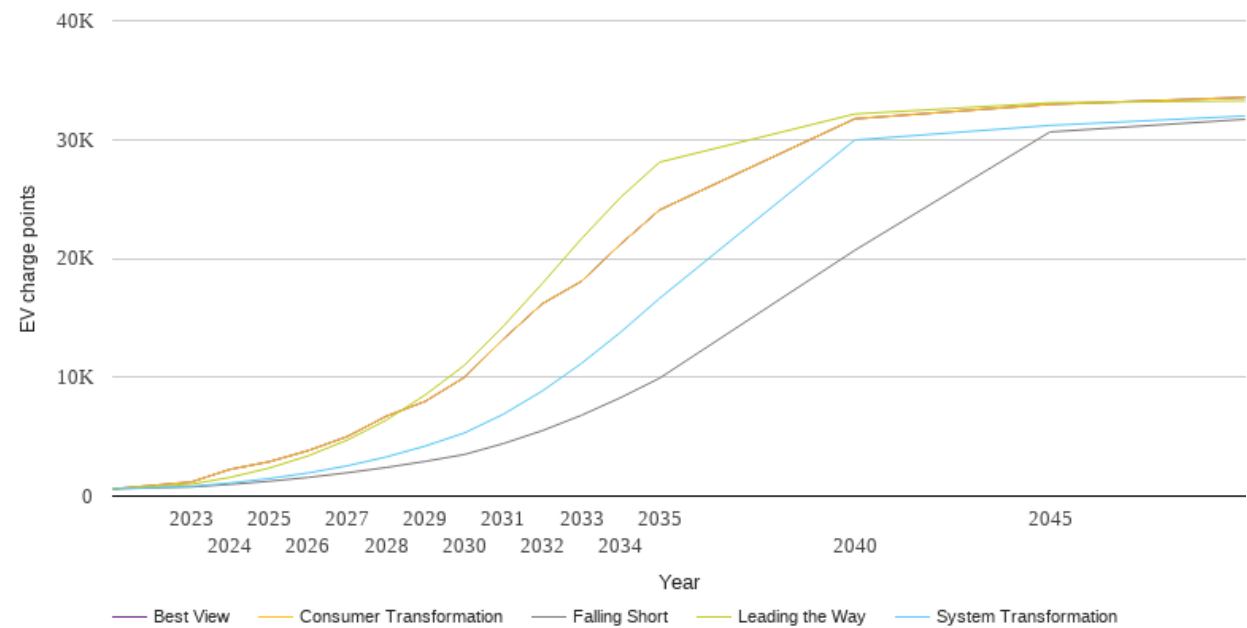
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1271	1271	1271	1271	1271
2023	1613	1645	2063	1881	2063
2024	2058	2150	3510	2761	3510
2025	2613	2801	4583	3950	4583
2026	3307	3676	6216	5618	6216
2027	4166	4813	8390	7816	8390
2028	5217	6253	11592	10671	11592
2029	6498	8056	14462	14365	14462
2030	8031	10292	18880	18862	18880
2031	9918	13143	24647	24306	24647
2032	12116	16623	30032	30236	30032
2033	14698	20763	33803	36325	33803
2034	17617	25477	39527	42136	39527
2035	20835	30574	44725	47203	44725
2040	41339	53318	58443	58138	58443
2045	56760	58827	58176	54874	58176
2050	59195	52416	52351	44385	52351



