

# Distribution Future Energy Scenarios 2022

Local Authority:  
Warwick

## What are Distribution Future Energy Scenarios?

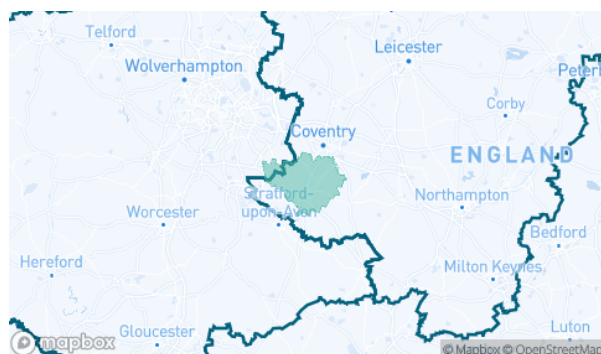
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Warwick 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 Warwick 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	899	2546	2192	2192	899	39774	21803	21803	899
Domestic	New dwellings	0	5526	5810	5810	6513	7604	7344	7344	7148
Electric vehicles	Electric vehicles	2946	19326	22202	40949	40575	122319	100729	105425	85137
EV Charge Point	EV charge points	1419	8849	11793	22176	24273	65265	57196	62433	62228
Heat pumps	Heat pump installations	367	5020	4546	12071	17899	34992	40068	66588	59164
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	0.3	0.0	0.2	0.2	0.9	0.2	1.5
Non domestic	Floorspace (metres squared) of new I&C developments	0	251767	313152	313152	329185	502728	501146	501146	502728
Other Distributed Generation	MW (installed capacity)	4.7	4.7	4.7	4.7	4.4	1.7	1.0	1.0	1.0
Resistive electric heating	Resistive electric heating units	11738	9772	9482	10160	9678	6052	2455	6276	6569
Solar Generation	MW (installed capacity)	17.7	25.3	34.8	48.4	45.4	64.2	116.6	170.5	167.3
Storage	MW (installed capacity)	0.0	0.2	1.5	3.3	4.3	4.5	11.3	28.9	37.3
Wind	MW (installed capacity)	0.0	0.0	0.2	1.8	1.3	1.4	4.4	16.3	13.0

## 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

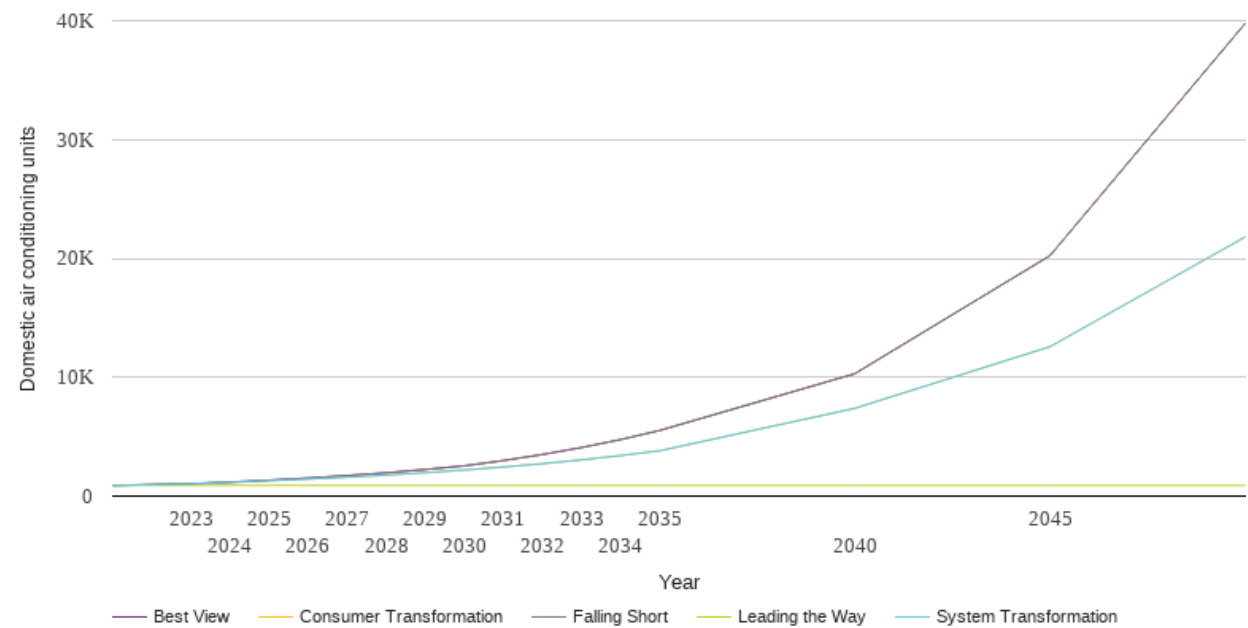
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

