

Distribution Future Energy Scenarios 2022

Local Authority:
Bath and North East Somerset

What are Distribution Future Energy Scenarios?

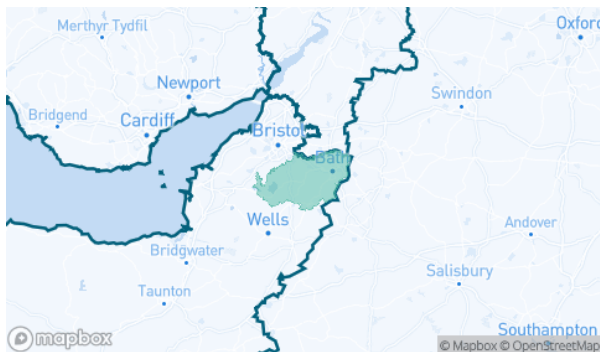
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Bath and North East Somerset covered by the NGED licence areas.



Scenario Summary

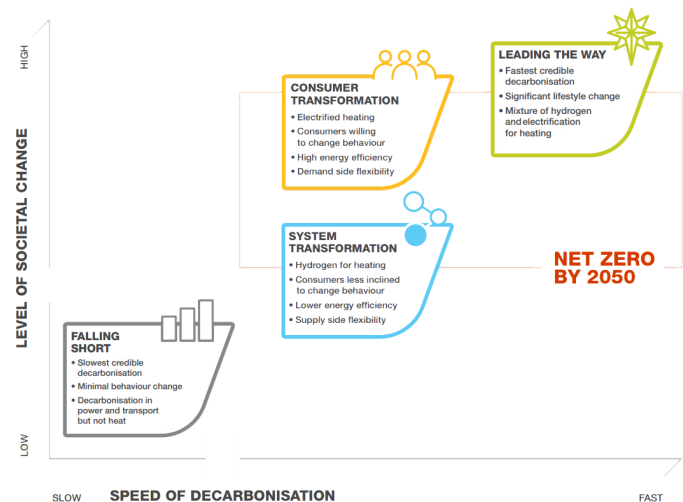
This DFES scenario framework includes three scenarios that are compliant with UK government targets of Net Zero greenhouse gas emissions by 2050. A summary of each scenario is below:

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 Bath and North East Somerset 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	677	2088	1748	1748	677	36646	19693	19693	677
Domestic	New dwellings	0	1765	1844	1844	2092	2367	2261	2261	2183
Electric vehicles	Electric vehicles	2368	20344	24336	45115	44850	141324	125672	130081	103060
EV Charge Point	EV charge points	1237	9310	12779	24283	26485	74226	67777	70152	73424
Heat pumps	Heat pump installations	597	5809	4817	13617	20927	43699	49771	83090	72744
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	0.2	0.0	0.8	0.3	3.3	2.0	4.1
Non domestic	Floorspace (metres squared) of new I&C developments	0	92317	129634	129634	123498	361179	361179	361179	361179
Other Distributed Generation	MW (installed capacity)	3.0	15.2	15.2	16.8	8.8	15.2	1.1	2.7	5.7
Resistive electric heating	Resistive electric heating units	13545	10842	10600	11332	10742	6636	2599	6988	7252
Solar Generation	MW (installed capacity)	13.2	20.0	32.2	52.1	54.6	56.6	119.9	199.9	210.7
Storage	MW (installed capacity)	0.0	0.3	1.7	4.3	5.7	6.4	17.4	43.9	55.2
Wind	MW (installed capacity)	0.1	0.2	0.3	1.9	1.5	1.9	5.4	17.6	14.2

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

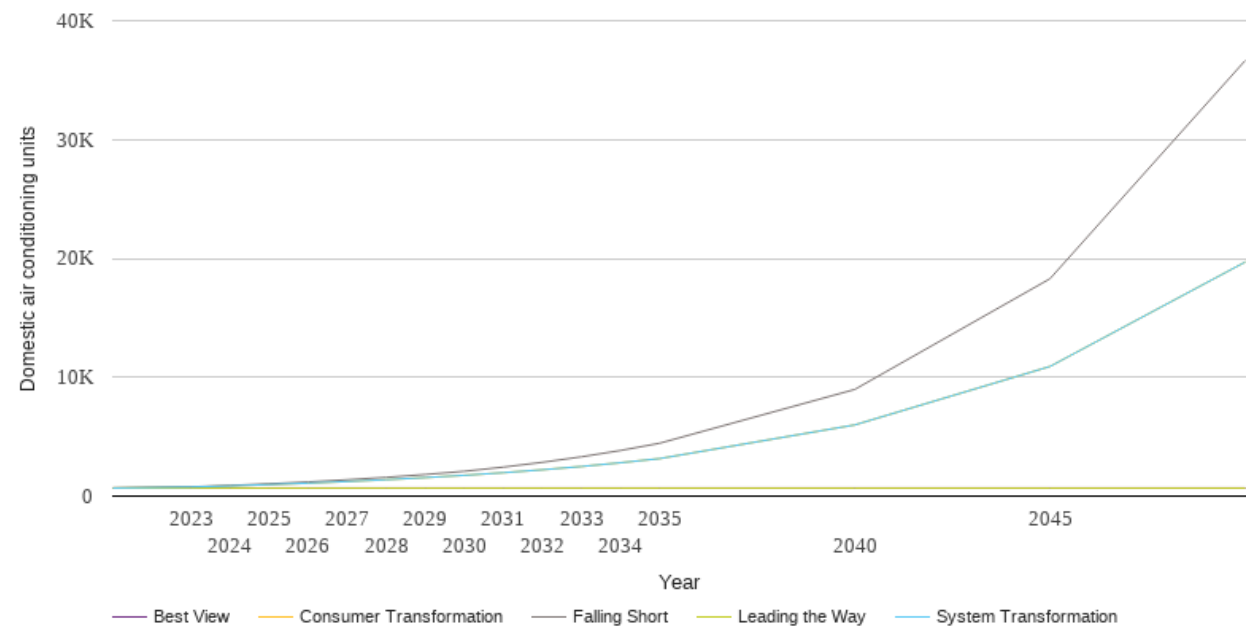
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

