

Distribution Future Energy Scenarios 2022

Local Authority:
Wychavon

What are Distribution Future Energy Scenarios?

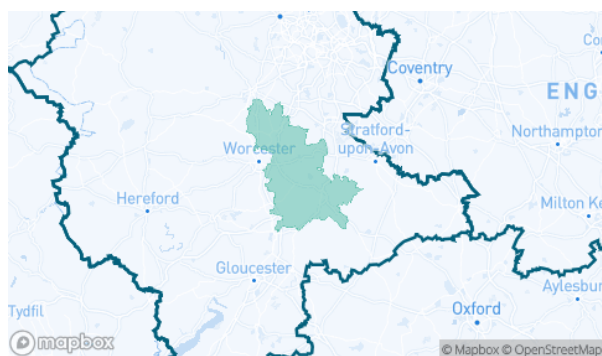
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Wychavon 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 Wychavon 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	315	190	190	0	20128	9485	9485	0
Domestic	New dwellings	0	1510	1626	1626	1878	2000	1949	1949	1924
Electric vehicles	Electric vehicles	1526	12587	15288	28439	28277	87429	72038	73669	63673
EV Charge Point	EV charge points	855	5898	8369	15755	17281	48863	45881	48117	48663
Heat pumps	Heat pump installations	629	5066	5547	11187	16818	31724	36729	61372	55785
Hydrogen electrolysis	MW (installed capacity)	0.0	0.9	3.9	0.6	3.7	9.9	16.9	10.9	17.2
Non domestic	Floorspace (metres squared) of new I&C developments	0	11004 2	13467 0	13467 0	14197 0	21864 2	21864 2	21864 2	21864 2
Other Distributed Generation	MW (installed capacity)	19.0	23.9	25.1	26.6	32.4	18.2	17.8	9.9	28.6
Resistive electric heating	Resistive electric heating units	7299	6091	5871	6257	5975	4536	1951	4307	4574
Solar Generation	MW (installed capacity)	31.8	39.3	49.1	59.5	82.6	98.5	170.1	211.8	227.6
Storage	MW (installed capacity)	0.0	0.6	1.7	3.0	6.9	5.7	13.9	29.4	39.4
Wind	MW (installed capacity)	0.6	0.6	0.7	1.6	1.3	1.5	3.9	11.7	9.4

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

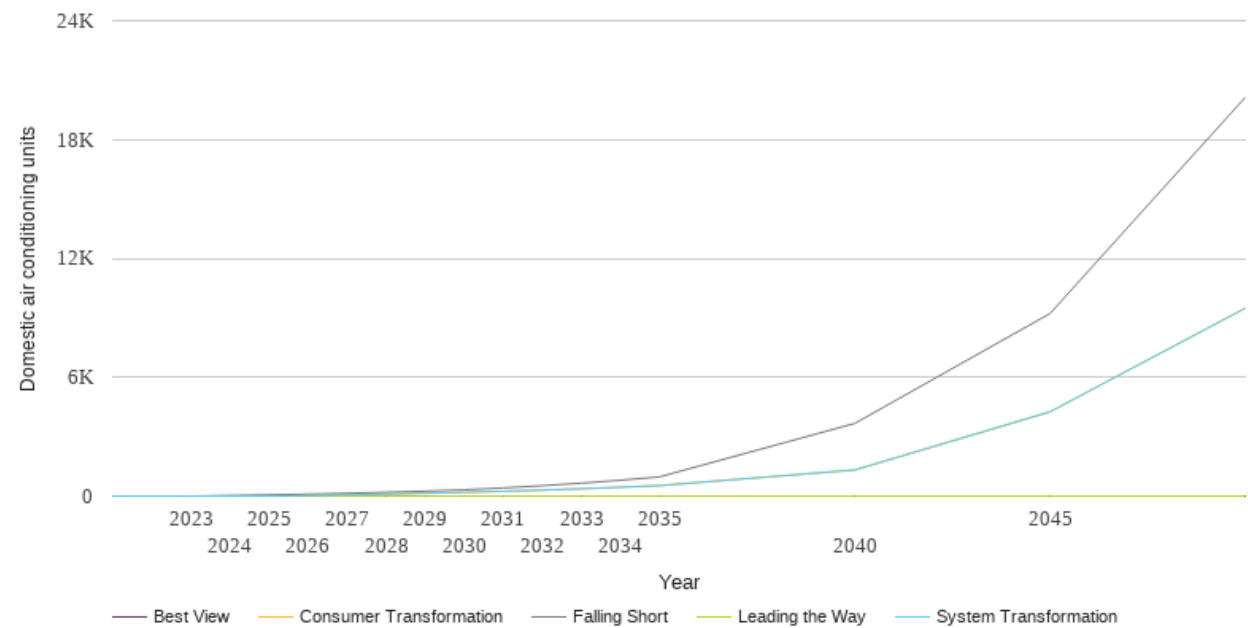
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

