

# Distribution Future Energy Scenarios 2022

Local Authority:  
North Northamptonshire

## What are Distribution Future Energy Scenarios?

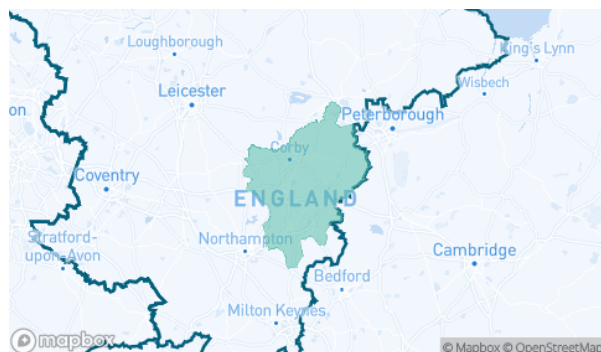
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Northamptonshire covered by the NGED licence areas.



## Scenario Summary

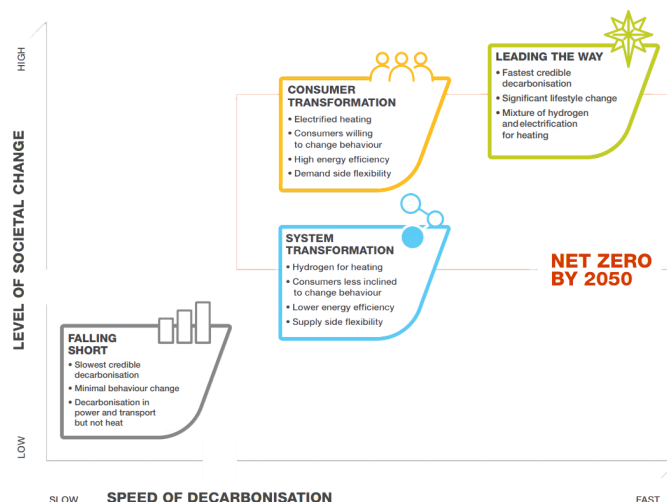
This DFES scenario framework includes three scenarios that are compliant with UK government targets of Net Zero greenhouse gas emissions by 2050. A summary of each scenario is below:

**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 Northamptonshire 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	1214	3169	2800	2800	1220	85036	41880	41879	1226
Domestic	New dwellings	0	13444	14679	14679	17420	27861	27539	27539	27315
Electric vehicles	Electric vehicles	5168	32706	41009	75402	75235	234956	208485	209280	173890
EV Charge Point	EV charge points	2498	14319	21322	40161	44105	125048	123666	131271	129949
Heat pumps	Heat pump installations	1791	11114	11595	28289	43195	82005	94522	163260	144766
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	1.2	0.0	1.6	3.4	15.6	7.6	14.2
Non domestic	Floorspace (metres squared) of new I&C developments	0	811185	962107	962107	102777	1615115	1610452	1610452	1615115
Other Distributed Generation	MW (installed capacity)	18.5	14.9	14.9	14.9	14.5	10.0	9.6	9.6	9.6
Resistive electric heating	Resistive electric heating units	14939	13444	12757	13492	13116	10651	4932	9734	10381
Solar Generation	MW (installed capacity)	39.7	52.4	74.5	103.4	114.3	150.5	308.6	433.9	434.5
Storage	MW (installed capacity)	0.0	0.5	3.1	6.7	9.3	10.9	28.0	68.1	88.9
Wind	MW (installed capacity)	1.1	1.4	2.2	12.5	9.5	10.7	31.3	108.9	87.5

## 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.

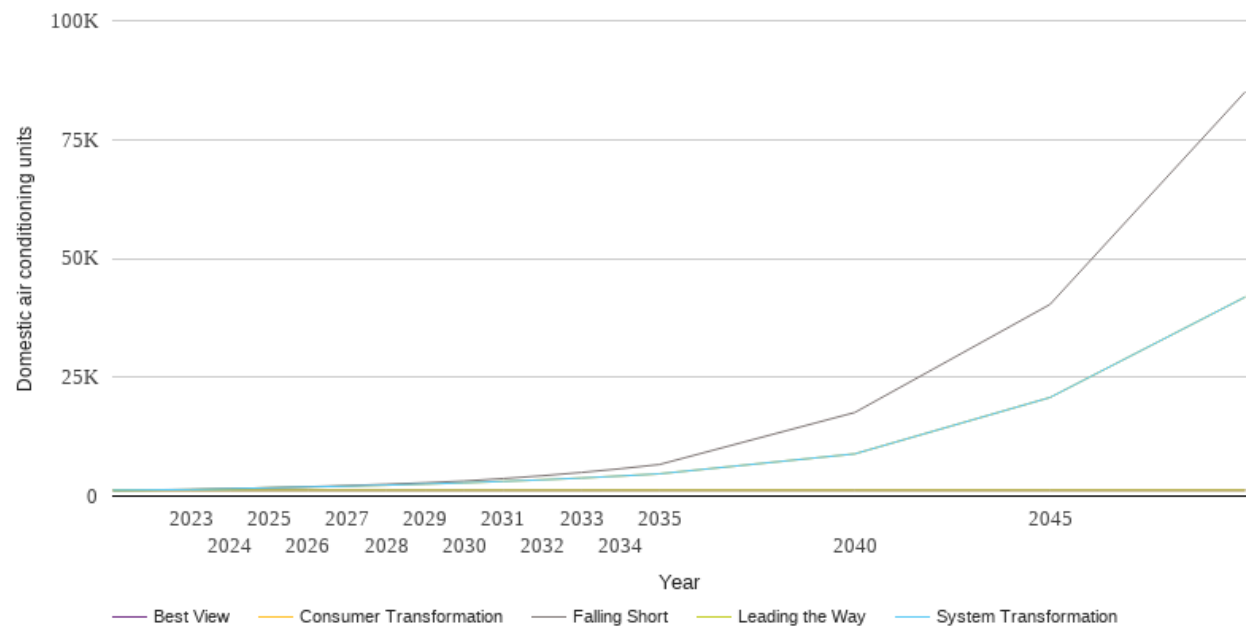
If you have any comments or queries regarding these reports, please contact

[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.

