

Distribution Future Energy Scenarios 2022

Local Authority:
Bolsover

What are Distribution Future Energy Scenarios?

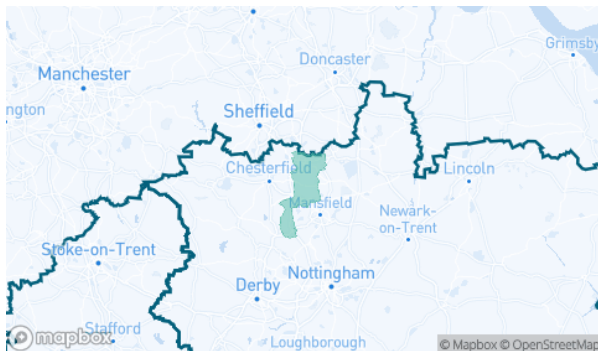
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Bolsover covered by the NGED licence areas.



Scenario Summary

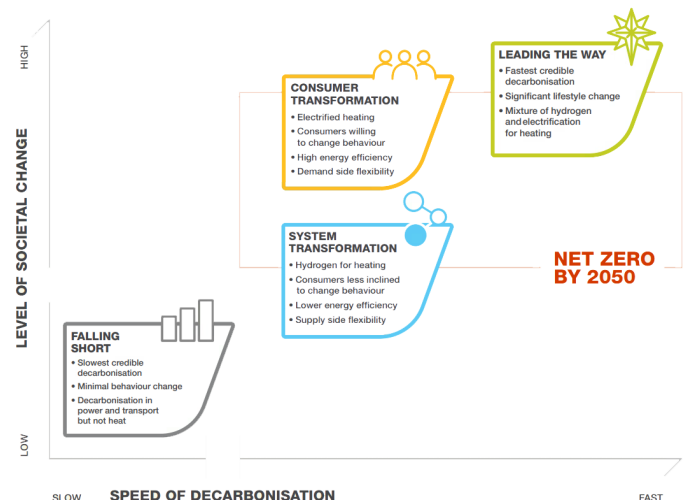
This DFES scenario framework includes three scenarios that are compliant with UK government targets of Net Zero greenhouse gas emissions by 2050. A summary of each scenario is below:

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 Bolsover 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	16033	6743	6743	0
Domestic	New dwellings	0	826	838	838	949	1067	1001	1001	961
Electric vehicles	Electric vehicles	1131	7001	9227	16866	16875	52421	47720	46585	39565
EV Charge Point	EV charge points	573	2990	4737	8856	9781	28443	29660	30975	30605
Heat pumps	Heat pump installations	90	1941	2089	6190	10852	19151	22559	39009	34283
Hydrogen electrolysis	MW (installed capacity)	0.0	1.0	5.1	1.1	0.0	2.3	10.0	4.8	1.0
Non domestic	Floorspace (metres squared) of new I&C developments	0	21635 2	26611 9	26611 9	27778 5	55868 7	55864 5	55864 5	55868 7
Other Distributed Generation	MW (installed capacity)	19.2	35.8	22.8	22.8	12.8	29.1	20.4	2.6	30.3
Resistive electric heating	Resistive electric heating units	1593	1458	1384	1462	1421	1374	650	1163	1259
Solar Generation	MW (installed capacity)	17.0	20.4	25.1	31.8	31.1	37.7	64.8	93.7	95.7
Storage	MW (installed capacity)	0.0	0.1	0.7	1.6	2.2	2.4	6.3	16.3	21.3
Wind	MW (installed capacity)	1.4	1.4	1.5	3.2	2.6	2.5	5.6	17.2	14.3

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.

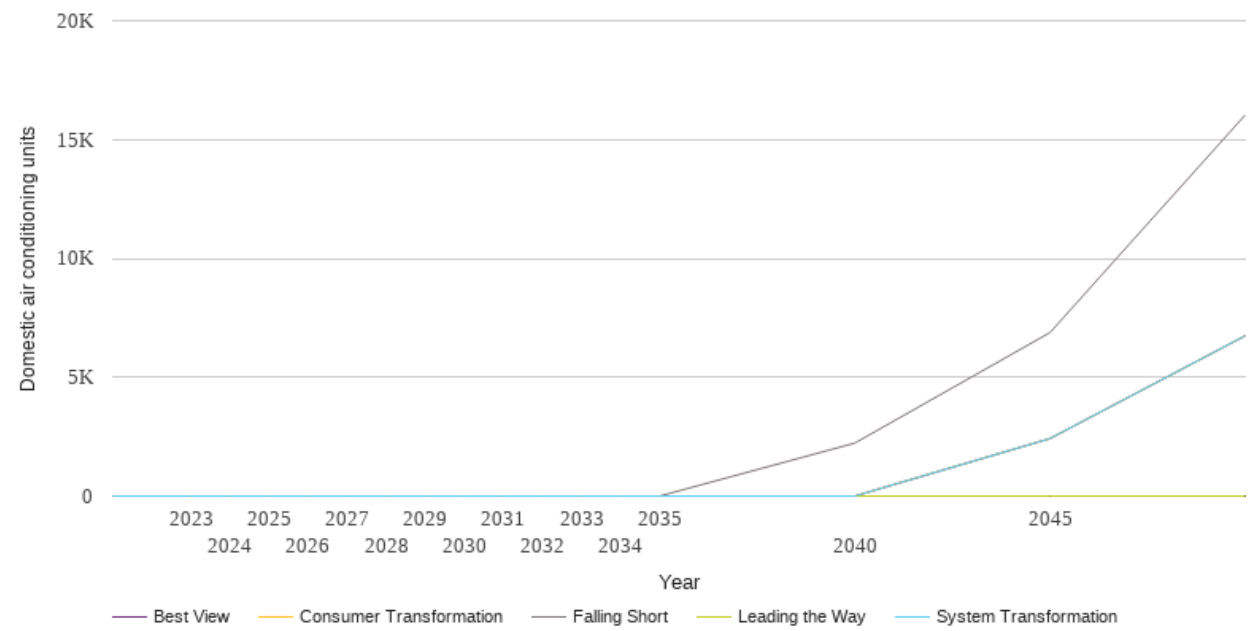
If you have any comments or queries regarding these reports, please contact

nged.energyplanning@nationalgrid.co.uk.