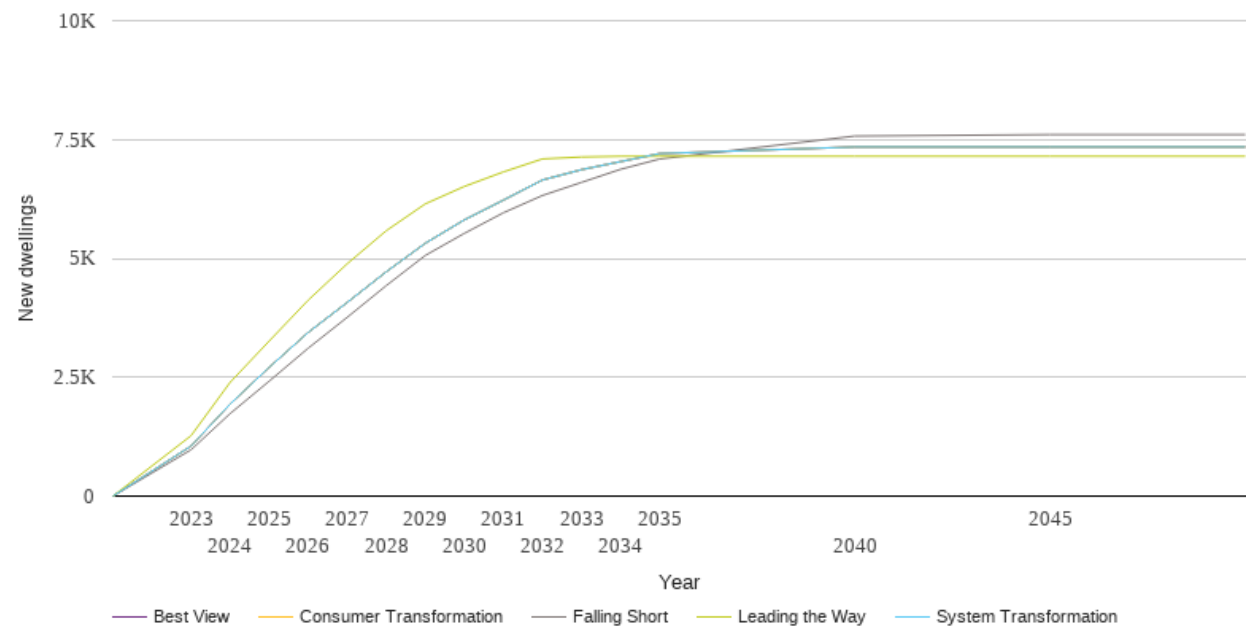
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	899	899	899	899	899
2023	1037	1020	1020	899	1037
2024	1174	1145	1145	899	1174
2025	1334	1291	1291	899	1334
2026	1516	1431	1431	899	1516
2027	1725	1589	1589	899	1725
2028	1960	1768	1768	899	1960
2029	2235	1969	1969	899	2235
2030	2546	2192	2192	899	2546
2031	2991	2446	2446	899	2991
2032	3500	2729	2729	899	3500
2033	4085	3048	3048	899	4085
2034	4754	3409	3409	899	4754
2035	5519	3809	3809	899	5519
2040	10296	7384	7384	899	10296
2045	20229	12568	12568	899	20229
2050	39774	21803	21803	899	39774



# Technology Summary: Domestic

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

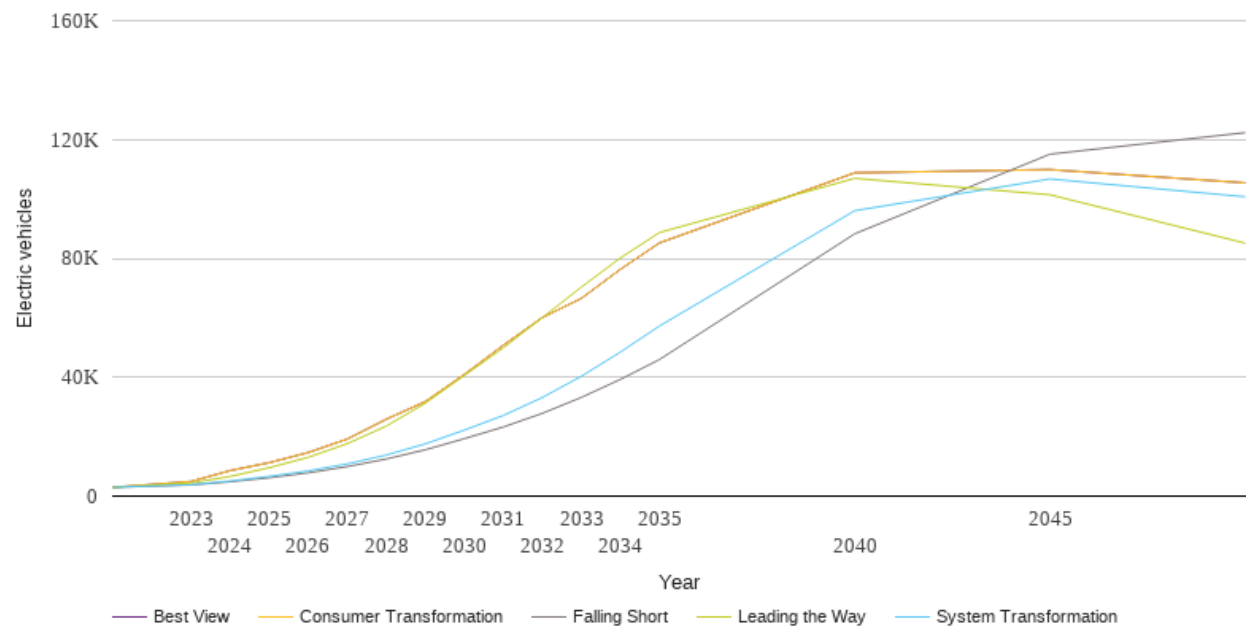
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	974	1052	1052	1270	1052
2024	1734	1935	1935	2391	1935
2025	2416	2707	2707	3260	2707
2026	3110	3442	3442	4121	3442
2027	3760	4073	4073	4887	4073
2028	4427	4718	4718	5582	4718
2029	5062	5318	5318	6147	5318
2030	5526	5810	5810	6513	5810
2031	5959	6225	6225	6819	6225
2032	6323	6649	6649	7092	6649
2033	6598	6866	6866	7133	6866
2034	6873	7035	7035	7148	7035
2035	7090	7204	7204	7148	7204
2040	7573	7344	7344	7148	7344
2045	7604	7344	7344	7148	7344
2050	7604	7344	7344	7148	7344



