

Distribution Future Energy Scenarios 2022

Local Authority:
North Warwickshire

What are Distribution Future Energy Scenarios?

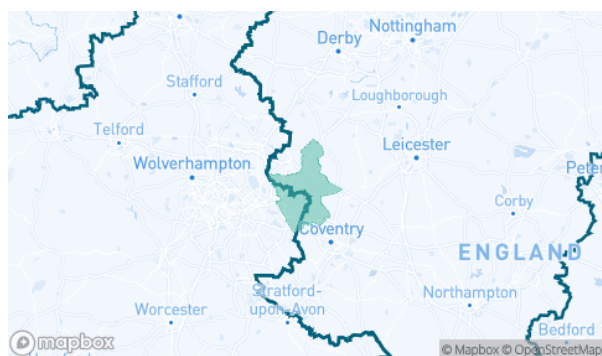
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Warwickshire covered by the NGED licence areas.



Scenario Summary

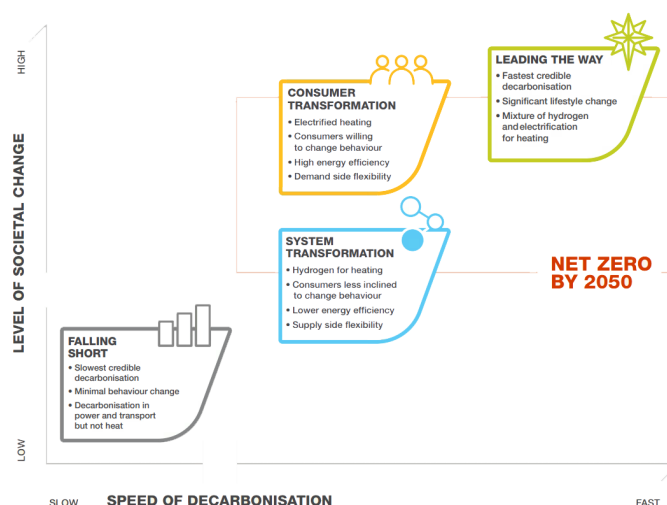
This DFES scenario framework includes three scenarios that are compliant with UK government targets of Net Zero greenhouse gas emissions by 2050. A summary of each scenario is below:

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 Warwickshire 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	11820	4985	4985	0
Domestic	New dwellings	0	1057	1107	1107	1245	2019	1964	1964	1924
Electric vehicles	Electric vehicles	928	6168	7771	14320	14269	43714	37253	36991	32318
EV Charge Point	EV charge points	490	2778	4161	7773	8609	24503	24279	25499	25379
Heat pumps	Heat pump installations	318	2332	2115	5573	8844	14628	17126	29780	26749
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	1.4	0.2	2.4	1.7	8.7	4.3	8.7
Non domestic	Floorspace (metres squared) of new I&C developments	0	211300	247507	247507	260928	296841	294647	294647	296841
Other Distributed Generation	MW (installed capacity)	21.2	23.8	22.6	20.9	19.7	12.2	15.1	12.2	18.5
Resistive electric heating	Resistive electric heating units	4433	3593	3501	3746	3561	2400	984	2423	2559
Solar Generation	MW (installed capacity)	11.9	16.0	21.4	26.5	24.1	46.2	83.6	104.3	98.7
Storage	MW (installed capacity)	0.0	0.1	0.8	1.5	2.1	2.5	6.2	14.3	18.5
Wind	MW (installed capacity)	0.6	0.6	0.8	2.0	1.8	2.7	7.1	20.4	16.4

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.

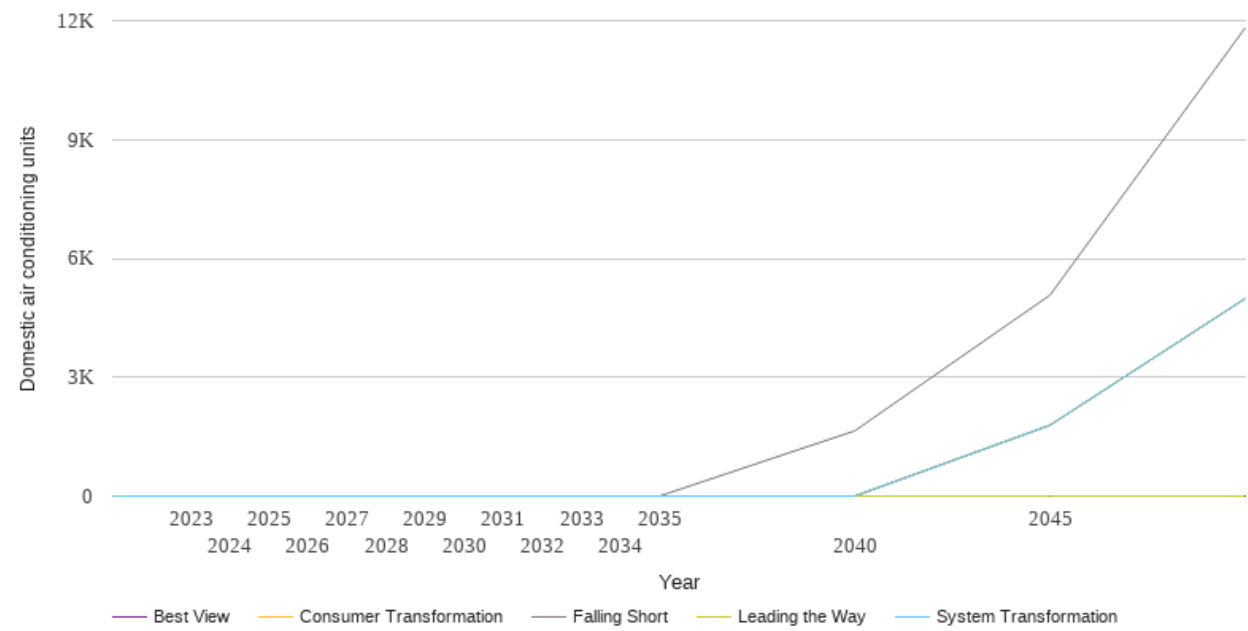
If you have any comments or queries regarding these reports, please contact

nged.energyplanning@nationalgrid.co.uk.

