

# Distribution Future Energy Scenarios 2022

Local Authority:  
West 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 West 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 West 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	1475	5301	4274	4274	1487	100894	53908	53908	1509
Domestic	New dwellings	0	18231	20167	20167	24038	33378	33123	33123	32950
Electric vehicles	Electric vehicles	6655	42571	51688	95297	94882	294769	255903	261544	214980
EV Charge Point	EV charge points	3217	18843	26946	50611	55587	154700	146865	156932	156211
Heat pumps	Heat pump installations	2303	14359	14754	35173	52310	95993	109567	183150	161052
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	3.0	0.0	0.7	6.1	27.7	13.7	23.7
Non domestic	Floorspace (metres squared) of new I&C developments	0	1322417	1550960	1634997	1648299	2068551	2055381	2139418	2068551
Other Distributed Generation	MW (installed capacity)	18.8	20.3	18.1	18.3	12.1	12.7	9.1	3.6	12.0
Resistive electric heating	Resistive electric heating units	23236	20186	19287	20538	19819	13901	5890	13424	14163
Solar Generation	MW (installed capacity)	58.7	81.3	107.8	142.4	133.1	193.8	381.8	527.4	507.9
Storage	MW (installed capacity)	1.0	1.7	5.0	9.5	12.5	14.3	35.2	83.3	107.2
Wind	MW (installed capacity)	11.2	11.5	12.3	21.9	19.4	23.3	48.3	131.8	109.2

## 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

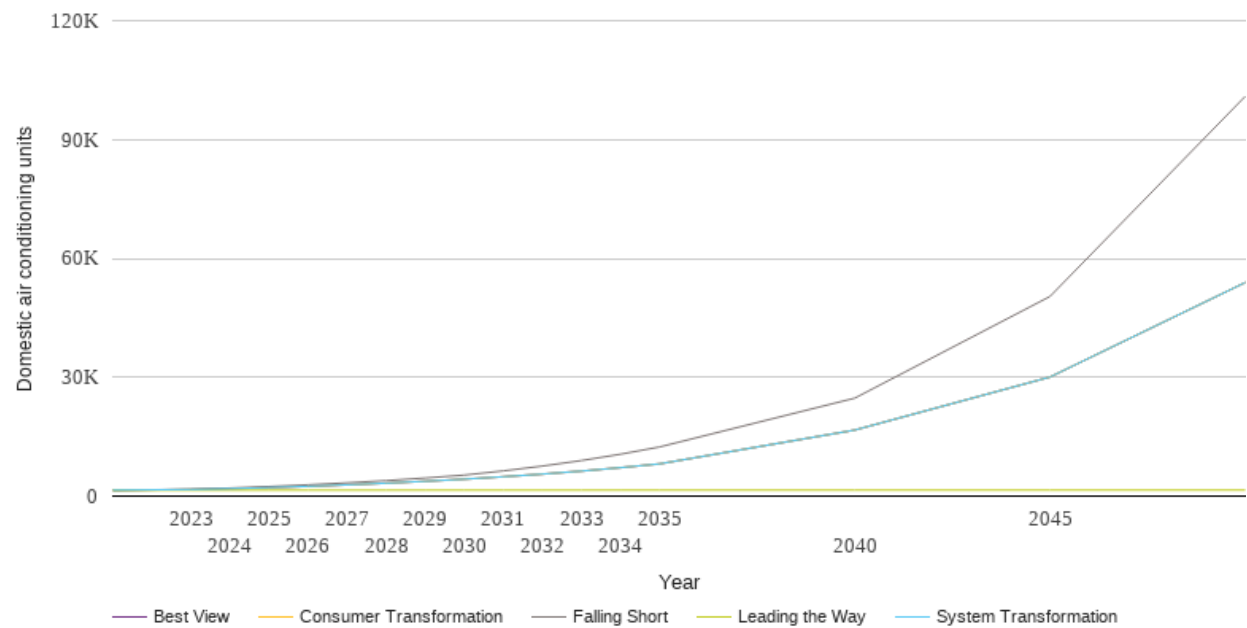
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

If you have any comments or queries regarding these reports, please contact [nged.energyplanning@nationalgrid.co.uk](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.

