

# Distribution Future Energy Scenarios 2022

Local Authority:  
Lincoln

## What are Distribution Future Energy Scenarios?

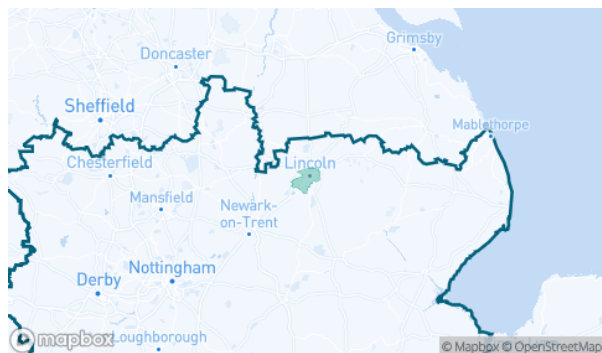
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Lincoln covered by the NGED licence areas.



## Scenario Summary

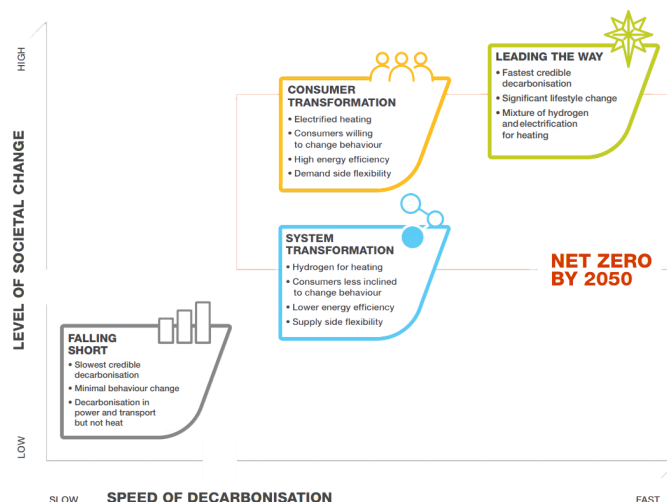
This DFES scenario framework includes three scenarios that are compliant with UK government targets of Net Zero greenhouse gas emissions by 2050. A summary of each scenario is below:

**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 Lincoln 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	760	2409	2011	2011	760	31051	18088	18088	760
Domestic	New dwellings	0	2193	2204	2204	2479	5457	5234	5234	5084
Electric vehicles	Electric vehicles	1448	9118	11609	21283	21269	67135	63647	63307	49838
EV Charge Point	EV charge points	657	3658	5614	10588	11557	33190	33747	35601	35289
Heat pumps	Heat pump installations	443	2396	2140	7052	11106	23786	27007	44941	38126
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Non domestic	Floorspace (metres squared) of new I&C developments	0	53581	65742	65742	67863	162393	162300	162300	162393
Other Distributed Generation	MW (installed capacity)	13.1	10.1	7.6	7.6	7.6	10.1	241.5	3.0	242.8
Resistive electric heating	Resistive electric heating units	4493	4086	3898	4050	3956	3031	1560	2957	3023
Solar Generation	MW (installed capacity)	6.3	12.4	16.5	23.7	24.2	21.6	42.2	73.8	77.2
Storage	MW (installed capacity)	0.5	0.6	1.2	2.1	2.6	2.8	6.5	16.6	21.3
Wind	MW (installed capacity)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

## 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

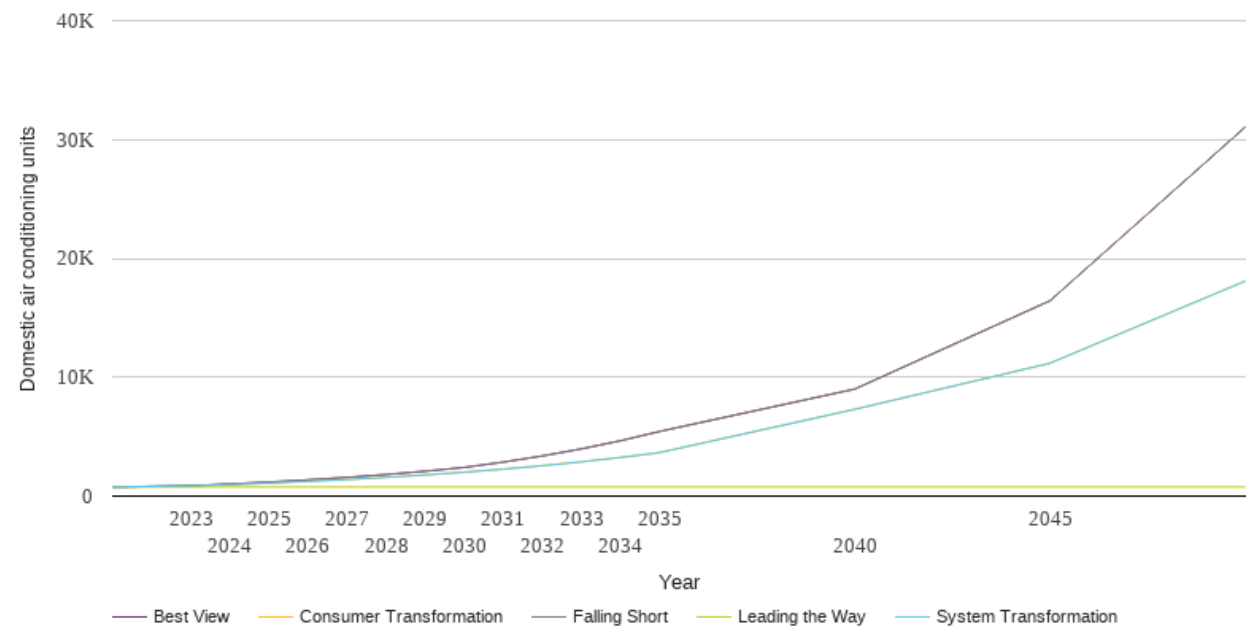
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

