

Distribution Future Energy Scenarios 2022

Local Authority:
Herefordshire, County of

What are Distribution Future Energy Scenarios?

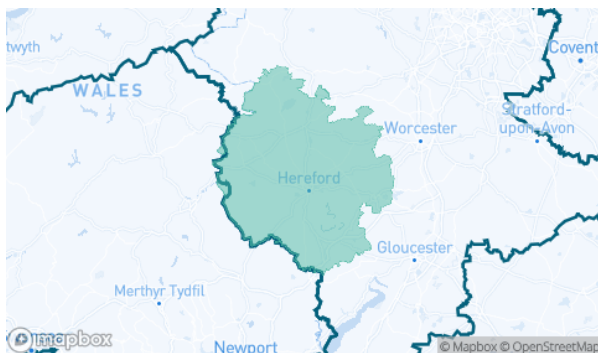
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Herefordshire, County of 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 Herefordshire, County of 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	500	298	298	0	32947	15463	15463	0
Domestic	New dwellings	0	3906	4260	4260	4924	5286	5206	5206	5138
Electric vehicles	Electric vehicles	2188	17880	22386	41577	41423	128335	109726	110063	94596
EV Charge Point	EV charge points	1087	8005	11845	22409	24634	71093	69281	71873	72740
Heat pumps	Heat pump installations	2015	10850	11646	19204	27140	51905	57937	86444	78497
Hydrogen electrolysis	MW (installed capacity)	0.0	0.3	4.5	0.8	3.1	5.1	27.3	18.6	23.5
Non domestic	Floorspace (metres squared) of new I&C developments	0	186068	214419	214419	232976	266451	263920	263920	266451
Other Distributed Generation	MW (installed capacity)	21.6	21.7	31.5	45.4	48.3	19.9	40.9	57.5	65.6
Resistive electric heating	Resistive electric heating units	16084	12993	12668	13510	12855	8046	3280	8471	8903
Solar Generation	MW (installed capacity)	56.4	66.3	78.3	94.8	90.2	119.7	193.4	260.0	249.2
Storage	MW (installed capacity)	0.1	0.9	2.3	4.4	6.6	7.5	18.5	41.0	51.1
Wind	MW (installed capacity)	0.2	0.2	0.3	1.6	1.2	1.2	3.7	13.1	10.3

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

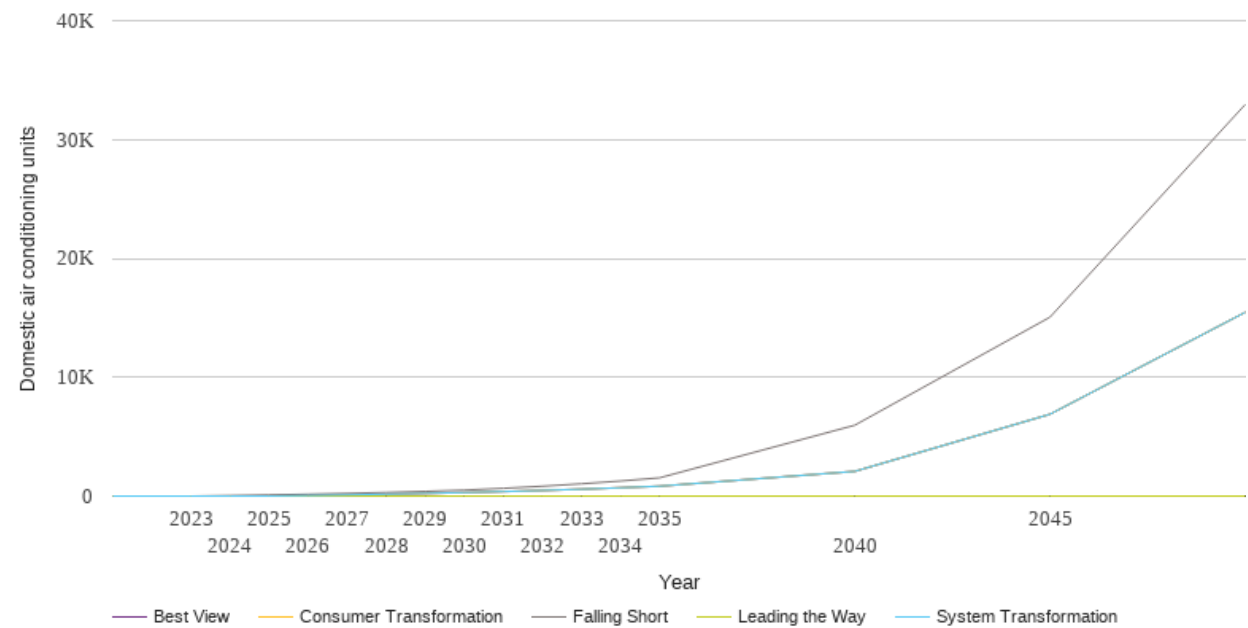
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