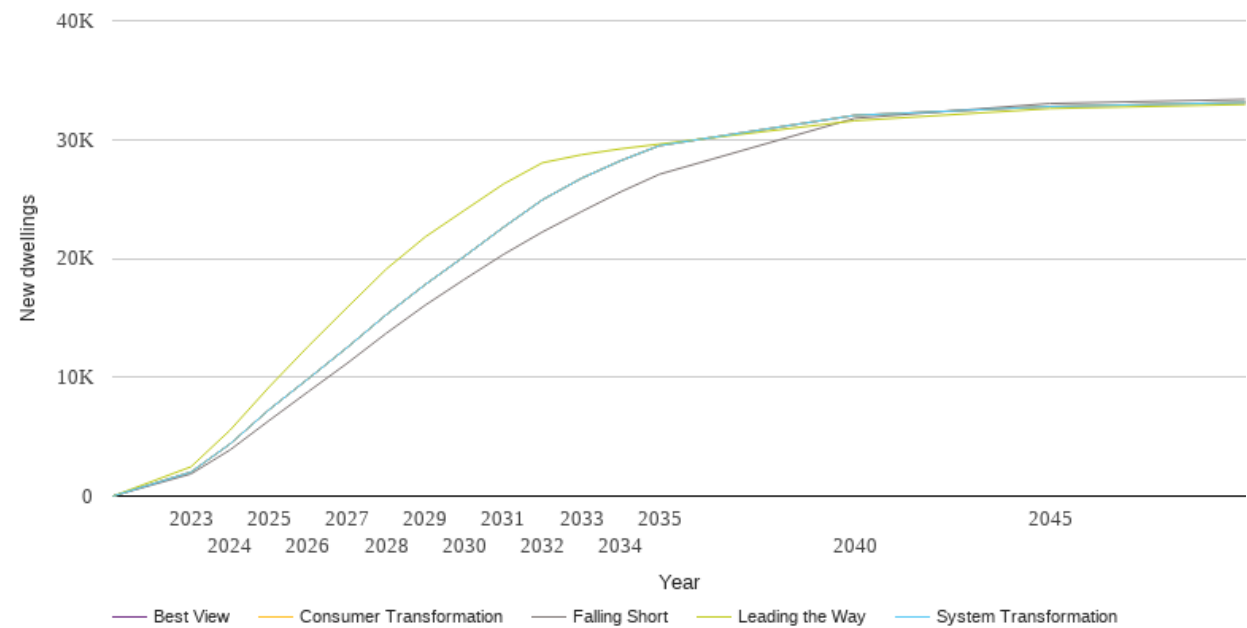
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1475	1475	1475	1475	1475
2023	1702	1675	1675	1477	1675
2024	2028	1882	1882	1479	1882
2025	2409	2123	2123	1481	2123
2026	2845	2457	2457	1483	2457
2027	3343	2834	2834	1483	2834
2028	3904	3263	3263	1485	3263
2029	4561	3741	3741	1487	3741
2030	5301	4274	4274	1487	4274
2031	6361	4880	4880	1489	4880
2032	7577	5555	5555	1491	5555
2033	8972	6313	6313	1491	6313
2034	10571	7176	7176	1493	7176
2035	12400	8130	8130	1493	8130
2040	24726	16666	16666	1499	16666
2045	50386	30044	30044	1503	30044
2050	100894	53908	53908	1509	53908



# Technology Summary: Domestic

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

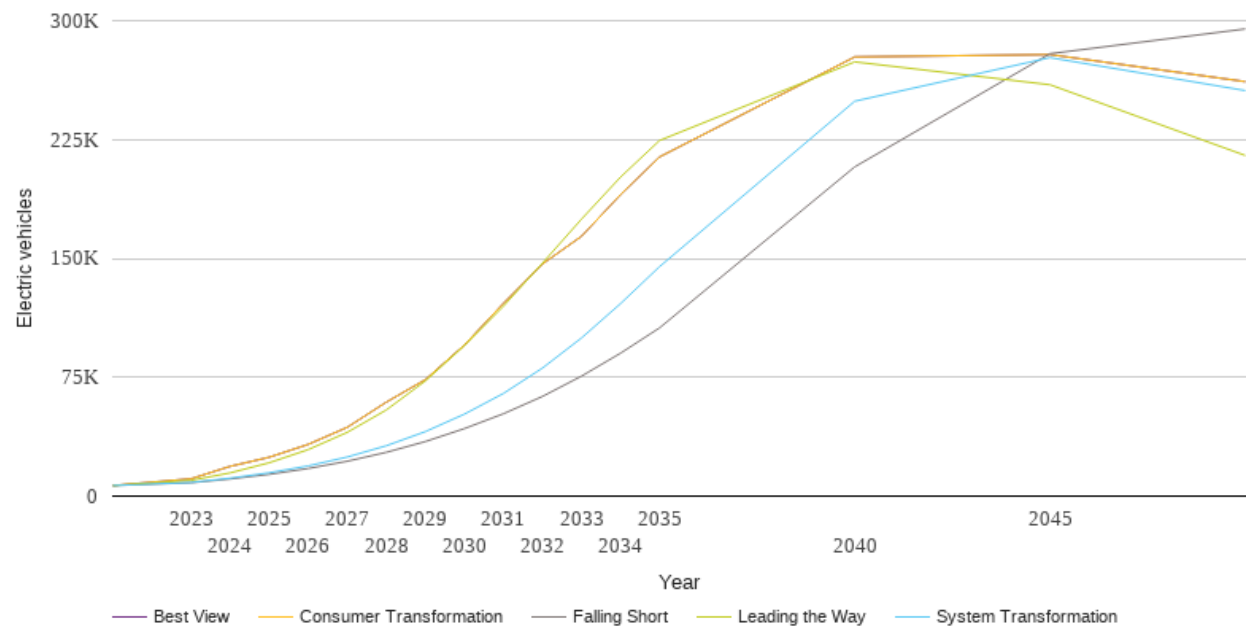
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	1869	2024	2024	2468	2024
2024	3884	4389	4389	5547	4389
2025	6357	7274	7274	9178	7274
2026	8781	9870	9870	12597	9870
2027	11175	12505	12505	15869	12505
2028	13697	15261	15261	19098	15261
2029	16065	17800	17800	21810	17800
2030	18231	20167	20167	24038	20167
2031	20327	22611	22611	26251	22611
2032	22222	24928	24928	28042	24928
2033	23934	26735	26735	28719	26735
2034	25590	28213	28213	29215	28213
2035	27080	29491	29491	29619	29491
2040	31786	32032	32032	31584	32032
2045	33032	32777	32777	32604	32777
2050	33378	33123	33123	32950	33123



