

Distribution Future Energy Scenarios 2022

Local Authority:
Stratford-on-Avon

What are Distribution Future Energy Scenarios?

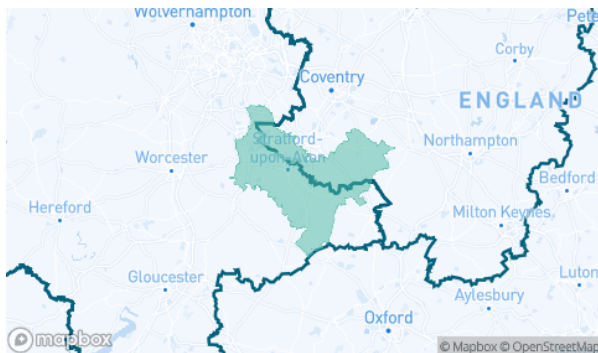
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Stratford-on-Avon 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 Stratford-on-Avon 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	160	96	96	0	22009	9793	9793	0
Domestic	New dwellings	0	6572	7089	7089	8382	16378	16147	16147	15976
Electric vehicles	Electric vehicles	2009	15117	17992	33465	33272	102250	82407	85669	74333
EV Charge Point	EV charge points	1307	7209	9852	18245	20042	55106	50138	53179	53615
Heat pumps	Heat pump installations	1685	7300	8004	14444	20551	35614	41238	68163	61267
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	3.1	0.0	0.8	4.1	21.2	13.9	16.1
Non domestic	Floorspace (metres squared) of new I&C developments	0	628150	766921	766921	823494	1447105	1446288	1446288	1447105
Other Distributed Generation	MW (installed capacity)	4.7	4.7	4.7	4.9	4.9	3.7	3.4	3.6	4.6
Resistive electric heating	Resistive electric heating units	9408	7977	7658	8214	7854	5969	2491	5554	5867
Solar Generation	MW (installed capacity)	68.4	75.9	87.0	99.9	93.5	133.6	232.5	286.4	281.4
Storage	MW (installed capacity)	0.9	1.4	2.6	4.2	6.0	6.6	15.5	33.3	44.6
Wind	MW (installed capacity)	0.0	0.1	0.4	3.6	2.6	3.1	9.6	34.1	27.1

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

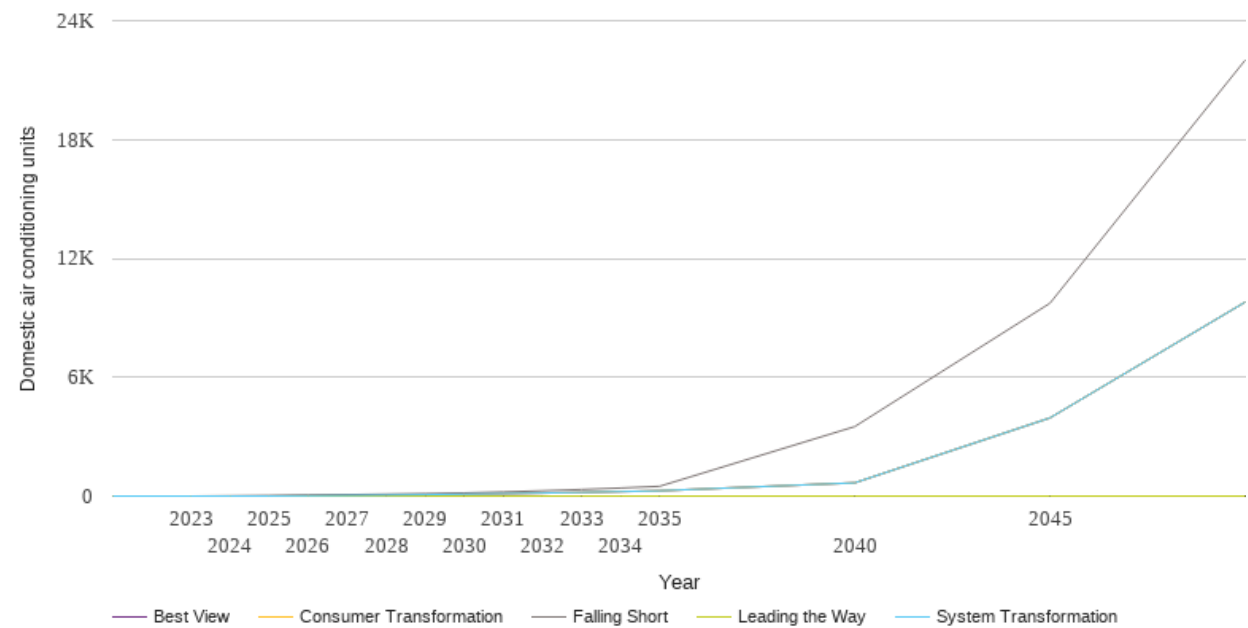
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