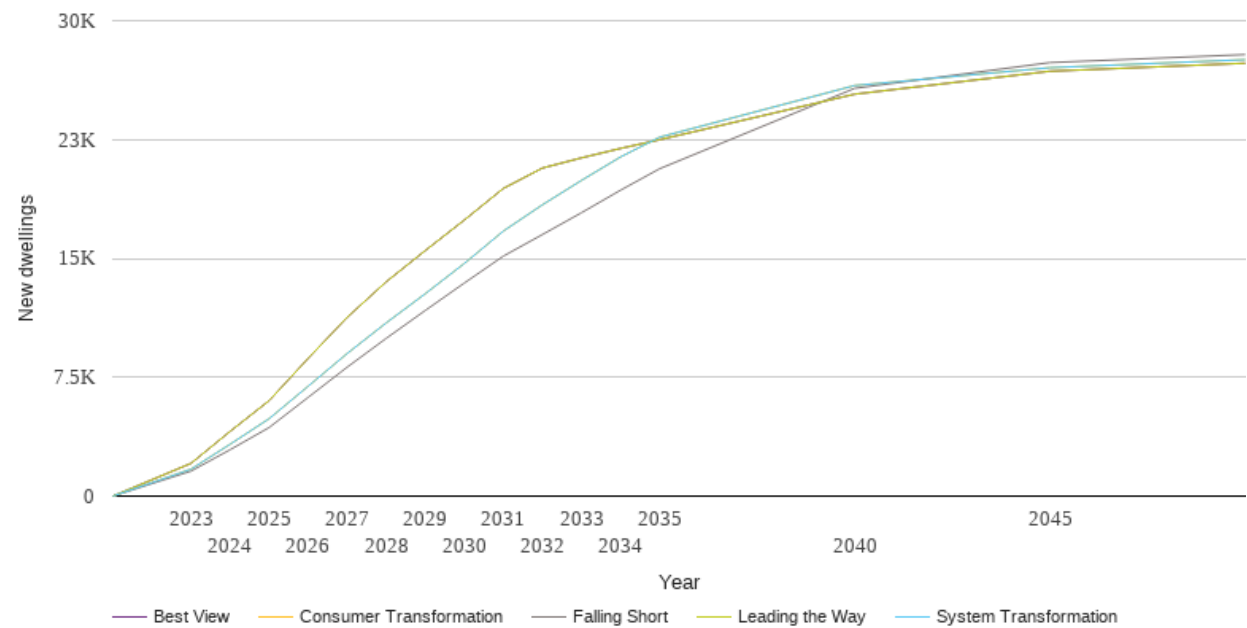
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1214	1214	1214	1214	1214
2023	1401	1377	1377	1215	1215
2024	1562	1547	1547	1216	1216
2025	1749	1744	1744	1217	1217
2026	1963	1909	1909	1218	1218
2027	2208	2093	2093	1218	1218
2028	2483	2302	2302	1219	1219
2029	2806	2538	2538	1220	1220
2030	3169	2800	2800	1220	1220
2031	3689	3097	3097	1221	1221
2032	4285	3429	3429	1222	1222
2033	4970	3802	3802	1222	1222
2034	5755	4224	4224	1223	1223
2035	6652	4692	4692	1223	1223
2040	17580	8881	8880	1225	1225
2045	40309	20739	20738	1226	1226
2050	85036	41880	41879	1226	1226