Technology Summary: EV Charge Point

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

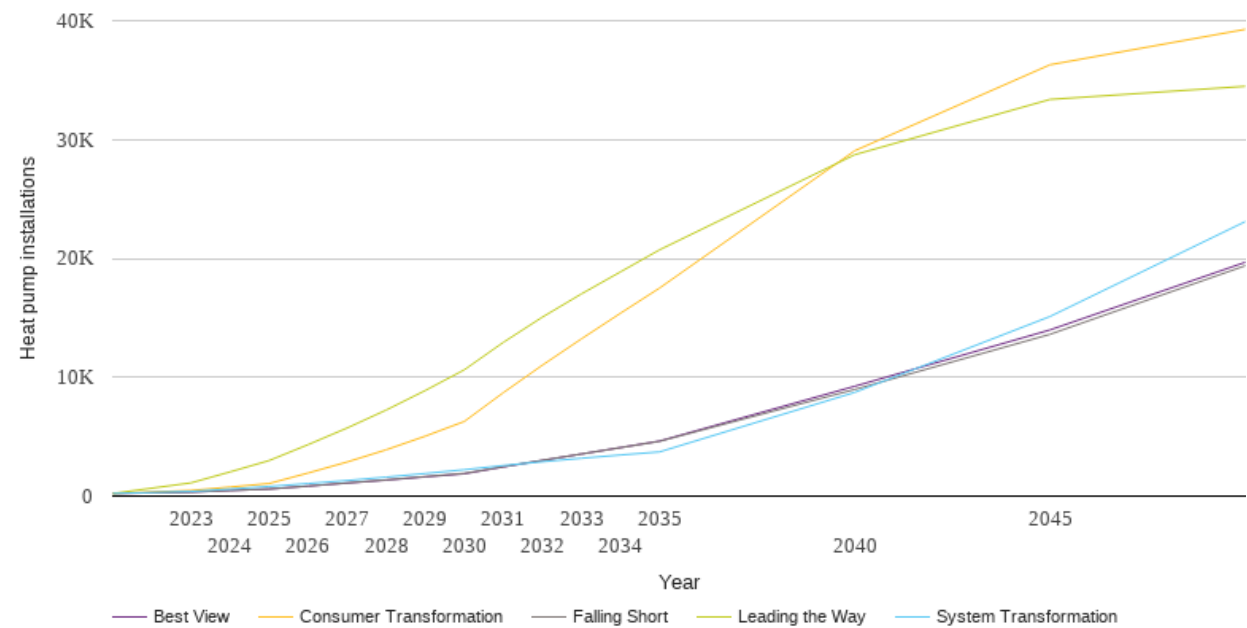
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	605	605	605	605	605
2023	768	816	1181	995	1181
2024	982	1103	2248	1573	2248
2025	1247	1473	2890	2356	2890
2026	1570	1947	3827	3386	3827
2027	1961	2548	5007	4713	5007
2028	2408	3294	6722	6392	6722
2029	2921	4213	7974	8520	7974
2030	3499	5311	9984	10997	9984
2031	4419	6891	13211	14291	13211
2032	5508	8850	16189	17894	16189
2033	6800	11166	18070	21654	18070
2034	8279	13781	21192	25129	21192
2035	9919	16633	24076	28094	24076
2040	20678	29958	31745	32147	31745
2045	30639	31189	32960	33088	32960
2050	31702	31982	33546	33253	33546