Technology Summary: Air conditioning

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

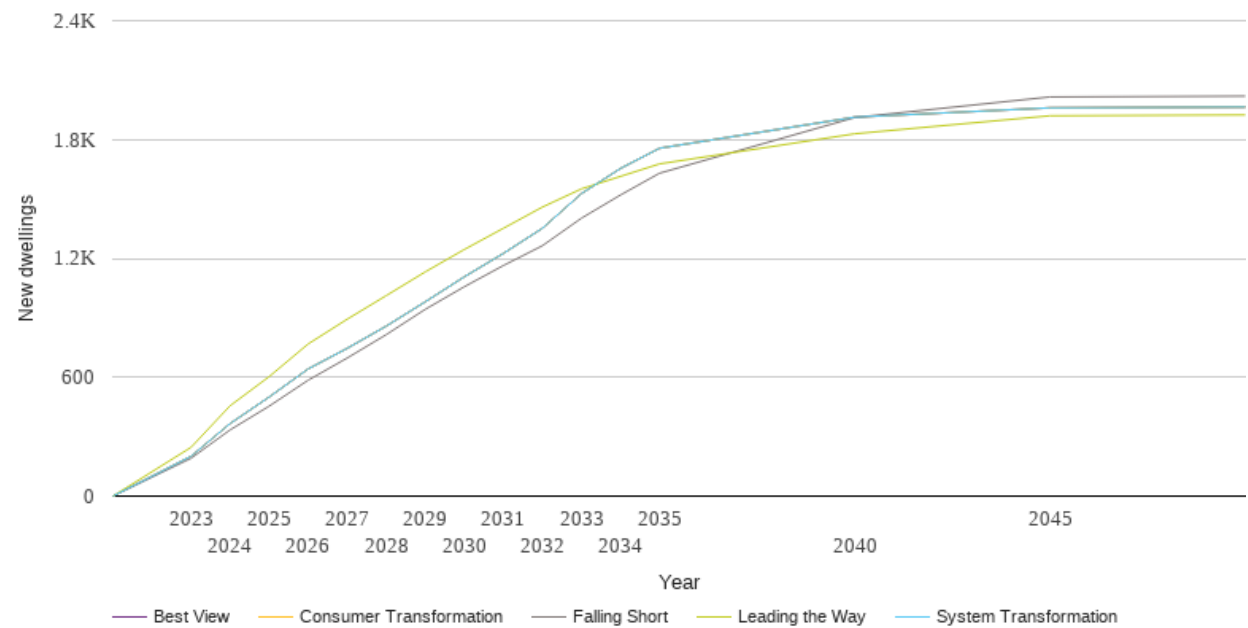
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	0	0	0	0	0
2025	0	0	0	0	0
2026	0	0	0	0	0
2027	0	0	0	0	0
2028	0	0	0	0	0
2029	0	0	0	0	0
2030	0	0	0	0	0
2031	0	0	0	0	0
2032	0	0	0	0	0
2033	0	0	0	0	0
2034	0	0	0	0	0
2035	0	0	0	0	0
2040	1647	0	0	0	0
2045	5071	1789	1789	0	1789
2050	11820	4985	4985	0	4985



Technology Summary: Domestic

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

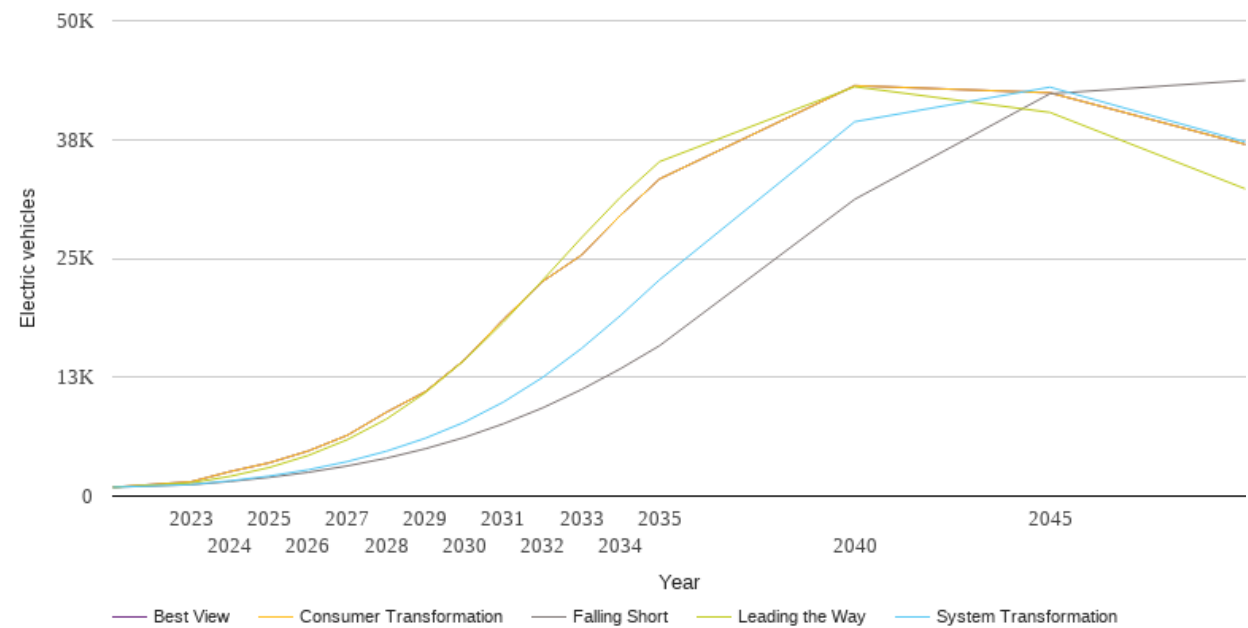
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	191	201	201	246	201
2024	334	366	366	456	366
2025	454	500	500	603	500
2026	585	642	642	768	642
2027	697	746	746	893	746
2028	815	858	858	1012	858
2029	943	981	981	1132	981
2030	1057	1107	1107	1245	1107
2031	1164	1225	1225	1352	1225
2032	1264	1352	1352	1459	1352
2033	1403	1527	1527	1551	1527
2034	1520	1654	1654	1614	1654
2035	1630	1756	1756	1677	1756
2040	1911	1913	1913	1829	1913
2045	2015	1960	1960	1920	1960
2050	2019	1964	1964	1924	1964