Technology Summary: Air conditioning

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

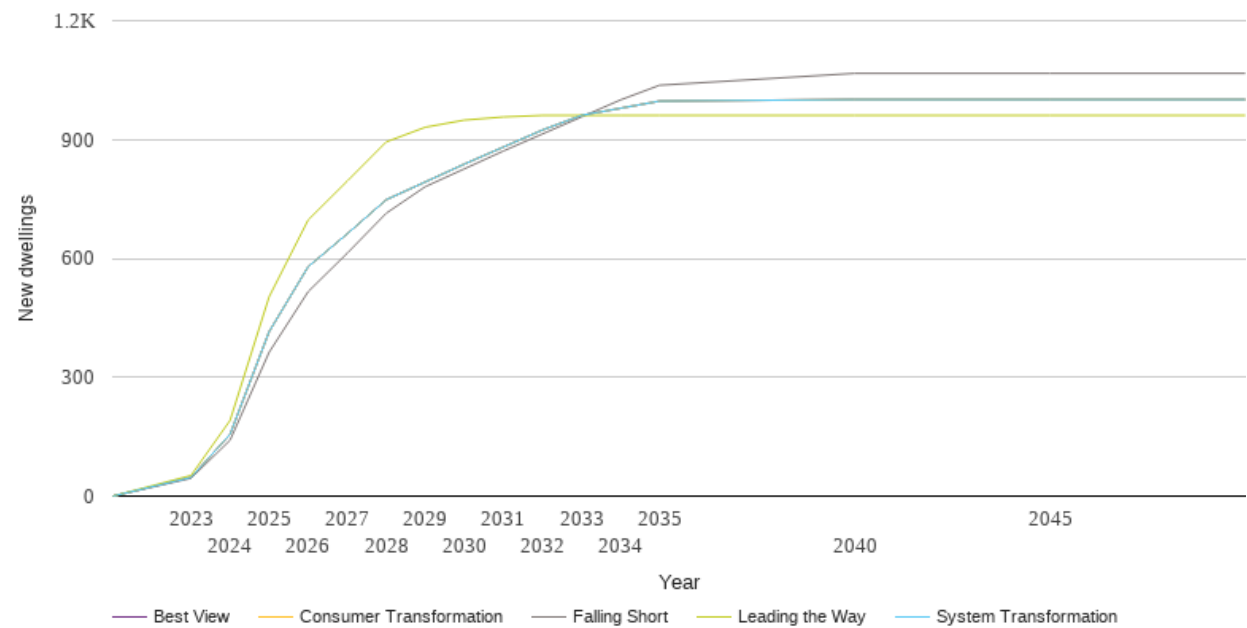
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	0	0	0	0	0
2025	0	0	0	0	0
2026	0	0	0	0	0
2027	0	0	0	0	0
2028	0	0	0	0	0
2029	0	0	0	0	0
2030	0	0	0	0	0
2031	0	0	0	0	0
2032	0	0	0	0	0
2033	0	0	0	0	0
2034	0	0	0	0	0
2035	0	0	0	0	0
2040	2228	0	0	0	0
2045	6878	2421	2421	0	2421
2050	16033	6743	6743	0	6743



Technology Summary: Domestic

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

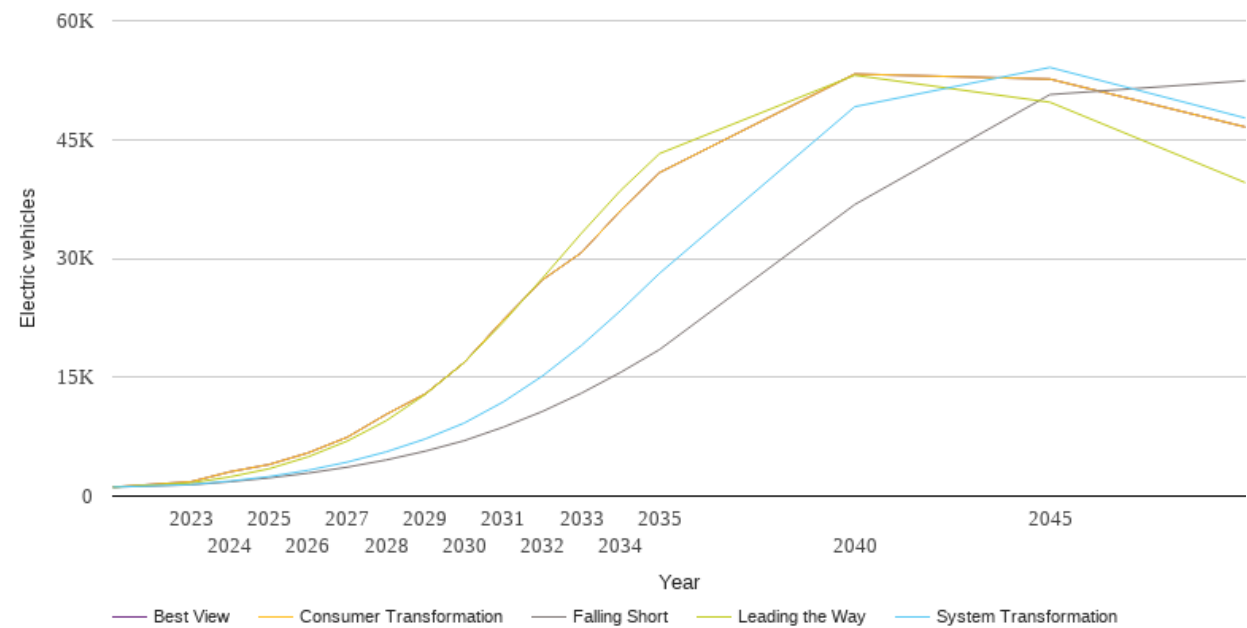
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	45	47	47	52	47
2024	141	156	156	191	156
2025	363	415	415	503	415
2026	516	579	579	697	579
2027	613	662	662	795	662
2028	714	748	748	894	748
2029	781	793	793	931	793
2030	826	838	838	949	838
2031	871	881	881	957	881
2032	914	924	924	961	924
2033	957	961	961	961	961
2034	1000	979	979	961	979
2035	1037	997	997	961	997
2040	1067	1001	1001	961	1001
2045	1067	1001	1001	961	1001
2050	1067	1001	1001	961	1001