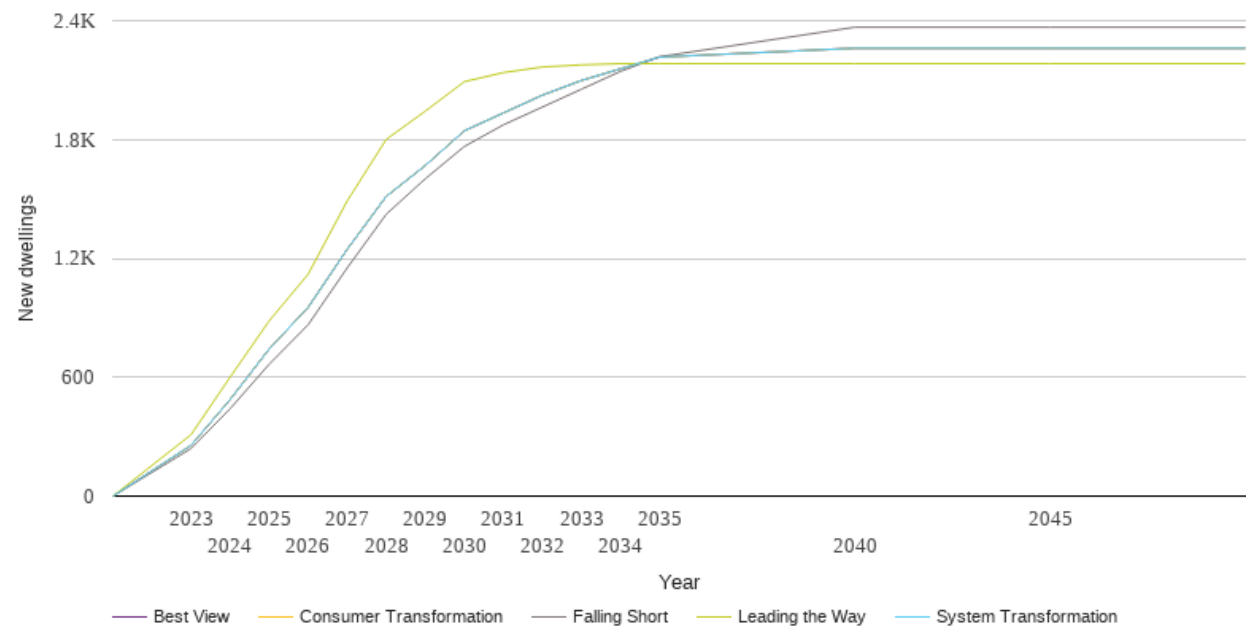
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	677	677	677	677	677
2023	779	766	766	677	677
2024	897	859	859	677	677
2025	1033	968	968	677	677
2026	1191	1089	1089	677	677
2027	1372	1224	1224	677	677
2028	1577	1379	1379	677	677
2029	1817	1554	1554	677	677
2030	2088	1748	1748	677	677
2031	2439	1968	1968	677	677
2032	2841	2215	2215	677	677
2033	3305	2491	2491	677	677
2034	3837	2806	2806	677	677
2035	4444	3153	3153	677	677
2040	8973	5987	5987	677	677
2045	18288	10906	10906	677	677
2050	36646	19693	19693	677	677



Technology Summary: Domestic

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

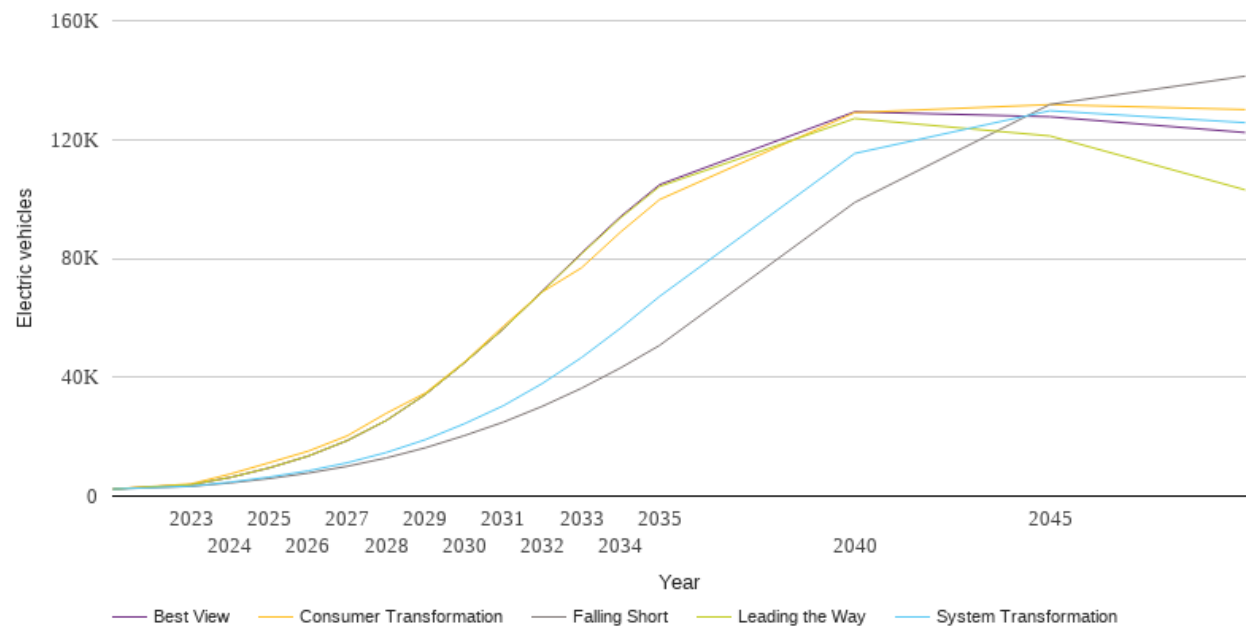
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	240	256	256	310	256
2024	441	487	487	600	487
2025	665	742	742	884	742
2026	865	953	953	1120	953
2027	1152	1246	1246	1490	1246
2028	1423	1513	1513	1801	1513
2029	1602	1669	1669	1943	1669
2030	1765	1844	1844	2092	1844
2031	1874	1934	1934	2138	1934
2032	1964	2024	2024	2166	2024
2033	2054	2098	2098	2177	2098
2034	2144	2157	2157	2183	2157
2035	2218	2216	2216	2183	2216
2040	2367	2261	2261	2183	2261
2045	2367	2261	2261	2183	2261
2050	2367	2261	2261	2183	2261