# Technology Summary: Electric vehicles

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

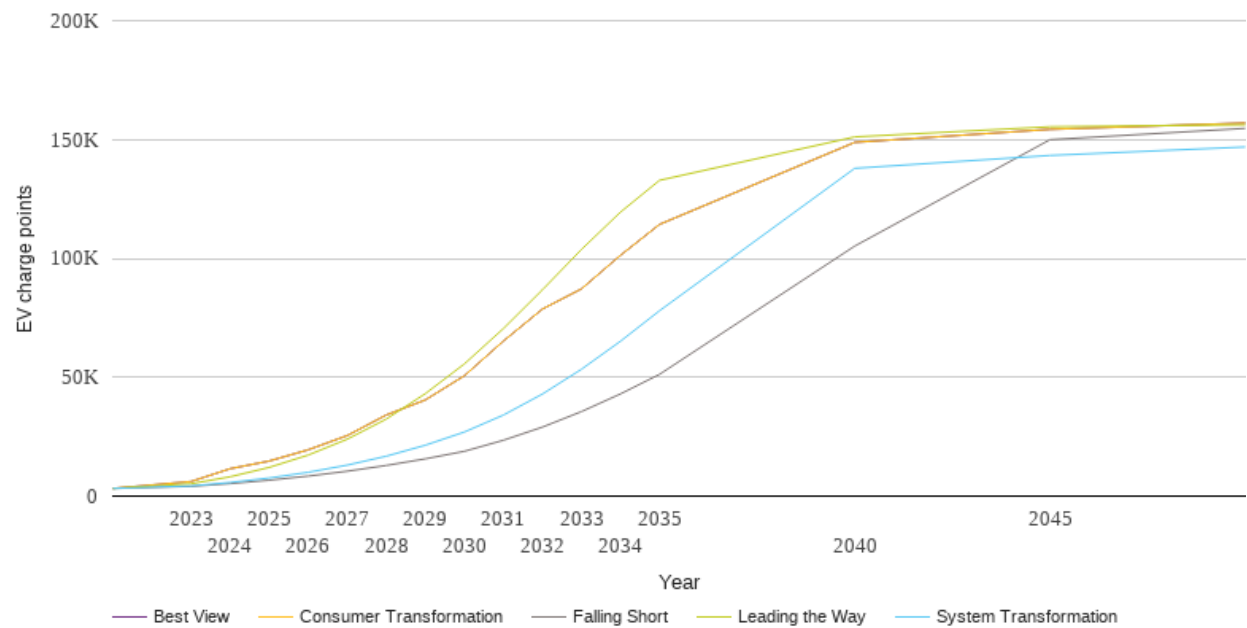
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	6655	6655	6655	6655	6655
2023	8451	8609	10909	9913	10909
2024	10786	11276	18764	14632	18764
2025	13717	14709	24499	21015	24499
2026	17403	19039	32612	29308	32612
2027	21992	24649	43393	40201	43393
2028	27592	31749	59250	54320	59250
2029	34401	40668	73448	72630	73448
2030	42571	51688	95297	94882	95297
2031	51949	64760	121603	119791	121603
2032	62879	80761	146468	146972	146468
2033	75684	99766	163908	174750	163908
2034	90154	121422	190160	201266	190160
2035	106149	144791	214021	224390	214021
2040	207766	249177	277137	274005	277137
2045	279155	276696	278620	259582	278620
2050	294769	255903	261544	214980	261544



# 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	3217	3217	3217	3217	3217
2023	4101	4273	6125	5195	6125
2024	5250	5723	11501	8114	11501
2025	6681	7607	14743	12051	14743
2026	8410	10006	19463	17245	19463
2027	10471	13026	25458	23935	25458
2028	12880	16782	34115	32384	34115
2029	15669	21395	40446	43082	40446
2030	18843	26946	50611	55587	50611
2031	23494	34089	65217	70471	65217
2032	29021	42932	78687	86774	78687
2033	35547	53361	87183	103765	87183
2034	42989	65148	101302	119464	101302
2035	51229	77983	114300	132843	114300
2040	105176	137897	148812	151107	148812
2045	149927	143307	154286	155374	154286
2050	154700	146865	156932	156211	156932