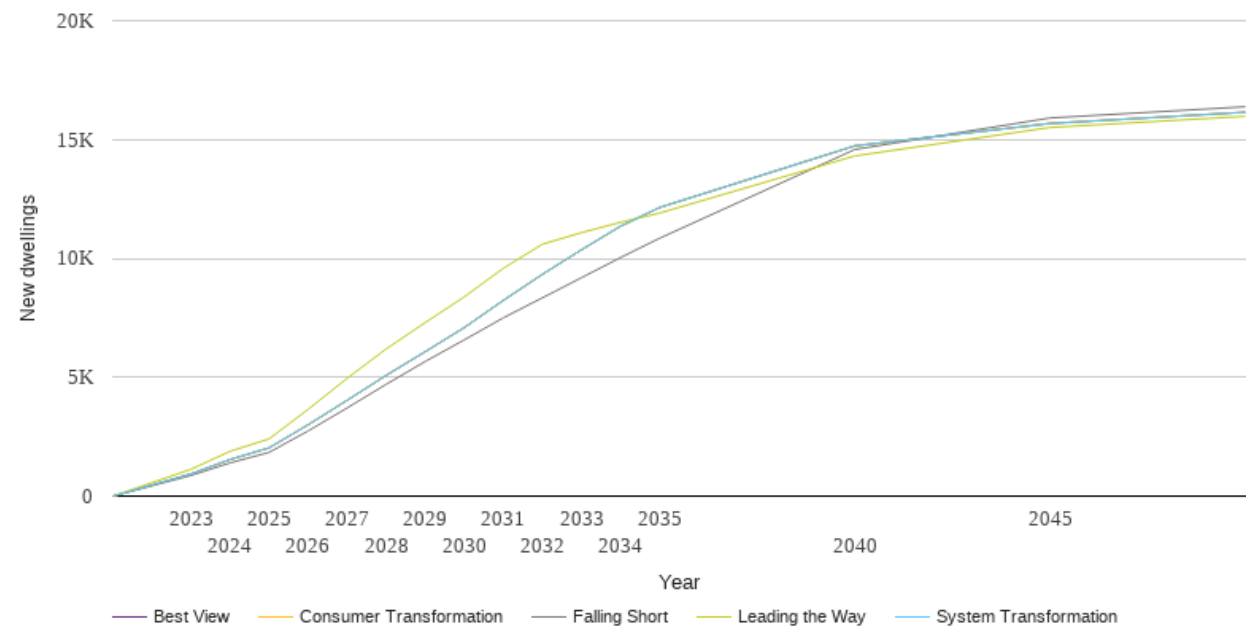
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	15	0	0	0	0
2025	32	0	0	0	0
2026	51	15	15	0	15
2027	73	32	32	0	32
2028	98	51	51	0	51
2029	127	72	72	0	72
2030	160	96	96	0	96
2031	210	123	123	0	123
2032	267	153	153	0	153
2033	332	187	187	0	187
2034	407	226	226	0	226
2035	493	269	269	0	269
2040	3508	669	669	0	669
2045	9737	3947	3947	0	3947
2050	22009	9793	9793	0	9793



Technology Summary: Domestic

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

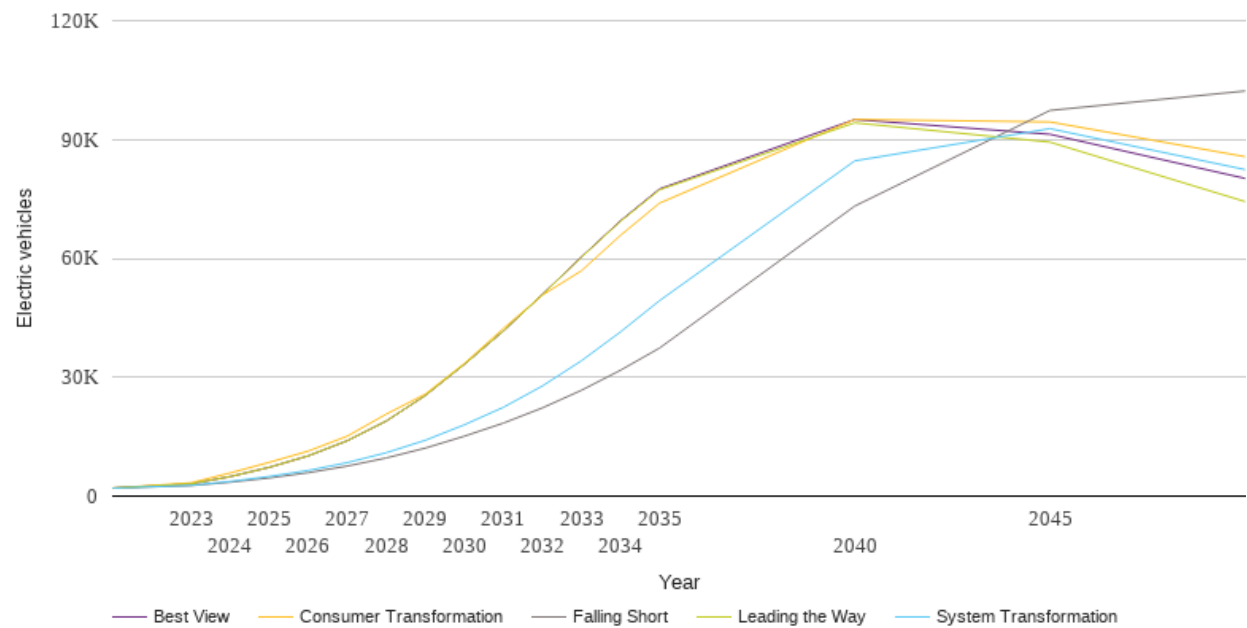
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	869	933	933	1130	933
2024	1397	1536	1536	1884	1536
2025	1840	2030	2030	2408	2030
2026	2742	3001	3001	3651	3001
2027	3710	4032	4032	4958	4032
2028	4704	5080	5080	6193	5080
2029	5664	6077	6077	7300	6077
2030	6572	7089	7089	8382	7089
2031	7500	8234	8234	9585	8234
2032	8342	9327	9327	10596	9327
2033	9186	10361	10361	11082	10361
2034	10033	11353	11353	11518	11353
2035	10846	12140	12140	11905	12140
2040	14580	14733	14733	14310	14733
2045	15907	15676	15676	15505	15676
2050	16378	16147	16147	15976	16147