# Technology Summary: Electric vehicles

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

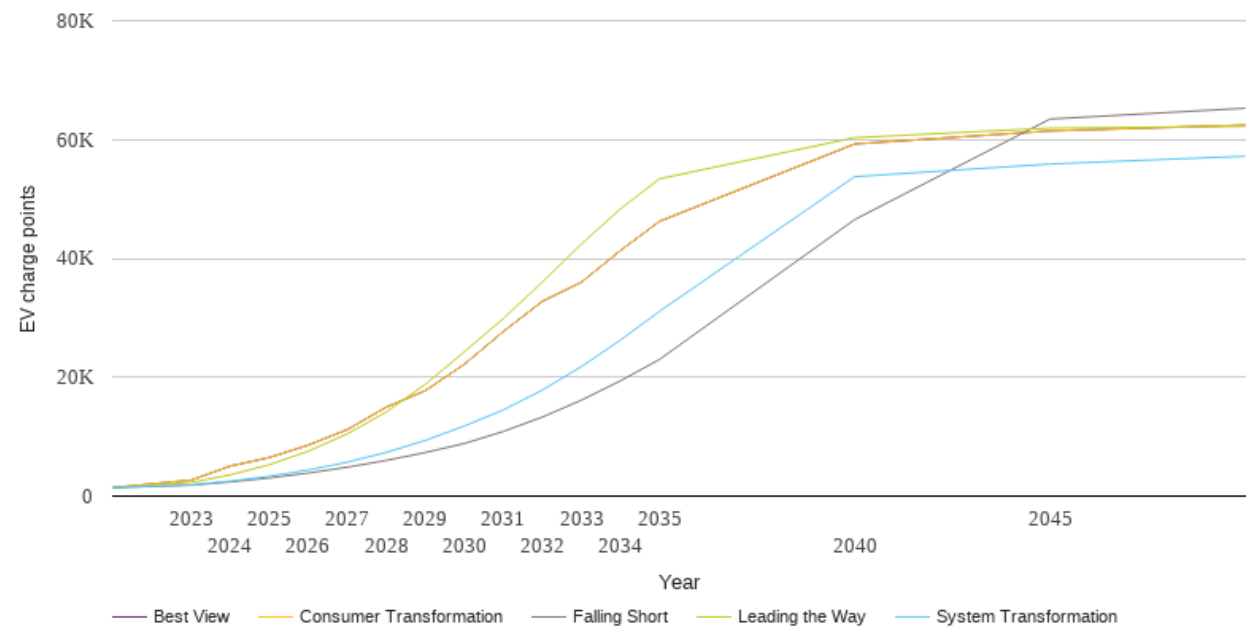
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	2946	2946	2946	2946	2946
2023	3762	3835	4919	4433	4919
2024	4819	5060	8583	6612	8583
2025	6154	6637	11247	9555	11247
2026	7833	8466	14664	13047	14664
2027	9923	10831	19193	17630	19193
2028	12483	13821	25876	23566	25876
2029	15591	17576	31798	31256	31798
2030	19326	22202	40949	40575	40949
2031	23262	27142	50790	49913	50790
2032	27861	33193	60108	60070	60108
2033	33228	40346	66560	70361	66560
2034	39292	48485	76345	80170	76345
2035	45976	57242	85225	88706	85225
2040	88276	96055	108798	106940	108798
2045	115075	106724	109874	101410	109874
2050	122319	100729	105425	85137	105425



# 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	1419	1419	1419	1419	1419
2023	1845	1885	2683	2290	2683
2024	2382	2517	5038	3564	5038
2025	3058	3335	6484	5280	6484
2026	3878	4379	8572	7549	8572
2027	4860	5707	11190	10466	11190
2028	6003	7349	14973	14149	14973
2029	7329	9371	17735	18816	17735
2030	8849	11793	22176	24273	22176
2031	10888	14499	27690	29882	27690
2032	13302	17841	32780	36024	32780
2033	16149	21790	35993	42426	35993
2034	19401	26246	41333	48342	41333
2035	22998	31096	46242	53398	46242
2040	46542	53762	59254	60316	59254
2045	63445	55882	61449	61919	61449
2050	65265	57196	62433	62228	62433