Technology Summary: Electric vehicles

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

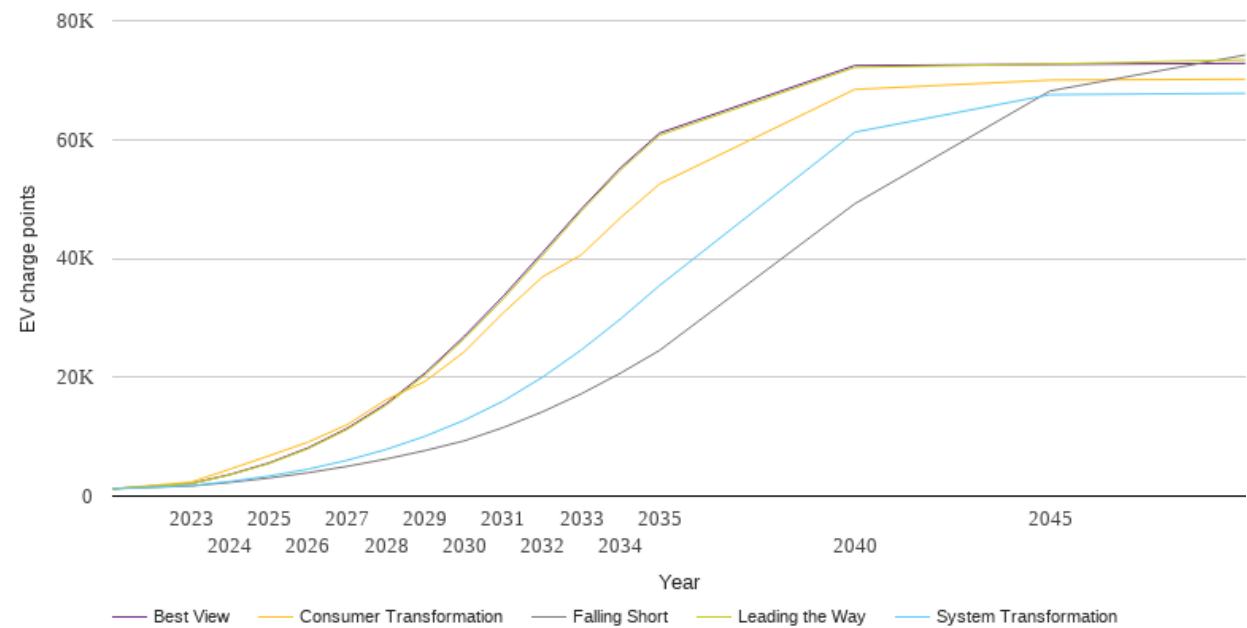
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	2368	2368	2368	2368	2368
2023	3264	3351	4103	3826	3826
2024	4436	4679	7424	6270	6267
2025	5889	6402	11219	9482	9477
2026	7726	8498	15116	13461	13455
2027	10029	11219	20274	18690	18676
2028	12831	14659	27854	25441	25430
2029	16247	18984	34668	34203	34188
2030	20344	24336	45115	44850	44825
2031	24895	30424	57176	56296	56265
2032	30229	37912	68734	68806	69027
2033	36282	46593	76811	81482	81771
2034	43133	56502	88839	93616	94035
2035	50715	67195	99784	104210	104804
2040	98838	115313	129068	127079	129334
2045	131822	129693	131759	121201	127667
2050	141324	125672	130081	103060	122357