Technology Summary: Electric vehicles

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

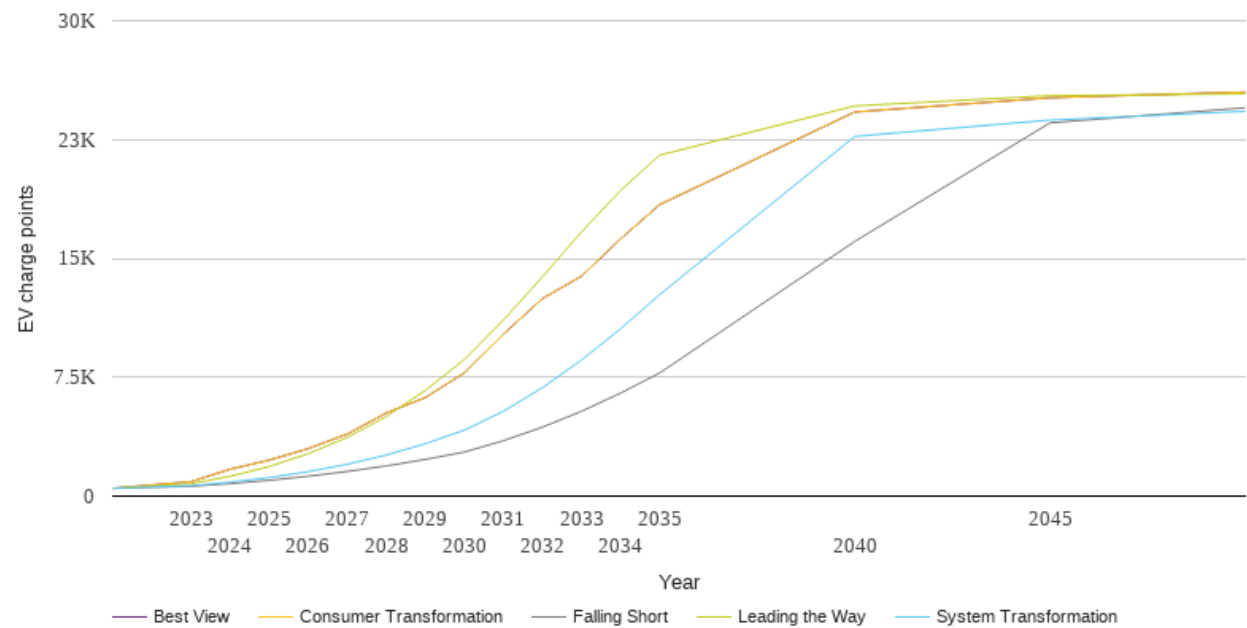
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	928	928	928	928	928
2023	1196	1214	1507	1385	1507
2024	1538	1606	2580	2079	2580
2025	1965	2104	3498	3001	3498
2026	2499	2766	4741	4267	4741
2027	3167	3626	6389	5929	6389
2028	3981	4715	8810	8084	8810
2029	4976	6082	10979	10876	10979
2030	6168	7771	14320	14269	14320
2031	7602	9888	18588	18292	18588
2032	9264	12464	22558	22670	22558
2033	11202	15519	25339	27168	25339
2034	13394	18991	29543	31447	29543
2035	15816	22751	33353	35174	33353
2040	31218	39373	43166	43054	43166
2045	42314	43010	42414	40353	42414
2050	43714	37253	36991	32318	36991