Technology Summary: Electric vehicles

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

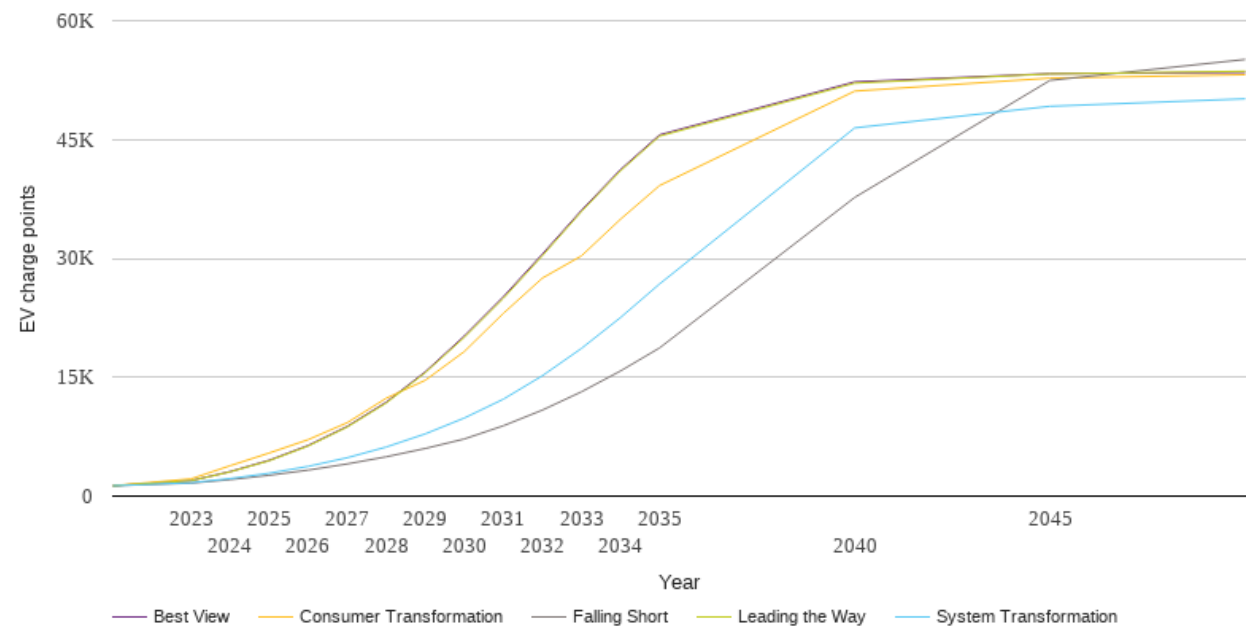
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	2009	2009	2009	2009	2009
2023	2663	2718	3343	3097	3097
2024	3506	3692	5837	4912	4913
2025	4571	4949	8511	7247	7250
2026	5904	6465	11347	10147	10143
2027	7576	8443	15130	13975	13967
2028	9624	10944	20689	18948	18939
2029	12114	14089	25738	25399	25389
2030	15117	17992	33465	33272	33255
2031	18419	22407	42306	41670	41647
2032	22264	27796	50733	50854	50915
2033	26713	34159	56879	60292	60371
2034	31767	41442	65821	69361	69497
2035	37366	49329	73953	77317	77521
2040	73203	84617	95070	94226	95058
2045	97342	92752	94441	89343	91326
2050	102250	82407	85669	74333	80183