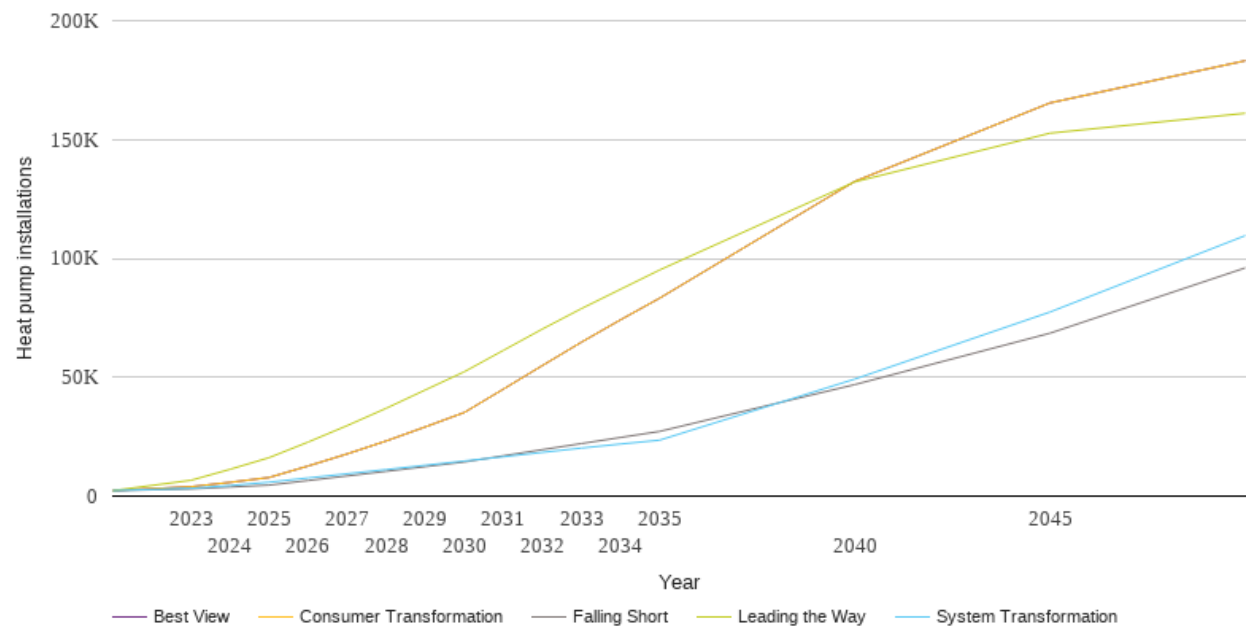




# Technology Summary: Heat pumps

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

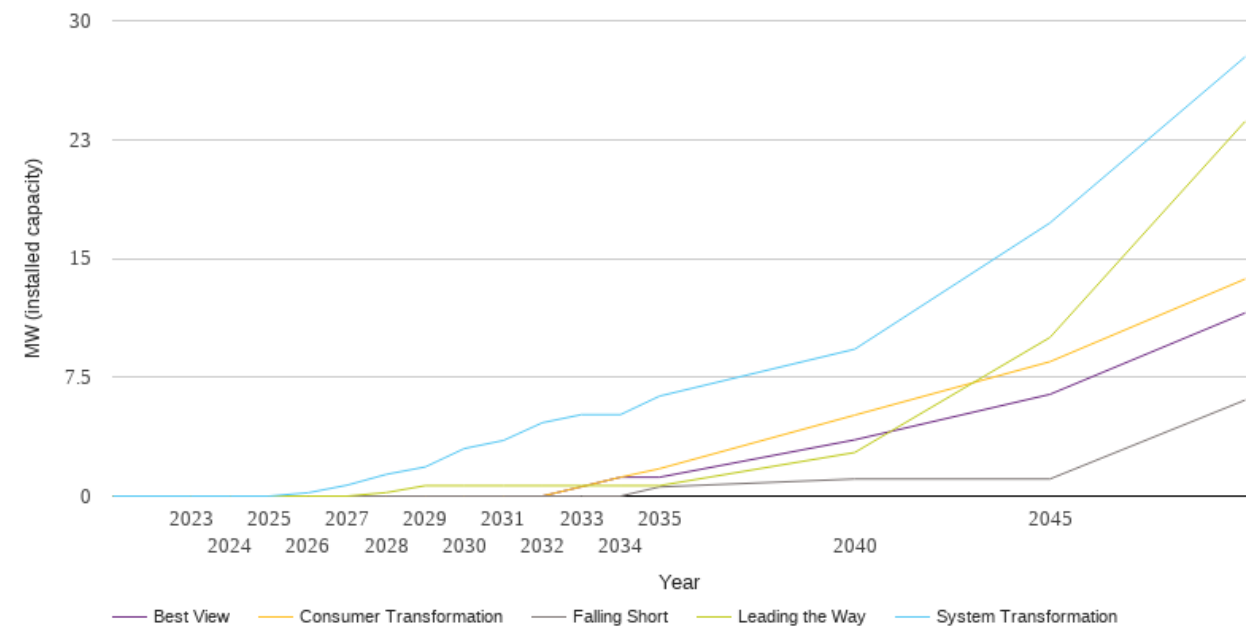
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	2303	2303	2303	2303	2303
2023	3027	3268	3936	6650	3936
2024	3812	4450	5774	11258	5774
2025	4616	5837	7828	16171	7828
2026	6545	7633	12657	22726	12657
2027	8484	9387	17757	29654	17757
2028	10430	11154	23198	36945	23198
2029	12391	12969	29099	44655	29099
2030	14359	14754	35173	52310	35173
2031	16942	16546	45001	61306	45001
2032	19541	18390	54925	70277	54925
2033	22101	20205	64751	78872	64751
2034	24656	21905	74144	87006	74144
2035	27206	23524	83238	95102	83238
2040	46902	49219	132388	132189	132388
2045	68525	77433	165396	152672	165396
2050	95993	109567	183150	161052	183150