Technology Summary: Heat pumps

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

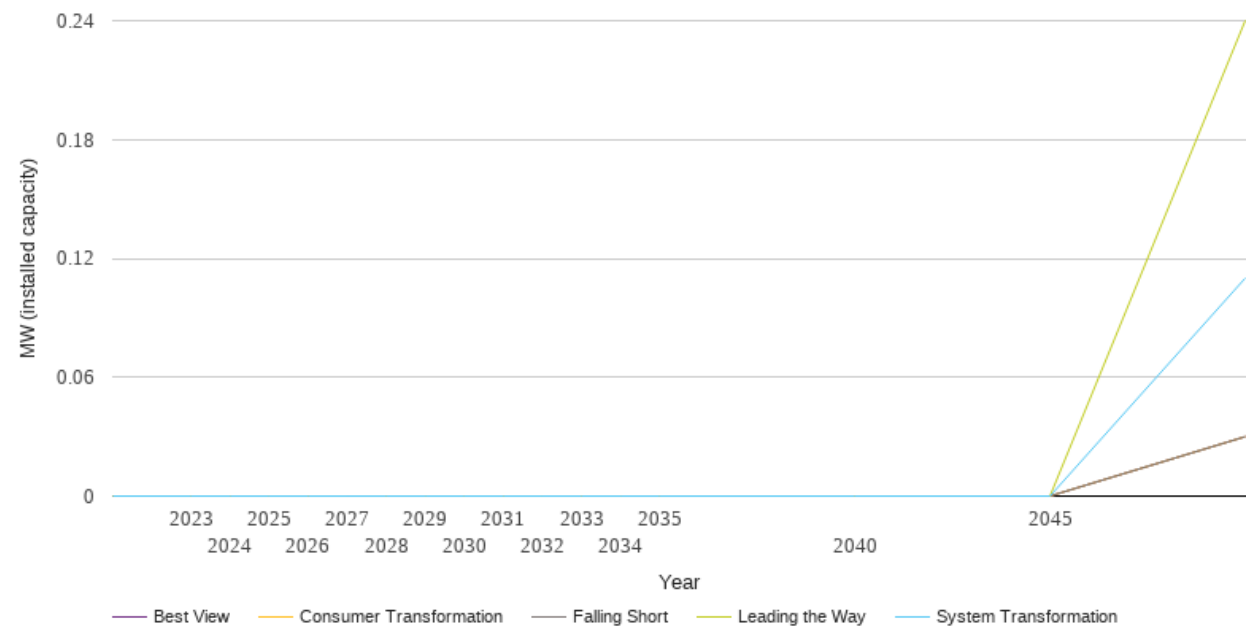
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	223	223	223	223	223
2023	338	392	473	1114	338
2024	474	596	760	2034	474
2025	594	811	1058	2991	594
2026	845	1059	1942	4331	838
2027	1112	1310	2871	5733	1099
2028	1367	1598	3898	7241	1346
2029	1644	1901	5043	8885	1618
2030	1913	2220	6280	10627	1878
2031	2473	2572	8705	12938	2454
2032	3012	2892	11016	15059	3002
2033	3543	3183	13231	17014	3543
2034	4073	3459	15386	18867	4084
2035	4607	3717	17503	20720	4632
2040	8972	8726	29059	28723	9243
2045	13610	15110	36289	33372	13980
2050	19382	23092	39270	34479	19671



Technology Summary: Hydrogen electrolysis

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

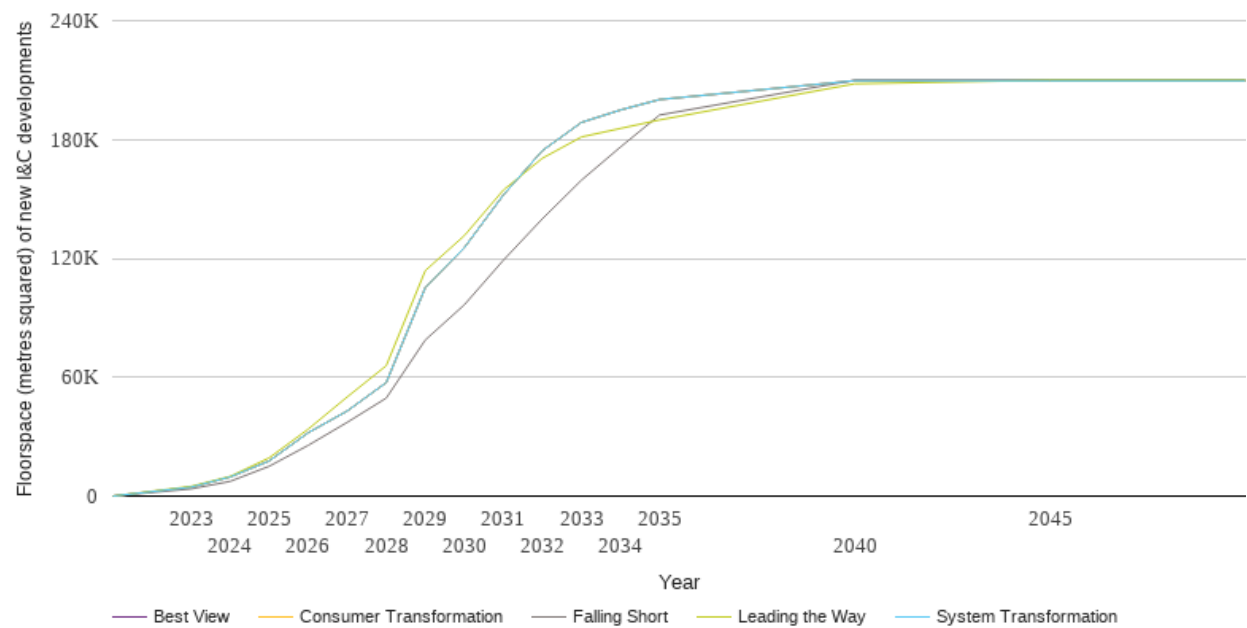
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0	0.0
2028	0.0	0.0	0.0	0.0	0.0
2029	0.0	0.0	0.0	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	0.1	0.0	0.2	0.0