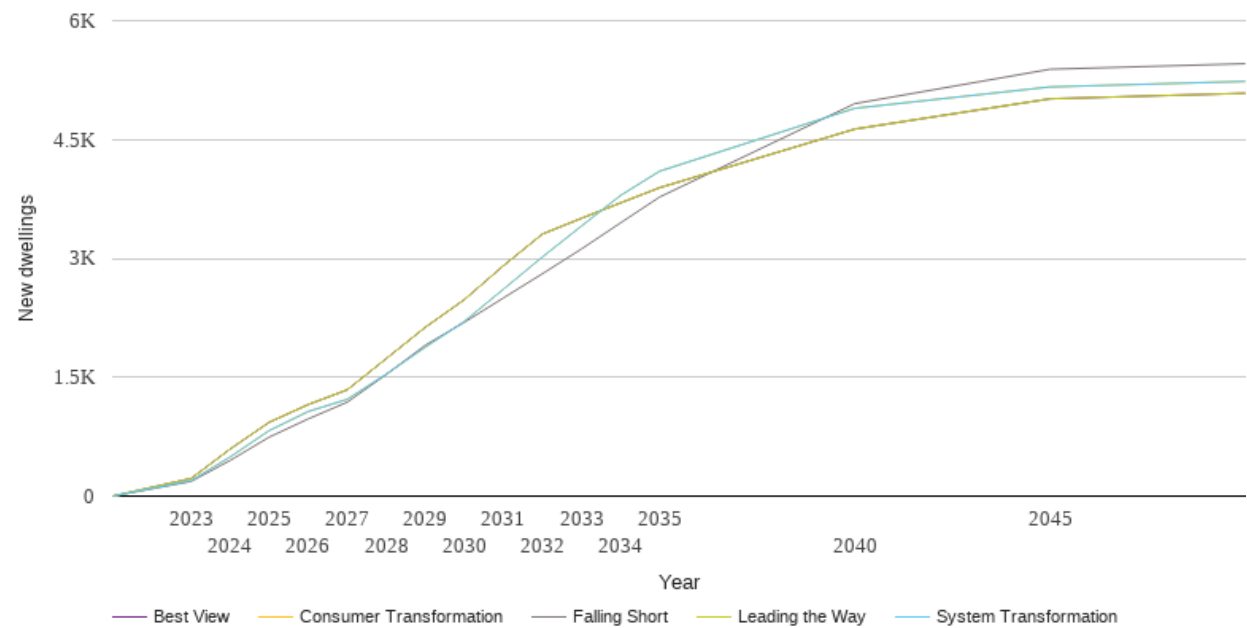
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	760	760	760	760	760
2023	876	862	862	760	876
2024	1016	968	968	760	1016
2025	1178	1092	1092	760	1178
2026	1363	1234	1234	760	1363
2027	1575	1394	1394	760	1575
2028	1814	1577	1577	760	1814
2029	2093	1783	1783	760	2093
2030	2409	2011	2011	760	2409
2031	2862	2269	2269	760	2862
2032	3380	2558	2558	760	3380
2033	3975	2883	2883	760	3975
2034	4658	3252	3252	760	4658
2035	5438	3659	3659	760	5438
2040	9005	7302	7302	760	9005
2045	16433	11178	11178	760	16433
2050	31051	18088	18088	760	31051