Technology Summary: EV Charge Point

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

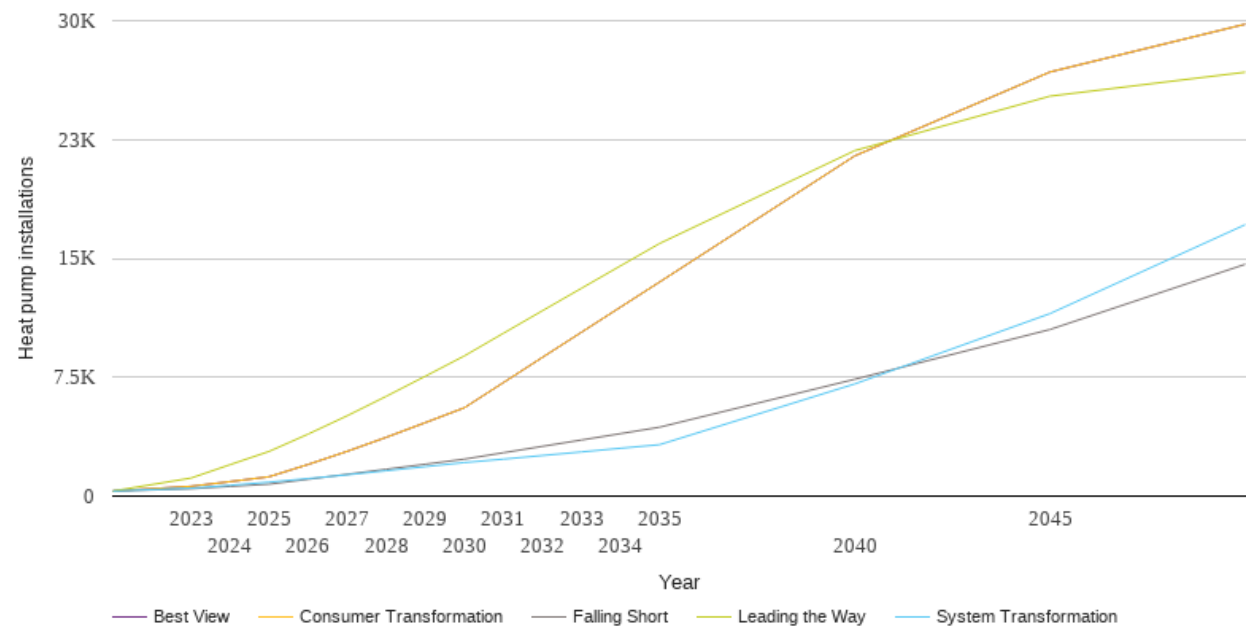
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	490	490	490	490	490
2023	619	654	910	785	910
2024	786	878	1696	1250	1696
2025	997	1166	2269	1863	2269
2026	1250	1538	2996	2670	2996
2027	1554	2007	3914	3708	3914
2028	1906	2590	5245	5019	5245
2029	2313	3305	6215	6675	6215
2030	2778	4161	7773	8609	7773
2031	3495	5352	10211	11104	10211
2032	4349	6836	12463	13832	12463
2033	5351	8581	13875	16667	13875
2034	6496	10551	16224	19280	16224
2035	7762	12702	18390	21511	18390
2040	16070	22697	24237	24620	24237
2045	23555	23728	25136	25266	25136
2050	24503	24279	25499	25379	25499



Technology Summary: Heat pumps

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

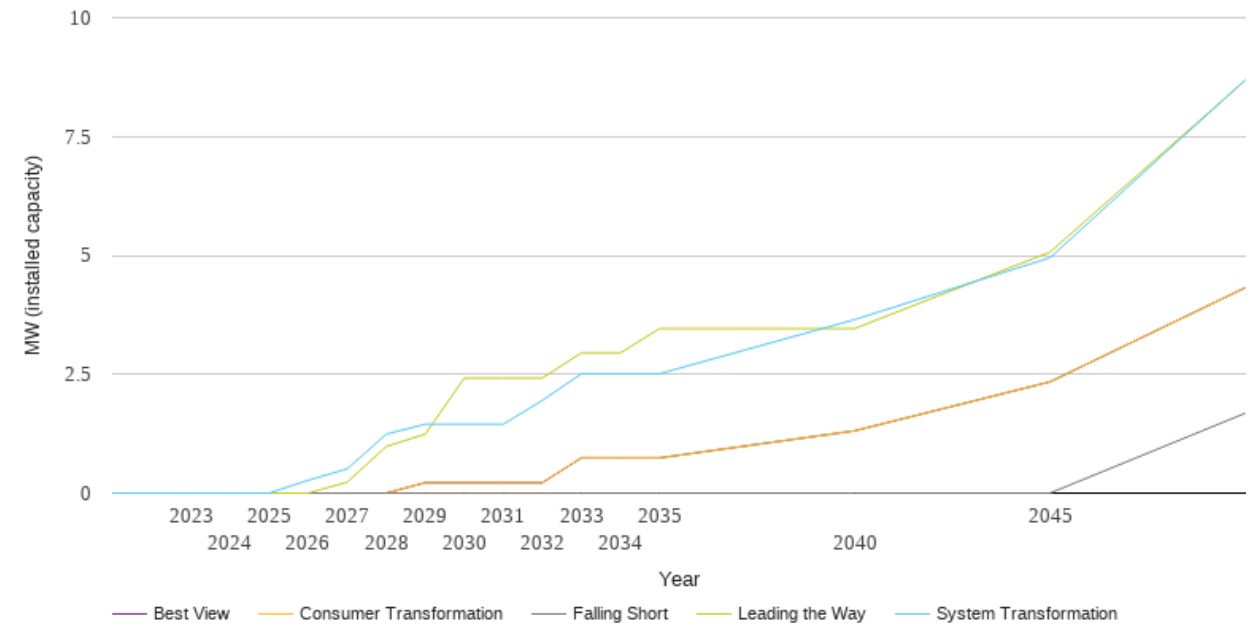
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	318	318	318	318	318
2023	463	496	615	1137	615
2024	610	683	912	1983	912
2025	753	879	1220	2819	1220
2026	1062	1105	1996	3913	1996
2027	1376	1345	2825	5070	2825
2028	1696	1602	3709	6296	3709
2029	2010	1859	4635	7563	4635
2030	2332	2115	5573	8844	5573
2031	2735	2332	7161	10274	7161
2032	3139	2561	8754	11696	8754
2033	3539	2786	10339	13114	10339
2034	3940	3018	11924	14529	11924
2035	4346	3245	13507	15938	13507
2040	7373	7077	21467	21800	21467
2045	10512	11515	26762	25236	26762
2050	14628	17126	29780	26749	29780