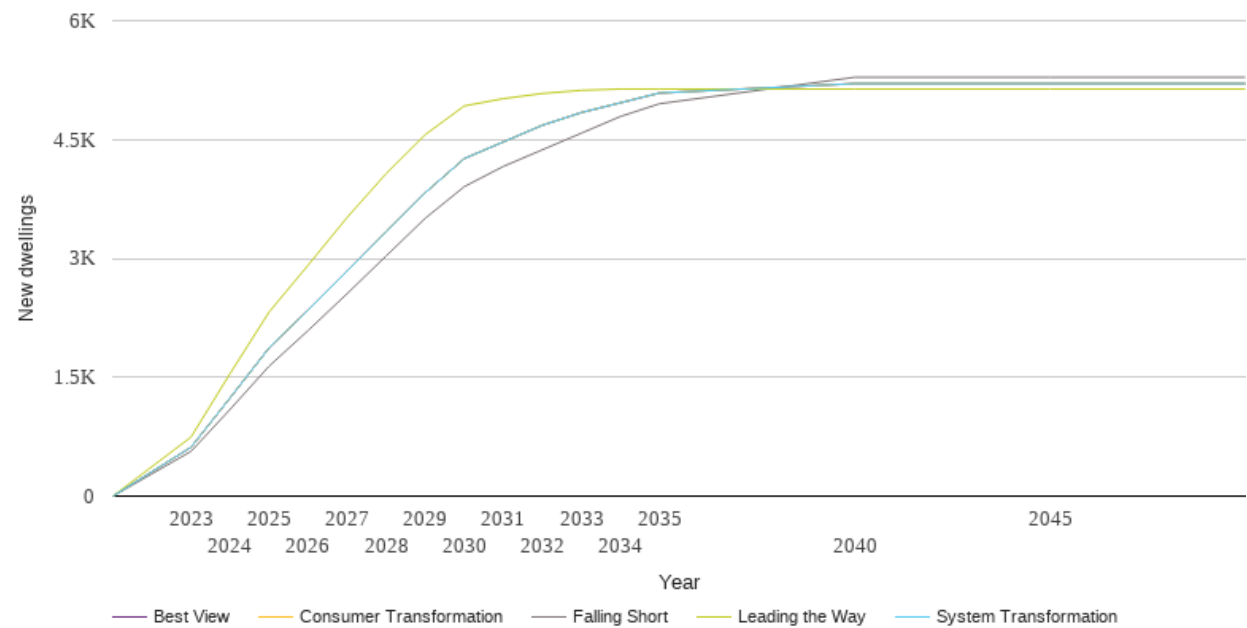
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	45	0	0	0	0
2025	98	0	0	0	0
2026	158	47	47	0	47
2027	227	99	99	0	99
2028	305	158	158	0	158
2029	397	225	225	0	225
2030	500	298	298	0	298
2031	654	382	382	0	382
2032	831	476	476	0	476
2033	1035	581	581	0	581
2034	1268	701	701	0	701
2035	1535	834	834	0	834
2040	5963	2078	2078	0	2078
2045	15053	6886	6886	0	6886
2050	32947	15463	15463	0	15463



Technology Summary: Domestic

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

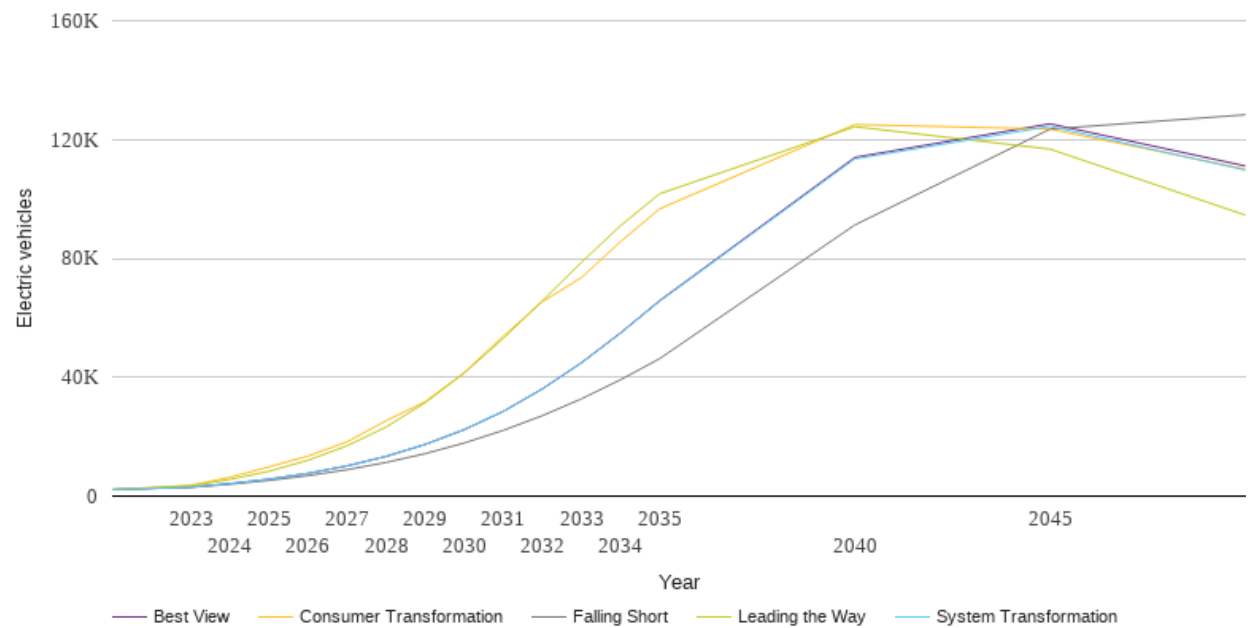
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	565	617	617	745	617
2024	1094	1239	1239	1546	1239
2025	1640	1871	1871	2323	1871
2026	2090	2348	2348	2915	2348
2027	2556	2841	2841	3518	2841
2028	3032	3338	3338	4072	3338
2029	3507	3830	3830	4562	3830
2030	3906	4260	4260	4924	4260
2031	4161	4470	4470	5016	4470
2032	4371	4680	4680	5081	4680
2033	4581	4841	4841	5121	4841
2034	4791	4964	4964	5138	4964
2035	4952	5087	5087	5138	5087
2040	5286	5206	5206	5138	5206
2045	5286	5206	5206	5138	5206
2050	5286	5206	5206	5138	5206