# Technology Summary: Domestic

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

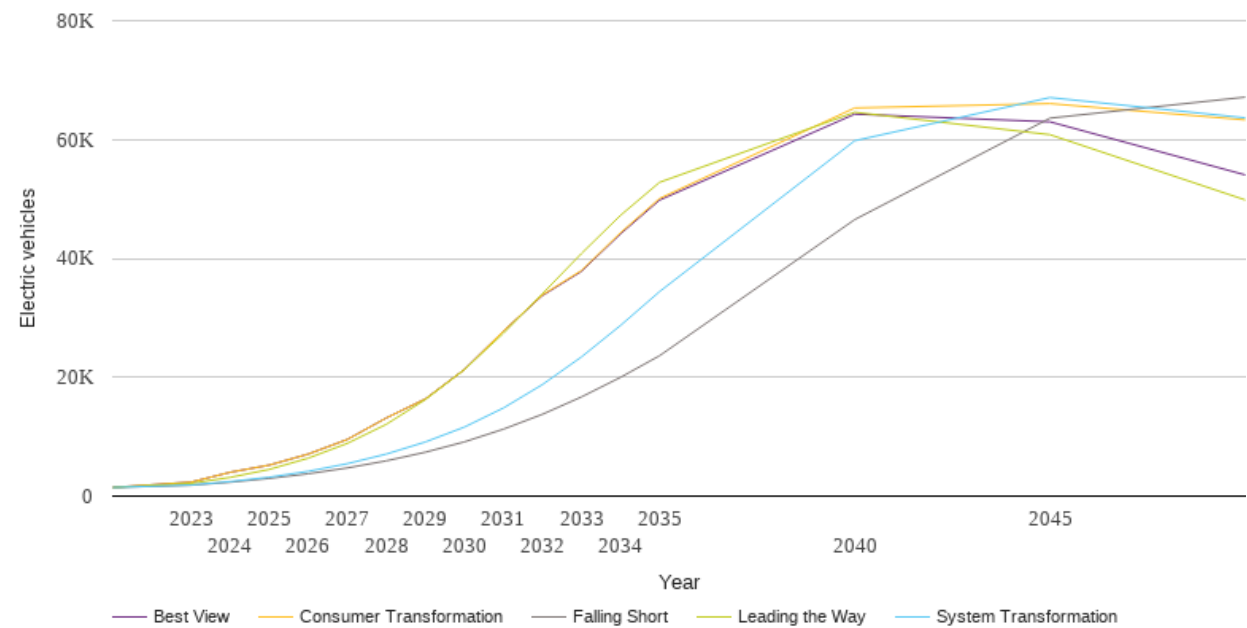
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	185	194	194	222	222
2024	449	493	493	593	593
2025	744	826	826	931	931
2026	974	1067	1067	1155	1155
2027	1185	1221	1221	1341	1341
2028	1534	1540	1540	1735	1735
2029	1904	1879	1879	2130	2130
2030	2193	2204	2204	2479	2479
2031	2500	2610	2610	2907	2907
2032	2806	3018	3018	3307	3307
2033	3119	3408	3408	3506	3506
2034	3448	3794	3794	3700	3700
2035	3774	4100	4100	3892	3892
2040	4953	4894	4894	4632	4632
2045	5387	5164	5164	5014	5014
2050	5457	5234	5234	5084	5084



# Technology Summary: Electric vehicles

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

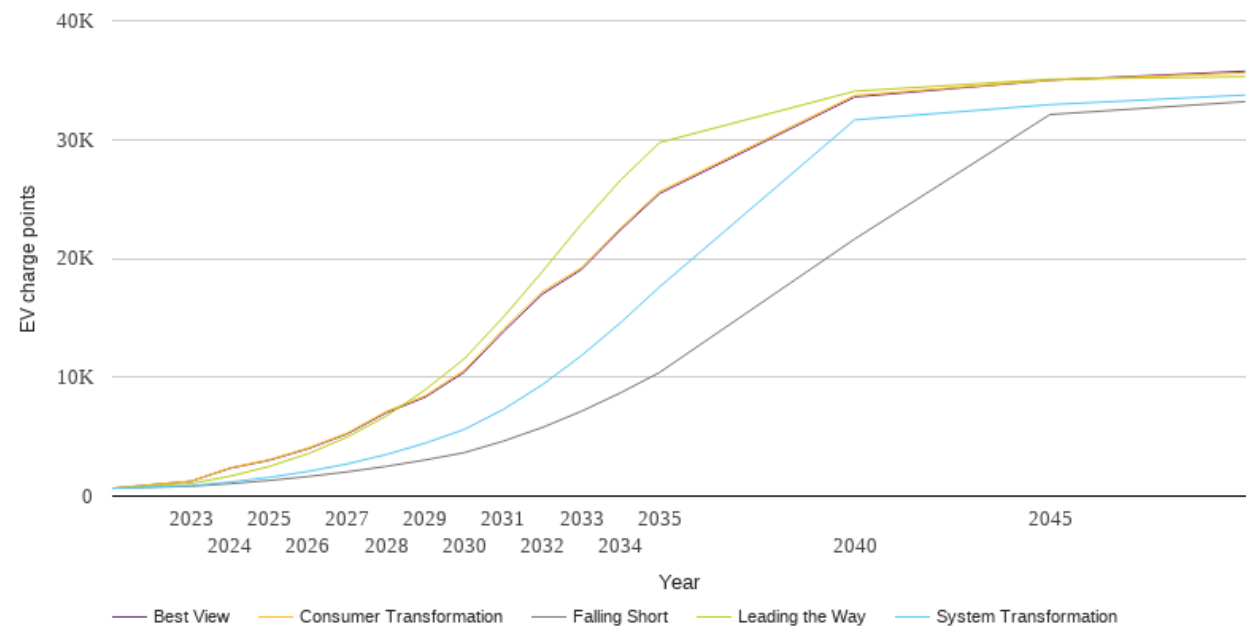
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1448	1448	1448	1448	1448
2023	1836	1866	2348	2140	2348
2024	2341	2441	4002	3141	4002
2025	2972	3174	5208	4485	5209
2026	3757	4165	7063	6377	7068
2027	4734	5448	9519	8860	9525
2028	5930	7067	13138	12071	13144
2029	7381	9103	16338	16230	16345
2030	9118	11609	21283	21269	21292
2031	11262	14822	27769	27395	27780
2032	13764	18763	33848	34050	33741
2033	16686	23417	37955	40820	37820
2034	19982	28711	44312	47238	44121
2035	23618	34407	50076	52800	49806
2040	46533	59803	65321	64587	64280
2045	63597	67065	66048	60816	62981
2050	67135	63647	63307	49838	54050