Technology Summary: Hydrogen electrolysis

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

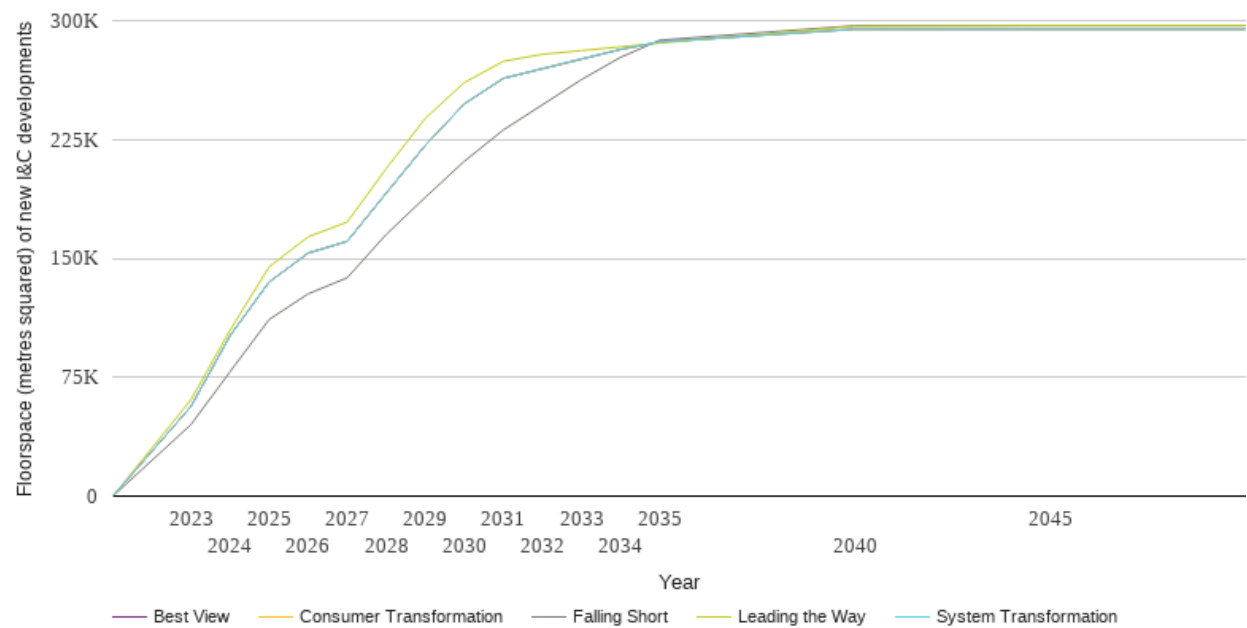
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.3	0.0	0.0	0.0
2027	0.0	0.5	0.0	0.2	0.0
2028	0.0	1.2	0.0	1.0	0.0
2029	0.0	1.4	0.2	1.2	0.2
2030	0.0	1.4	0.2	2.4	0.2
2031	0.0	1.4	0.2	2.4	0.2
2032	0.0	1.9	0.2	2.4	0.2
2033	0.0	2.5	0.7	2.9	0.7
2034	0.0	2.5	0.7	2.9	0.7
2035	0.0	2.5	0.7	3.5	0.7
2040	0.0	3.6	1.3	3.5	1.3
2045	0.0	4.9	2.3	5.1	2.3
2050	1.7	8.7	4.3	8.7	4.3