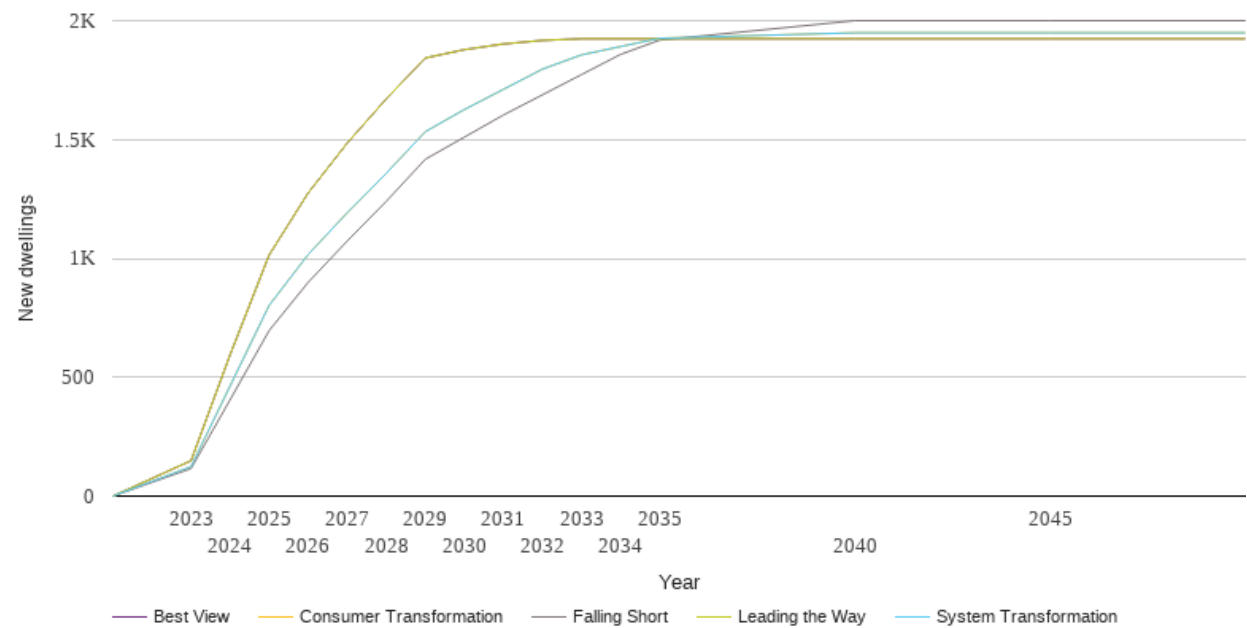
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	28	0	0	0	0
2025	61	0	0	0	0
2026	99	30	30	0	0
2027	142	63	63	0	0
2028	192	101	101	0	0
2029	250	143	143	0	0
2030	315	190	190	0	0
2031	413	243	243	0	0
2032	525	303	303	0	0
2033	653	370	370	0	0
2034	801	446	446	0	0
2035	970	531	531	0	0
2040	3669	1319	1319	0	0
2045	9214	4253	4253	0	0
2050	20128	9485	9485	0	0