Technology Summary: Electric vehicles

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

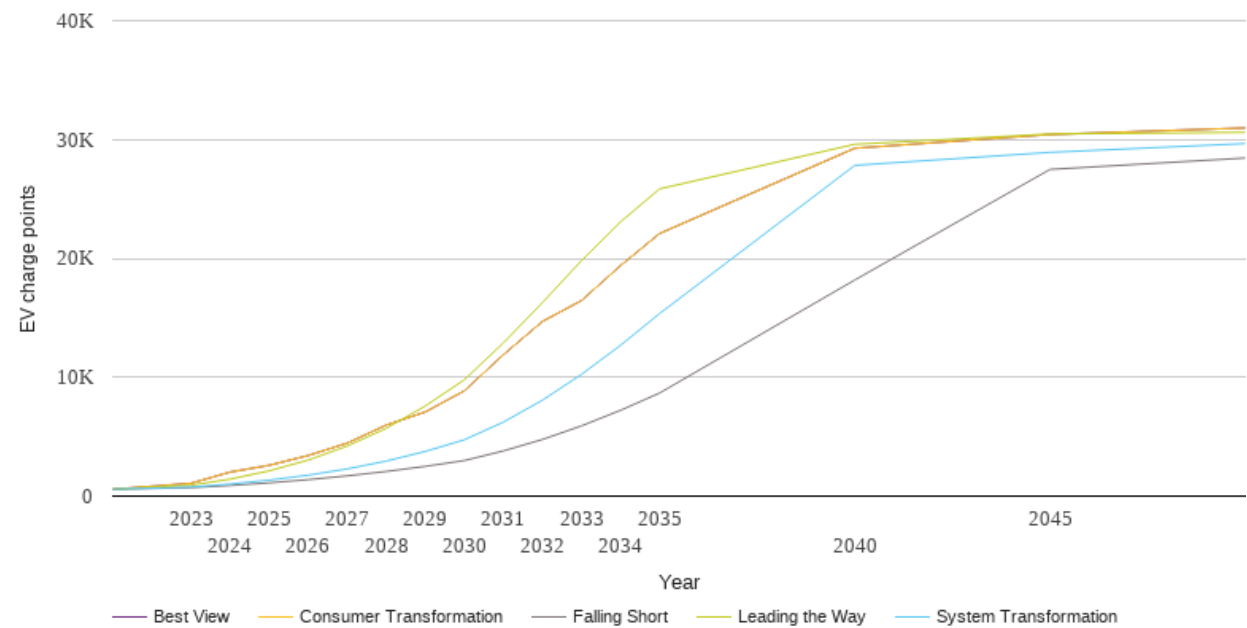
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1131	1131	1131	1131	1131
2023	1425	1456	1814	1661	1814
2024	1812	1896	3067	2424	3067
2025	2292	2460	3986	3450	3986
2026	2895	3255	5460	4960	5460
2027	3650	4287	7426	6945	7426
2028	4561	5585	10316	9513	10316
2029	5671	7214	12897	12836	12897
2030	7001	9227	16866	16875	16866
2031	8705	11899	22267	21966	22267
2032	10682	15152	27283	27493	27283
2033	12992	19012	30728	33171	30728
2034	15606	23400	36024	38558	36024
2035	18489	28125	40827	43225	40827
2040	36794	49142	53264	53114	53264
2045	50673	54101	52627	49707	52627
2050	52421	47720	46585	39565	46585