# Technology Summary: Domestic

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

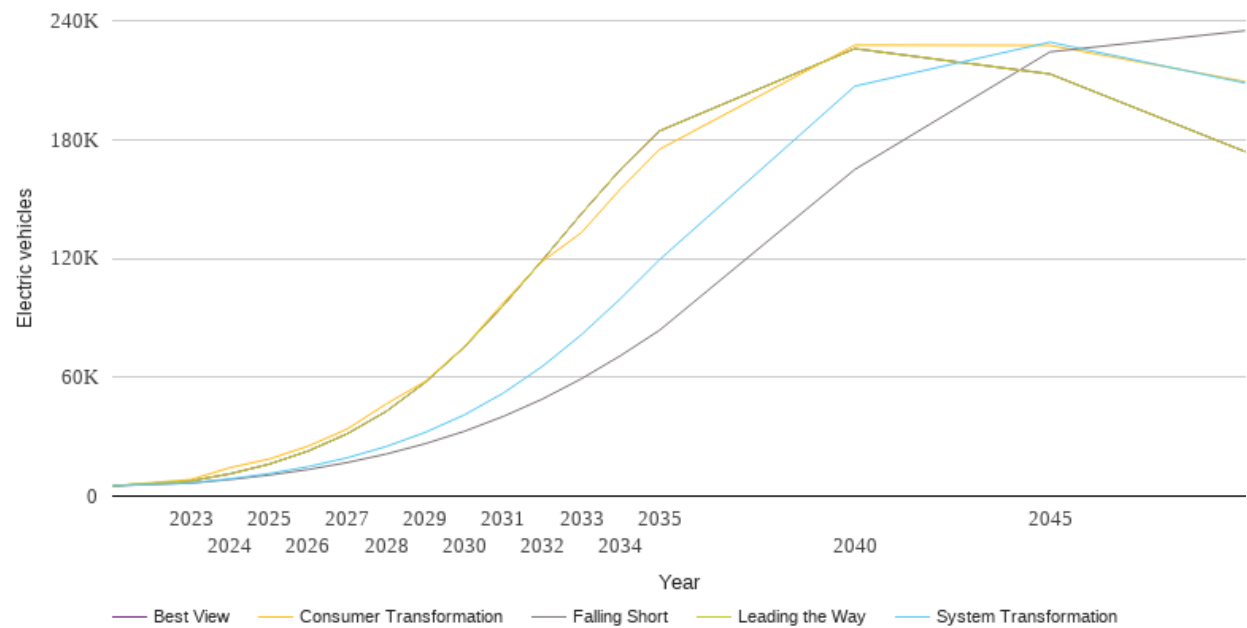
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	1578	1700	1700	2067	2067
2024	2924	3270	3270	4081	4081
2025	4326	4885	4885	6021	6021
2026	6229	6932	6932	8691	8691
2027	8138	9000	9000	11281	11281
2028	9955	10931	10931	13524	13524
2029	11715	12772	12772	15495	15495
2030	13444	14679	14679	17420	17420
2031	15143	16723	16723	19416	19416
2032	16505	18381	18381	20700	20700
2033	17880	19920	19920	21342	21342
2034	19301	21398	21398	21938	21938
2035	20656	22647	22647	22487	22487
2040	25732	25907	25907	25363	25363
2045	27356	27034	27034	26810	26810
2050	27861	27539	27539	27315	27315



# Technology Summary: Electric vehicles

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

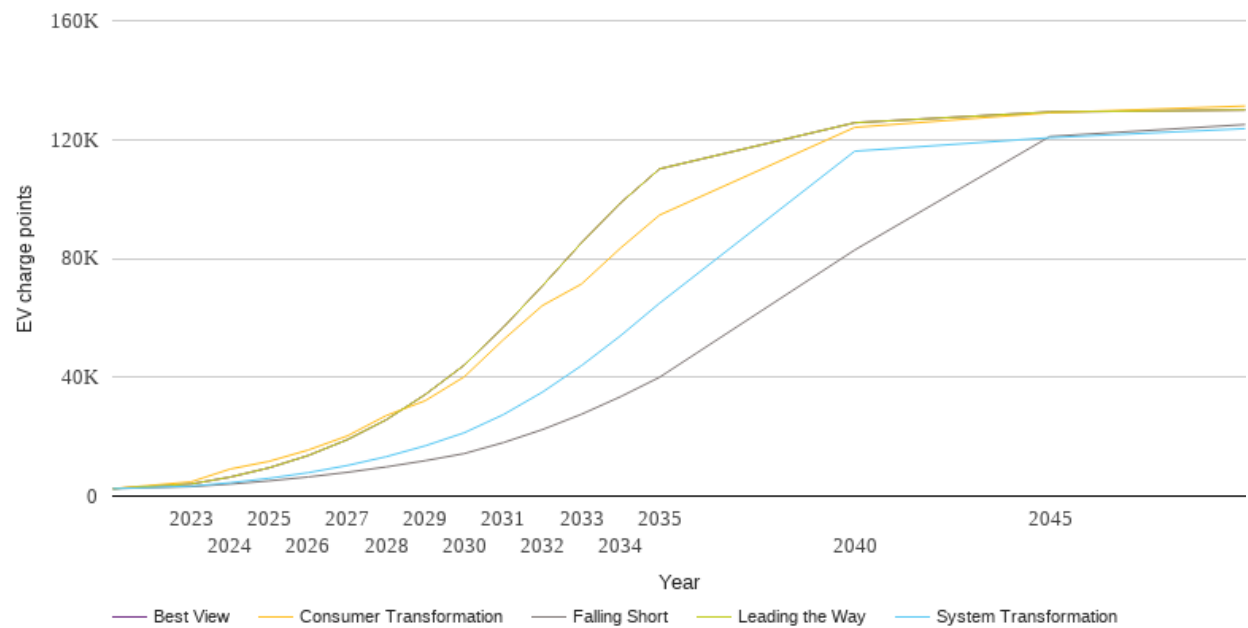
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	5168	5168	5168	5168	5168
2023	6552	6671	8407	7654	7654
2024	8351	8722	14360	11258	11258
2025	10599	11365	18721	16117	16117
2026	13415	14844	25219	22747	22747
2027	16935	19339	33854	31460	31460
2028	21233	25031	46564	42772	42772
2029	26452	32174	57913	57424	57424
2030	32706	41009	75402	75235	75235
2031	40225	52021	97639	96241	96241
2032	48982	65488	118505	119125	119125
2033	59251	81470	133040	142569	142569
2034	70868	99672	155081	164895	164895
2035	83707	119339	175093	184351	184351
2040	164877	206921	227669	225898	225898
2045	224246	229174	227528	213087	213087
2050	234956	208485	209280	173890	173890



# 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	2498	2498	2498	2498	2498
2023	3174	3341	4798	4075	4075
2024	4040	4495	9094	6393	6393
2025	5124	5986	11702	9519	9519
2026	6434	7883	15488	13648	13648
2027	8000	10289	20232	18964	18964
2028	9818	13267	27103	25682	25682
2029	11921	16929	32119	34182	34182
2030	14319	21322	40161	44105	44105
2031	18010	27424	52627	56822	56822
2032	22380	34985	64123	70743	70743
2033	27539	43888	71369	85250	85250
2034	33452	53954	83454	98660	98660
2035	39994	64915	94574	110109	110109
2040	82832	116073	124095	125654	125654
2045	121039	120627	129006	129277	129277
2050	125048	123666	131271	129949	129949