Technology Summary: Electric vehicles

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

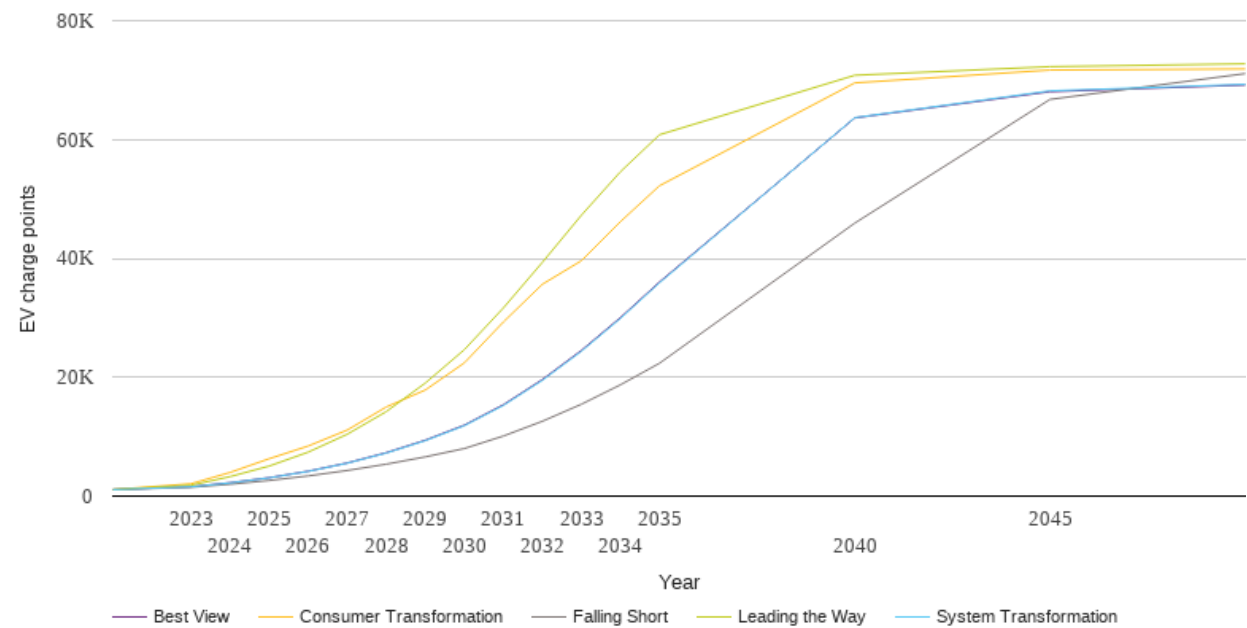
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	2188	2188	2188	2188	2188
2023	2976	3037	3638	3426	3037
2024	3992	4190	6345	5626	4190
2025	5280	5682	9834	8368	5682
2026	6881	7635	13473	12078	7635
2027	8886	10169	18302	16956	10169
2028	11330	13375	25401	23281	13375
2029	14304	17408	31782	31463	17408
2030	17880	22386	41577	41423	22386
2031	22135	28527	53894	53053	28527
2032	27079	36016	65431	65722	36111
2033	32740	44768	73519	78666	44886
2034	39148	54754	85657	90994	54908
2035	46229	65534	96663	101737	65736
2040	91234	113472	125038	124319	113975
2045	123502	124451	123525	116782	125293
2050	128335	109726	110063	94596	111116