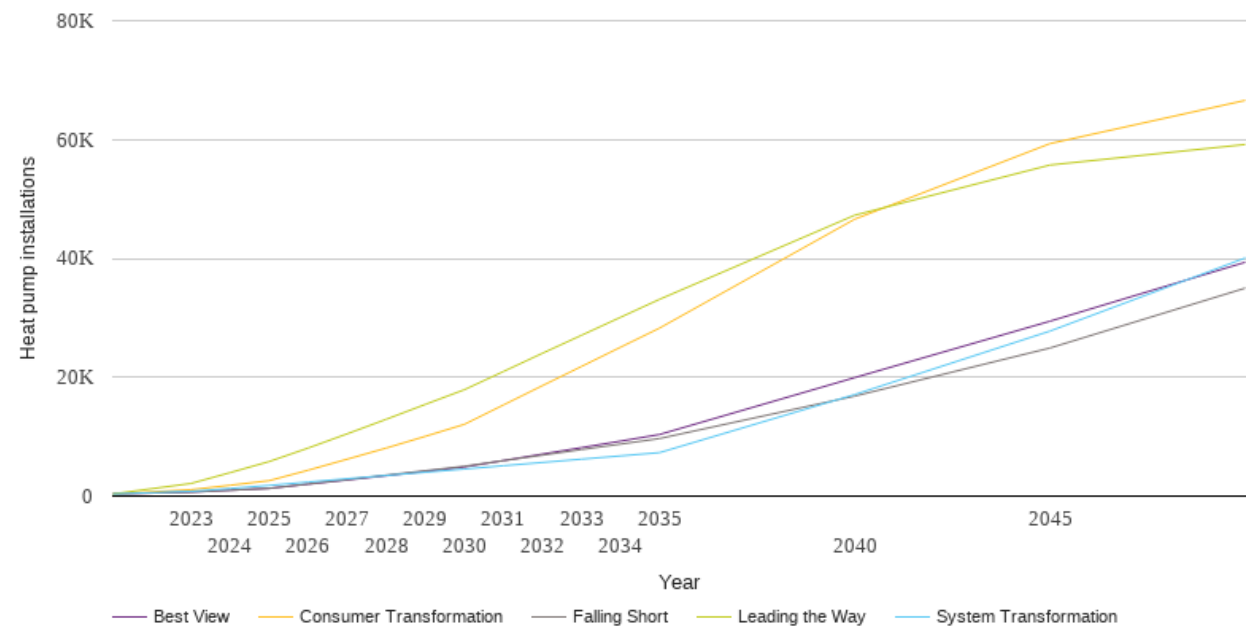




# Technology Summary: Heat pumps

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

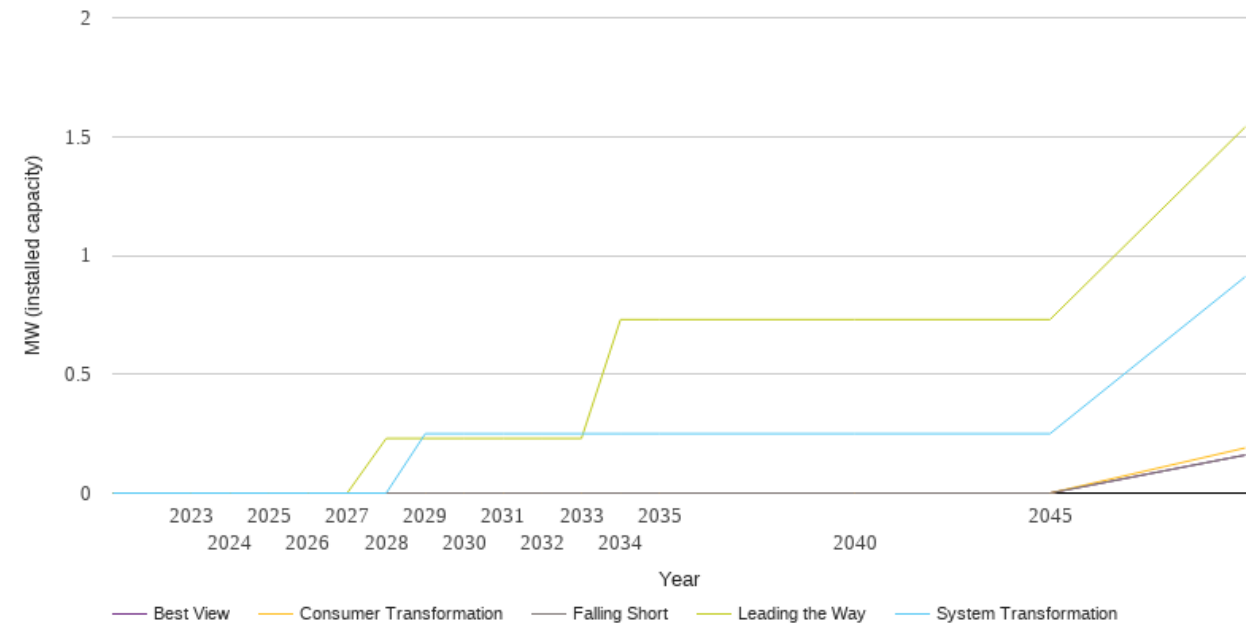
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	367	367	367	367	367
2023	678	805	1075	2125	678
2024	987	1282	1822	3945	987
2025	1300	1796	2596	5809	1300
2026	2044	2366	4356	8085	2007
2027	2780	2926	6210	10478	2713
2028	3523	3467	8085	12923	3429
2029	4269	4012	10054	15428	4159
2030	5020	4546	12071	17899	4894
2031	5959	5110	15328	20960	5975
2032	6890	5658	18585	24031	7067
2033	7828	6213	21814	27059	8150
2034	8749	6763	25048	30086	9247
2035	9686	7314	28271	33112	10367
2040	16829	17091	46600	47266	19939
2045	24917	27766	59314	55709	29431
2050	34992	40068	66588	59164	39352