Technology Summary: EV Charge Point

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

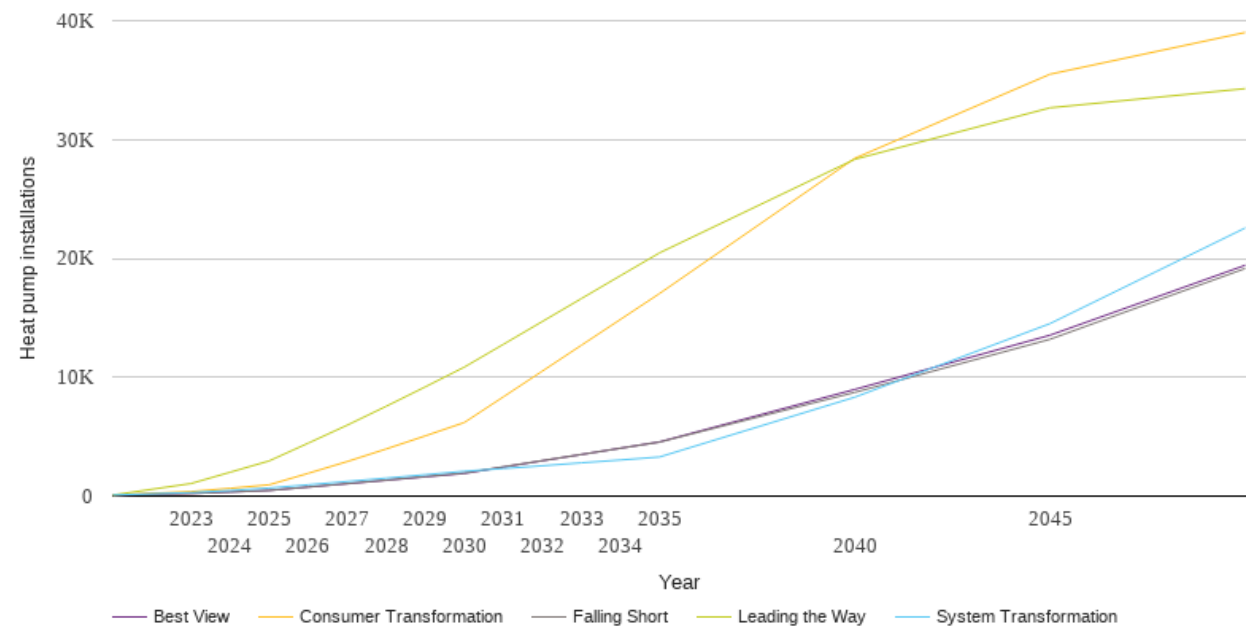
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	573	573	573	573	573
2023	712	758	1077	919	1077
2024	891	1013	2021	1428	2021
2025	1115	1340	2589	2120	2589
2026	1383	1758	3414	3031	3414
2027	1702	2288	4456	4212	4456
2028	2073	2947	5975	5699	5975
2029	2502	3759	7080	7582	7080
2030	2990	4737	8856	9781	8856
2031	3802	6225	11893	12881	11893
2032	4764	8069	14690	16276	14690
2033	5909	10239	16451	19808	16451
2034	7217	12683	19391	23066	19391
2035	8670	15353	22092	25847	22092
2040	18180	27828	29267	29601	29267
2045	27485	28921	30423	30465	30423
2050	28443	29660	30975	30605	30975



Technology Summary: Heat pumps

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

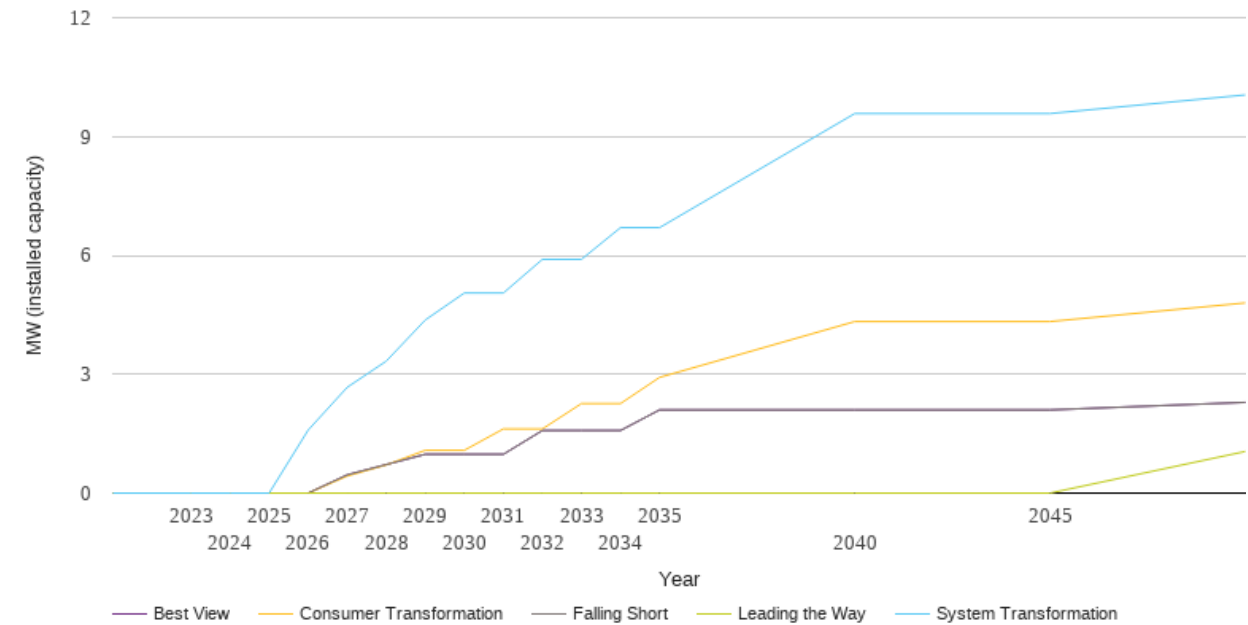
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	90	90	90	90	90
2023	221	295	381	1056	221
2024	346	474	654	2005	346
2025	477	678	949	2958	477
2026	767	950	1913	4452	760
2027	1056	1230	2907	5966	1042
2028	1352	1510	3967	7558	1330
2029	1647	1798	5066	9190	1621
2030	1941	2089	6190	10852	1906
2031	2463	2318	8349	12769	2440
2032	2987	2552	10519	14694	2973
2033	3501	2801	12696	16621	3500
2034	4023	3037	14868	18548	4034
2035	4541	3292	17044	20465	4559
2040	8725	8321	28418	28337	8975
2045	13193	14511	35493	32669	13536
2050	19151	22559	39009	34283	19419