Technology Summary: Non domestic

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

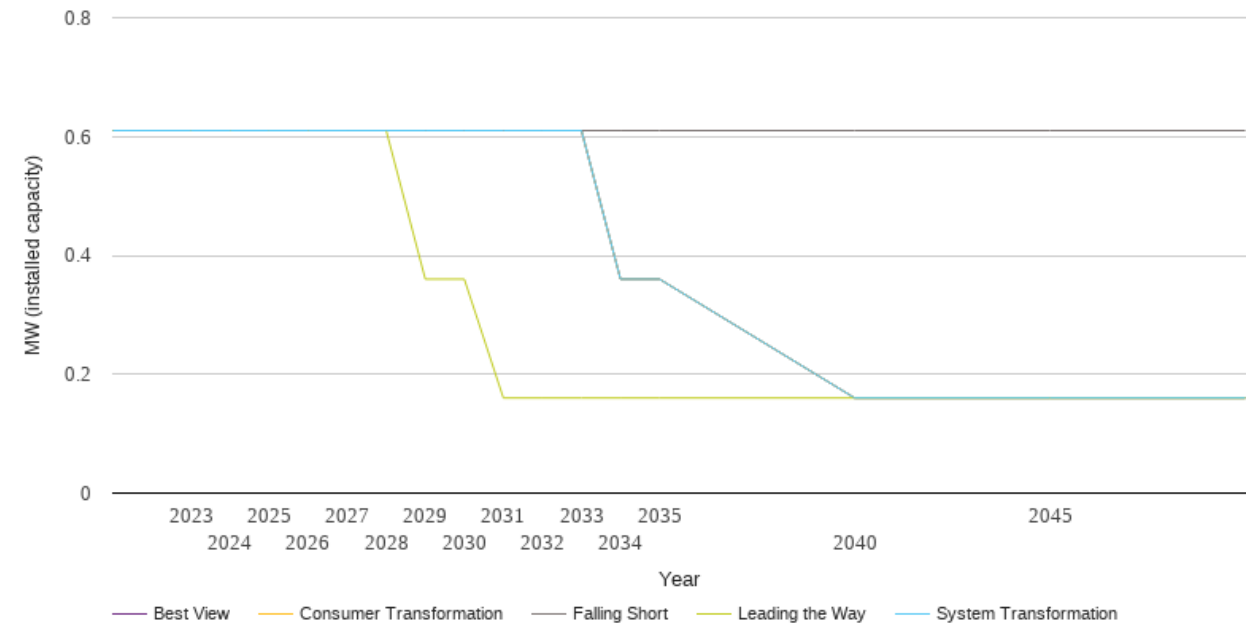
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	3637	4515	4515	4891	4515
2024	7425	9632	9632	9908	9632
2025	15040	17732	17732	19301	17732
2026	25603	31963	31963	33786	31963
2027	37226	42965	42965	50043	42965
2028	49455	57301	57301	65812	57301
2029	78811	105238	105238	113829	105238
2030	96569	125390	125390	131473	125390
2031	119071	152005	152005	154493	152005
2032	140012	174410	174410	170562	174410
2033	159487	188635	188635	181304	188635
2034	176235	194917	194917	185605	194917
2035	192375	200191	200191	189905	200191
2040	209945	209694	209694	208155	209694
2045	209945	209694	209694	209945	209694
2050	209945	209694	209694	209945	209694