# Technology Summary: Hydrogen electrolysis

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

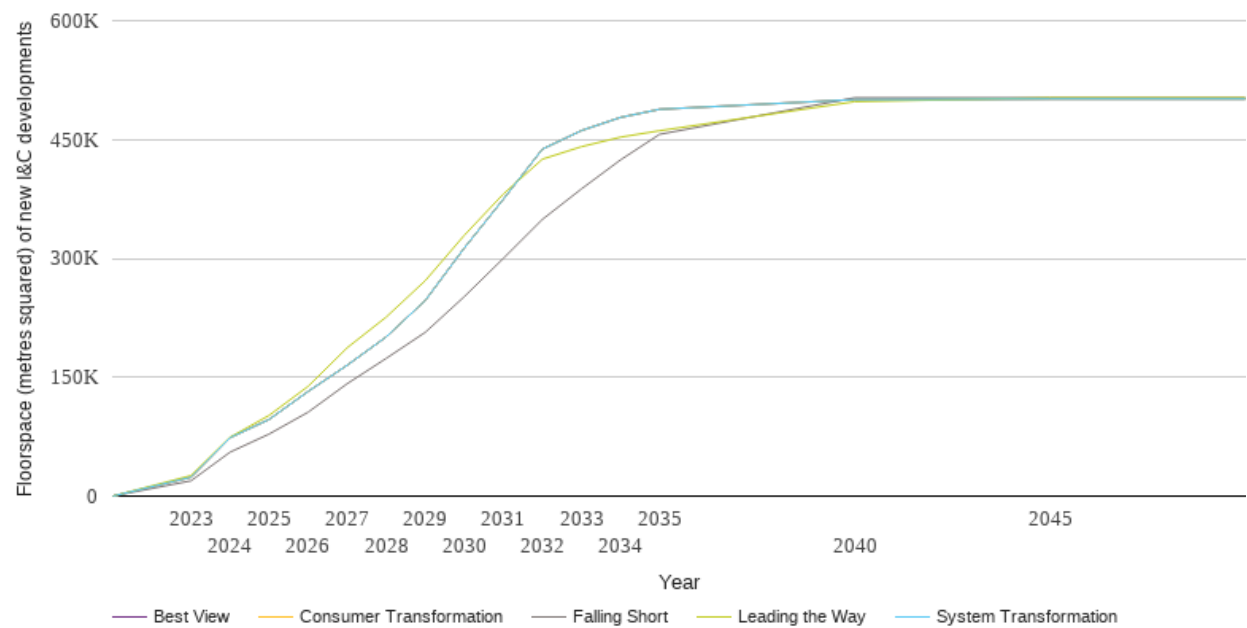
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0	0.0
2028	0.0	0.0	0.0	0.0	0.0
2029	0.0	0.3	0.0	0.2	0.0
2030	0.0	0.3	0.0	0.2	0.0
2031	0.0	0.3	0.0	0.2	0.0
2032	0.0	0.3	0.0	0.2	0.0
2033	0.0	0.3	0.0	0.2	0.0
2034	0.0	0.3	0.0	0.7	0.0
2035	0.0	0.3	0.0	0.7	0.0
2040	0.0	0.3	0.0	0.7	0.0
2045	0.0	0.3	0.0	0.7	0.0
2050	0.2	0.9	0.2	1.5	0.2



# Technology Summary: Non domestic

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

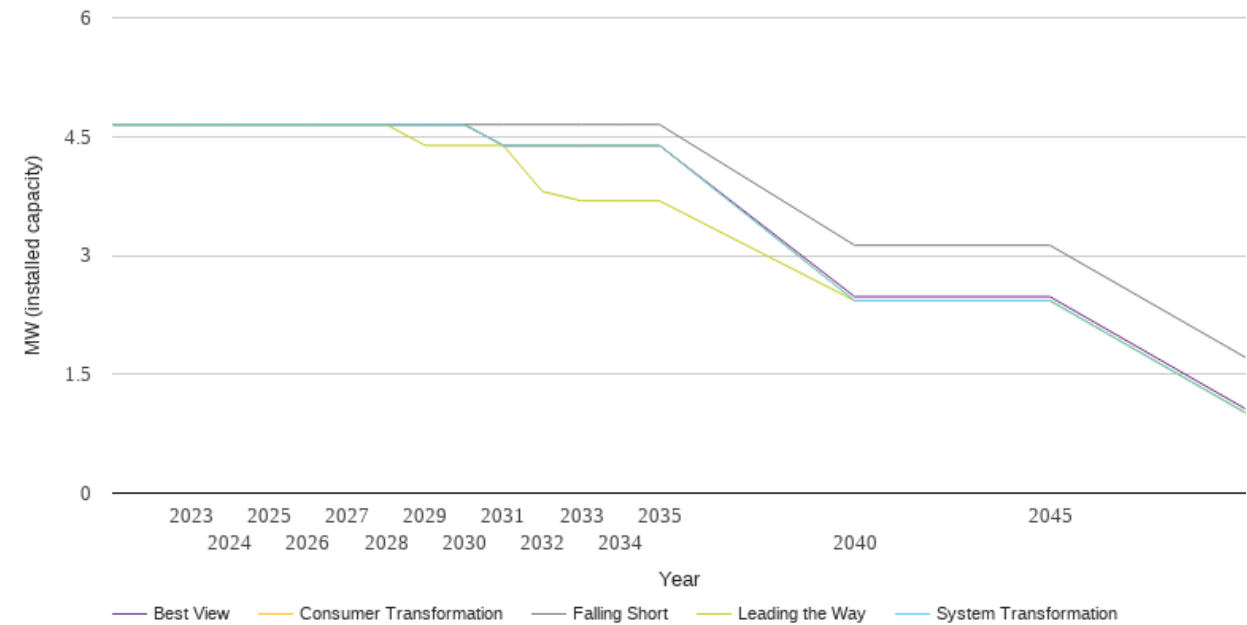
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	19295	23791	23791	25904	23791
2024	55446	73700	73700	74267	73700
2025	78308	96747	96747	101898	96747
2026	105927	132072	132072	138572	132072
2027	141853	165179	165179	187223	165179
2028	173806	200945	200945	225983	200945
2029	206701	246892	246892	271914	246892
2030	251767	313152	313152	329185	313152
2031	300002	374700	374700	381322	374700
2032	349209	437926	437926	425250	437926
2033	387683	461348	461348	440989	461348
2034	424289	477901	477901	452999	477901
2035	456568	488174	488174	461111	488174
2040	502728	500366	500366	497846	500366
2045	502728	501146	501146	502728	501146
2050	502728	501146	501146	502728	501146