Technology Summary: Hydrogen electrolysis

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

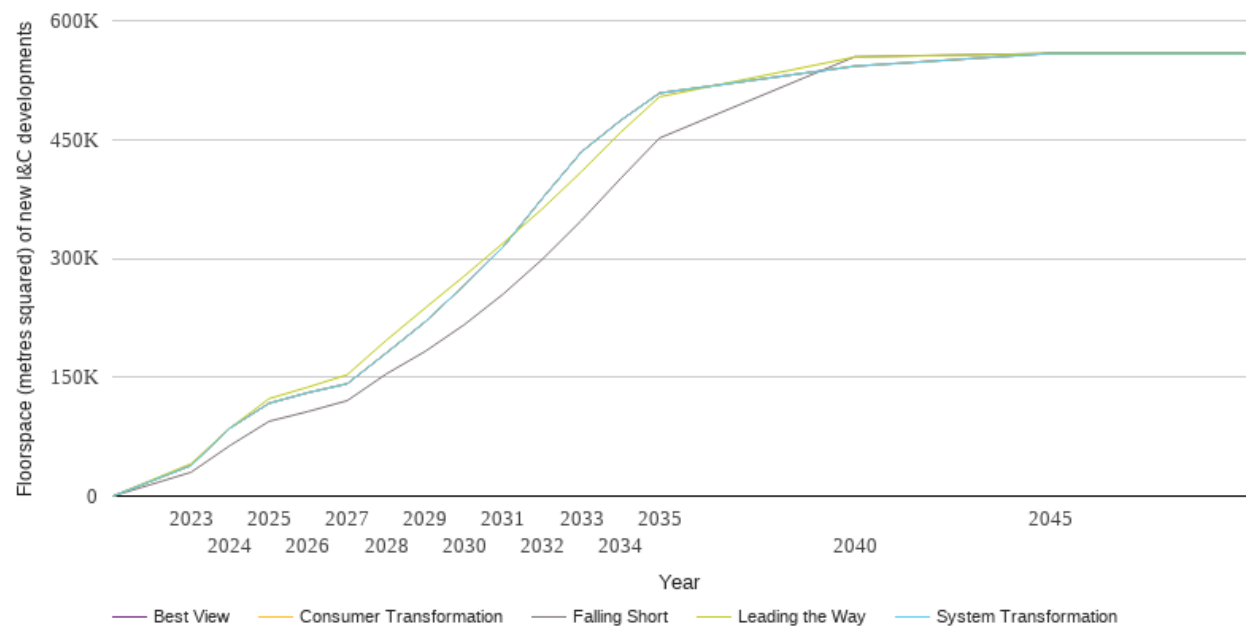
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	1.6	0.0	0.0	0.0
2027	0.5	2.7	0.4	0.0	0.5
2028	0.7	3.3	0.7	0.0	0.7
2029	1.0	4.4	1.1	0.0	1.0
2030	1.0	5.1	1.1	0.0	1.0
2031	1.0	5.1	1.6	0.0	1.0
2032	1.6	5.9	1.6	0.0	1.6
2033	1.6	5.9	2.3	0.0	1.6
2034	1.6	6.7	2.3	0.0	1.6
2035	2.1	6.7	2.9	0.0	2.1
2040	2.1	9.6	4.3	0.0	2.1
2045	2.1	9.6	4.3	0.0	2.1
2050	2.3	10.0	4.8	1.0	2.3