Technology Summary: Other Distributed Generation

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

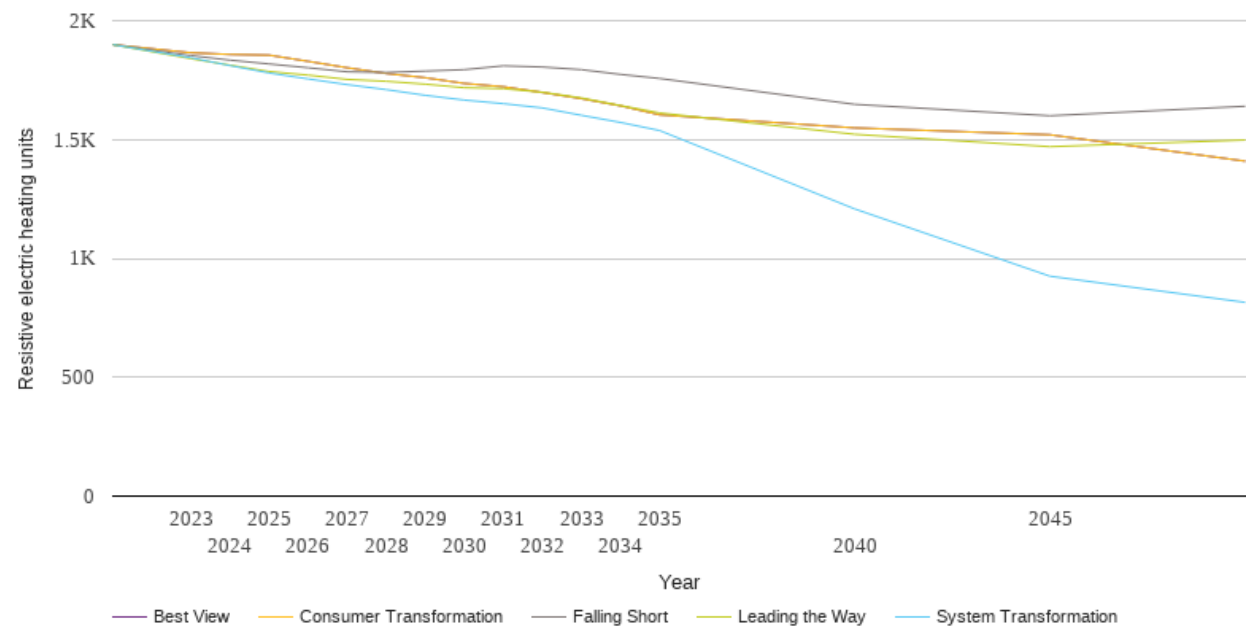
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.6	0.6	0.6	0.6	0.6
2023	0.6	0.6	0.6	0.6	0.6
2024	0.6	0.6	0.6	0.6	0.6
2025	0.6	0.6	0.6	0.6	0.6
2026	0.6	0.6	0.6	0.6	0.6
2027	0.6	0.6	0.6	0.6	0.6
2028	0.6	0.6	0.6	0.6	0.6
2029	0.6	0.6	0.6	0.4	0.6
2030	0.6	0.6	0.6	0.4	0.6
2031	0.6	0.6	0.6	0.2	0.6
2032	0.6	0.6	0.6	0.2	0.6
2033	0.6	0.6	0.6	0.2	0.6
2034	0.6	0.4	0.4	0.2	0.4
2035	0.6	0.4	0.4	0.2	0.4
2040	0.6	0.2	0.2	0.2	0.2
2045	0.6	0.2	0.2	0.2	0.2
2050	0.6	0.2	0.2	0.2	0.2