Technology Summary: Non domestic

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

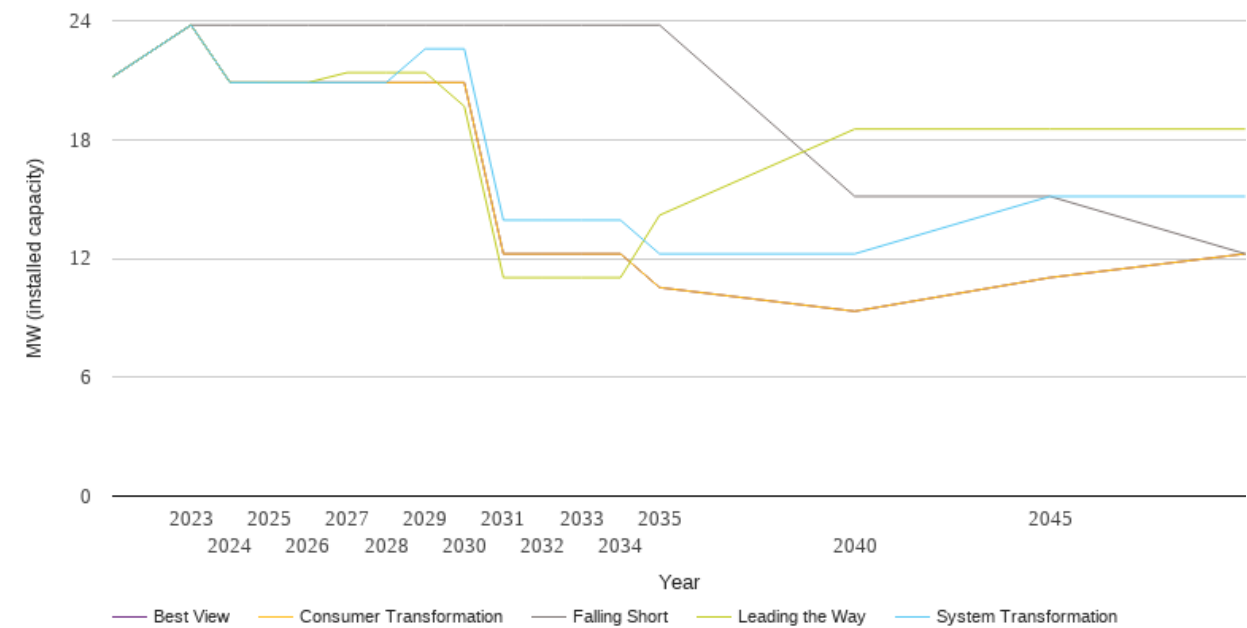
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	45171	56668	56668	60912	56668
2024	78474	101238	101238	104728	101238
2025	111449	135076	135076	144618	135076
2026	127599	153341	153341	163638	153341
2027	137760	160760	160760	172937	160760
2028	165156	191220	191220	206718	191220
2029	188549	221349	221349	238330	221349
2030	211300	247507	247507	260928	247507
2031	231057	263602	263602	274348	263602
2032	246946	269681	269681	278783	269681
2033	262836	275760	275760	281135	275760
2034	276836	281840	281840	283488	281840
2035	287675	286561	286561	285841	286561
2040	296841	294647	294647	296454	294647
2045	296841	294647	294647	296841	294647
2050	296841	294647	294647	296841	294647



Technology Summary: Other Distributed Generation

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

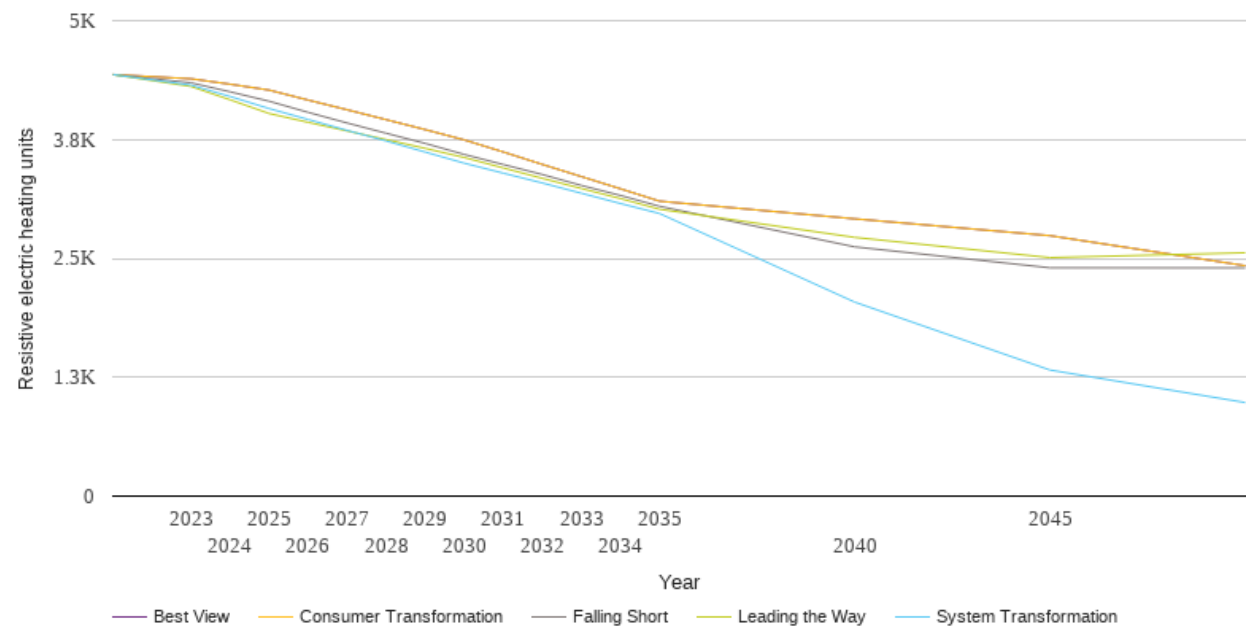
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	21.2	21.2	21.2	21.2	21.2
2023	23.8	23.8	23.8	23.8	23.8
2024	23.8	20.9	20.9	20.9	20.9
2025	23.8	20.9	20.9	20.9	20.9
2026	23.8	20.9	20.9	20.9	20.9
2027	23.8	20.9	20.9	21.4	20.9
2028	23.8	20.9	20.9	21.4	20.9
2029	23.8	22.6	20.9	21.4	20.9
2030	23.8	22.6	20.9	19.7	20.9
2031	23.8	13.9	12.2	11.0	12.2
2032	23.8	13.9	12.2	11.0	12.2
2033	23.8	13.9	12.2	11.0	12.2
2034	23.8	13.9	12.2	11.0	12.2
2035	23.8	12.2	10.5	14.2	10.5
2040	15.1	12.2	9.3	18.5	9.3
2045	15.1	15.1	11.0	18.5	11.0
2050	12.2	15.1	12.2	18.5	12.2