Technology Summary: EV Charge Point

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

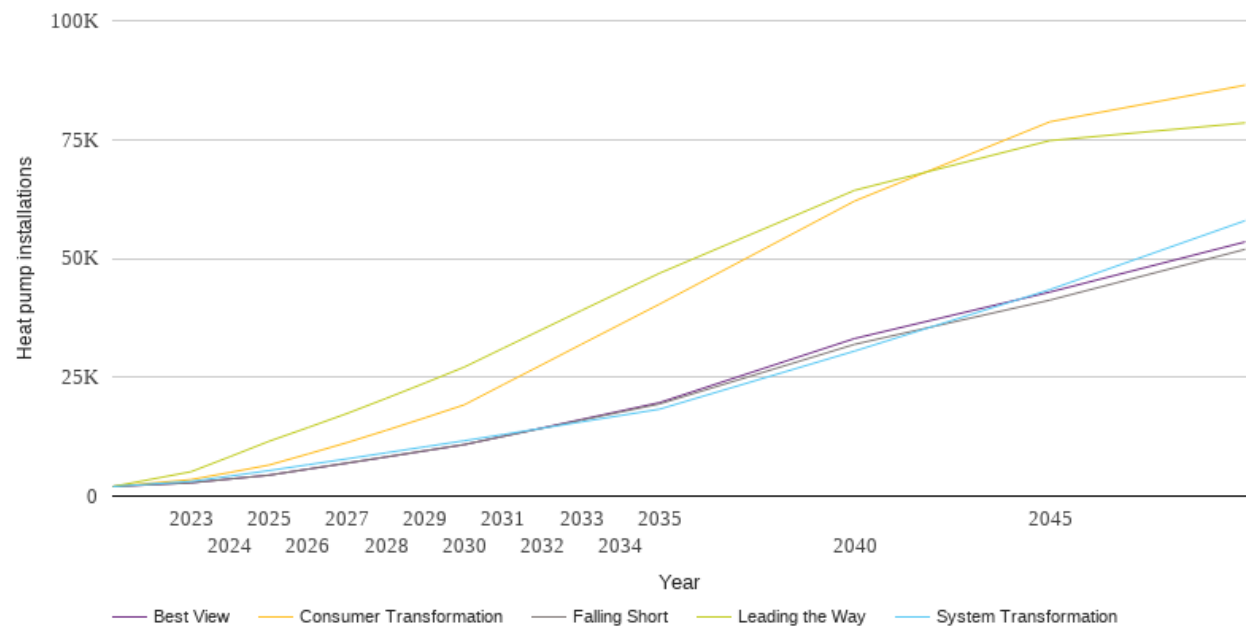
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1087	1087	1087	1087	1087
2023	1482	1562	2075	1826	1572
2024	1993	2219	3976	3274	2239
2025	2628	3063	6285	5047	3093
2026	3392	4154	8420	7393	4187
2027	4307	5531	11110	10403	5572
2028	5371	7242	14994	14211	7302
2029	6600	9330	17850	19021	9404
2030	8005	11845	22409	24634	11939
2031	10105	15258	29297	31662	15374
2032	12593	19482	35651	39343	19617
2033	15460	24376	39613	47276	24520
2034	18733	29897	46195	54593	30044
2035	22359	35897	52231	60810	36034
2040	45936	63676	69528	70813	63636
2045	66749	68191	71693	72265	68060
2050	71093	69281	71873	72740	69182



Technology Summary: Heat pumps

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

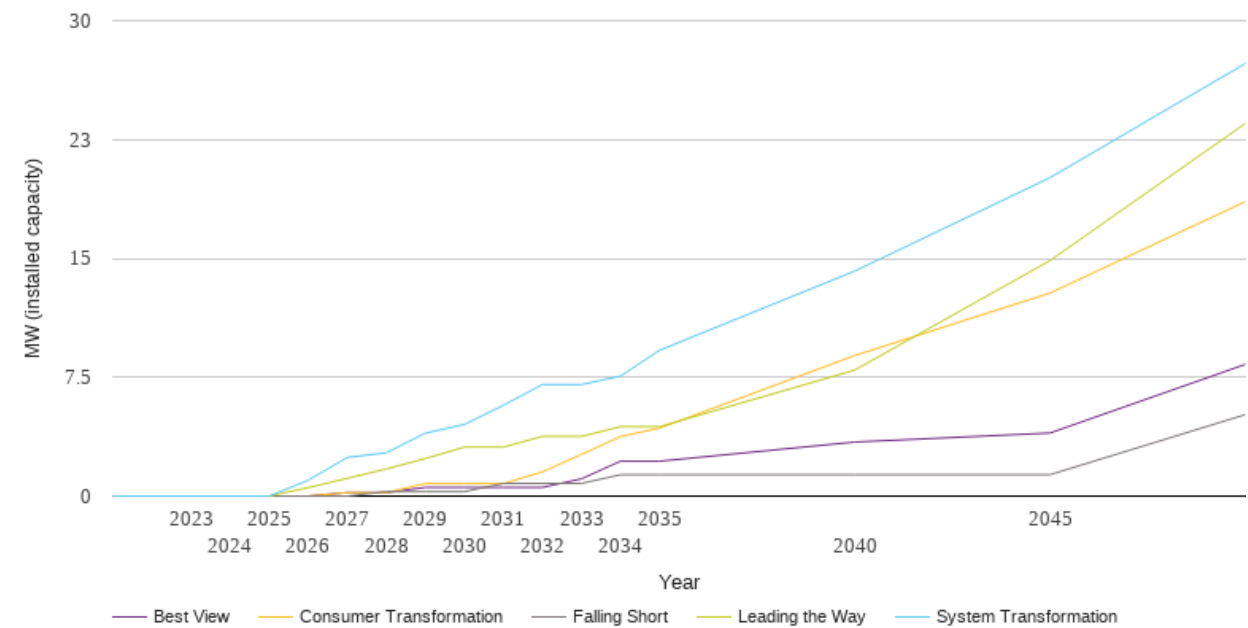
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	2015	2015	2015	2015	2015
2023	2798	3090	3475	5125	2798
2024	3605	4207	4975	8295	3605
2025	4404	5368	6533	11535	4404
2026	5686	6601	8868	14424	5669
2027	6963	7841	11260	17387	6933
2028	8255	9108	13832	20554	8217
2029	9554	10382	16485	23810	9519
2030	10850	11646	19204	27140	10817
2031	12563	12967	23454	31123	12584
2032	14266	14280	27680	35078	14349
2033	15968	15611	31933	39037	16122
2034	17672	16945	36147	42958	17895
2035	19378	18280	40378	46878	19673
2040	31929	30511	62076	64326	33149
2045	41225	43441	78736	74773	42915
2050	51905	57937	86444	78497	53473