Technology Summary: EV Charge Point

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

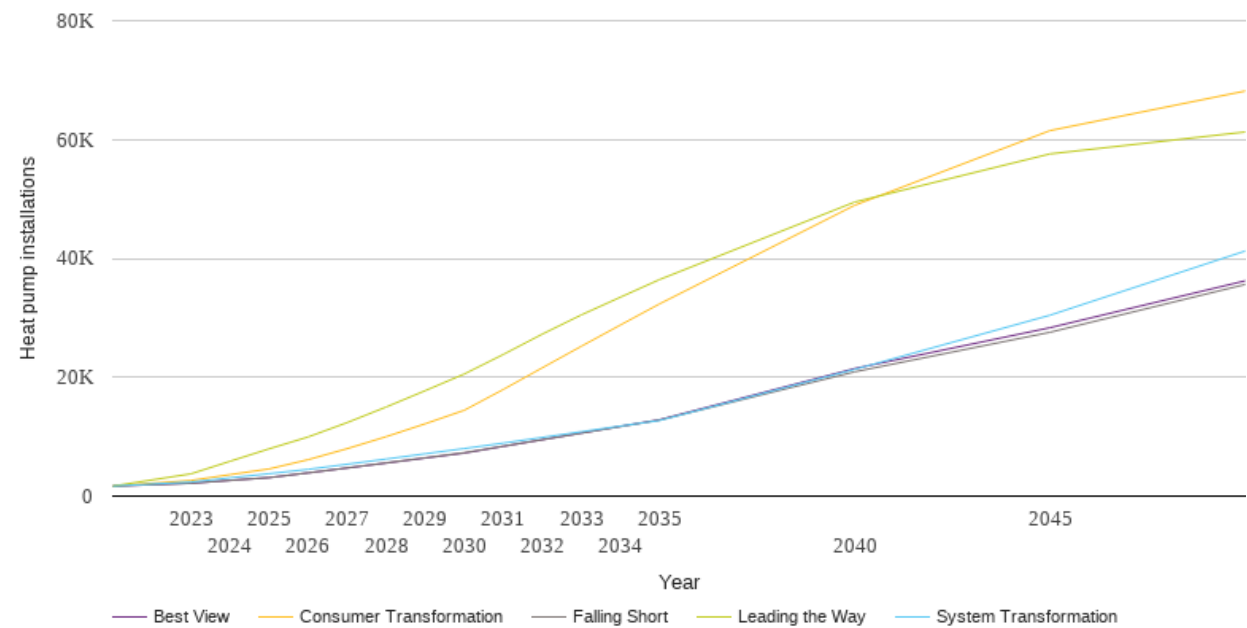
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1307	1307	1307	1307	1307
2023	1641	1685	2174	1940	1948
2024	2078	2210	3829	3051	3089
2025	2625	2887	5434	4459	4518
2026	3278	3751	7123	6318	6388
2027	4058	4841	9263	8715	8792
2028	4963	6195	12353	11745	11858
2029	6009	7852	14620	15574	15687
2030	7209	9852	18245	20042	20207
2031	8876	12234	23063	24962	25161
2032	10857	15192	27514	30339	30547
2033	13165	18639	30317	35909	36068
2034	15793	22531	34942	41050	41205
2035	18697	26771	39193	45430	45588
2040	37697	46472	51114	52116	52279
2045	52464	49197	52751	53282	53309
2050	55106	50138	53179	53615	53479



Technology Summary: Heat pumps

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

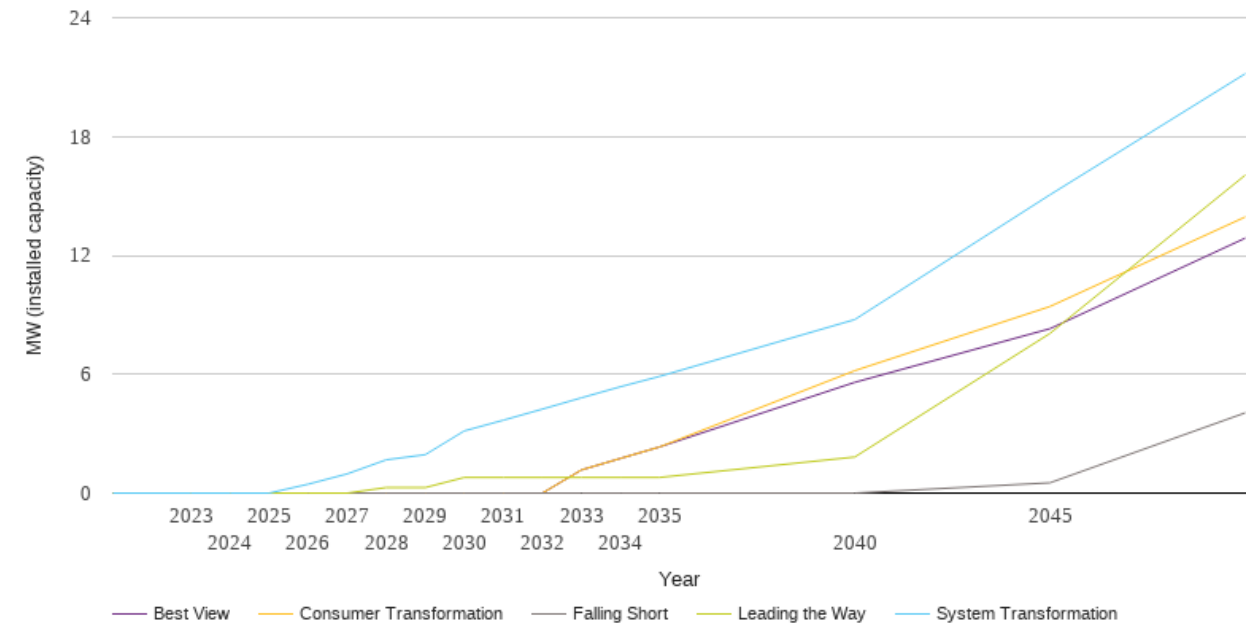
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1685	1685	1685	1685	1685
2023	2164	2370	2633	3750	2164
2024	2645	3076	3608	5859	2645
2025	3110	3770	4572	7952	3110
2026	3915	4501	6131	9950	3904
2027	4749	5363	7981	12373	4726
2028	5594	6234	10001	14992	5560
2029	6451	7121	12173	17744	6402
2030	7300	8004	14444	20551	7240
2031	8404	8918	17950	23840	8368
2032	9501	9877	21601	27267	9487
2033	10596	10833	25224	30498	10608
2034	11698	11781	28799	33478	11735
2035	12788	12723	32342	36436	12850
2040	20915	21324	48939	49484	21469
2045	27565	30438	61502	57581	28333
2050	35614	41238	68163	61267	36228