Technology Summary: Domestic

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

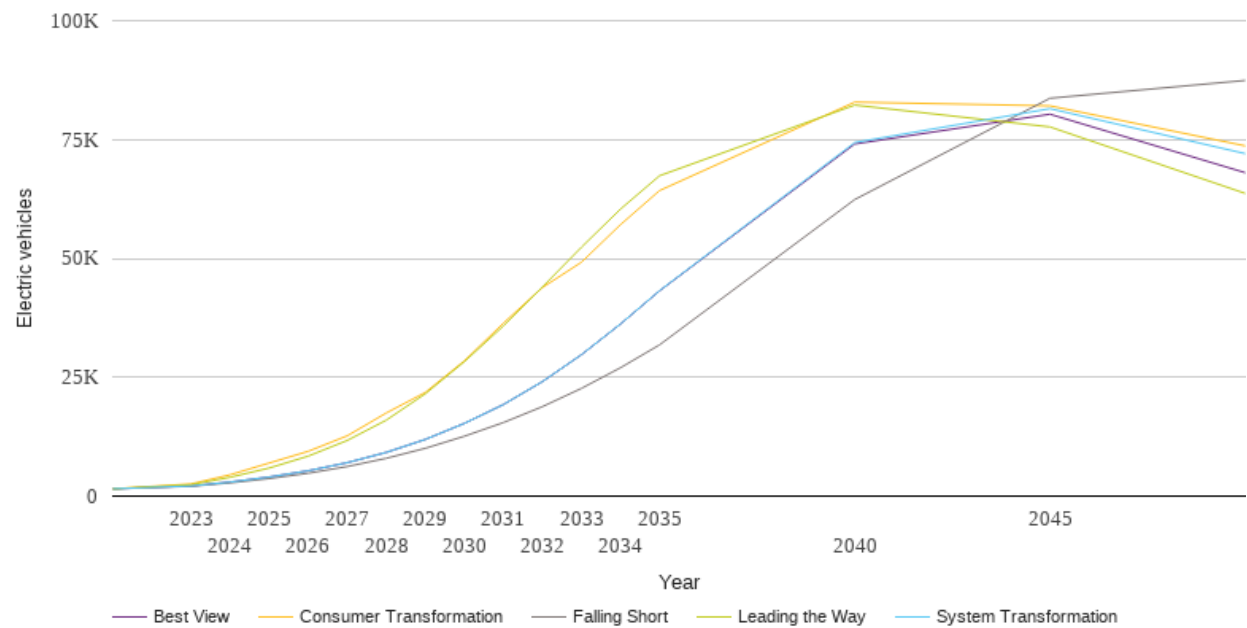
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	116	124	124	149	149
2024	405	463	463	594	594
2025	696	802	802	1014	1014
2026	899	1016	1016	1275	1275
2027	1073	1192	1192	1485	1485
2028	1240	1358	1358	1671	1671
2029	1417	1533	1533	1843	1843
2030	1510	1626	1626	1878	1878
2031	1603	1711	1711	1902	1902
2032	1688	1796	1796	1917	1917
2033	1773	1856	1856	1924	1924
2034	1858	1891	1891	1924	1924
2035	1918	1926	1926	1924	1924
2040	2000	1949	1949	1924	1924
2045	2000	1949	1949	1924	1924
2050	2000	1949	1949	1924	1924