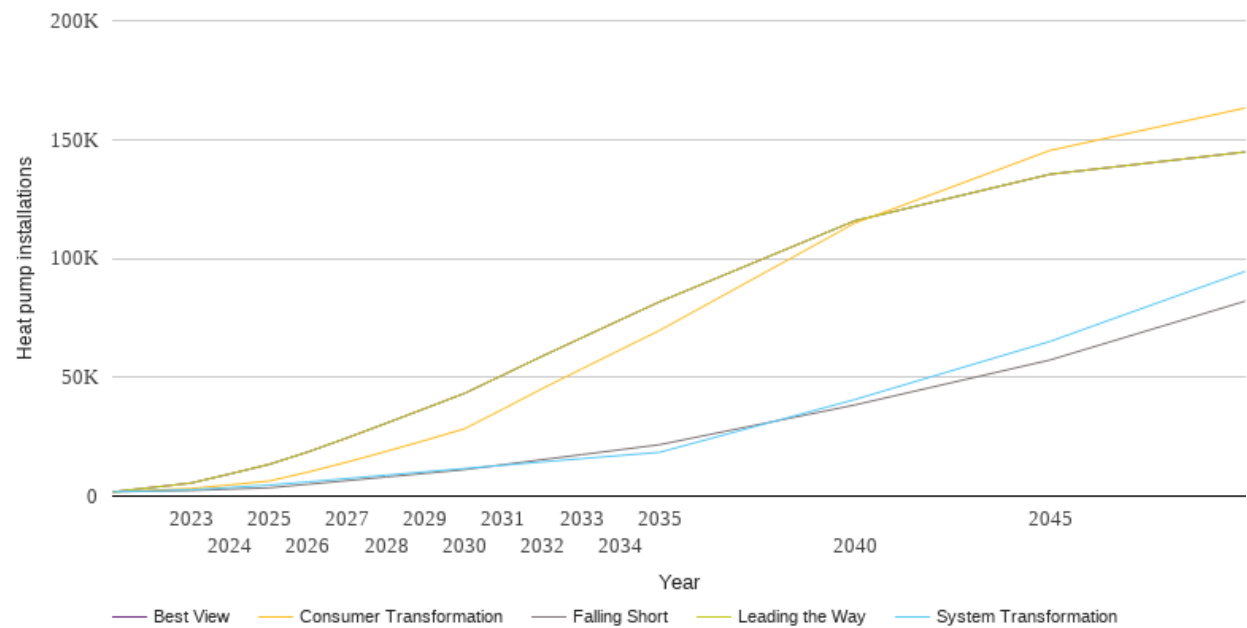




# Technology Summary: Heat pumps

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

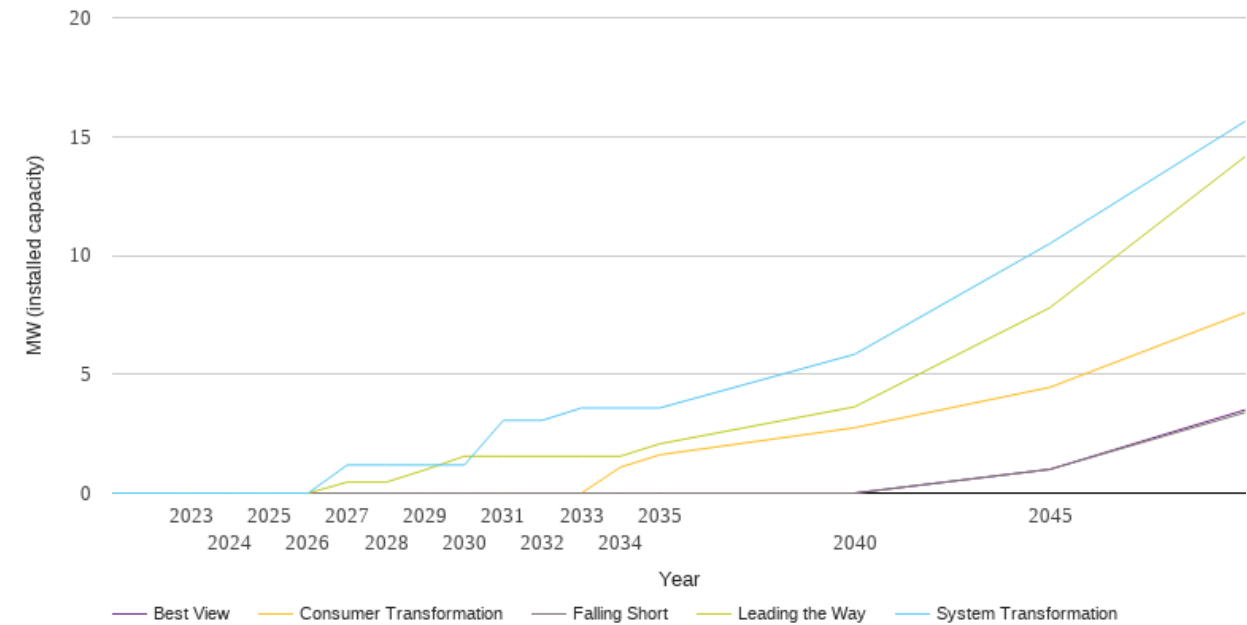
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1791	1791	1791	1791	1791
2023	2342	2624	3189	5482	5482
2024	2922	3598	4712	9342	9342
2025	3497	4644	6334	13346	13346
2026	4985	5971	10117	18604	18604
2027	6505	7393	14324	24493	24493
2028	8039	8817	18812	30660	30660
2029	9570	10212	23469	36905	36905
2030	11114	11595	28289	43195	43195
2031	13222	12973	36687	51011	51011
2032	15346	14396	45238	58886	58886
2033	17429	15754	53449	66525	66525
2034	19518	17082	61578	74143	74143
2035	21618	18414	69663	81724	81724
2040	38332	40613	114841	115810	115810
2045	57252	65046	145405	135384	135384
2050	82005	94522	163260	144766	144766