Technology Summary: Non domestic

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

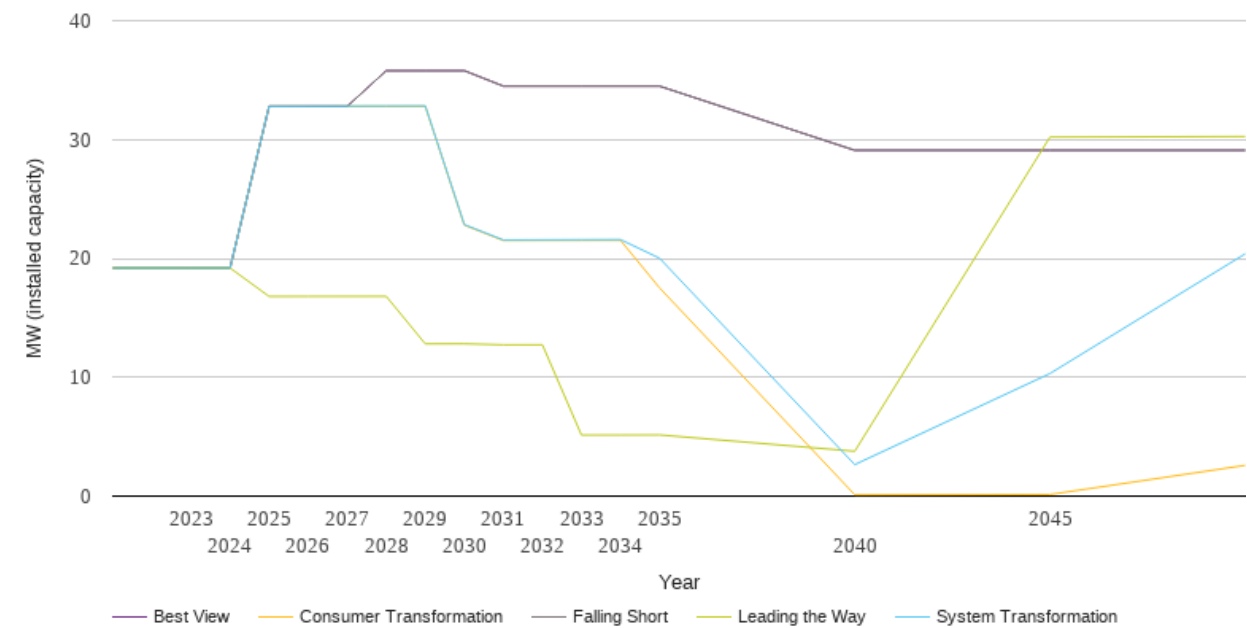
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	30086	38656	38656	40824	38656
2024	63857	85888	85888	85974	85888
2025	94360	117179	117179	122986	117179
2026	106772	130582	130582	137559	130582
2027	120450	141755	141755	153122	141755
2028	154115	180556	180556	196590	180556
2029	182687	220026	220026	237510	220026
2030	216352	266119	266119	277785	266119
2031	255111	314758	314758	319589	314758
2032	298964	375883	375883	362670	375883
2033	347912	434461	434461	409535	434461
2034	400665	473936	473936	458947	473936
2035	451876	508592	508592	503896	508592
2040	554469	542568	542568	554102	542568
2045	558687	558645	558645	558687	558645
2050	558687	558645	558645	558687	558645



Technology Summary: Other Distributed Generation

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

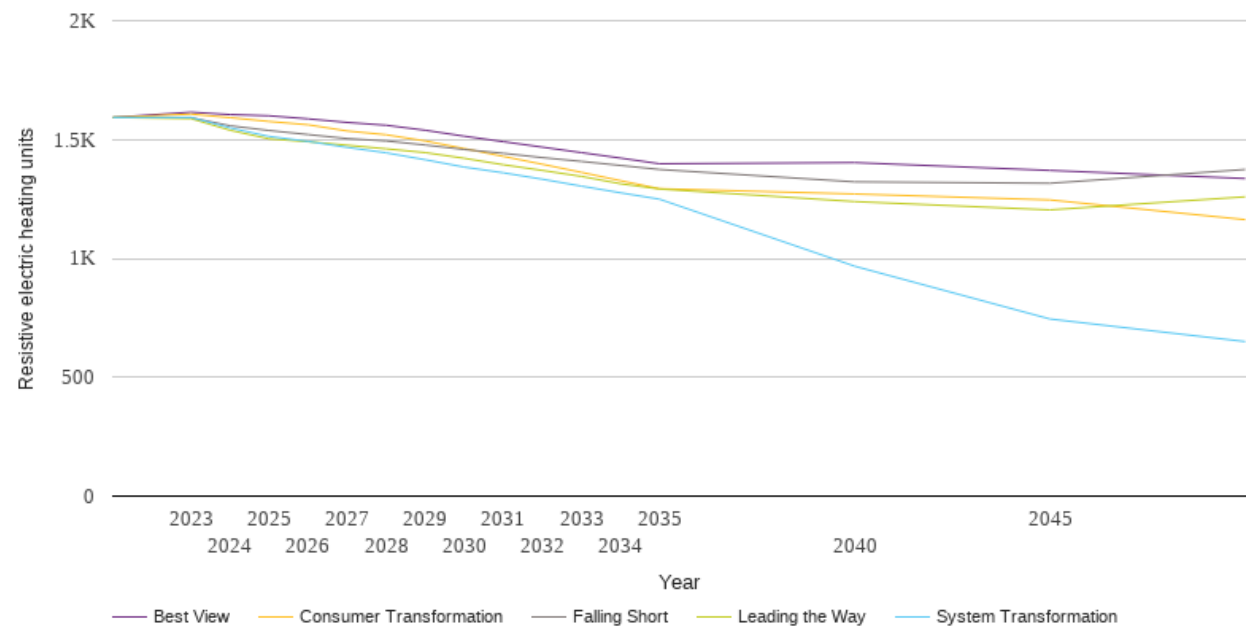
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	19.2	19.2	19.2	19.2	19.2
2023	19.2	19.2	19.2	19.2	19.2
2024	19.2	19.2	19.2	19.2	19.2
2025	32.8	32.8	32.8	16.8	32.8
2026	32.8	32.8	32.8	16.8	32.8
2027	32.8	32.8	32.8	16.8	32.8
2028	35.8	32.8	32.8	16.8	35.8
2029	35.8	32.8	32.8	12.8	35.8
2030	35.8	22.8	22.8	12.8	35.8
2031	34.5	21.5	21.5	12.7	34.5
2032	34.5	21.6	21.5	12.7	34.5
2033	34.5	21.6	21.5	5.1	34.5
2034	34.5	21.6	21.5	5.1	34.5
2035	34.5	20.0	17.5	5.1	34.5
2040	29.1	2.6	0.1	3.8	29.1
2045	29.1	10.3	0.1	30.2	29.1
2050	29.1	20.4	2.6	30.3	29.1