Technology Summary: Hydrogen electrolysis

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

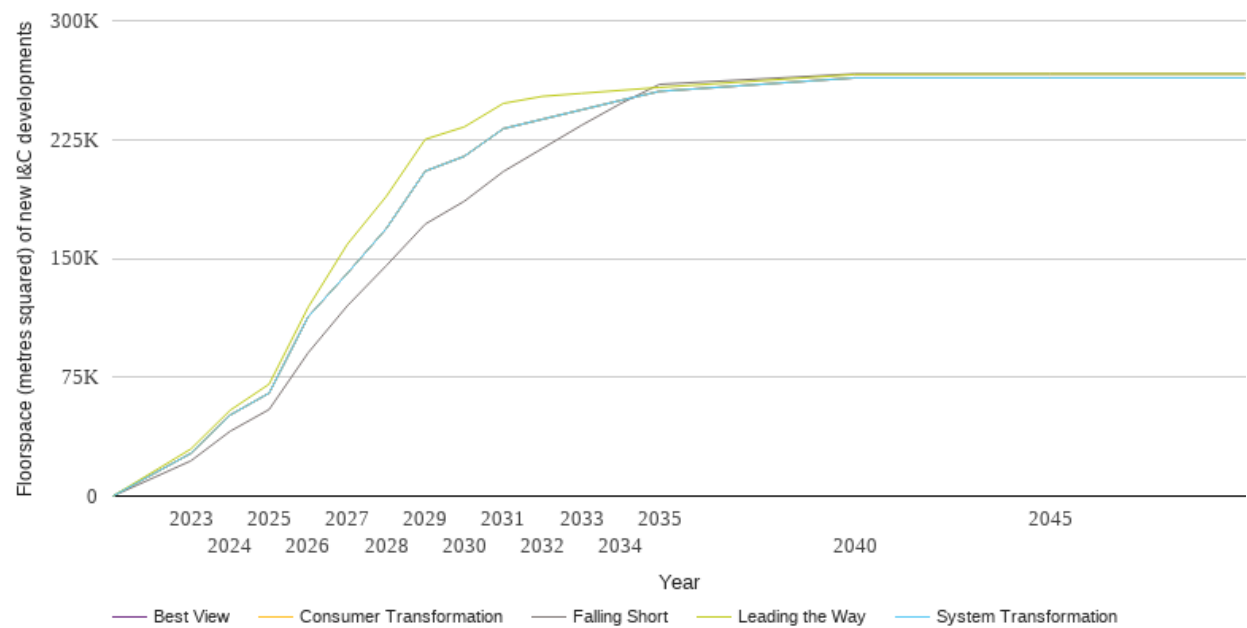
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	1.0	0.0	0.5	0.0
2027	0.0	2.4	0.2	1.1	0.2
2028	0.3	2.7	0.2	1.7	0.2
2029	0.3	4.0	0.8	2.4	0.6
2030	0.3	4.5	0.8	3.1	0.6
2031	0.8	5.7	0.8	3.1	0.6
2032	0.8	7.0	1.5	3.8	0.6
2033	0.8	7.0	2.6	3.8	1.1
2034	1.4	7.6	3.8	4.4	2.2
2035	1.4	9.2	4.3	4.4	2.2
2040	1.4	14.2	8.9	8.0	3.4
2045	1.4	20.1	12.8	14.9	4.0
2050	5.1	27.3	18.6	23.5	8.3



Technology Summary: Non domestic

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

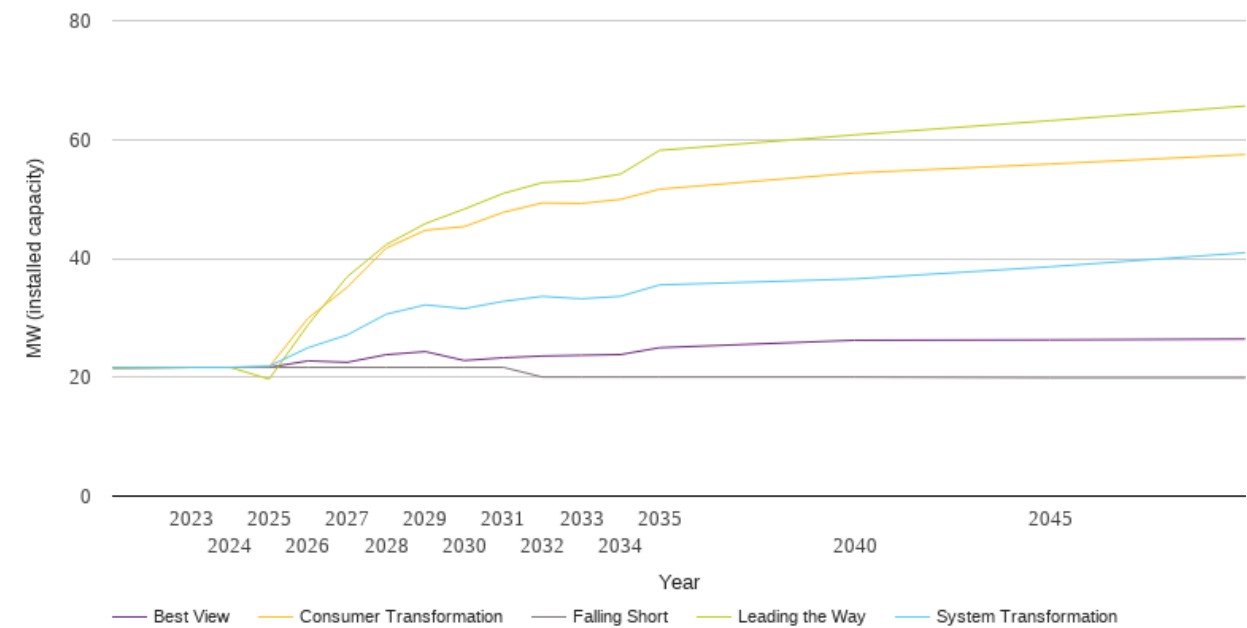
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	22289	27030	27030	29797	27030
2024	40883	51098	51098	54108	51098
2025	54639	64989	64989	70634	64989
2026	90419	113150	113150	119160	113150
2027	119974	140466	140466	158807	140466
2028	145380	168779	168779	189073	168779
2029	171663	205054	205054	225159	205054
2030	186068	214419	214419	232976	214419
2031	204817	231857	231857	247799	231857
2032	219385	237801	237801	252243	237801
2033	233954	243744	243744	254136	243744
2034	247621	249688	249688	256029	249688
2035	259825	255426	255426	257921	255426
2040	266451	263920	263920	266033	263920
2045	266451	263920	263920	266451	263920
2050	266451	263920	263920	266451	263920