# Technology Summary: Hydrogen electrolysis

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

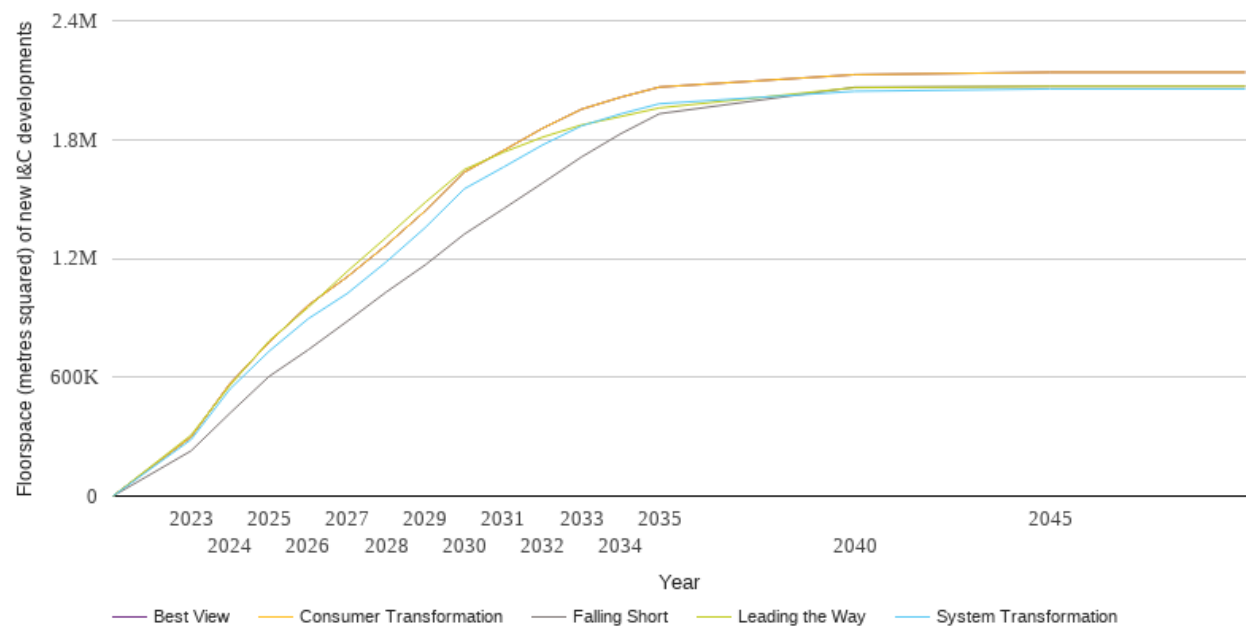
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.2	0.0	0.0	0.0
2027	0.0	0.7	0.0	0.0	0.0
2028	0.0	1.4	0.0	0.2	0.0
2029	0.0	1.8	0.0	0.7	0.0
2030	0.0	3.0	0.0	0.7	0.0
2031	0.0	3.5	0.0	0.7	0.0
2032	0.0	4.6	0.0	0.7	0.0
2033	0.0	5.1	0.6	0.7	0.6
2034	0.0	5.1	1.2	0.7	1.2
2035	0.6	6.3	1.7	0.7	1.2
2040	1.1	9.3	5.1	2.8	3.5
2045	1.1	17.2	8.5	10.0	6.4
2050	6.1	27.7	13.7	23.7	11.6



# Technology Summary: Non domestic

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

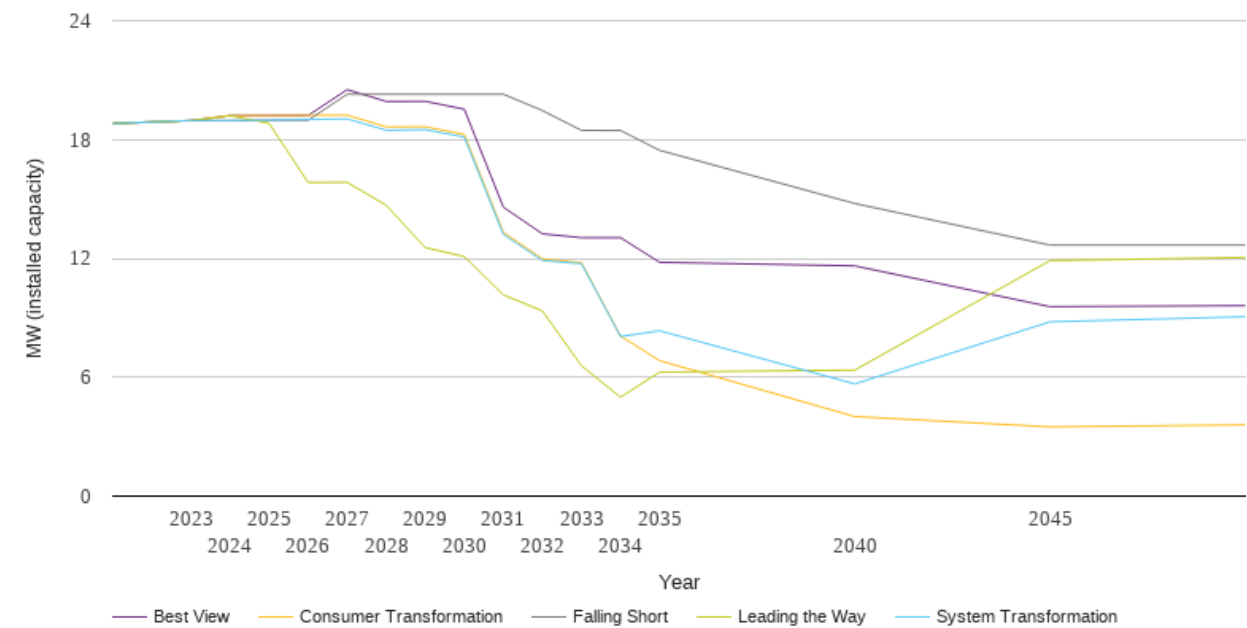
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	228290	285049	297986	307470	297986
2024	419122	541020	568620	559128	568620
2025	604386	731403	776353	783629	776353
2026	738150	895048	962955	952439	962955
2027	882304	1022596	1106633	1133913	1106633
2028	1029970	1182115	1266153	1305829	1266153
2029	1167179	1355893	1439931	1483160	1439931
2030	1322417	1550960	1634997	1648299	1634997
2031	1450040	1660295	1744332	1735628	1744332
2032	1580009	1772175	1856213	1811640	1856213
2033	1711824	1868758	1952795	1873399	1952795
2034	1828697	1929177	2013215	1915881	2013215
2035	1930400	1980848	2064886	1959782	2064886
2040	2064110	2043446	2127484	2061939	2127484
2045	2068551	2055381	2139418	2068551	2139418
2050	2068551	2055381	2139418	2068551	2139418