Technology Summary: Hydrogen electrolysis

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

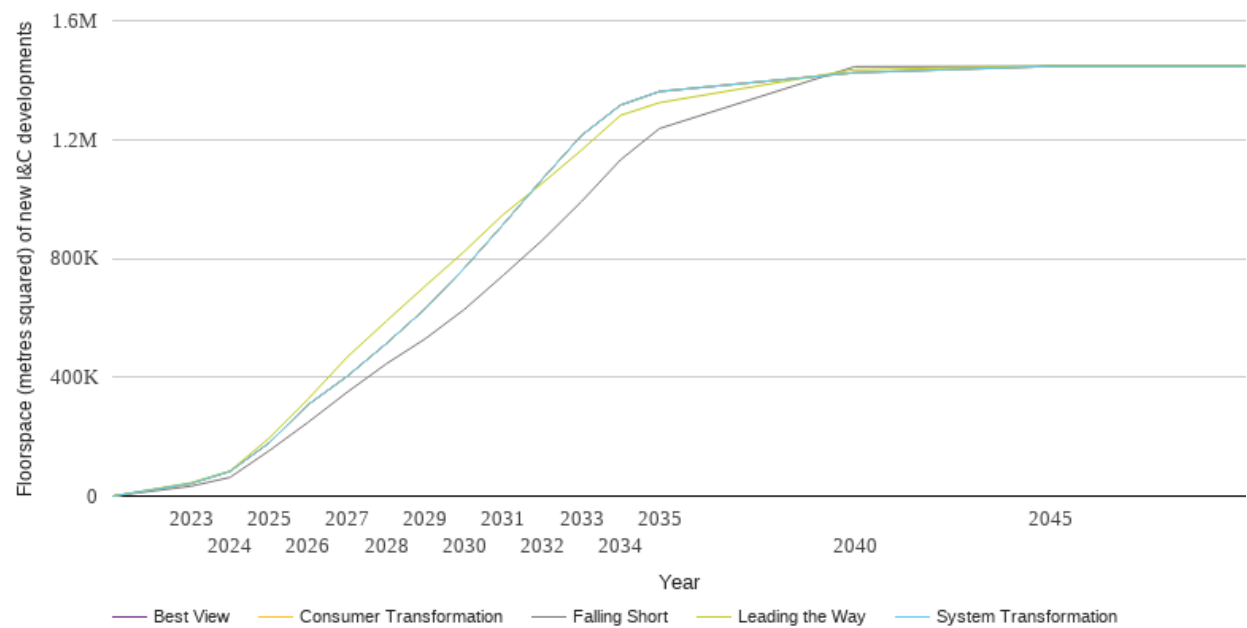
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.5	0.0	0.0	0.0
2027	0.0	1.0	0.0	0.0	0.0
2028	0.0	1.7	0.0	0.3	0.0
2029	0.0	1.9	0.0	0.3	0.0
2030	0.0	3.1	0.0	0.8	0.0
2031	0.0	3.7	0.0	0.8	0.0
2032	0.0	4.2	0.0	0.8	0.0
2033	0.0	4.8	1.2	0.8	1.2
2034	0.0	5.4	1.7	0.8	1.7
2035	0.0	5.9	2.3	0.8	2.3
2040	0.0	8.8	6.2	1.8	5.6
2045	0.5	15.1	9.4	8.1	8.3
2050	4.1	21.2	13.9	16.1	12.9



Technology Summary: Non domestic

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

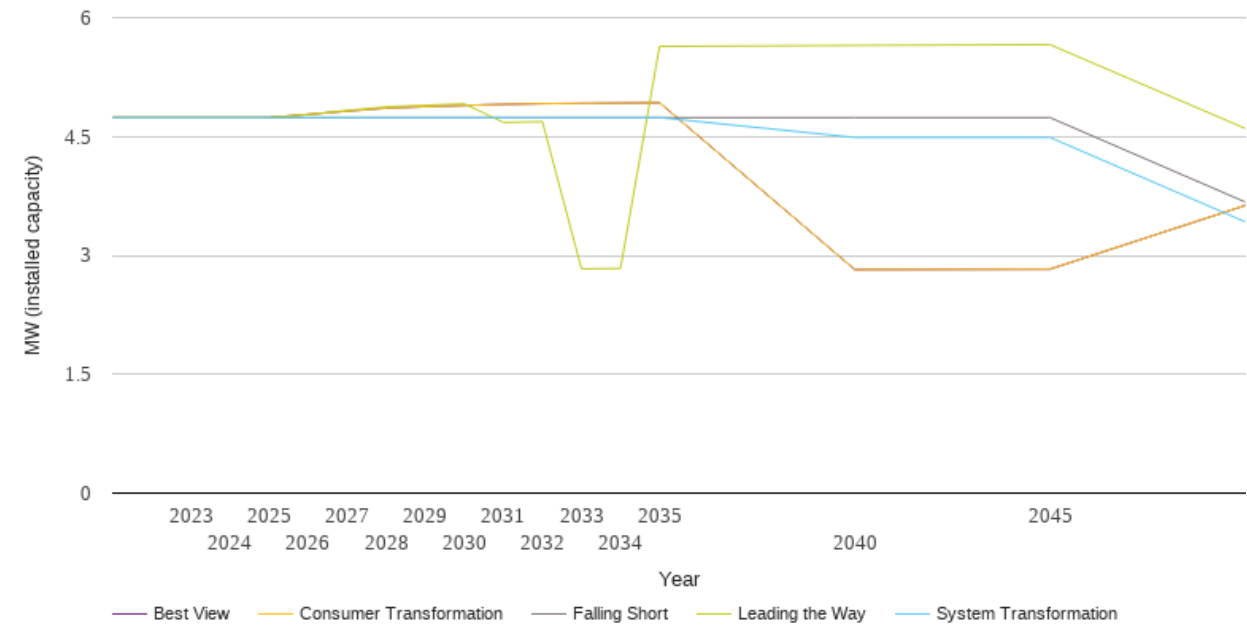
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	33269	42249	42249	45004	42249
2024	63092	83197	83197	84596	83197
2025	152521	179096	179096	195295	179096
2026	248499	307775	307775	326748	307775
2027	349744	403245	403245	467849	403245
2028	444952	512960	512960	588475	512960
2029	529440	630696	630696	707242	630696
2030	628150	766921	766921	823494	766921
2031	743377	914846	914846	948028	914846
2032	861465	1067175	1067175	1053367	1067175
2033	991365	1213599	1213599	1164378	1213599
2034	1131668	1315728	1315728	1281294	1315728
2035	1237157	1361652	1361652	1324116	1361652
2040	1445293	1424946	1424946	1435579	1424946
2045	1447105	1446288	1446288	1447105	1446288
2050	1447105	1446288	1446288	1447105	1446288