Technology Summary: Other Distributed Generation

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

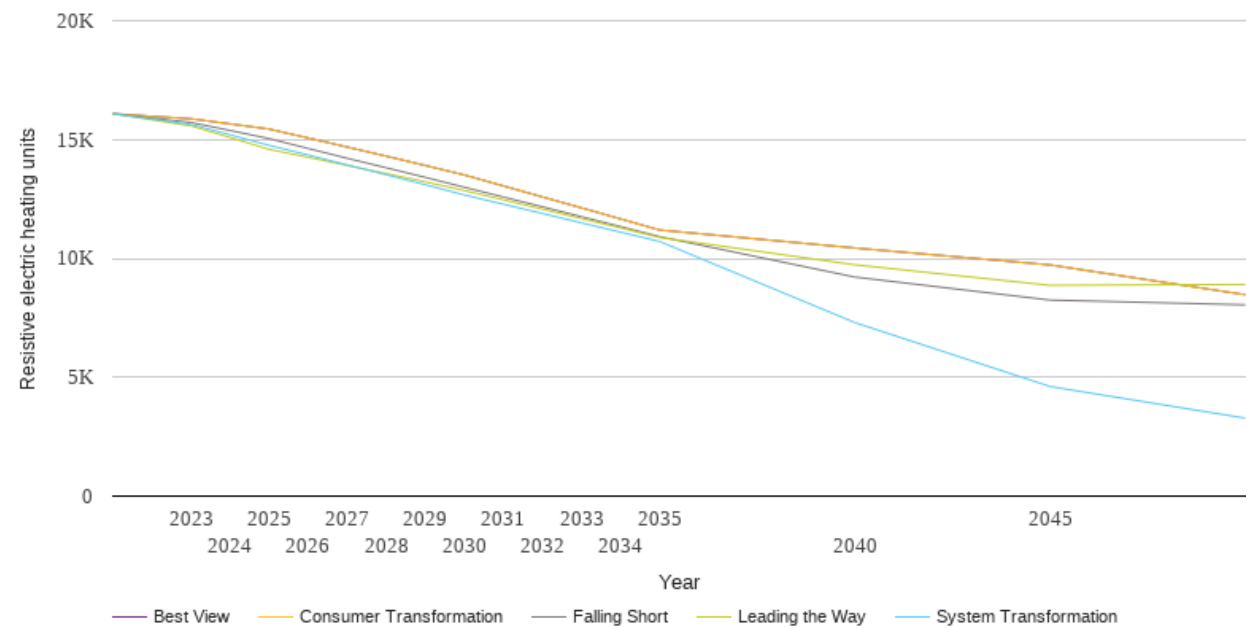
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	21.6	21.6	21.6	21.6	21.6
2023	21.7	21.7	21.7	21.7	21.7
2024	21.7	21.7	21.7	21.7	21.7
2025	21.7	21.9	21.7	19.7	21.7
2026	21.7	25.0	29.9	28.8	22.8
2027	21.7	27.1	35.1	36.9	22.5
2028	21.7	30.6	41.7	42.3	23.8
2029	21.7	32.2	44.7	45.8	24.3
2030	21.7	31.5	45.4	48.3	22.8
2031	21.7	32.8	47.8	50.9	23.3
2032	20.0	33.6	49.3	52.7	23.6
2033	20.0	33.2	49.2	53.1	23.7
2034	20.0	33.6	49.9	54.2	23.8
2035	20.0	35.5	51.6	58.2	25.0
2040	20.0	36.5	54.4	60.8	26.2
2045	19.9	38.6	55.9	63.2	26.3
2050	19.9	40.9	57.5	65.6	26.4