Technology Summary: Electric vehicles

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

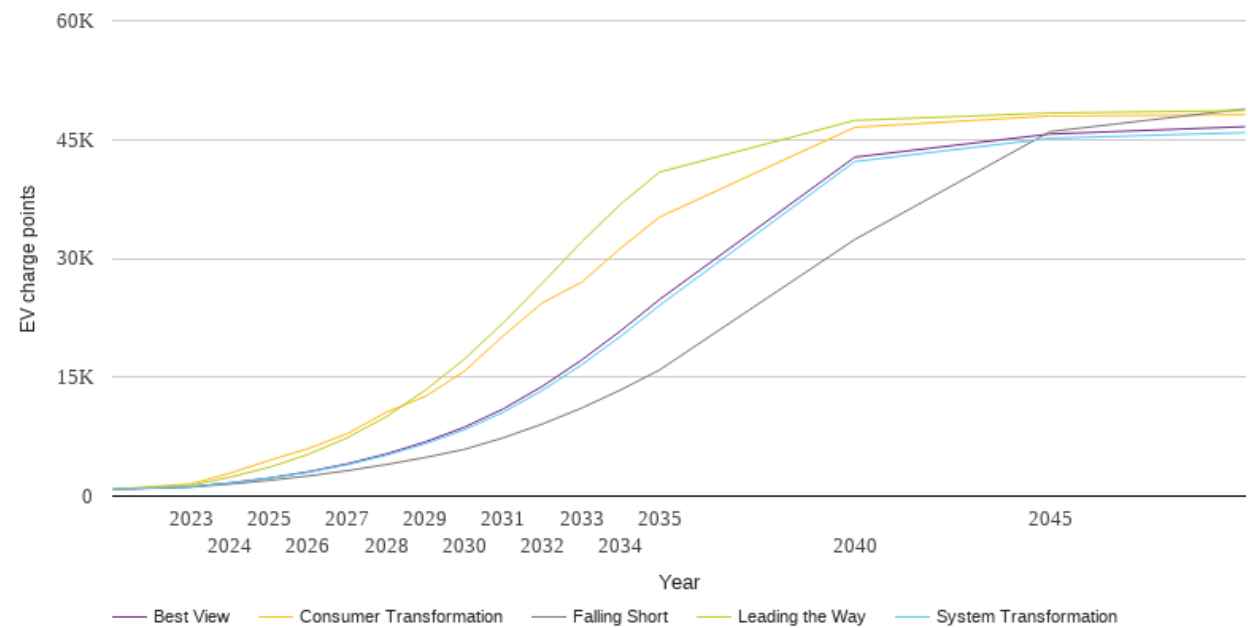
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1526	1526	1526	1526	1526
2023	2072	2132	2557	2397	2132
2024	2781	2946	4480	3957	2946
2025	3682	4004	6955	5898	4004
2026	4806	5321	9412	8400	5321
2027	6214	7027	12677	11698	7027
2028	7947	9189	17475	15972	9189
2029	10054	11917	21803	21518	11917
2030	12587	15288	28439	28277	15288
2031	15465	19255	36375	35790	19255
2032	18815	24088	43869	43981	24079
2033	22655	29753	49198	52354	29744
2034	27000	36214	57094	60367	36190
2035	31812	43214	64265	67384	43171
2040	62383	74370	82871	82246	74068
2045	83681	81491	82089	77651	80329
2050	87429	72038	73669	63673	68031



Technology Summary: EV Charge Point

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

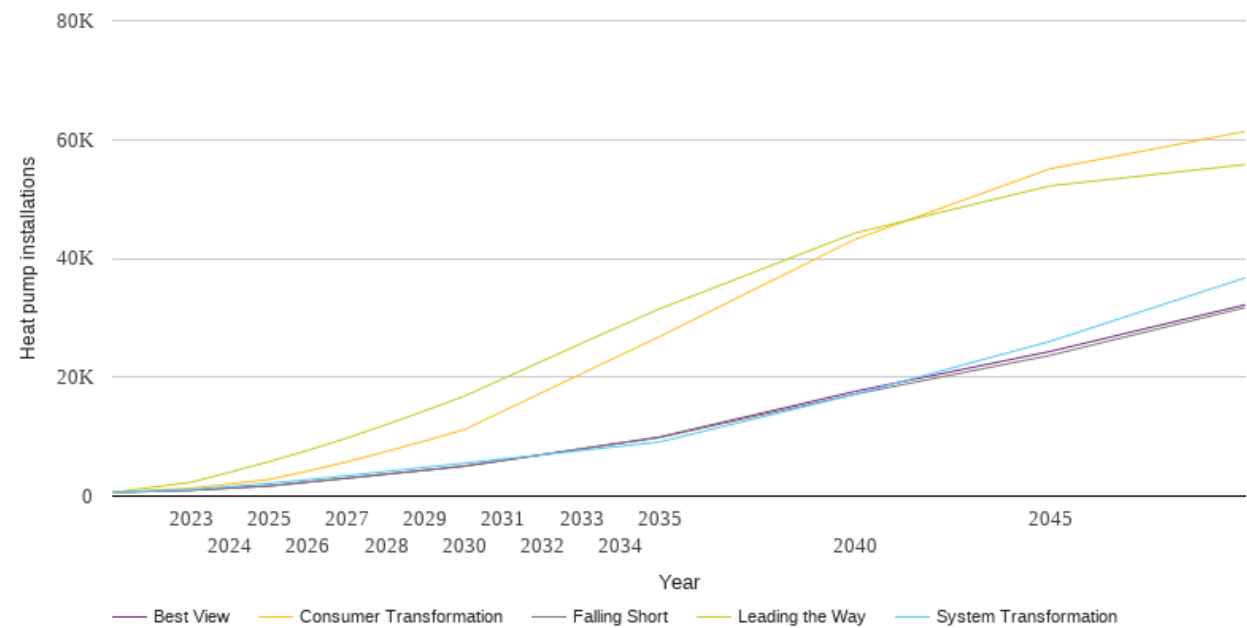
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	855	855	855	855	855
2023	1141	1188	1547	1377	1193
2024	1516	1651	2886	2389	1661
2025	1980	2244	4503	3628	2274
2026	2538	3005	5995	5263	3067
2027	3205	3963	7877	7363	4069
2028	3983	5156	10582	10017	5315
2029	4874	6615	12576	13369	6840
2030	5898	8369	15755	17281	8689
2031	7359	10595	20242	21867	11010
2032	9096	13348	24391	26883	13868
2033	11101	16544	26980	32060	17158
2034	13388	20147	31279	36835	20844
2035	15916	24065	35218	40895	24811
2040	32385	42218	46541	47405	42776
2045	45994	45156	47980	48348	45699
2050	48863	45881	48117	48663	46626