# 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	657	657	657	657	657
2023	827	878	1261	1067	1249
2024	1045	1181	2379	1673	2346
2025	1315	1575	3057	2489	3018
2026	1644	2074	4045	3569	3992
2027	2040	2707	5302	4965	5236
2028	2502	3493	7114	6725	7013
2029	3040	4456	8446	8950	8334
2030	3658	5614	10588	11557	10427
2031	4627	7294	14029	15058	13827
2032	5779	9372	17205	18888	16995
2033	7139	11819	19211	22889	19064
2034	8687	14583	22542	26585	22396
2035	10400	17597	25610	29748	25463
2040	21633	31653	33713	34065	33586
2045	32107	32935	35001	35076	34989
2050	33190	33747	35601	35289	35745

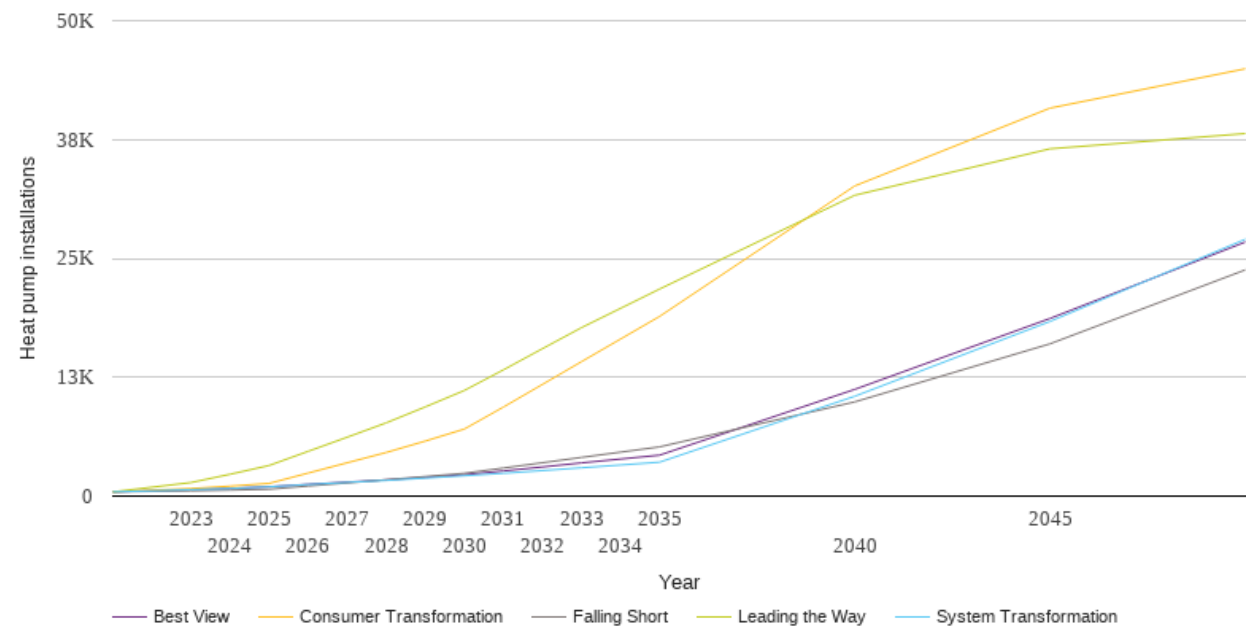




# Technology Summary: Heat pumps

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	443	443	443	443	443
2023	554	672	793	1425	672
2024	632	807	1043	2296	807
2025	721	978	1334	3218	978
2026	1057	1220	2421	4708	1235
2027	1386	1443	3504	6193	1471
2028	1716	1650	4587	7705	1699
2029	2055	1890	5786	9378	1970
2030	2396	2140	7052	11106	2254
2031	2950	2397	9360	13274	2643
2032	3508	2681	11743	15504	3064
2033	4067	2978	14136	17714	3491
2034	4622	3269	16514	19741	3898
2035	5176	3564	18895	21774	4305
2040	9908	10499	32621	31639	11224
2045	16014	18366	40801	36524	18682
2050	23786	27007	44941	38126	26715