Technology Summary: EV Charge Point

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

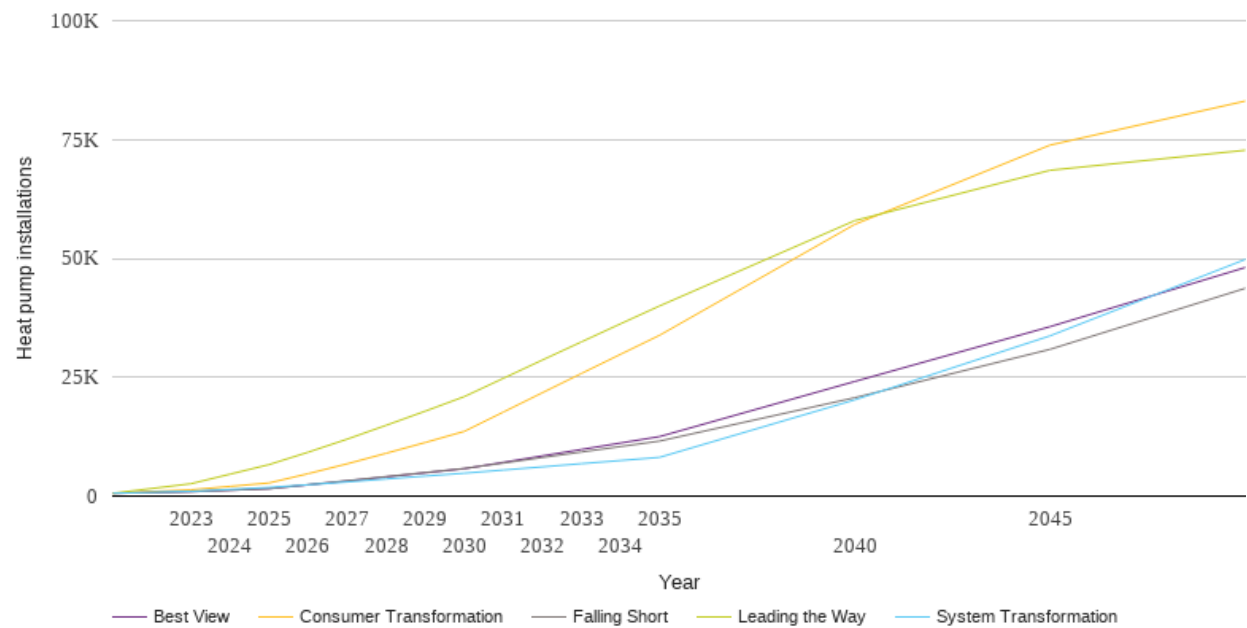
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1237	1237	1237	1237	1237
2023	1704	1756	2357	2091	2107
2024	2302	2465	4535	3583	3644
2025	3044	3372	6792	5485	5581
2026	3933	4534	9088	7987	8120
2027	5001	6028	12020	11233	11403
2028	6239	7854	16220	15299	15558
2029	7671	10086	19321	20445	20732
2030	9310	12779	24283	26485	26890
2031	11544	16009	30852	33172	33651
2032	14175	19994	36883	40453	40950
2033	17225	24610	40621	47971	48327
2034	20689	29802	46844	54877	55226
2035	24513	35435	52529	60722	61081
2040	49192	61233	68436	72139	72446
2045	68173	67548	69995	72703	72650
2050	74226	67777	70152	73424	72822



Technology Summary: Heat pumps

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

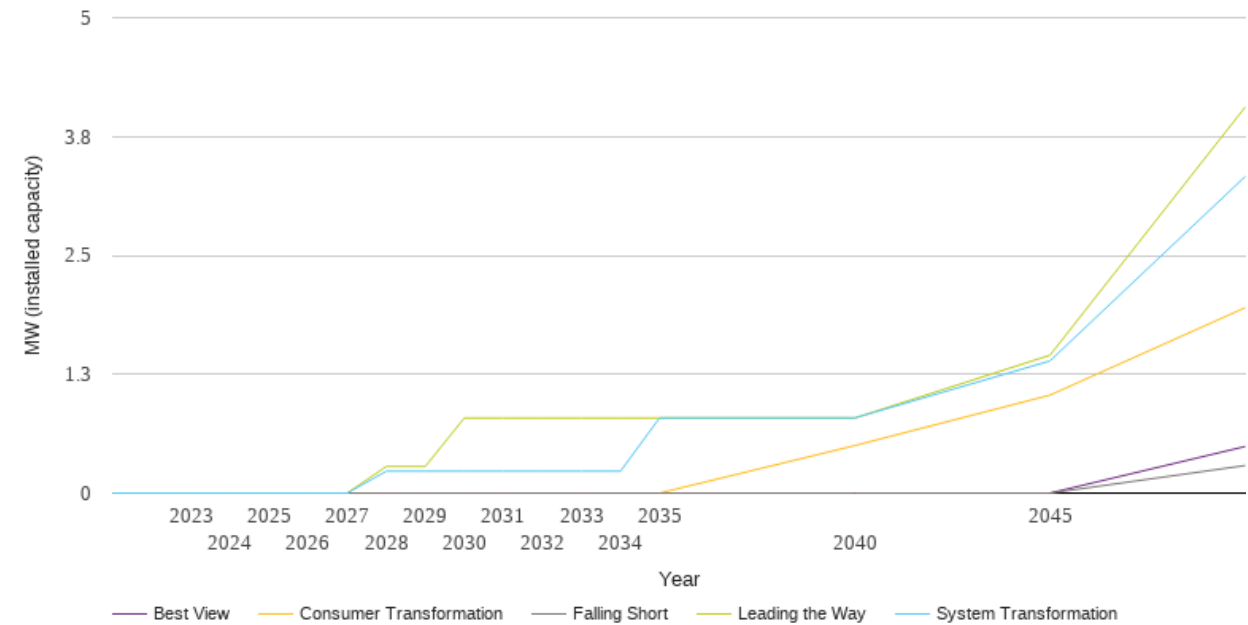
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	597	597	597	597	597
2023	926	1010	1320	2604	926
2024	1245	1410	2036	4612	1245
2025	1567	1819	2765	6631	1567
2026	2400	2381	4718	9230	2360
2027	3235	2977	6792	11980	3171
2028	4099	3600	9011	14894	4033
2029	4955	4213	11274	17867	4898
2030	5809	4817	13617	20927	5764
2031	6955	5480	17677	24774	7097
2032	8120	6150	21749	28623	8454
2033	9273	6821	25796	32441	9806
2034	10423	7482	29822	36236	11161
2035	11575	8147	33822	39995	12511
2040	20696	20242	57151	57938	24110
2045	30865	33703	73822	68527	35632
2050	43699	49771	83090	72744	48077