# Technology Summary: Hydrogen electrolysis

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

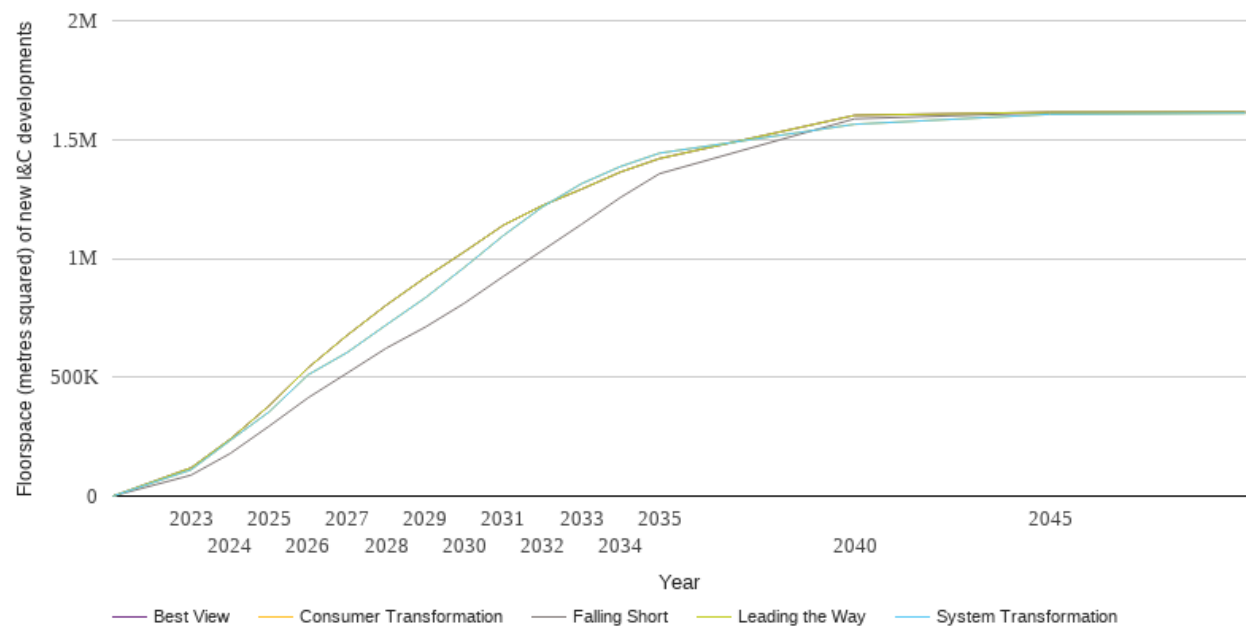
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	1.2	0.0	0.5	0.0
2028	0.0	1.2	0.0	0.5	0.0
2029	0.0	1.2	0.0	1.0	0.0
2030	0.0	1.2	0.0	1.6	0.0
2031	0.0	3.1	0.0	1.6	0.0
2032	0.0	3.1	0.0	1.6	0.0
2033	0.0	3.6	0.0	1.6	0.0
2034	0.0	3.6	1.1	1.6	0.0
2035	0.0	3.6	1.6	2.1	0.0
2040	0.0	5.8	2.8	3.6	0.0
2045	1.0	10.5	4.5	7.8	1.0
2050	3.4	15.6	7.6	14.2	3.5