# Technology Summary: Hydrogen electrolysis

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

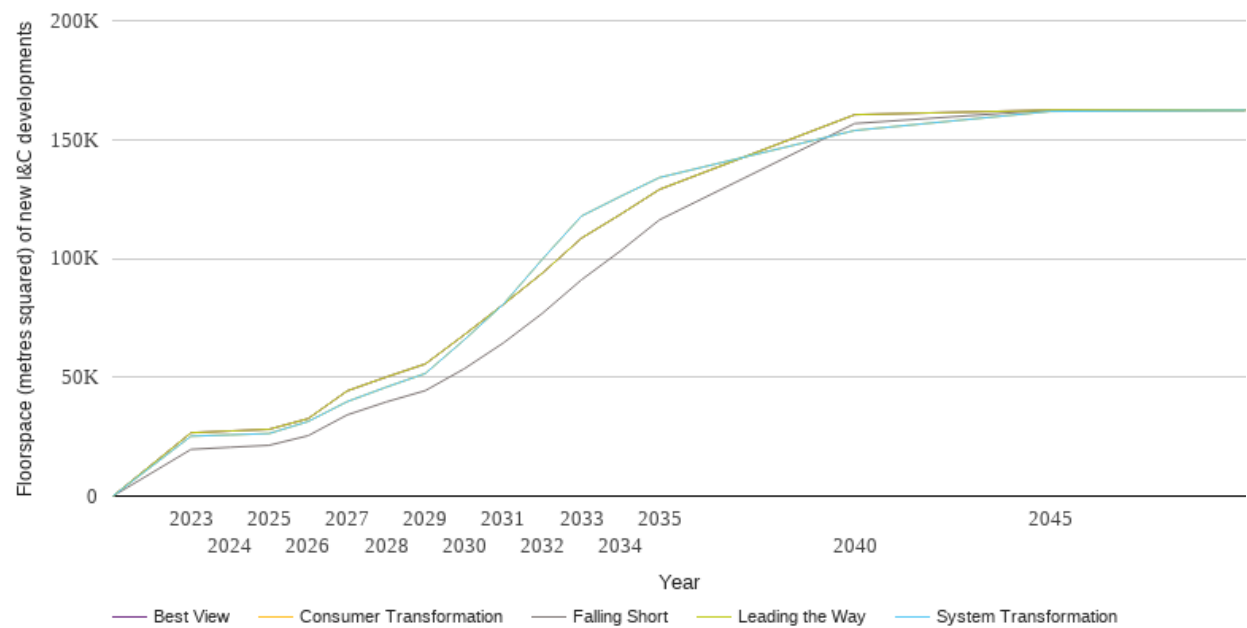
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0	0.0
2028	0.0	0.0	0.0	0.0	0.0
2029	0.0	0.0	0.0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



# Technology Summary: Non domestic

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

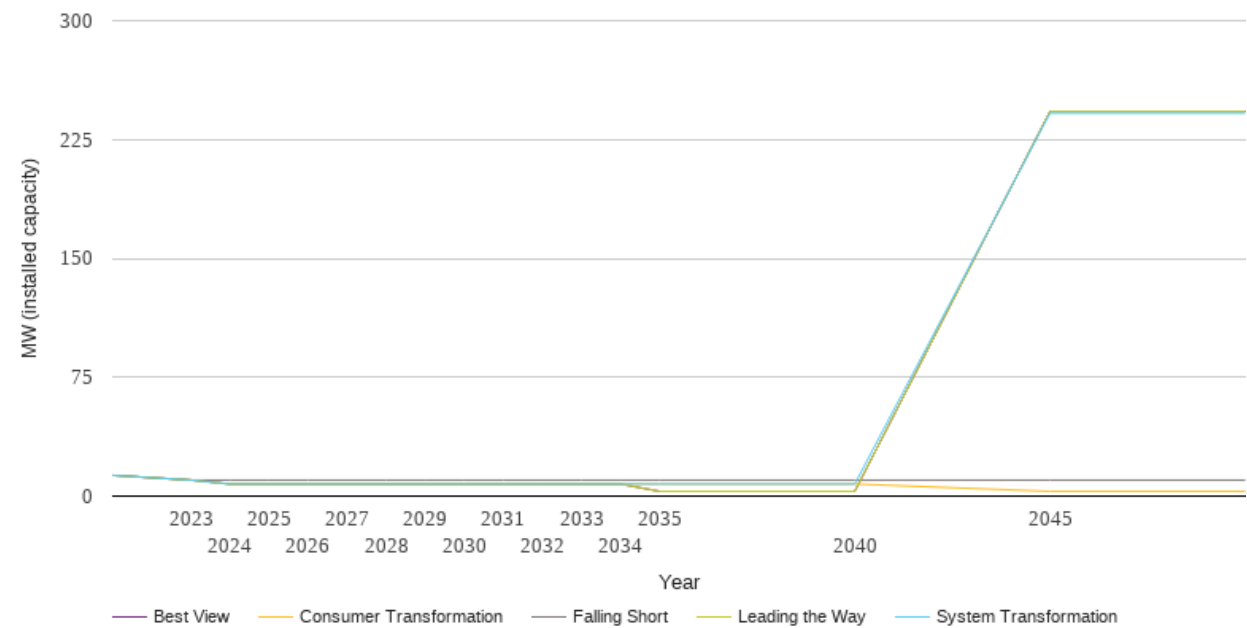
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	19646	25200	25200	26646	26646
2024	20533	25760	25760	27393	27393
2025	21373	26320	26320	28093	28093
2026	25413	31380	31380	32593	32593
2027	34159	39746	39746	44251	44251
2028	39604	45838	45838	50083	50083
2029	44366	51575	51575	55572	55572
2030	53581	65742	65742	67863	67863
2031	64424	80723	80723	80643	80643
2032	76893	99670	99670	93811	93811
2033	90989	117804	117804	108495	108495
2034	103135	126074	126074	118517	118517
2035	116223	134002	134002	129011	129011
2040	156738	153818	153818	160457	160457
2045	162393	161829	161829	162393	162393
2050	162393	162300	162300	162393	162393