Technology Summary: Resistive electric heating

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

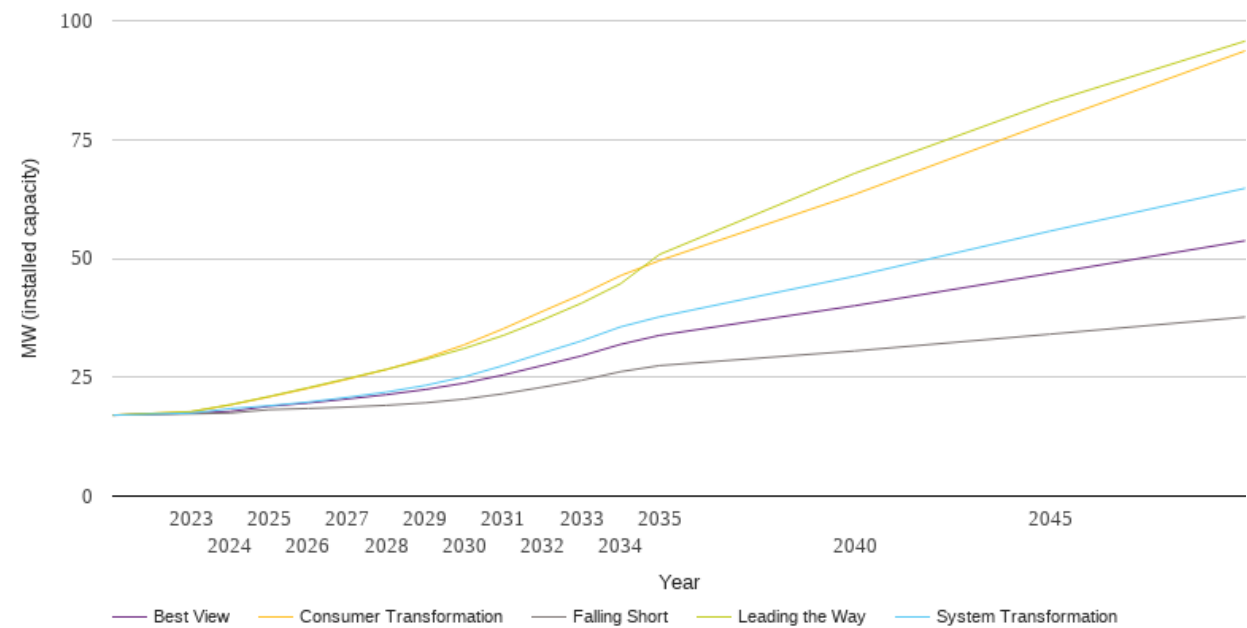
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1593	1593	1593	1593	1593
2023	1592	1593	1607	1588	1615
2024	1558	1549	1592	1539	1605
2025	1538	1513	1576	1503	1600
2026	1521	1492	1562	1491	1587
2027	1504	1467	1536	1476	1572
2028	1494	1444	1520	1461	1560
2029	1477	1415	1494	1445	1539
2030	1458	1384	1462	1421	1514
2031	1442	1360	1429	1394	1491
2032	1424	1333	1396	1370	1468
2033	1408	1304	1362	1345	1445
2034	1391	1276	1327	1314	1422
2035	1374	1249	1293	1292	1398
2040	1322	967	1271	1239	1403
2045	1316	745	1246	1204	1370
2050	1374	650	1163	1259	1336



Technology Summary: Solar Generation

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

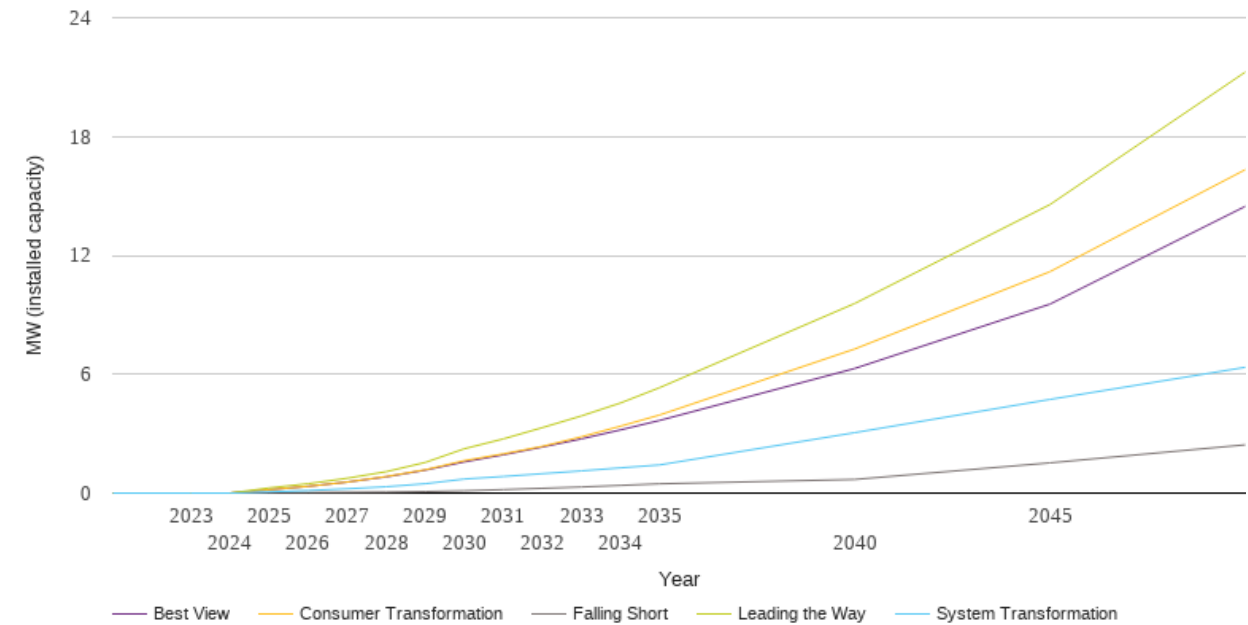
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	17.0	17.0	17.0	17.0	17.0
2023	17.3	17.5	17.7	17.8	17.4
2024	17.5	18.4	19.2	19.2	17.8
2025	18.2	19.0	20.9	21.0	18.9
2026	18.4	19.8	22.7	22.8	19.6
2027	18.7	20.8	24.6	24.7	20.4
2028	19.1	21.9	26.6	26.6	21.3
2029	19.6	23.3	29.0	28.7	22.4
2030	20.4	25.1	31.8	31.1	23.8
2031	21.5	27.5	35.2	33.8	25.5
2032	22.9	30.1	38.9	37.0	27.5
2033	24.4	32.6	42.4	40.6	29.5
2034	26.2	35.6	46.4	44.7	31.9
2035	27.4	37.7	49.5	50.8	33.8
2040	30.5	46.2	63.5	67.9	40.0
2045	34.1	55.7	78.7	82.8	46.8
2050	37.7	64.8	93.7	95.7	53.7