Technology Summary: Resistive electric heating

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

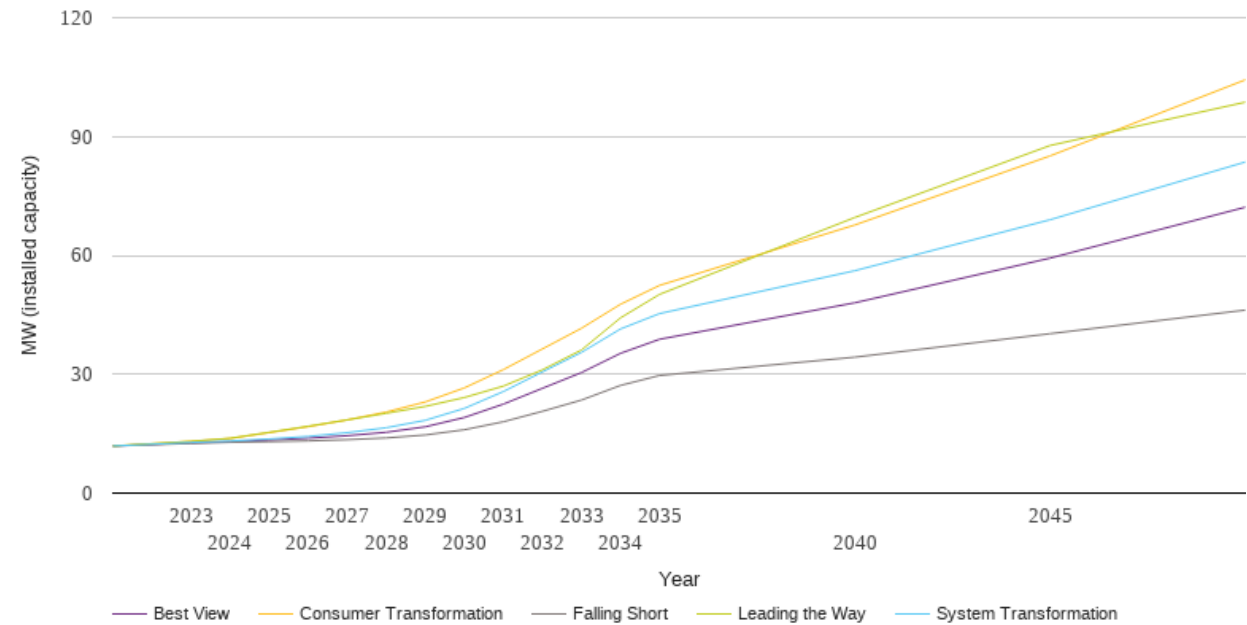
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	4433	4433	4433	4433	4433
2023	4347	4322	4389	4308	4389
2024	4252	4203	4332	4168	4332
2025	4153	4076	4270	4024	4270
2026	4036	3961	4165	3931	4165
2027	3924	3846	4063	3840	4063
2028	3816	3735	3959	3749	3959
2029	3709	3618	3854	3657	3854
2030	3593	3501	3746	3561	3746
2031	3487	3396	3619	3451	3619
2032	3382	3293	3488	3342	3488
2033	3267	3185	3360	3235	3360
2034	3162	3077	3232	3129	3232
2035	3048	2972	3102	3017	3102
2040	2621	2040	2916	2721	2916
2045	2401	1326	2739	2508	2739
2050	2400	984	2423	2559	2423



Technology Summary: Solar Generation

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

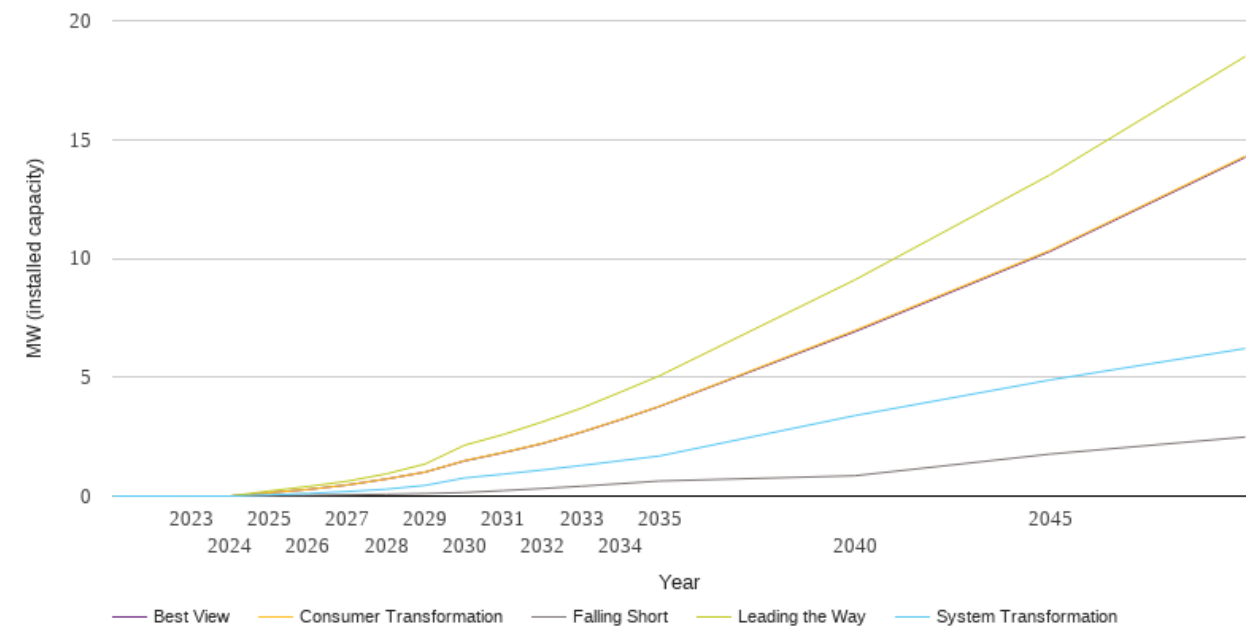
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	11.9	11.9	11.9	11.9	11.9
2023	12.5	12.8	13.0	13.1	12.7
2024	12.8	13.1	13.8	13.8	13.0
2025	13.0	13.7	15.3	15.3	13.4
2026	13.2	14.3	16.8	16.9	13.8
2027	13.5	15.3	18.5	18.5	14.5
2028	13.9	16.5	20.5	20.1	15.4
2029	14.7	18.4	23.0	21.9	16.7
2030	16.0	21.4	26.5	24.1	19.1
2031	18.0	25.6	31.2	27.0	22.5
2032	20.6	30.6	36.4	31.1	26.4
2033	23.5	35.5	41.6	36.1	30.4
2034	27.2	41.4	47.7	44.2	35.3
2035	29.7	45.3	52.4	50.2	38.8
2040	34.3	56.1	67.7	69.6	48.0
2045	40.2	69.0	85.1	87.7	59.3
2050	46.2	83.6	104.3	98.7	72.2