# Technology Summary: Other Distributed Generation

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

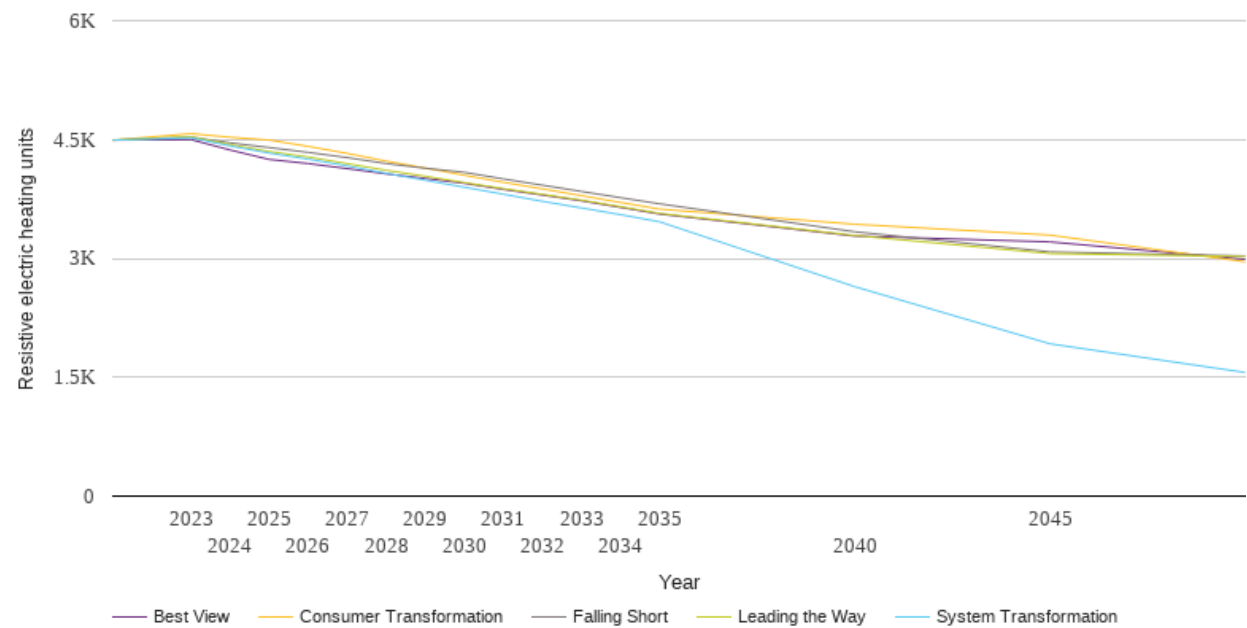
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	13.1	13.1	13.1	13.1	13.1
2023	10.1	10.1	10.1	10.1	10.1
2024	10.1	7.6	7.6	7.6	7.6
2025	10.1	7.6	7.6	7.6	7.6
2026	10.1	7.6	7.6	7.6	7.6
2027	10.1	7.6	7.6	7.6	7.6
2028	10.1	7.6	7.6	7.6	7.6
2029	10.1	7.6	7.6	7.6	7.6
2030	10.1	7.6	7.6	7.6	7.6
2031	10.1	7.6	7.6	7.6	7.6
2032	10.1	7.6	7.6	7.6	7.6
2033	10.1	7.6	7.6	7.6	7.6
2034	10.1	7.6	7.6	7.6	7.6
2035	10.1	7.6	7.6	3.0	3.0
2040	10.1	7.6	7.6	3.0	3.0
2045	10.1	241.5	3.0	242.8	242.8
2050	10.1	241.5	3.0	242.8	242.8