# Technology Summary: Other Distributed Generation

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

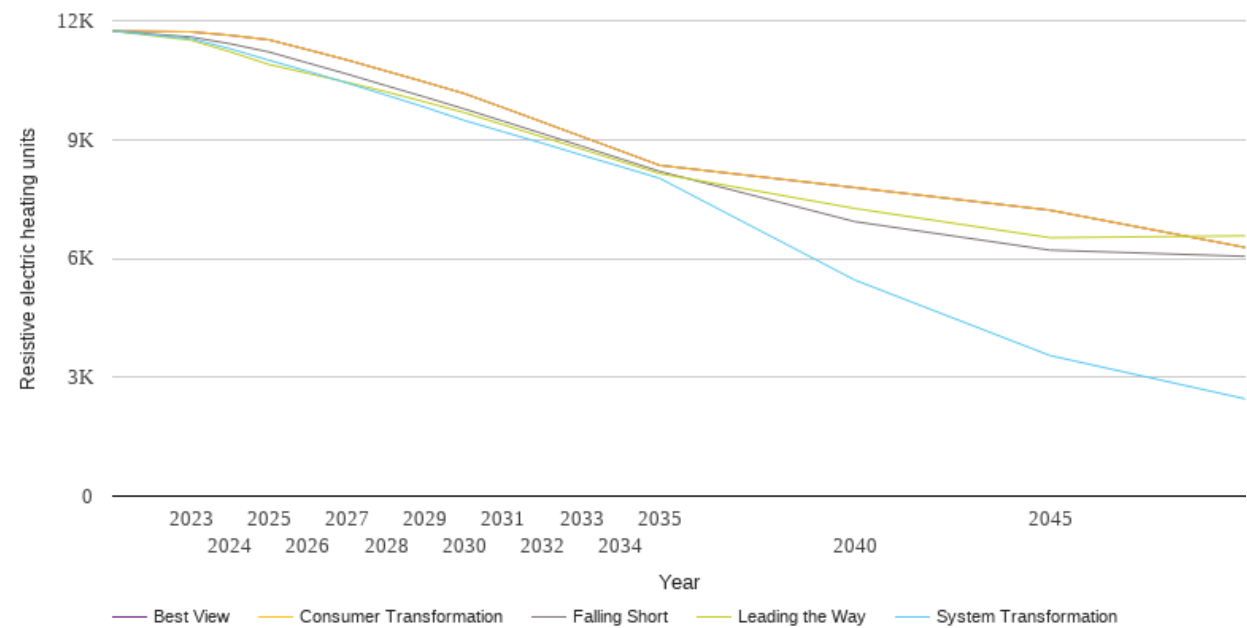
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	4.7	4.7	4.7	4.7	4.7
2023	4.7	4.7	4.7	4.7	4.7
2024	4.7	4.7	4.7	4.7	4.7
2025	4.7	4.7	4.7	4.7	4.7
2026	4.7	4.7	4.7	4.7	4.7
2027	4.7	4.7	4.7	4.7	4.7
2028	4.7	4.7	4.7	4.7	4.7
2029	4.7	4.7	4.7	4.4	4.7
2030	4.7	4.7	4.7	4.4	4.7
2031	4.7	4.4	4.4	4.4	4.4
2032	4.7	4.4	4.4	3.8	4.4
2033	4.7	4.4	4.4	3.7	4.4
2034	4.7	4.4	4.4	3.7	4.4
2035	4.7	4.4	4.4	3.7	4.4
2040	3.1	2.4	2.4	2.4	2.5
2045	3.1	2.4	2.4	2.4	2.5
2050	1.7	1.0	1.0	1.0	1.1