# Technology Summary: Other Distributed Generation

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

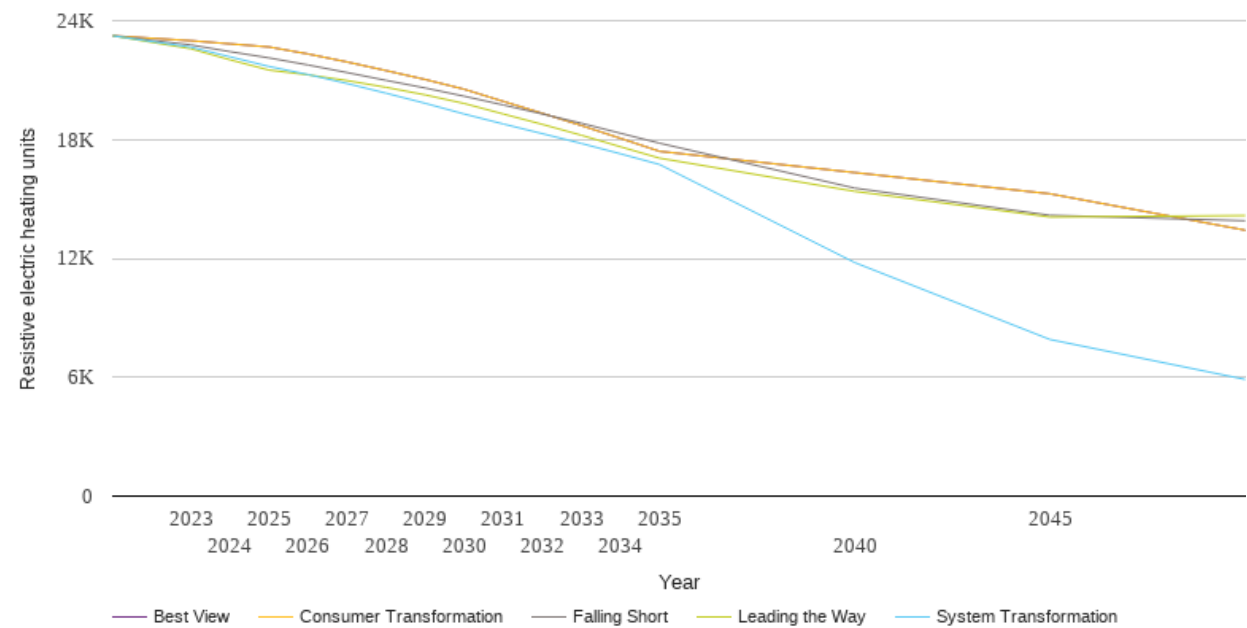
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	18.8	18.8	18.8	18.8	18.8
2023	19.0	19.0	19.0	19.0	19.0
2024	19.0	19.0	19.2	19.2	19.2
2025	19.0	19.0	19.2	18.8	19.2
2026	19.0	19.0	19.2	15.8	19.2
2027	20.3	19.0	19.2	15.8	20.5
2028	20.3	18.5	18.6	14.7	19.9
2029	20.3	18.5	18.6	12.5	19.9
2030	20.3	18.1	18.3	12.1	19.5
2031	20.3	13.2	13.3	10.2	14.6
2032	19.5	11.9	12.0	9.3	13.2
2033	18.5	11.7	11.8	6.6	13.0
2034	18.5	8.1	8.1	5.0	13.0
2035	17.5	8.3	6.8	6.3	11.8
2040	14.8	5.7	4.0	6.4	11.6
2045	12.7	8.8	3.5	11.9	9.6
2050	12.7	9.1	3.6	12.0	9.6