Technology Summary: Hydrogen electrolysis

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

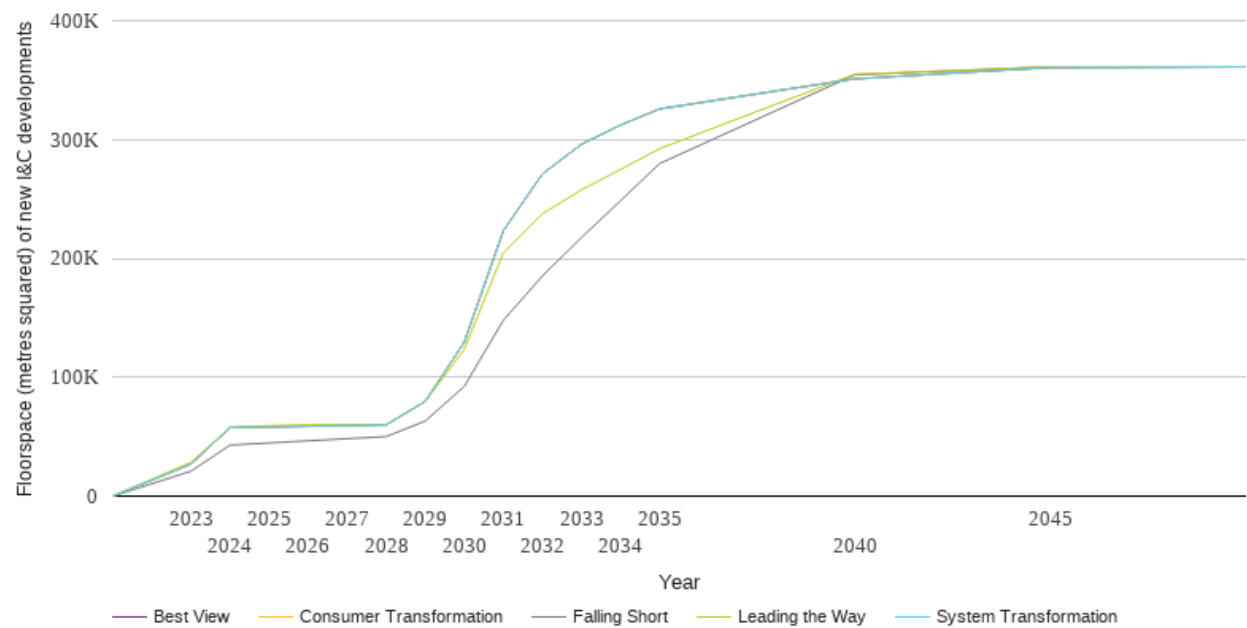
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0	0.0
2028	0.0	0.2	0.0	0.3	0.0
2029	0.0	0.2	0.0	0.3	0.0
2030	0.0	0.2	0.0	0.8	0.0
2031	0.0	0.2	0.0	0.8	0.0
2032	0.0	0.2	0.0	0.8	0.0
2033	0.0	0.2	0.0	0.8	0.0
2034	0.0	0.2	0.0	0.8	0.0
2035	0.0	0.8	0.0	0.8	0.0
2040	0.0	0.8	0.5	0.8	0.0
2045	0.0	1.4	1.0	1.5	0.0
2050	0.3	3.3	2.0	4.1	0.5