# Technology Summary: Non domestic

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

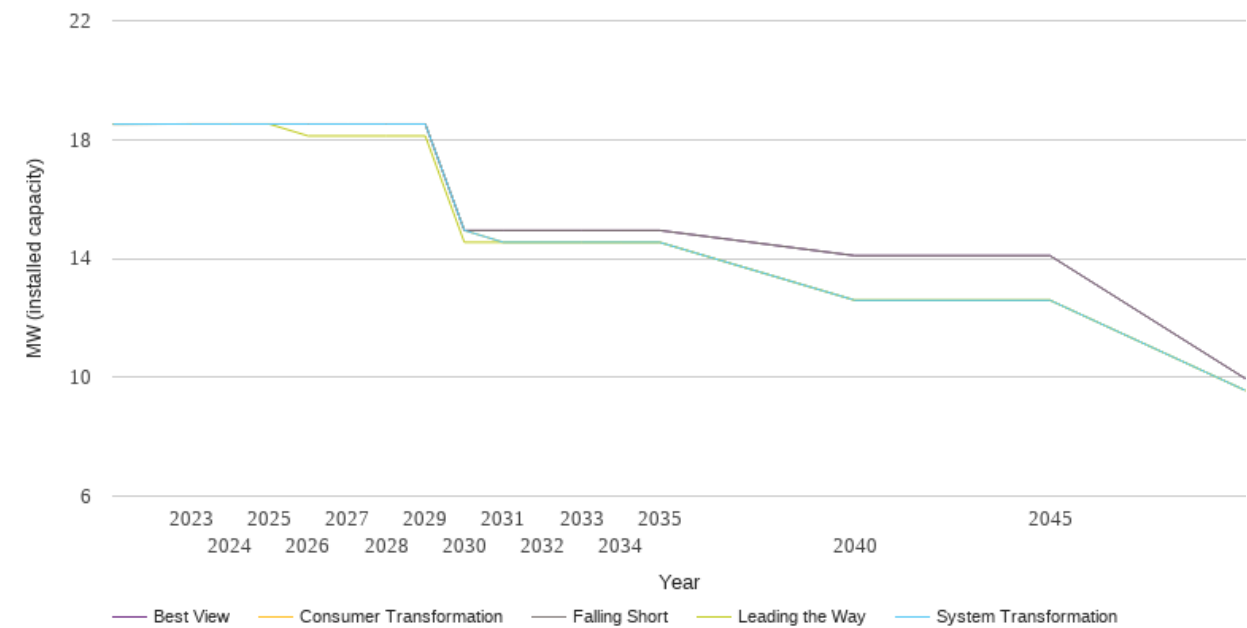
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	88209	110414	110414	118880	118880
2024	178840	233752	233752	239118	239118
2025	294138	354322	354322	380197	380197
2026	413753	510279	510279	540097	540097
2027	517615	604301	604301	676644	676644
2028	622276	720144	720144	803261	803261
2029	710905	834202	834202	919337	919337
2030	811185	962107	962107	1027777	1027777
2031	924280	1096075	1096075	1139730	1139730
2032	1033239	1216407	1216407	1222317	1222317
2033	1143218	1314128	1314128	1291067	1291067
2034	1256301	1386407	1386407	1363209	1363209
2035	1356404	1442648	1442648	1419967	1419967
2040	1587352	1564307	1564307	1601870	1601870
2045	1612915	1606327	1606327	1615115	1615115
2050	1615115	1610452	1610452	1615115	1615115



# Technology Summary: Other Distributed Generation

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

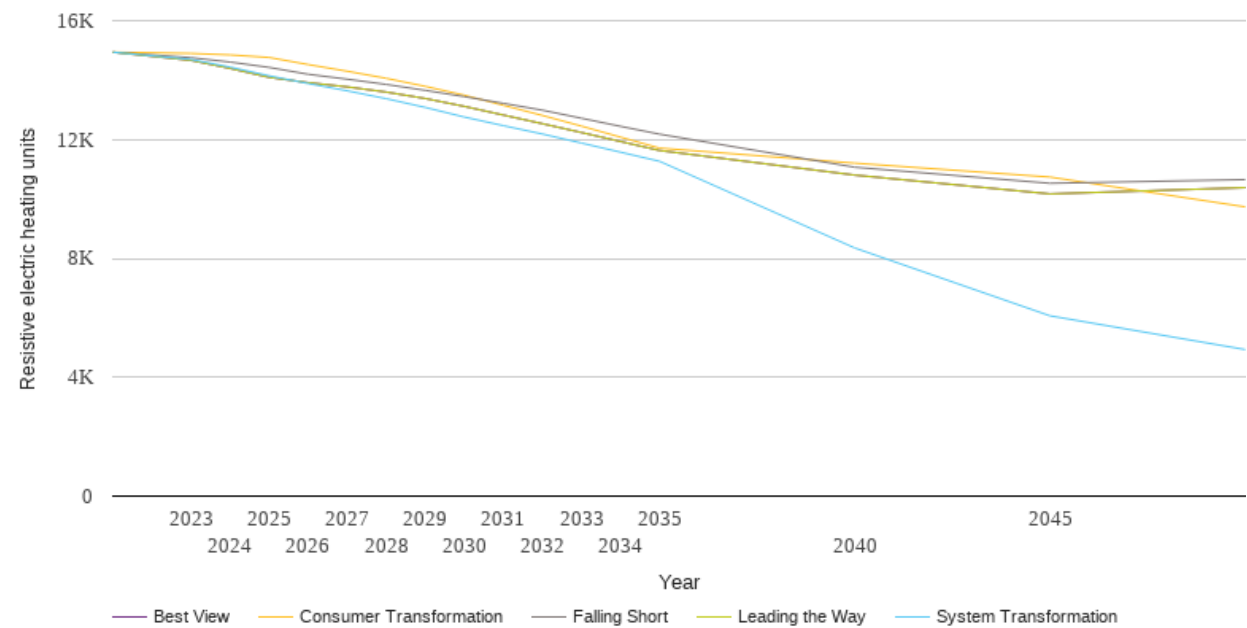
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	18.5	18.5	18.5	18.5	18.5
2023	18.5	18.5	18.5	18.5	18.5
2024	18.5	18.5	18.5	18.5	18.5
2025	18.5	18.5	18.5	18.5	18.5
2026	18.5	18.5	18.5	18.1	18.5
2027	18.5	18.5	18.5	18.1	18.5
2028	18.5	18.5	18.5	18.1	18.5
2029	18.5	18.5	18.5	18.1	18.5
2030	14.9	14.9	14.9	14.5	14.9
2031	14.9	14.5	14.5	14.5	14.9
2032	14.9	14.5	14.5	14.5	14.9
2033	14.9	14.5	14.5	14.5	14.9
2034	14.9	14.5	14.5	14.5	14.9
2035	14.9	14.5	14.5	14.5	14.9
2040	14.1	12.6	12.6	12.6	14.1
2045	14.1	12.6	12.6	12.6	14.1
2050	10.0	9.6	9.6	9.6	10.0