Technology Summary: Other Distributed Generation

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

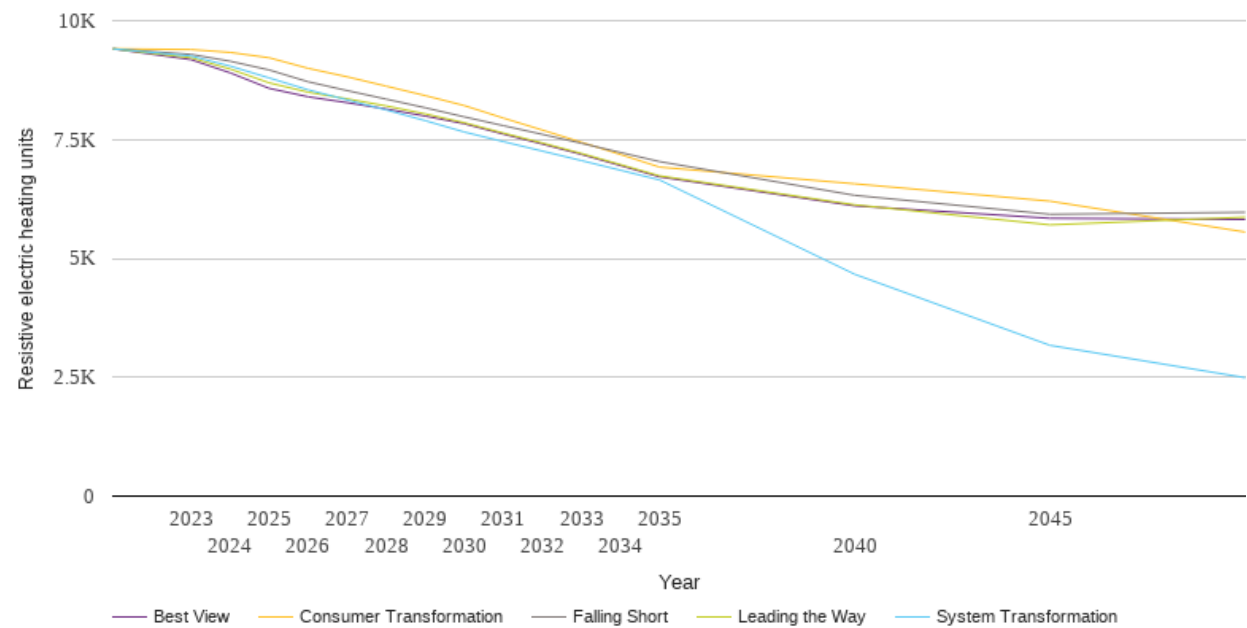
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	4.7	4.7	4.7	4.7	4.7
2023	4.7	4.7	4.7	4.7	4.7
2024	4.7	4.7	4.7	4.7	4.7
2025	4.7	4.7	4.7	4.7	4.7
2026	4.7	4.7	4.8	4.8	4.8
2027	4.7	4.7	4.8	4.8	4.8
2028	4.7	4.7	4.9	4.9	4.9
2029	4.7	4.7	4.9	4.9	4.9
2030	4.7	4.7	4.9	4.9	4.9
2031	4.7	4.7	4.9	4.7	4.9
2032	4.7	4.7	4.9	4.7	4.9
2033	4.7	4.7	4.9	2.8	4.9
2034	4.7	4.7	4.9	2.8	4.9
2035	4.7	4.7	4.9	5.6	4.9
2040	4.7	4.5	2.8	5.7	2.8
2045	4.7	4.5	2.8	5.7	2.8
2050	3.7	3.4	3.6	4.6	3.6