# Technology Summary: Resistive electric heating

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

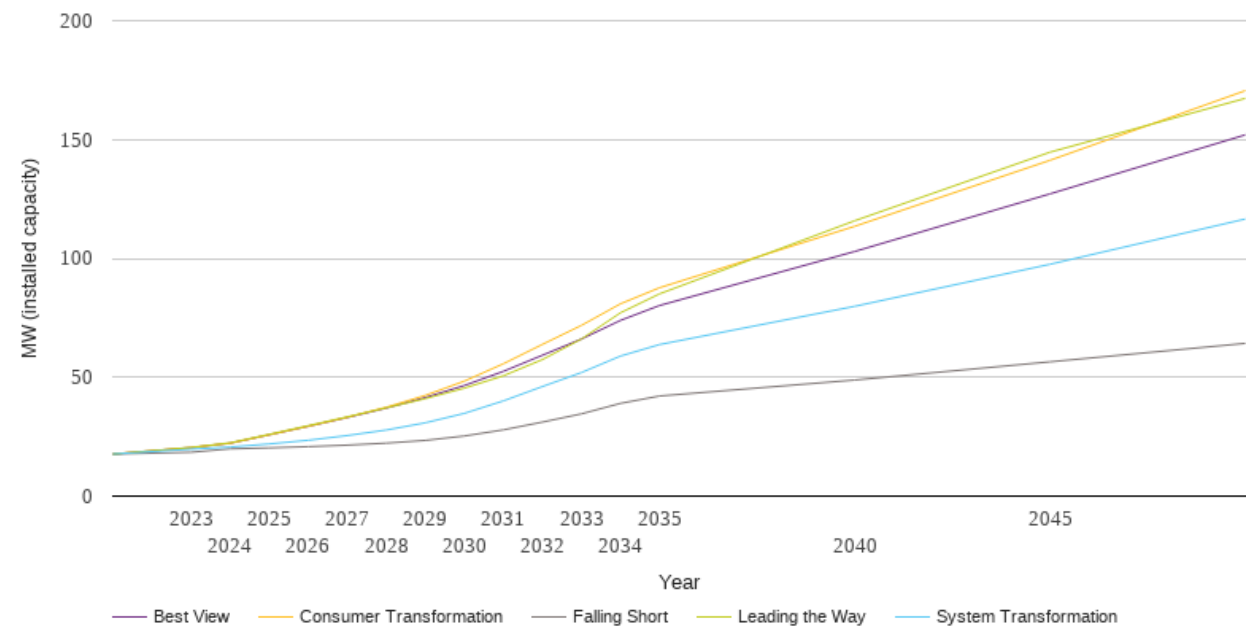
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	11738	11738	11738	11738	11738
2023	11589	11546	11718	11508	11718
2024	11417	11290	11631	11214	11631
2025	11209	11000	11516	10892	11516
2026	10929	10720	11265	10669	11265
2027	10652	10427	11007	10444	11007
2028	10358	10121	10728	10203	10728
2029	10070	9811	10448	9947	10448
2030	9772	9482	10160	9678	10160
2031	9462	9194	9804	9373	9804
2032	9151	8907	9442	9065	9442
2033	8834	8609	9078	8760	9078
2034	8516	8318	8715	8451	8715
2035	8197	8023	8350	8142	8350
2040	6929	5454	7787	7261	7787
2045	6208	3548	7217	6522	7217
2050	6052	2455	6276	6569	6276



# Technology Summary: Solar Generation

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

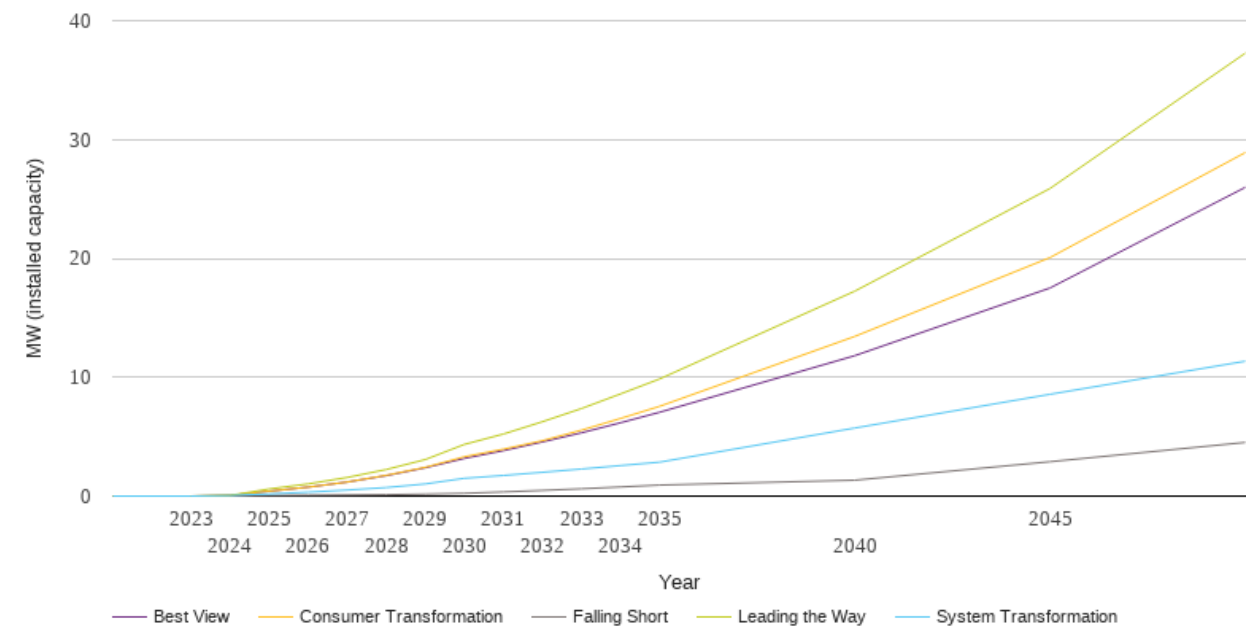
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	17.7	17.7	17.7	17.7	17.7
2023	18.4	19.7	20.4	20.4	20.4
2024	19.9	20.6	22.2	22.4	22.2
2025	20.3	21.9	25.8	26.0	25.8
2026	20.8	23.5	29.4	29.6	29.4
2027	21.4	25.5	33.2	33.3	33.1
2028	22.3	27.8	37.4	37.1	37.0
2029	23.4	30.8	42.3	41.0	41.5
2030	25.3	34.8	48.4	45.4	46.5
2031	27.9	40.1	55.7	50.6	52.5
2032	31.1	46.1	63.8	57.4	59.3
2033	34.6	52.0	71.8	66.1	66.1
2034	39.0	58.9	80.9	77.1	73.9
2035	42.1	63.7	87.7	85.1	80.2
2040	48.8	79.8	113.5	115.8	102.9
2045	56.5	97.5	141.3	144.7	127.1
2050	64.2	116.6	170.5	167.3	152.0