# Technology Summary: Resistive electric heating

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

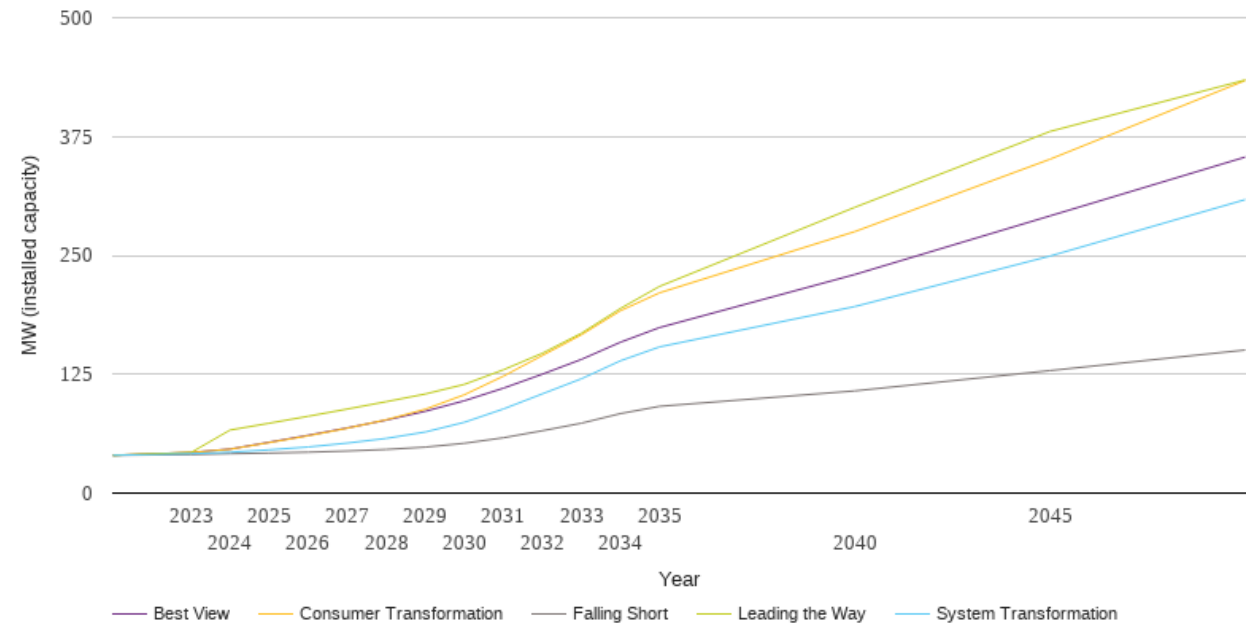
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	14939	14939	14939	14939	14939
2023	14755	14697	14898	14664	14664
2024	14608	14439	14848	14394	14394
2025	14428	14146	14762	14092	14092
2026	14197	13885	14524	13914	13914
2027	14031	13640	14299	13772	13772
2028	13855	13375	14061	13597	13597
2029	13655	13081	13790	13381	13381
2030	13444	12757	13492	13116	13116
2031	13219	12467	13152	12824	12824
2032	12988	12186	12811	12533	12533
2033	12717	11882	12452	12236	12236
2034	12444	11575	12081	11934	11934
2035	12181	11268	11712	11632	11632
2040	11068	8351	11205	10803	10803
2045	10527	6067	10737	10170	10170
2050	10651	4932	9734	10381	10381



# Technology Summary: Solar Generation

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

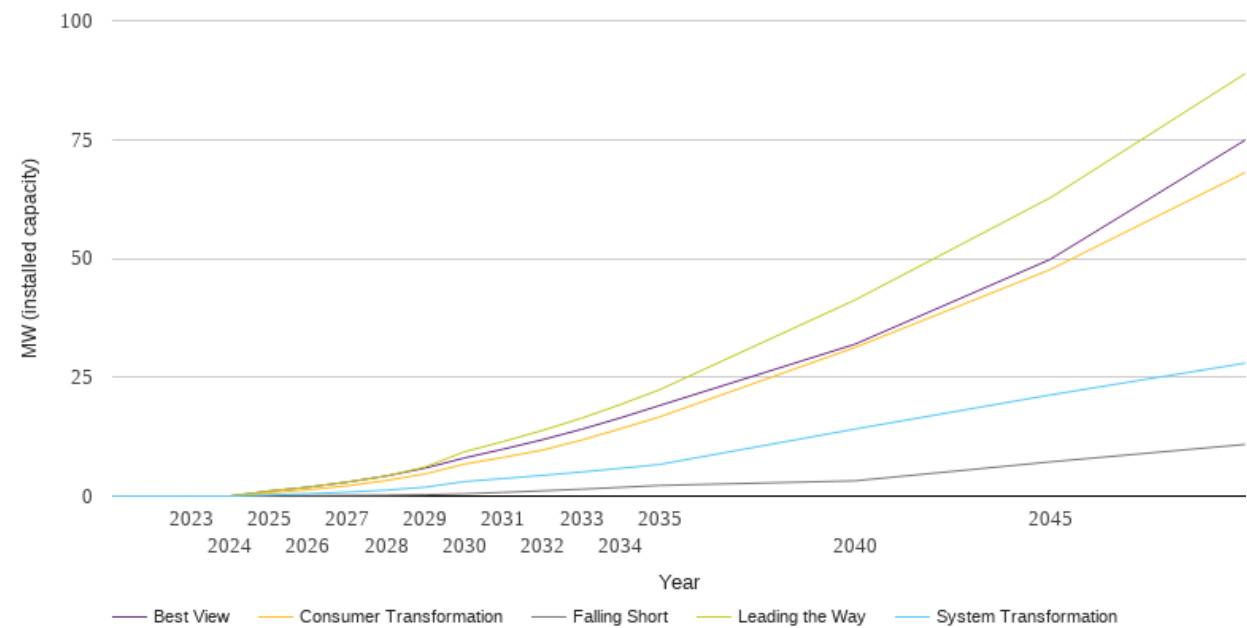
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	39.7	39.7	39.7	39.7	39.7
2023	40.5	41.4	42.6	42.7	42.7
2024	41.4	43.0	46.1	66.3	46.3
2025	42.1	45.5	53.1	73.5	53.5
2026	43.0	48.5	60.3	80.8	60.8
2027	44.3	52.6	68.2	88.4	68.6
2028	45.9	57.5	77.1	96.1	76.8
2029	48.3	64.3	88.2	104.2	86.1
2030	52.4	74.5	103.4	114.3	97.1
2031	58.2	88.5	123.0	129.7	110.3
2032	65.6	104.4	144.7	147.1	125.1
2033	73.5	120.3	166.5	168.2	140.6
2034	83.6	139.2	191.8	194.2	158.7
2035	91.3	153.8	210.6	217.4	174.1
2040	107.5	196.2	275.0	300.5	229.9
2045	128.8	249.3	351.1	380.3	291.5
2050	150.5	308.6	433.9	434.5	353.4