Technology Summary: Resistive electric heating

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

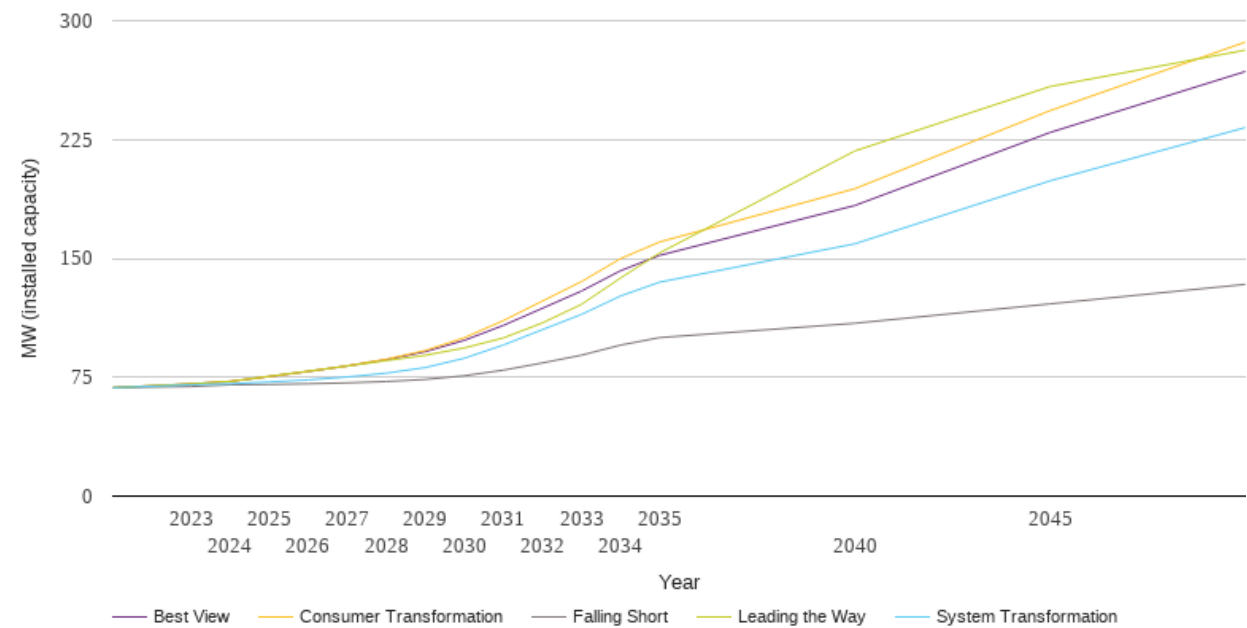
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	9408	9408	9408	9408	9408
2023	9291	9256	9393	9220	9181
2024	9148	9046	9333	8984	8904
2025	8964	8796	9220	8693	8577
2026	8715	8546	8998	8496	8399
2027	8529	8334	8819	8355	8276
2028	8350	8122	8623	8207	8142
2029	8168	7897	8424	8039	7994
2030	7977	7658	8214	7854	7832
2031	7792	7456	7952	7636	7614
2032	7609	7257	7699	7427	7405
2033	7421	7057	7442	7207	7187
2034	7228	6855	7185	6973	6952
2035	7036	6650	6920	6736	6715
2040	6326	4666	6569	6127	6105
2045	5928	3171	6204	5705	5843
2050	5969	2491	5554	5867	5820



Technology Summary: Solar Generation

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

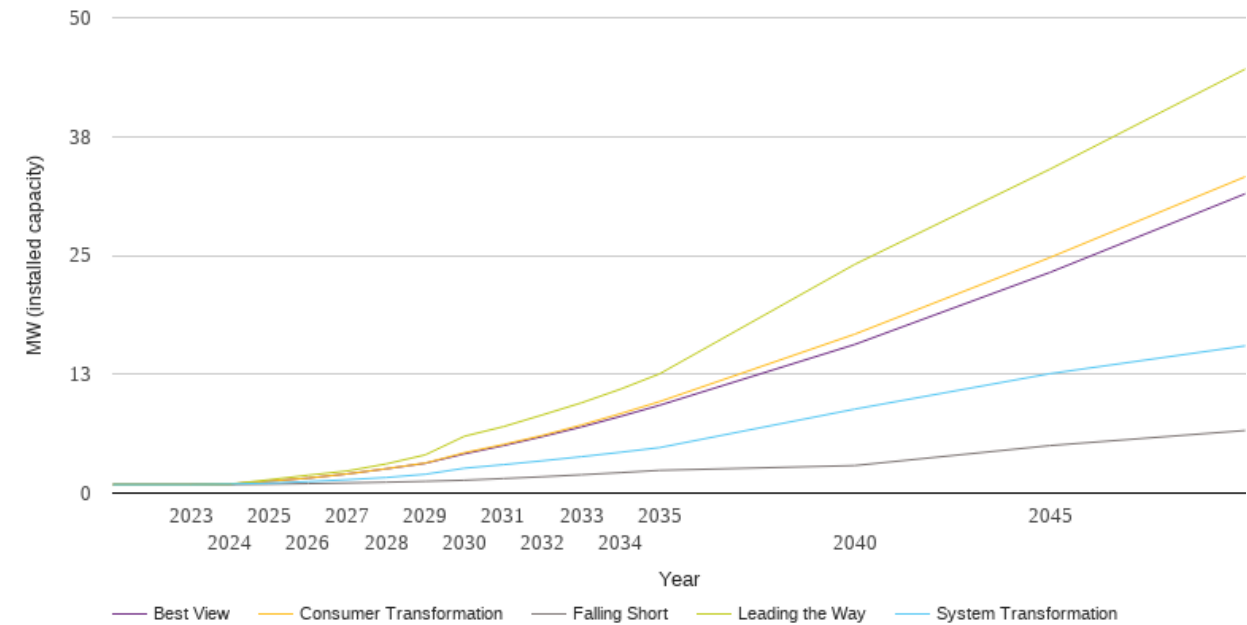
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	68.4	68.4	68.4	68.4	68.4
2023	69.1	70.3	70.8	70.8	70.8
2024	70.2	70.9	72.3	72.4	72.3
2025	70.5	72.0	75.5	75.6	75.5
2026	70.9	73.3	78.6	78.8	78.6
2027	71.4	75.2	82.2	82.1	82.1
2028	72.3	77.6	86.4	85.5	86.1
2029	73.6	81.1	91.8	88.8	91.1
2030	75.9	87.0	99.9	93.5	98.3
2031	79.5	95.3	110.7	99.8	107.7
2032	84.0	105.0	123.1	109.3	118.5
2033	88.9	114.6	135.3	121.0	129.4
2034	95.3	126.3	149.8	137.6	142.2
2035	100.0	135.0	160.3	153.4	151.9
2040	109.1	159.2	194.0	217.8	183.4
2045	121.3	198.9	243.2	258.4	229.4
2050	133.6	232.5	286.4	281.4	267.9