# Technology Summary: Resistive electric heating

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

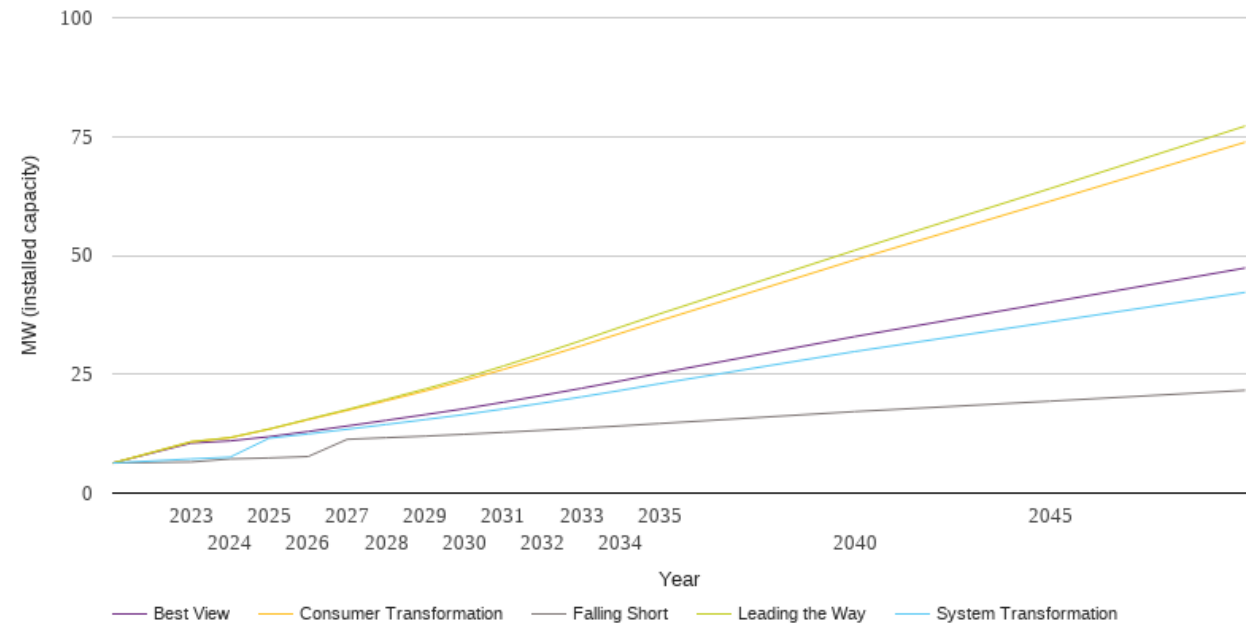
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	4493	4493	4493	4493	4493
2023	4530	4522	4574	4535	4499
2024	4458	4420	4529	4436	4368
2025	4399	4329	4493	4349	4249
2026	4338	4253	4414	4279	4197
2027	4272	4168	4325	4196	4133
2028	4197	4074	4228	4112	4067
2029	4138	3987	4139	4036	4009
2030	4086	3898	4050	3956	3948
2031	4003	3810	3960	3880	3871
2032	3924	3720	3877	3808	3800
2033	3845	3637	3792	3735	3727
2034	3766	3552	3706	3652	3644
2035	3689	3462	3622	3568	3560
2040	3336	2643	3431	3289	3282
2045	3082	1922	3294	3061	3208
2050	3031	1560	2957	3023	2989



# Technology Summary: Solar Generation

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

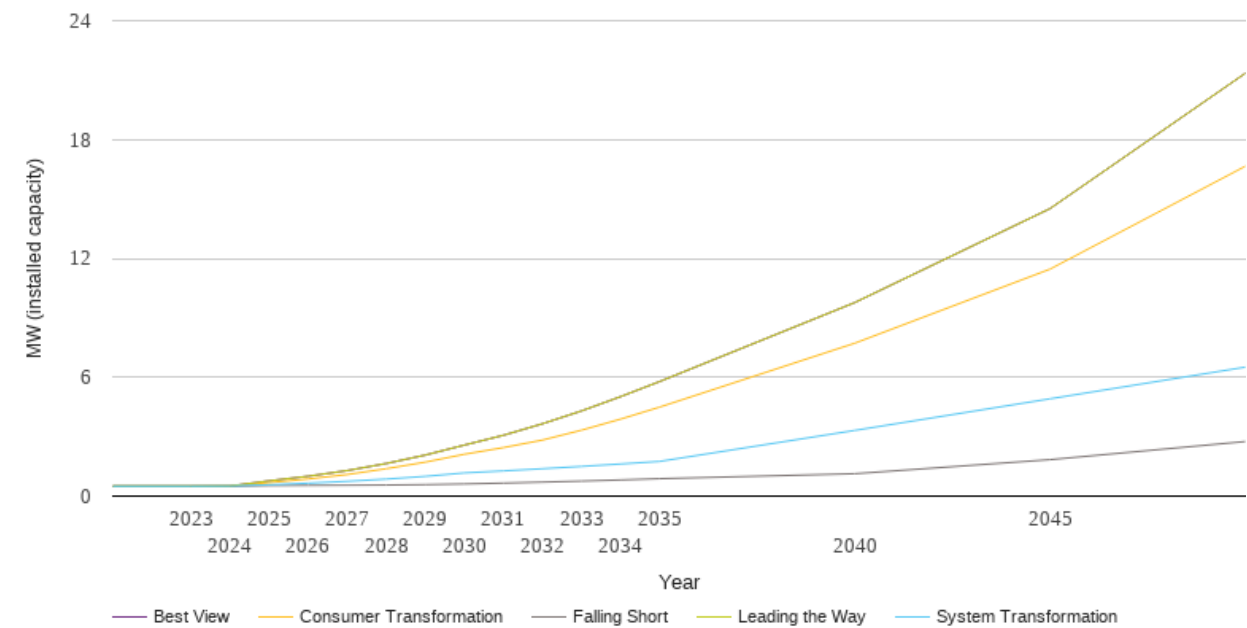
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	6.3	6.3	6.3	6.3	6.3
2023	6.5	7.2	10.8	10.8	10.5
2024	7.2	7.6	11.6	11.7	11.0
2025	7.4	11.5	13.4	13.5	11.9
2026	7.7	12.4	15.4	15.5	13.0
2027	11.3	13.4	17.4	17.6	14.1
2028	11.7	14.4	19.4	19.7	15.3
2029	12.0	15.5	21.5	21.9	16.5
2030	12.4	16.5	23.7	24.2	17.7
2031	12.8	17.7	26.0	26.7	19.1
2032	13.2	18.9	28.5	29.4	20.5
2033	13.7	20.2	31.0	32.1	22.0
2034	14.1	21.6	33.6	34.9	23.6
2035	14.6	23.0	36.2	37.7	25.2
2040	17.1	29.8	49.1	51.1	32.9
2045	19.3	36.0	61.4	64.0	40.1
2050	21.6	42.2	73.8	77.2	47.3