# Technology Summary: Storage

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

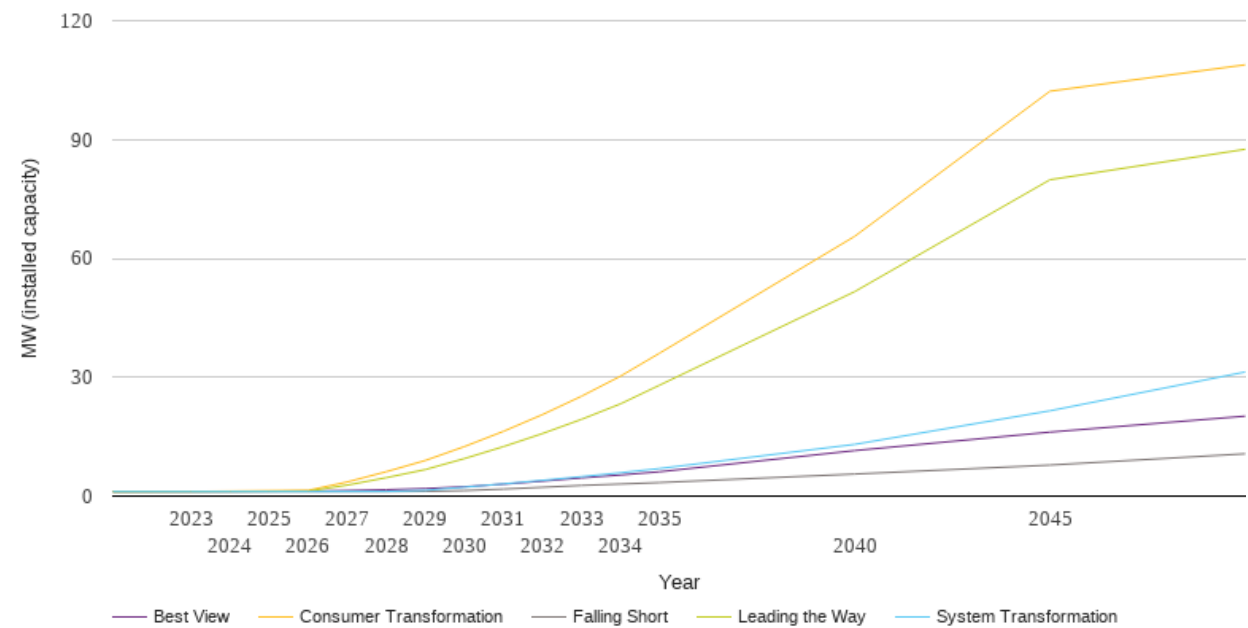
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.1	0.2	0.7	1.0	1.0
2026	0.1	0.5	1.3	1.9	1.9
2027	0.2	0.8	2.2	2.9	2.9
2028	0.2	1.2	3.3	4.2	4.2
2029	0.3	1.9	4.7	6.1	5.9
2030	0.5	3.1	6.7	9.3	8.0
2031	0.8	3.7	8.1	11.5	9.9
2032	1.1	4.4	9.7	13.8	11.9
2033	1.5	5.1	11.8	16.4	14.0
2034	1.8	5.8	14.2	19.3	16.5
2035	2.2	6.7	16.7	22.4	19.1
2040	3.2	14.1	31.2	41.2	31.9
2045	7.2	21.3	47.6	62.7	49.8
2050	10.9	28.0	68.1	88.9	74.9



# 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	1.1	1.1	1.1	1.1	1.1
2023	1.1	1.1	1.2	1.1	1.1
2024	1.1	1.1	1.2	1.2	1.2
2025	1.1	1.1	1.3	1.2	1.2
2026	1.1	1.1	1.4	1.2	1.2
2027	1.1	1.1	3.6	2.8	1.4
2028	1.1	1.2	6.2	4.6	1.6
2029	1.2	1.4	9.0	6.7	1.9
2030	1.4	2.2	12.5	9.5	2.3
2031	1.8	3.1	16.3	12.5	3.0
2032	2.2	4.0	20.6	15.8	3.8
2033	2.7	4.9	25.2	19.4	4.6
2034	3.0	5.9	30.3	23.3	5.3
2035	3.4	7.0	36.1	28.0	6.1
2040	5.6	13.1	65.6	51.6	11.5
2045	7.8	21.5	102.2	79.9	16.2
2050	10.7	31.3	108.9	87.5	20.2





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))  
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