Technology Summary: Resistive electric heating

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

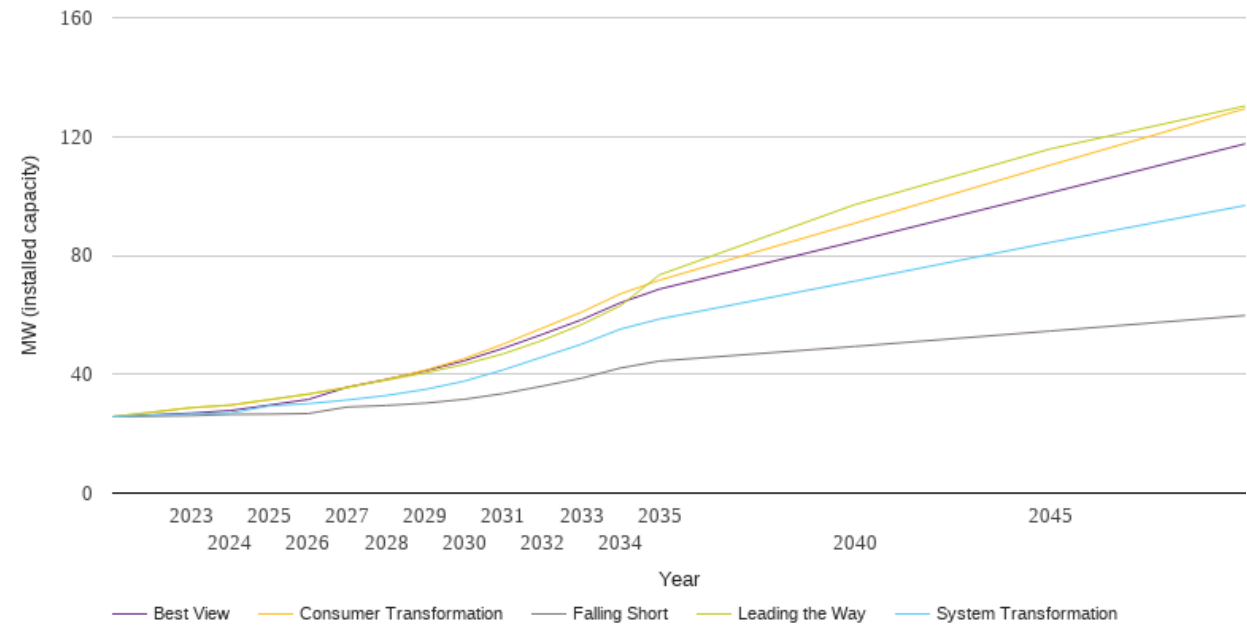
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1899	1899	1899	1899	1899
2023	1853	1844	1865	1840	1865
2024	1834	1811	1858	1813	1858
2025	1818	1780	1855	1786	1855
2026	1802	1755	1829	1771	1829
2027	1785	1731	1802	1753	1802
2028	1782	1710	1778	1745	1778
2029	1788	1686	1760	1733	1760
2030	1794	1666	1736	1718	1736
2031	1810	1651	1722	1714	1722
2032	1805	1633	1698	1699	1698
2033	1794	1602	1672	1675	1672
2034	1774	1572	1642	1643	1642
2035	1757	1538	1604	1612	1604
2040	1648	1208	1549	1522	1549
2045	1600	925	1520	1470	1520
2050	1640	815	1409	1498	1409