# Technology Summary: Resistive electric heating

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

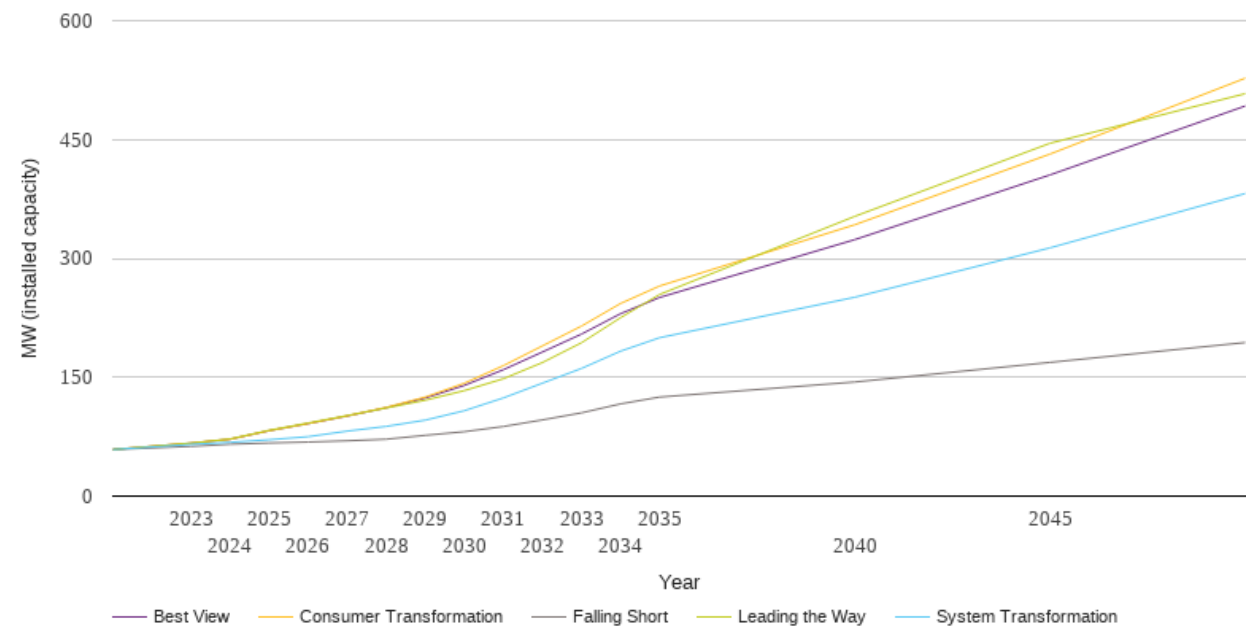
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	23236	23236	23236	23236	23236
2023	22776	22661	22989	22580	22989
2024	22437	22176	22831	22024	22831
2025	22121	21688	22673	21505	22673
2026	21763	21279	22319	21267	22319
2027	21380	20826	21915	20975	21915
2028	20985	20337	21479	20635	21479
2029	20602	19828	21031	20253	21031
2030	20186	19287	20538	19819	20538
2031	19744	18784	19924	19289	19924
2032	19290	18297	19322	18766	19322
2033	18823	17802	18705	18216	18705
2034	18317	17280	18060	17634	18060
2035	17816	16740	17406	17060	17406
2040	15547	11789	16331	15384	16331
2045	14174	7906	15260	14088	15260
2050	13901	5890	13424	14163	13424



# Technology Summary: Solar Generation

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

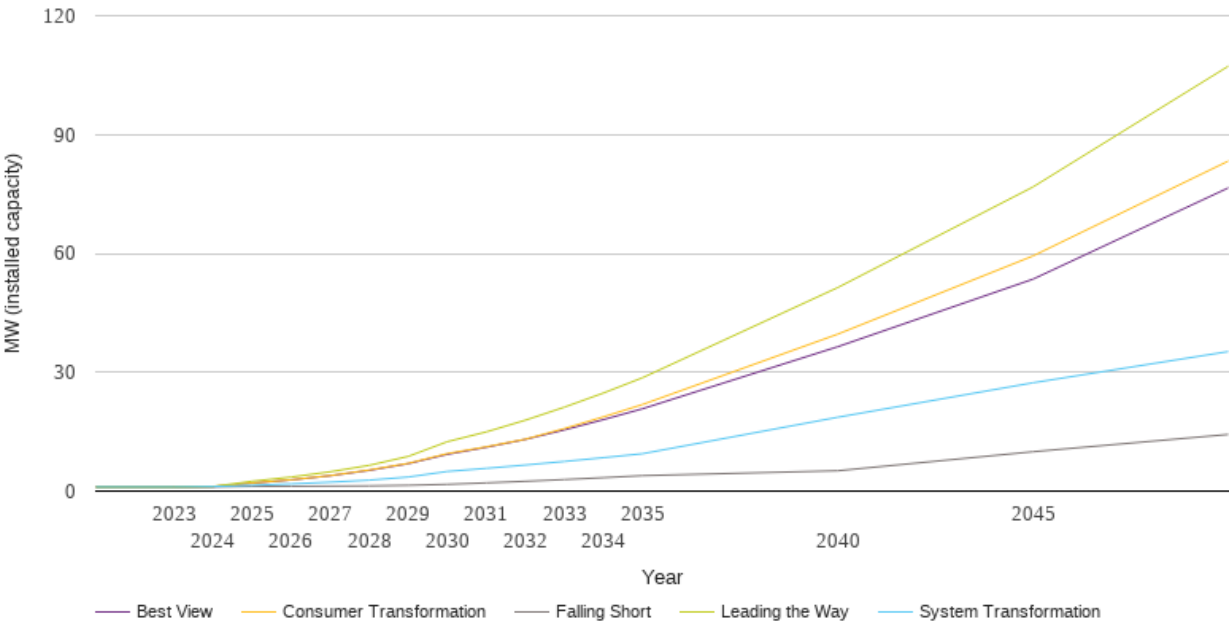
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	58.7	58.7	58.7	58.7	58.7
2023	62.7	65.2	66.7	66.9	66.7
2024	65.4	67.9	71.7	72.1	71.7
2025	67.0	71.1	82.5	83.0	82.5
2026	68.2	75.0	91.5	92.2	91.5
2027	69.8	82.0	101.2	101.6	101.1
2028	71.8	88.0	111.9	111.2	111.5
2029	76.7	95.9	125.0	121.0	123.8
2030	81.3	107.8	142.4	133.1	139.7
2031	87.9	123.9	164.6	148.1	159.5
2032	96.2	142.5	189.6	168.6	181.8
2033	105.1	161.1	214.6	193.5	204.4
2034	116.3	182.9	243.0	225.1	230.1
2035	125.0	199.9	265.1	254.5	250.7
2040	144.0	250.9	342.4	353.0	323.7
2045	168.7	313.3	431.6	445.3	405.3
2050	193.8	381.8	527.4	507.9	492.3