Technology Summary: Storage

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

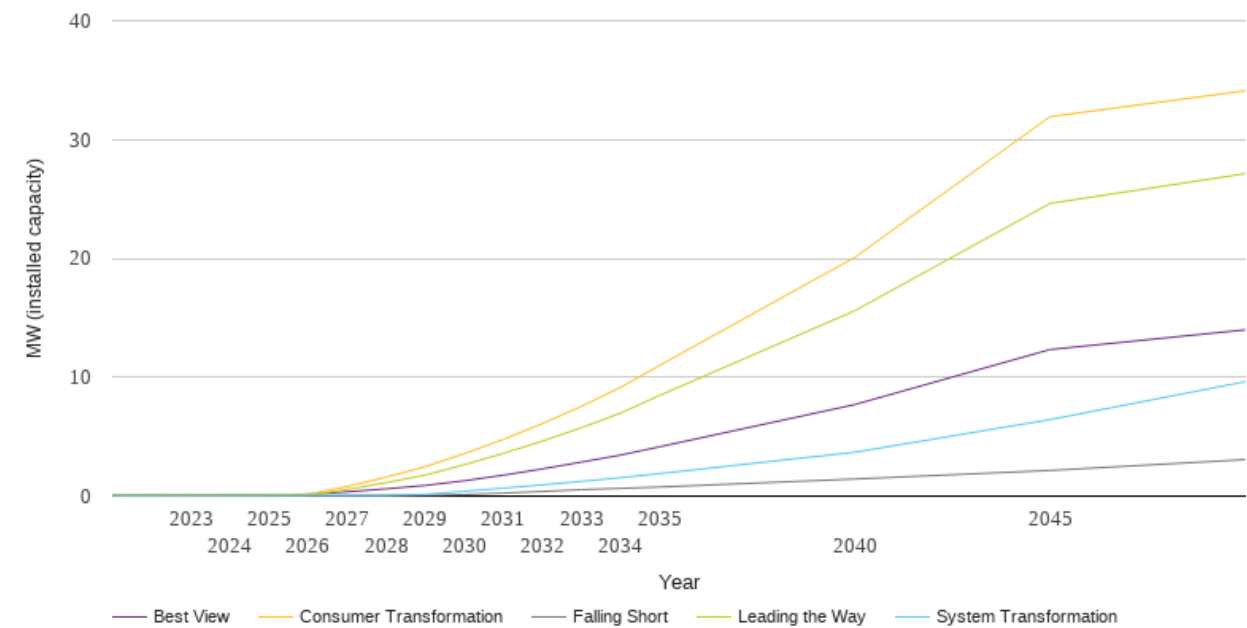
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.9	0.9	0.9	0.9	0.9
2023	0.9	0.9	0.9	0.9	0.9
2024	0.9	1.0	1.0	1.0	1.0
2025	0.9	1.0	1.2	1.4	1.2
2026	1.0	1.2	1.6	1.9	1.6
2027	1.1	1.4	2.0	2.3	2.0
2028	1.1	1.6	2.6	3.1	2.6
2029	1.2	2.0	3.2	4.0	3.1
2030	1.4	2.6	4.2	6.0	4.1
2031	1.5	3.0	5.1	7.0	5.0
2032	1.7	3.4	6.1	8.2	5.9
2033	1.9	3.8	7.2	9.5	7.0
2034	2.2	4.3	8.4	10.9	8.1
2035	2.4	4.8	9.6	12.5	9.2
2040	2.9	8.8	16.7	24.1	15.6
2045	5.0	12.6	24.8	34.1	23.2
2050	6.6	15.5	33.3	44.6	31.5



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	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.1	0.1	0.1
2024	0.0	0.0	0.1	0.1	0.1
2025	0.0	0.1	0.1	0.1	0.1
2026	0.0	0.1	0.1	0.1	0.1
2027	0.0	0.1	0.8	0.6	0.4
2028	0.1	0.1	1.6	1.1	0.6
2029	0.1	0.1	2.5	1.8	0.9
2030	0.1	0.4	3.6	2.6	1.3
2031	0.2	0.7	4.8	3.6	1.8
2032	0.4	0.9	6.1	4.6	2.3
2033	0.5	1.2	7.6	5.8	2.9
2034	0.6	1.5	9.1	7.0	3.5
2035	0.8	1.9	11.0	8.5	4.1
2040	1.4	3.7	20.1	15.6	7.7
2045	2.2	6.4	31.9	24.6	12.3
2050	3.1	9.6	34.1	27.1	14.0



National Grid Electricity Distribution PLC 09223384)
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