Technology Summary: Solar Generation

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

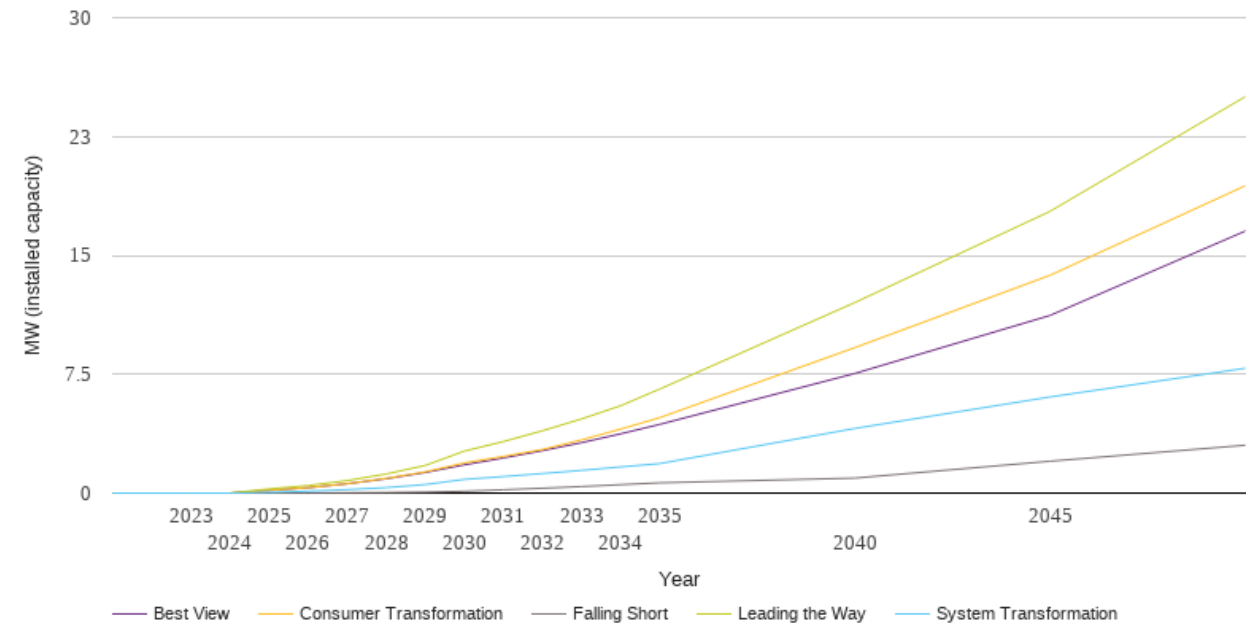
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	25.7	25.7	25.7	25.7	25.7
2023	26.1	26.6	28.7	28.7	26.9
2024	26.5	26.9	29.6	29.6	27.8
2025	26.6	29.3	31.4	31.4	29.6
2026	26.8	30.1	33.3	33.3	31.5
2027	29.0	31.3	35.6	35.6	35.6
2028	29.5	32.8	38.2	38.0	38.3
2029	30.3	34.9	41.4	40.5	41.1
2030	31.6	37.7	45.3	43.3	44.5
2031	33.5	41.5	50.2	46.9	48.7
2032	36.0	45.8	55.5	51.4	53.4
2033	38.7	50.1	60.9	56.7	58.3
2034	42.1	55.2	67.0	63.1	64.1
2035	44.4	58.6	71.7	73.5	68.7
2040	49.3	71.3	90.8	97.1	84.7
2045	54.5	84.3	110.4	115.8	101.0
2050	59.8	96.8	129.4	130.3	117.5