Technology Summary: Storage

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

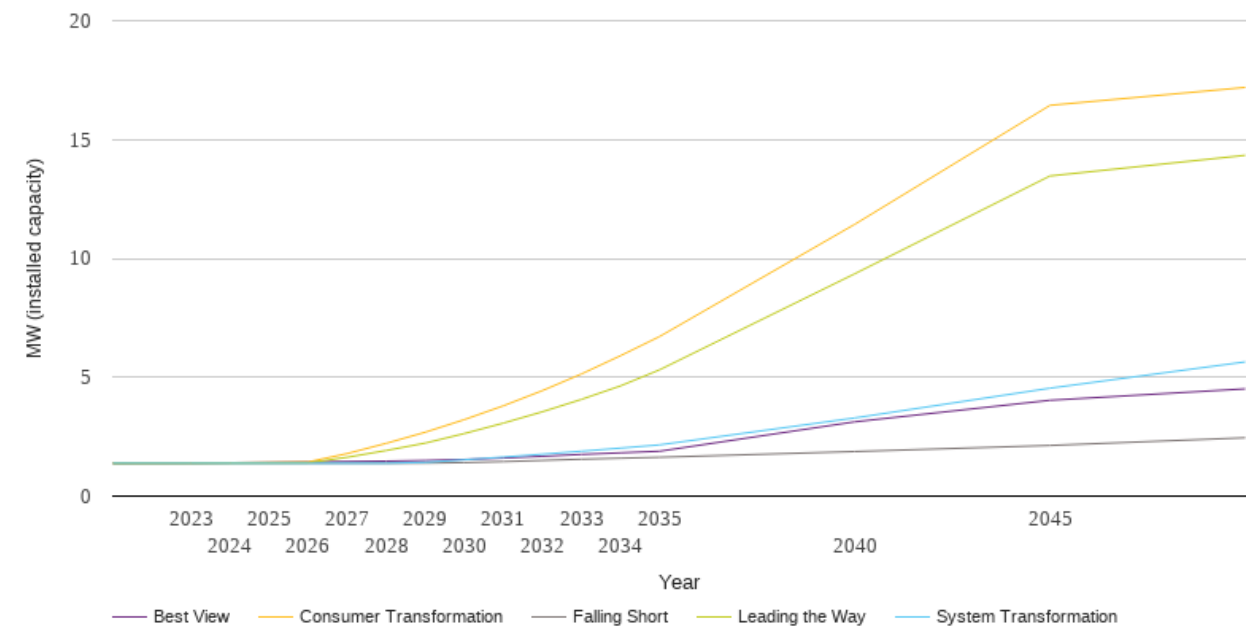
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.1	0.2	0.3	0.2
2026	0.0	0.1	0.3	0.5	0.3
2027	0.0	0.2	0.6	0.7	0.6
2028	0.1	0.3	0.8	1.1	0.8
2029	0.1	0.5	1.2	1.5	1.2
2030	0.1	0.7	1.6	2.2	1.6
2031	0.2	0.8	2.0	2.7	1.9
2032	0.2	1.0	2.4	3.3	2.3
2033	0.3	1.1	2.8	3.9	2.7
2034	0.4	1.3	3.4	4.5	3.2
2035	0.5	1.4	3.9	5.3	3.7
2040	0.7	3.1	7.3	9.6	6.3
2045	1.5	4.7	11.2	14.6	9.5
2050	2.4	6.3	16.3	21.3	14.5



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	1.4	1.4	1.4	1.4	1.4
2023	1.4	1.4	1.4	1.4	1.4
2024	1.4	1.4	1.4	1.4	1.4
2025	1.4	1.4	1.4	1.4	1.4
2026	1.4	1.4	1.4	1.4	1.4
2027	1.4	1.4	1.8	1.6	1.5
2028	1.4	1.4	2.2	1.9	1.5
2029	1.4	1.4	2.7	2.2	1.5
2030	1.4	1.5	3.2	2.6	1.5
2031	1.5	1.6	3.8	3.1	1.6
2032	1.5	1.8	4.4	3.5	1.7
2033	1.6	1.9	5.1	4.1	1.8
2034	1.6	2.0	5.9	4.6	1.8
2035	1.6	2.2	6.7	5.3	1.9
2040	1.9	3.3	11.4	9.4	3.1
2045	2.1	4.5	16.4	13.5	4.0
2050	2.5	5.6	17.2	14.3	4.5



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))
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