Technology Summary: Storage

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

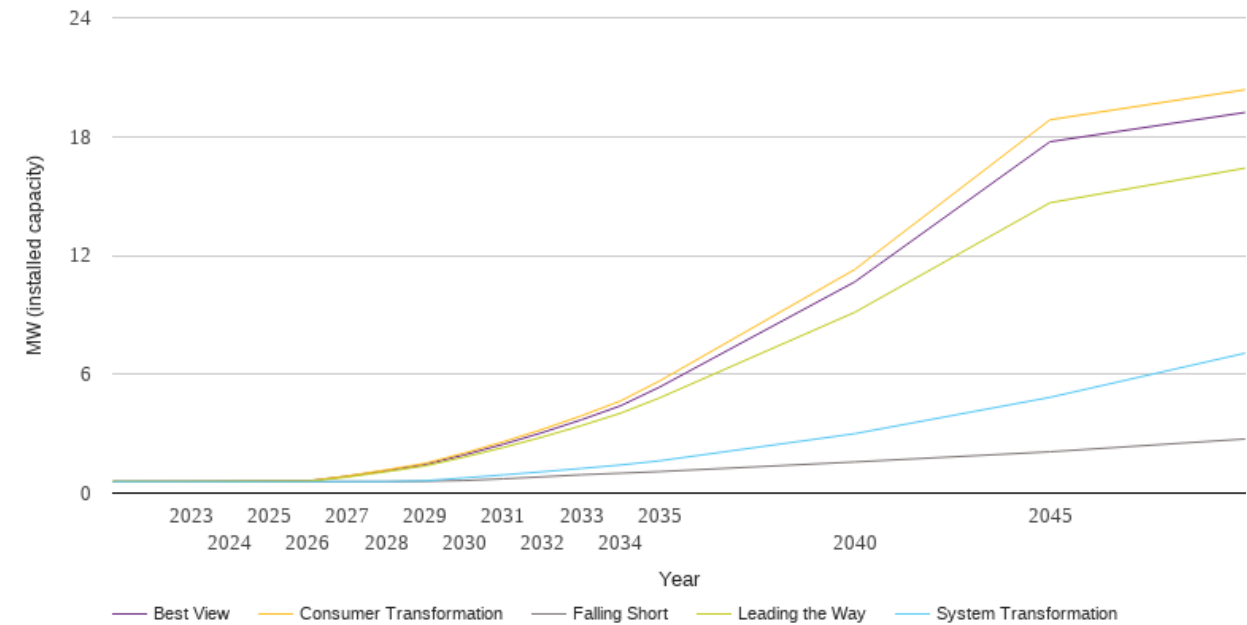
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.1	0.2	0.1
2026	0.0	0.1	0.3	0.4	0.3
2027	0.1	0.2	0.5	0.6	0.5
2028	0.1	0.3	0.7	0.9	0.7
2029	0.1	0.5	1.0	1.4	1.0
2030	0.1	0.8	1.5	2.1	1.5
2031	0.2	0.9	1.8	2.6	1.8
2032	0.3	1.1	2.2	3.1	2.2
2033	0.4	1.3	2.7	3.7	2.7
2034	0.5	1.5	3.2	4.4	3.2
2035	0.6	1.7	3.8	5.1	3.8
2040	0.9	3.4	7.0	9.1	6.9
2045	1.8	4.9	10.3	13.5	10.3
2050	2.5	6.2	14.3	18.5	14.3



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	0.6	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	0.9	0.8	0.8
2028	0.6	0.6	1.2	1.1	1.1
2029	0.6	0.6	1.5	1.4	1.4
2030	0.6	0.8	2.0	1.8	1.9
2031	0.7	0.9	2.6	2.3	2.5
2032	0.8	1.1	3.2	2.8	3.1
2033	0.9	1.2	3.9	3.4	3.7
2034	1.0	1.4	4.7	4.0	4.4
2035	1.1	1.6	5.7	4.8	5.3
2040	1.6	3.0	11.3	9.1	10.7
2045	2.1	4.8	18.8	14.7	17.7
2050	2.7	7.1	20.4	16.4	19.2



National Grid Electricity Distribution PLC 09223384)
National Grid Electricity Distribution (East Midlands) Plc (company number 02366923))
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