Technology Summary: Storage

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

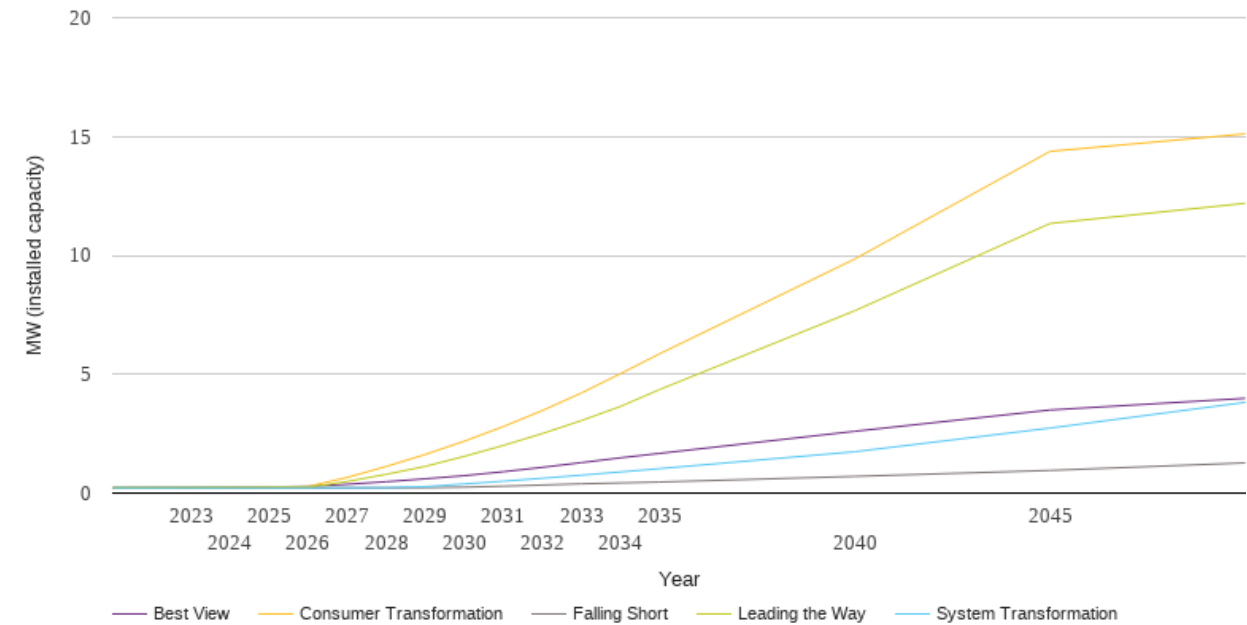
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.1	0.2	0.3	0.2
2026	0.0	0.1	0.3	0.5	0.3
2027	0.0	0.2	0.6	0.8	0.6
2028	0.0	0.3	0.9	1.2	0.9
2029	0.1	0.5	1.3	1.7	1.3
2030	0.1	0.9	1.9	2.6	1.8
2031	0.2	1.0	2.3	3.3	2.2
2032	0.3	1.2	2.8	3.9	2.7
2033	0.4	1.4	3.4	4.7	3.2
2034	0.5	1.6	4.0	5.5	3.7
2035	0.6	1.9	4.8	6.6	4.3
2040	0.9	4.1	9.2	12.0	7.5
2045	2.0	6.1	13.7	17.8	11.2
2050	3.0	7.9	19.4	25.0	16.5



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	0.3
2026	0.2	0.2	0.3	0.2	0.3
2027	0.2	0.2	0.7	0.5	0.4
2028	0.2	0.2	1.1	0.8	0.5
2029	0.2	0.3	1.6	1.1	0.6
2030	0.2	0.4	2.2	1.5	0.7
2031	0.3	0.5	2.8	2.0	0.9
2032	0.3	0.6	3.5	2.5	1.1
2033	0.4	0.8	4.2	3.1	1.3
2034	0.4	0.9	5.0	3.6	1.5
2035	0.5	1.0	5.9	4.4	1.7
2040	0.7	1.7	9.8	7.7	2.6
2045	1.0	2.7	14.4	11.3	3.5
2050	1.3	3.8	15.1	12.2	4.0



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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