# Technology Summary: Storage

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

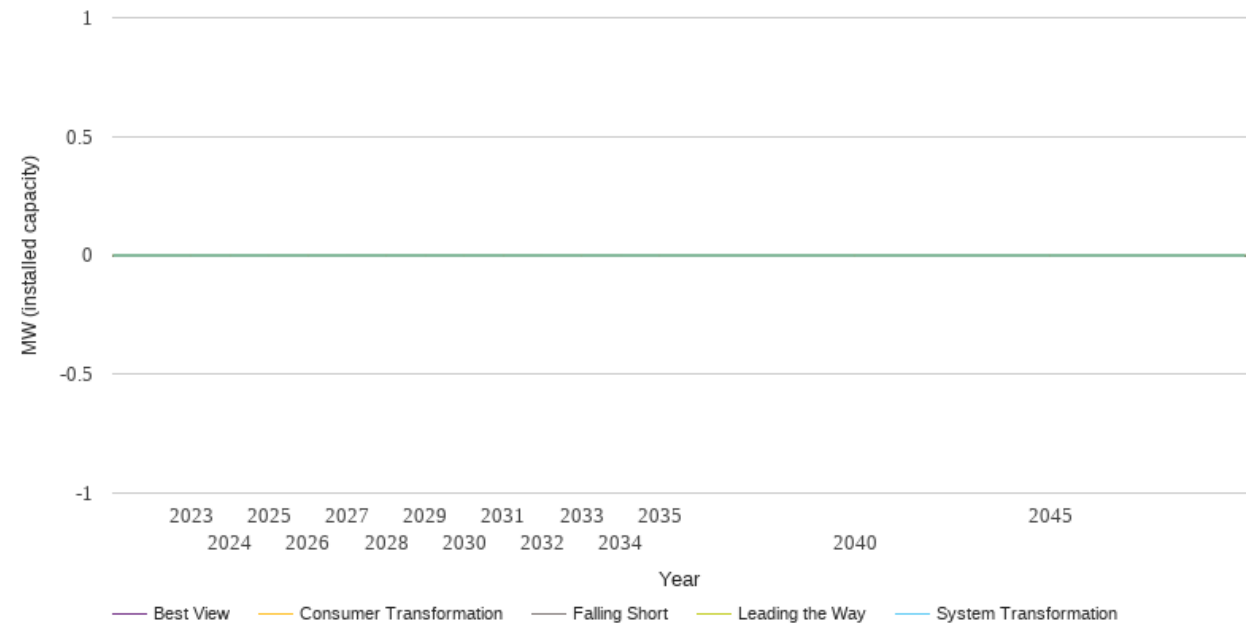
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.5	0.5	0.5	0.5	0.5
2023	0.5	0.5	0.5	0.5	0.5
2024	0.5	0.5	0.5	0.5	0.5
2025	0.5	0.6	0.7	0.8	0.8
2026	0.5	0.7	0.9	1.0	1.0
2027	0.5	0.7	1.1	1.3	1.3
2028	0.6	0.9	1.4	1.6	1.6
2029	0.6	1.0	1.7	2.1	2.1
2030	0.6	1.2	2.1	2.6	2.6
2031	0.7	1.3	2.4	3.1	3.1
2032	0.7	1.4	2.8	3.6	3.6
2033	0.8	1.5	3.3	4.3	4.3
2034	0.8	1.6	3.9	5.0	5.0
2035	0.9	1.7	4.5	5.8	5.8
2040	1.1	3.3	7.7	9.8	9.8
2045	1.8	4.9	11.5	14.5	14.5
2050	2.8	6.5	16.6	21.3	21.3



# 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	0.0	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	0.0	0.0	0.0	0.0





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

[nged.networkstrategy@nationalgrid.co.uk](mailto:nged.networkstrategy@nationalgrid.co.uk)