# Technology Summary: Storage

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

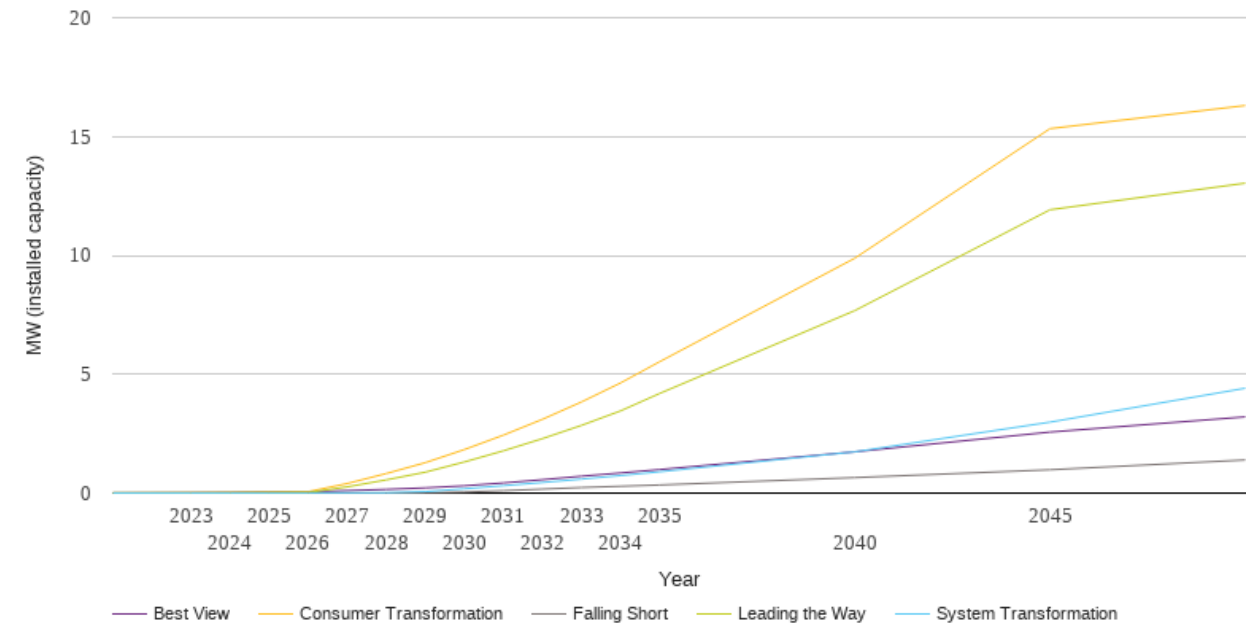
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.1	0.1	0.1	0.1
2025	0.1	0.2	0.4	0.6	0.4
2026	0.1	0.3	0.8	1.0	0.8
2027	0.1	0.5	1.2	1.6	1.2
2028	0.1	0.7	1.7	2.2	1.7
2029	0.2	1.0	2.4	3.1	2.4
2030	0.2	1.5	3.3	4.3	3.2
2031	0.4	1.7	3.9	5.2	3.8
2032	0.5	2.0	4.7	6.3	4.6
2033	0.6	2.3	5.5	7.4	5.3
2034	0.8	2.6	6.5	8.6	6.2
2035	0.9	2.9	7.6	9.9	7.1
2040	1.3	5.7	13.4	17.2	11.8
2045	2.9	8.6	20.1	25.9	17.5
2050	4.5	11.3	28.9	37.3	26.0



# 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	0.0	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	0.1	0.0	0.1
2027	0.0	0.0	0.4	0.3	0.1
2028	0.0	0.0	0.8	0.6	0.2
2029	0.0	0.1	1.3	0.9	0.2
2030	0.0	0.2	1.8	1.3	0.3
2031	0.1	0.3	2.4	1.8	0.4
2032	0.2	0.4	3.1	2.3	0.6
2033	0.2	0.6	3.8	2.8	0.7
2034	0.3	0.7	4.6	3.5	0.8
2035	0.3	0.9	5.5	4.2	1.0
2040	0.7	1.7	9.9	7.7	1.7
2045	1.0	3.0	15.3	11.9	2.6
2050	1.4	4.4	16.3	13.0	3.2





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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))  
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