# Technology Summary: Storage

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

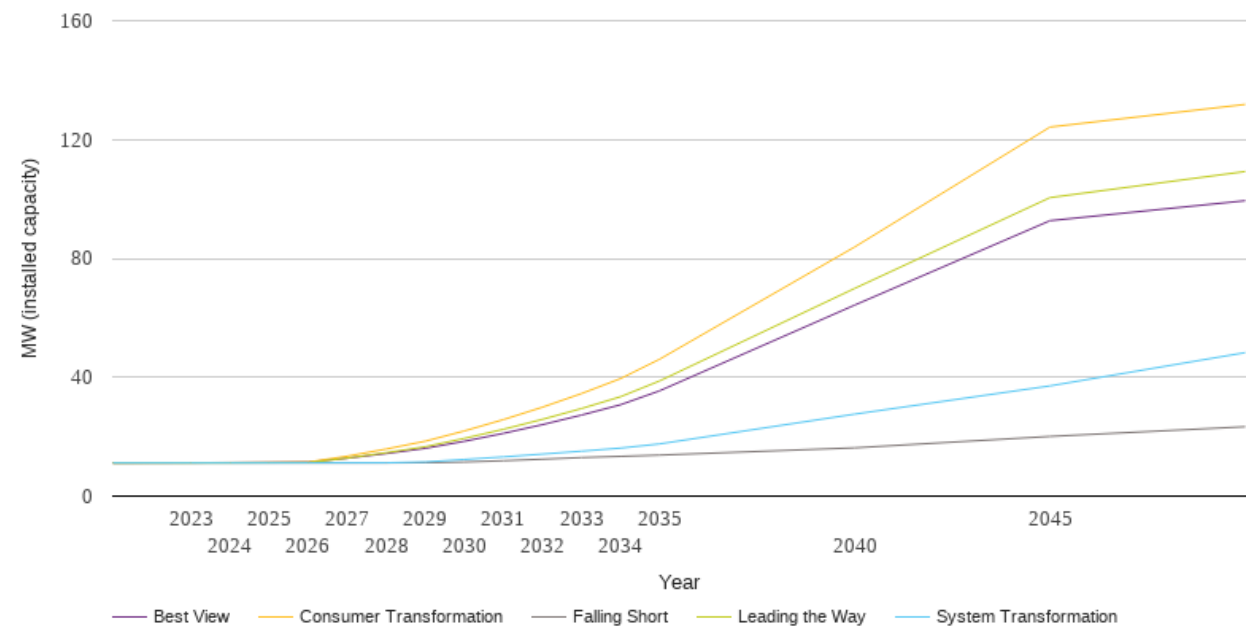
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1.0	1.0	1.0	1.0	1.0
2023	1.0	1.0	1.0	1.0	1.0
2024	1.0	1.2	1.2	1.2	1.1
2025	1.2	1.5	2.0	2.5	2.0
2026	1.2	1.8	2.9	3.5	2.8
2027	1.3	2.3	3.9	4.9	3.9
2028	1.3	2.8	5.3	6.5	5.2
2029	1.5	3.6	7.0	8.8	6.9
2030	1.7	5.0	9.5	12.5	9.3
2031	2.1	5.7	11.2	14.9	11.1
2032	2.5	6.6	13.1	17.9	13.1
2033	2.9	7.5	15.8	21.2	15.5
2034	3.4	8.4	18.7	24.8	18.0
2035	3.9	9.4	21.9	28.6	20.8
2040	5.1	18.6	39.6	51.4	36.4
2045	9.9	27.3	59.3	76.8	53.5
2050	14.3	35.2	83.3	107.2	76.5



# 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	11.2	11.2	11.2	11.2	11.2
2023	11.2	11.2	11.2	11.2	11.2
2024	11.2	11.2	11.3	11.2	11.3
2025	11.2	11.2	11.4	11.2	11.4
2026	11.2	11.2	11.4	11.3	11.4
2027	11.2	11.2	13.4	12.8	12.7
2028	11.2	11.2	15.8	14.6	14.3
2029	11.3	11.5	18.5	16.6	16.1
2030	11.5	12.3	21.9	19.4	18.4
2031	11.9	13.2	25.7	22.5	21.1
2032	12.4	14.1	29.9	25.8	24.0
2033	13.0	15.1	34.5	29.5	27.3
2034	13.4	16.1	39.5	33.4	30.7
2035	13.8	17.6	46.1	38.8	35.4
2040	16.2	27.6	83.9	69.9	64.3
2045	20.1	37.1	124.2	100.4	92.7
2050	23.3	48.3	131.8	109.2	99.4





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