Technology Summary: Resistive electric heating

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

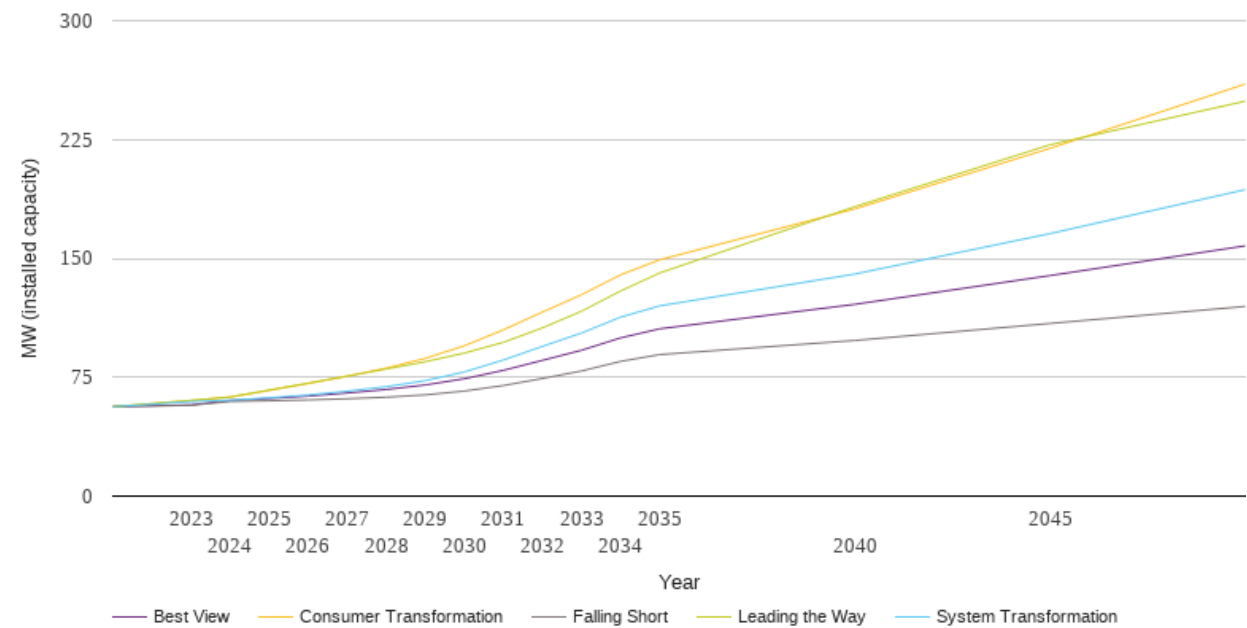
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	16084	16084	16084	16084	16084
2023	15718	15636	15871	15573	15871
2024	15382	15199	15659	15085	15659
2025	15038	14755	15439	14587	15439
2026	14625	14349	15066	14255	15066
2027	14211	13933	14683	13908	14683
2028	13813	13519	14301	13569	14301
2029	13409	13100	13908	13221	13908
2030	12993	12668	13510	12855	13510
2031	12582	12279	13049	12468	13049
2032	12170	11891	12585	12072	12585
2033	11754	11496	12126	11676	12126
2034	11338	11105	11661	11283	11661
2035	10916	10713	11194	10882	11194
2040	9215	7301	10437	9731	10437
2045	8247	4611	9727	8866	9727
2050	8046	3280	8471	8903	8471



Technology Summary: Solar Generation

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

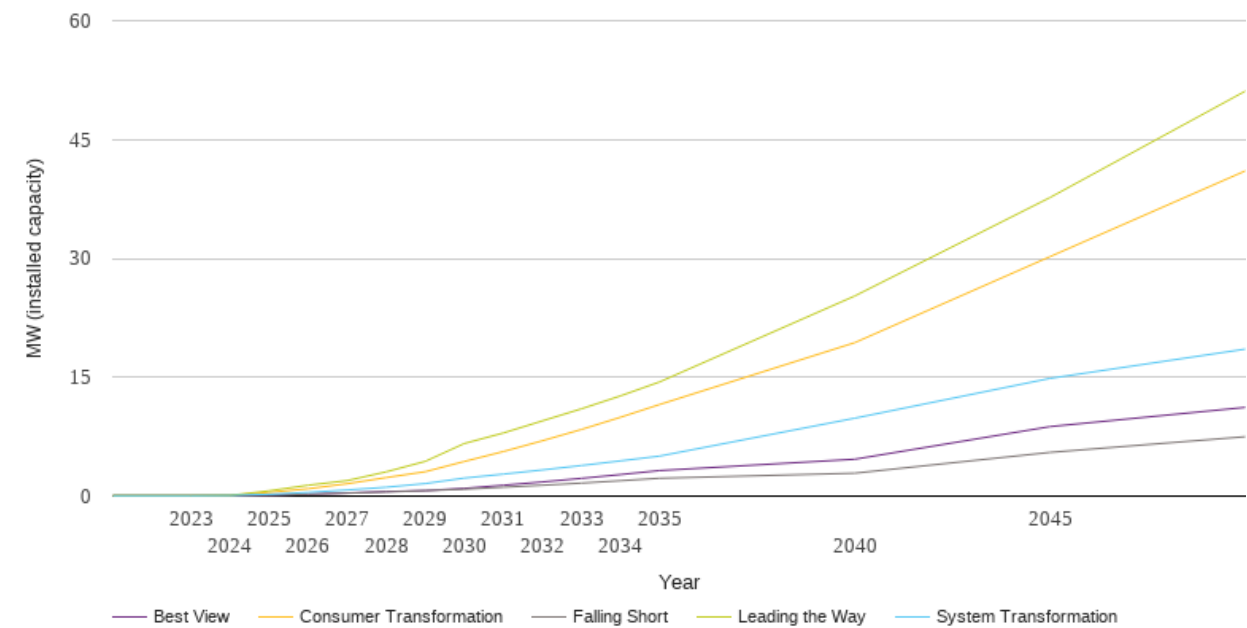
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	56.4	56.4	56.4	56.4	56.4
2023	57.3	59.6	60.3	60.4	57.6
2024	59.7	60.5	62.4	62.5	60.4
2025	60.1	62.0	66.7	66.9	61.6
2026	60.7	63.8	71.0	71.3	63.1
2027	61.4	66.2	75.6	75.7	65.0
2028	62.4	69.0	80.7	80.2	67.3
2029	63.9	72.9	86.9	84.8	70.1
2030	66.3	78.3	94.8	90.2	74.0
2031	69.8	85.9	104.9	97.0	79.3
2032	74.2	94.5	116.1	106.1	85.6
2033	78.9	102.9	127.1	116.6	92.0
2034	85.0	112.9	139.6	129.4	99.8
2035	89.3	120.0	149.1	140.8	105.5
2040	98.2	140.1	181.2	182.6	121.0
2045	108.9	165.6	219.4	221.7	139.1
2050	119.7	193.4	260.0	249.2	157.9