Technology Summary: Non domestic

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

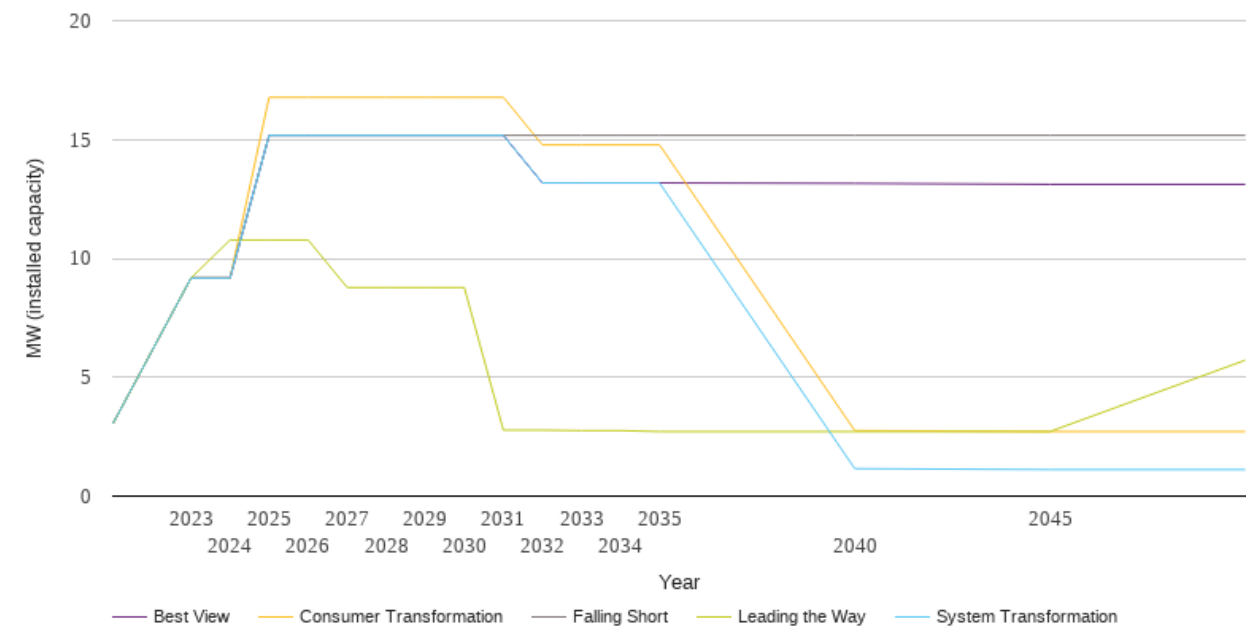
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	21000	27000	27000	28500	27000
2024	42900	57600	57600	57750	57600
2025	44700	58200	58200	59250	58200
2026	46500	58800	58800	60000	58800
2027	48300	59400	59400	60000	59400
2028	50100	60000	60000	60000	60000
2029	63160	79705	79705	79705	79705
2030	92317	129634	129634	123498	129634
2031	147907	223225	223225	204652	223225
2032	185198	271067	271067	237528	271067
2033	217490	296022	296022	257726	296022
2034	248508	312133	312133	274736	312133
2035	279751	325739	325739	292309	325739
2040	354429	351054	351054	354954	351054
2045	361179	360617	360617	361179	360617
2050	361179	361179	361179	361179	361179



Technology Summary: Other Distributed Generation

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

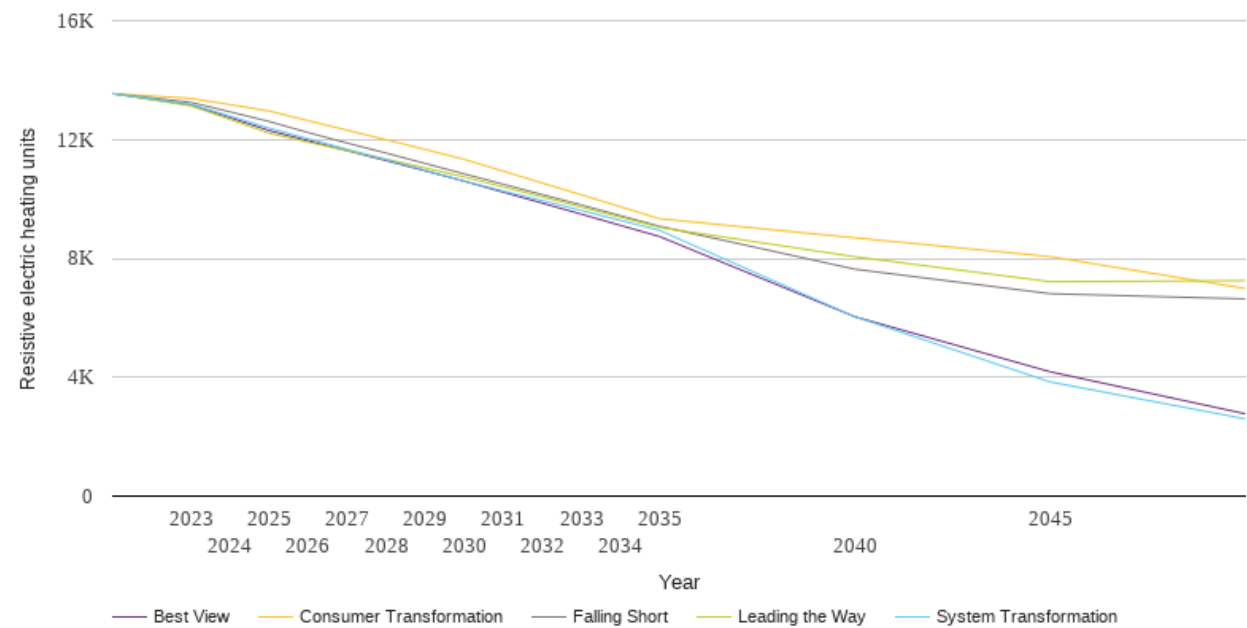
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	3.0	3.0	3.0	3.0	3.0
2023	9.2	9.2	9.2	9.2	9.2
2024	9.2	9.2	9.2	10.8	9.2
2025	15.2	15.2	16.8	10.8	15.2
2026	15.2	15.2	16.8	10.8	15.2
2027	15.2	15.2	16.8	8.8	15.2
2028	15.2	15.2	16.8	8.8	15.2
2029	15.2	15.2	16.8	8.8	15.2
2030	15.2	15.2	16.8	8.8	15.2
2031	15.2	15.2	16.8	2.8	15.2
2032	15.2	13.2	14.8	2.8	13.2
2033	15.2	13.2	14.8	2.8	13.2
2034	15.2	13.2	14.8	2.8	13.2
2035	15.2	13.2	14.8	2.7	13.2
2040	15.2	1.2	2.8	2.7	13.2
2045	15.2	1.1	2.7	2.7	13.1
2050	15.2	1.1	2.7	5.7	13.1



Technology Summary: Resistive electric heating

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

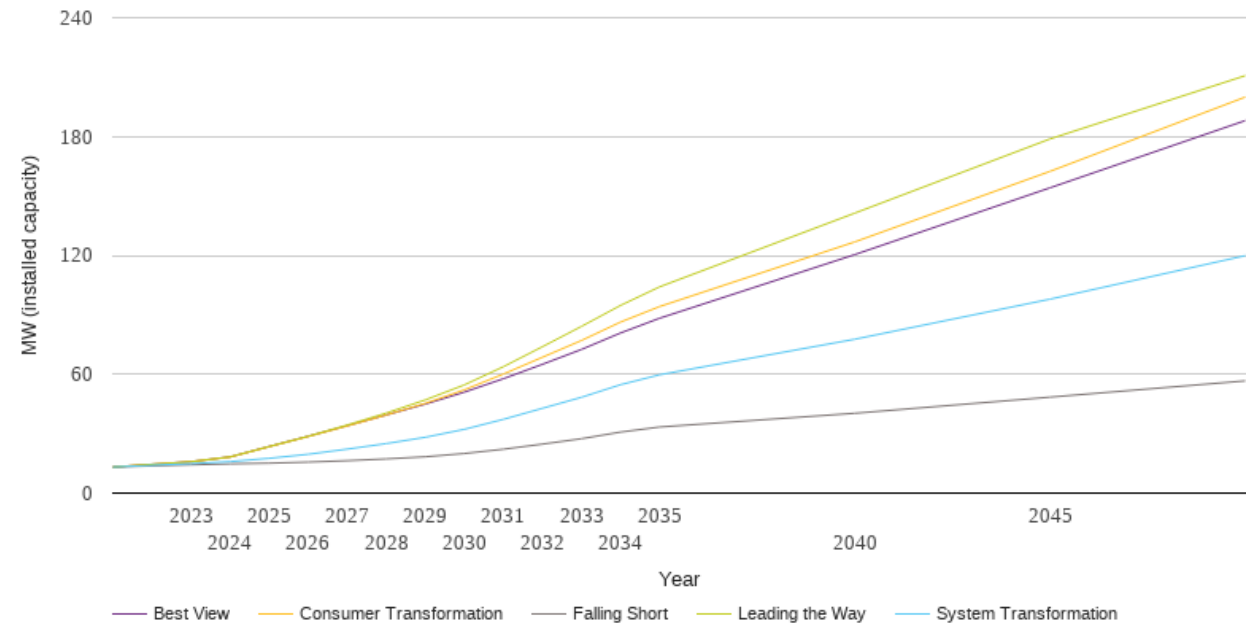
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	13545	13545	13545	13545	13545
2023	13250	13187	13384	13131	13163
2024	12932	12790	13175	12675	12735
2025	12607	12384	12960	12212	12302
2026	12235	12027	12633	11911	11961
2027	11881	11672	12313	11626	11625
2028	11543	11325	11993	11339	11292
2029	11194	10962	11667	11045	10948
2030	10842	10600	11332	10742	10600
2031	10494	10268	10934	10404	10227
2032	10144	9943	10535	10069	9859
2033	9796	9614	10138	9728	9487
2034	9437	9278	9737	9385	9111
2035	9081	8944	9336	9043	8736
2040	7637	6038	8693	8055	6038
2045	6812	3843	8060	7216	4185
2050	6636	2599	6988	7252	2771



Technology Summary: Solar Generation

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

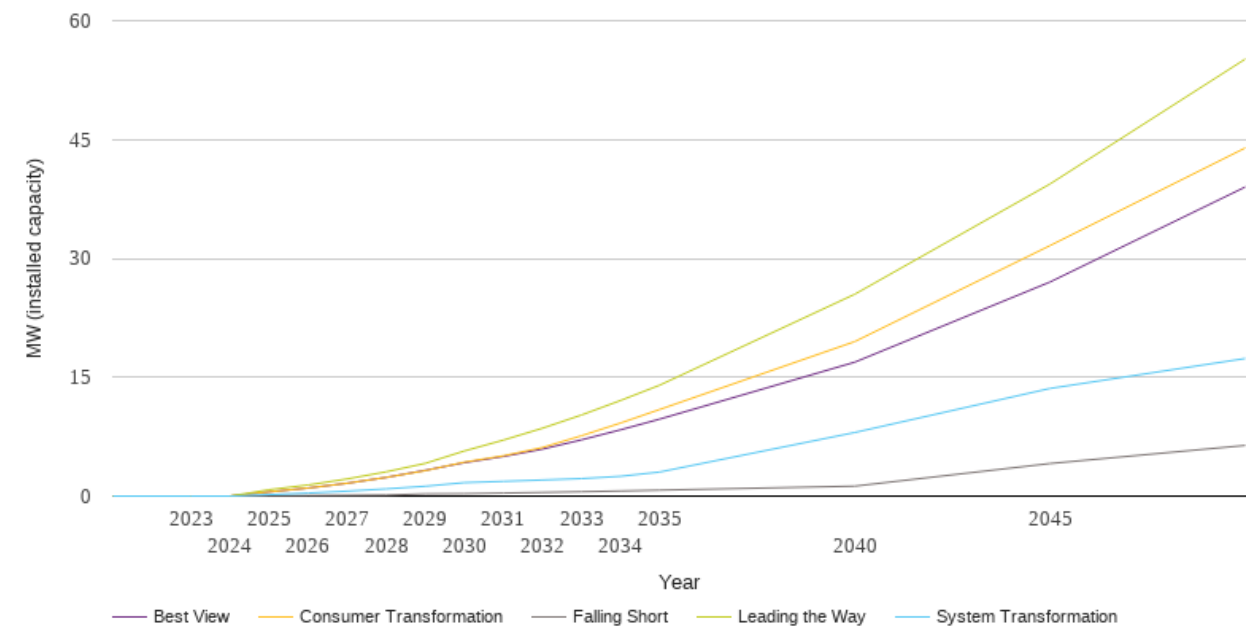
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	13.2	13.2	13.2	13.2	13.2
2023	14.3	14.9	15.8	15.8	15.8
2024	14.8	15.9	18.2	18.3	18.3
2025	15.1	17.6	23.4	23.5	23.5
2026	15.6	19.6	28.5	28.7	28.7
2027	16.4	22.2	33.9	34.4	34.0
2028	17.3	25.0	39.4	40.4	39.4
2029	18.3	28.2	45.3	47.0	44.9
2030	20.0	32.2	52.1	54.6	51.0
2031	22.1	37.2	60.1	63.8	57.7
2032	24.7	42.8	68.6	73.9	65.0
2033	27.4	48.3	77.0	84.1	72.5
2034	30.8	54.7	86.3	94.7	80.8
2035	33.3	59.7	94.2	104.1	88.3
2040	40.3	77.7	126.8	141.3	120.4
2045	48.4	97.9	162.4	178.8	154.1
2050	56.6	119.9	199.9	210.7	188.0