Technology Summary: Storage

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

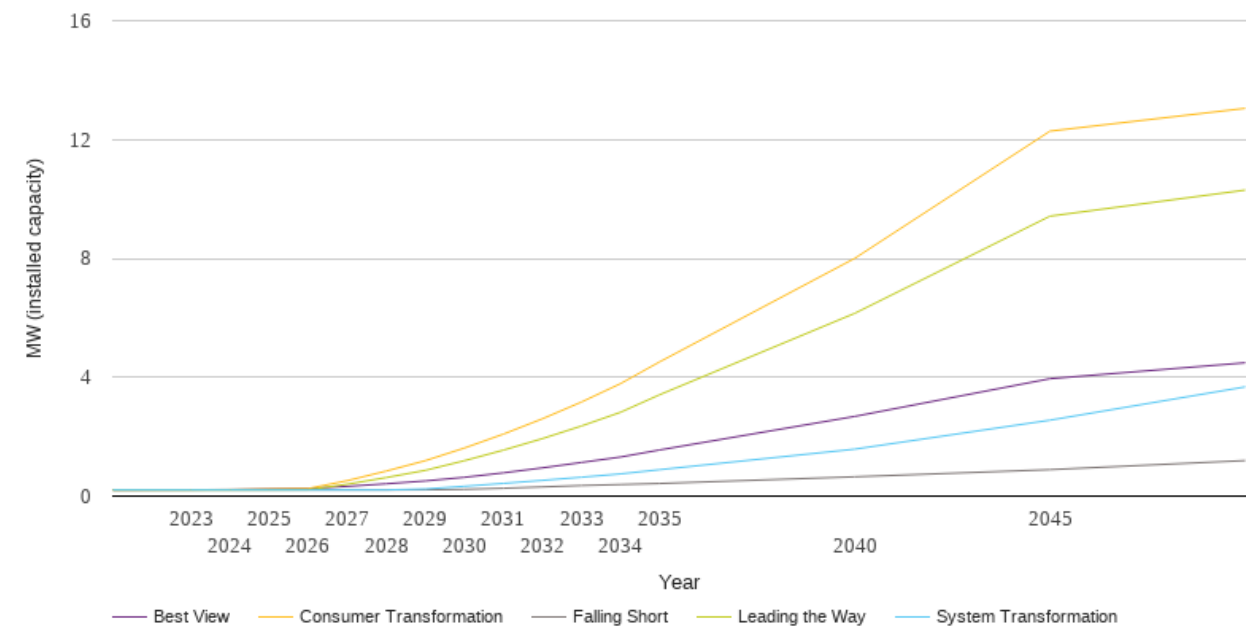
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.1	0.1	0.1	0.1	0.1
2023	0.1	0.1	0.1	0.1	0.1
2024	0.1	0.1	0.1	0.1	0.1
2025	0.1	0.2	0.5	0.7	0.1
2026	0.2	0.5	0.9	1.4	0.2
2027	0.4	0.8	1.6	2.0	0.4
2028	0.5	1.1	2.3	3.1	0.6
2029	0.7	1.6	3.1	4.4	0.7
2030	0.9	2.3	4.4	6.6	1.0
2031	1.1	2.8	5.6	8.0	1.4
2032	1.4	3.3	7.0	9.5	1.8
2033	1.6	3.9	8.4	11.0	2.2
2034	1.9	4.4	9.9	12.6	2.7
2035	2.2	5.0	11.6	14.4	3.2
2040	2.9	9.8	19.4	25.3	4.7
2045	5.5	14.9	30.2	37.7	8.8
2050	7.5	18.5	41.0	51.1	11.2



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	0.2	0.2	0.2	0.2	0.2
2023	0.2	0.2	0.2	0.2	0.2
2024	0.2	0.2	0.2	0.2	0.2
2025	0.2	0.2	0.2	0.2	0.2
2026	0.2	0.2	0.3	0.2	0.3
2027	0.2	0.2	0.5	0.4	0.3
2028	0.2	0.2	0.8	0.6	0.4
2029	0.2	0.2	1.2	0.9	0.5
2030	0.2	0.3	1.6	1.2	0.6
2031	0.3	0.4	2.1	1.5	0.8
2032	0.3	0.5	2.6	1.9	0.9
2033	0.4	0.6	3.2	2.4	1.1
2034	0.4	0.7	3.8	2.8	1.3
2035	0.4	0.9	4.5	3.4	1.6
2040	0.6	1.6	8.0	6.2	2.7
2045	0.9	2.6	12.3	9.4	4.0
2050	1.2	3.7	13.1	10.3	4.5



National Grid Electricity Distribution PLC 09223384)
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