Technology Summary: Storage

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

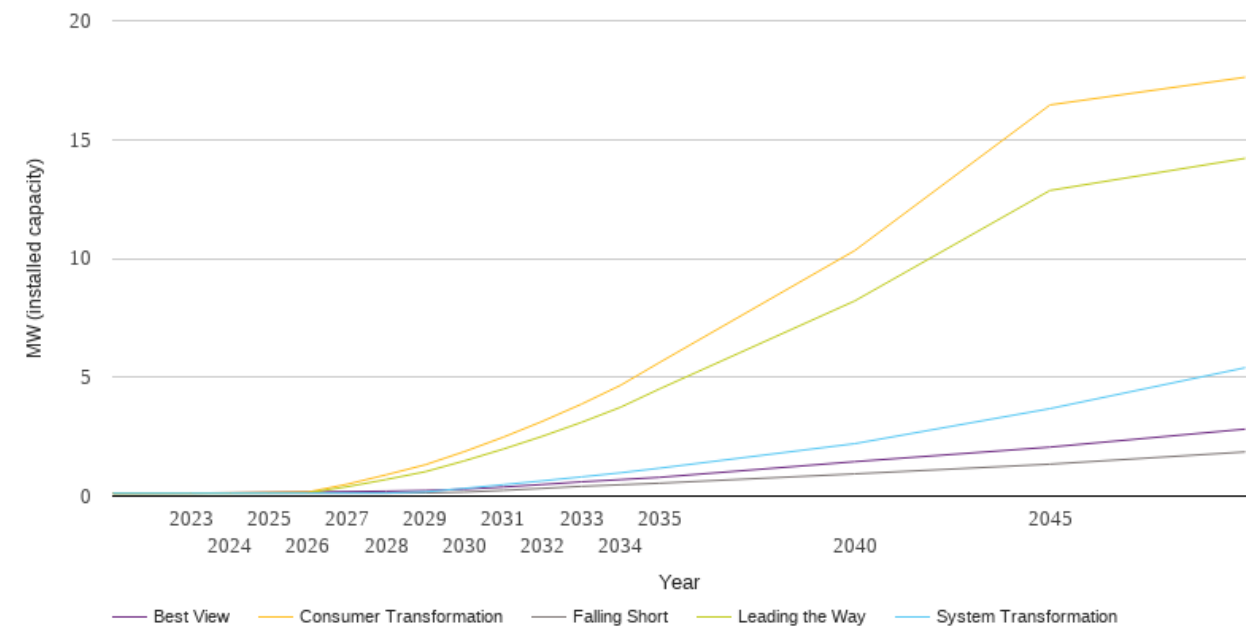
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.1	0.2	0.5	0.8	0.5
2026	0.1	0.4	1.0	1.4	1.0
2027	0.1	0.6	1.6	2.2	1.6
2028	0.1	0.9	2.4	3.1	2.4
2029	0.3	1.2	3.2	4.1	3.3
2030	0.3	1.7	4.3	5.7	4.2
2031	0.4	1.9	5.1	7.1	5.0
2032	0.5	2.0	6.1	8.6	5.9
2033	0.5	2.2	7.6	10.2	7.1
2034	0.6	2.5	9.2	12.1	8.4
2035	0.7	3.0	10.9	14.0	9.7
2040	1.3	8.0	19.5	25.5	16.9
2045	4.1	13.6	31.6	39.4	27.0
2050	6.4	17.4	43.9	55.2	39.0



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	0.2	0.1	0.2
2026	0.1	0.1	0.2	0.1	0.2
2027	0.1	0.1	0.5	0.4	0.2
2028	0.1	0.1	0.9	0.7	0.2
2029	0.1	0.2	1.3	1.0	0.2
2030	0.2	0.3	1.9	1.5	0.3
2031	0.2	0.5	2.5	2.0	0.4
2032	0.3	0.6	3.1	2.5	0.5
2033	0.4	0.8	3.9	3.1	0.6
2034	0.5	1.0	4.7	3.7	0.7
2035	0.5	1.2	5.6	4.5	0.8
2040	0.9	2.2	10.3	8.2	1.4
2045	1.3	3.7	16.5	12.9	2.1
2050	1.9	5.4	17.6	14.2	2.8



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))
National Grid Electricity Distribution (South Wales) Plc (company number 02366985))
(collectively, “NGED”)

nged.networkstrategy@nationalgrid.co.uk