Technology Summary: Heat pumps

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

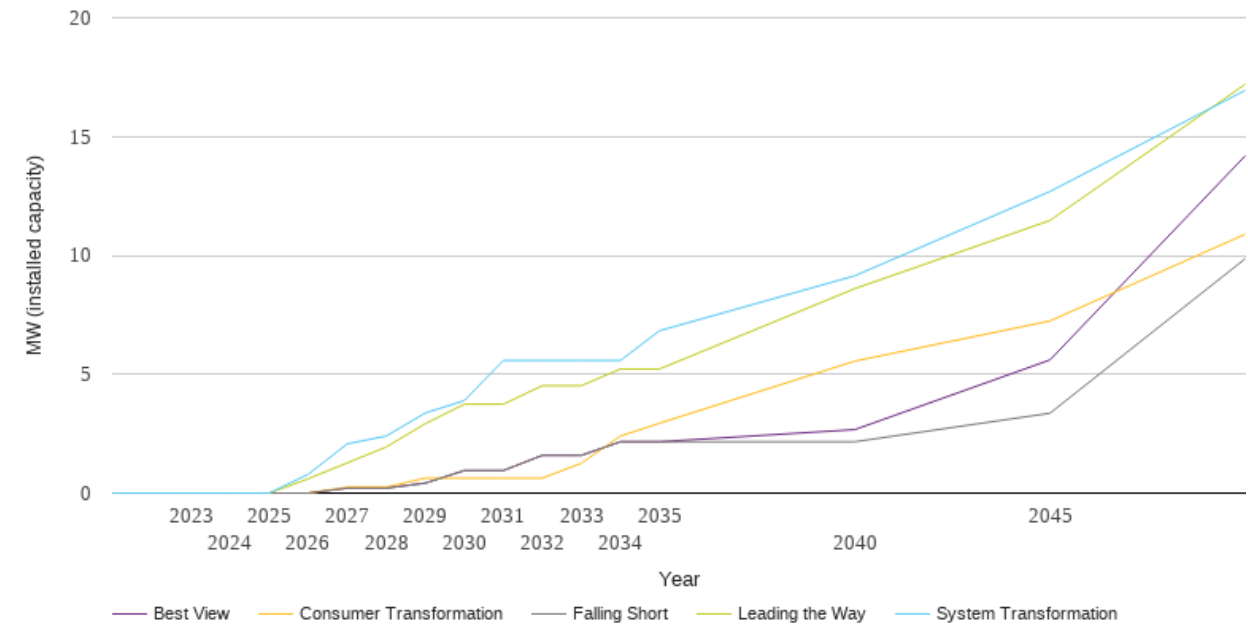
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	629	629	629	629	629
2023	988	1122	1336	2331	988
2024	1342	1615	2049	4033	1342
2025	1710	2156	2806	5805	1710
2026	2362	2778	4227	7710	2350
2027	3033	3441	5785	9772	3010
2028	3707	4145	7507	12032	3679
2029	4388	4843	9311	14386	4352
2030	5066	5547	11187	16818	5023
2031	6021	6251	14315	19770	6002
2032	6974	6962	17448	22729	6984
2033	7929	7677	20595	25689	7965
2034	8887	8398	23714	28608	8953
2035	9842	9100	26823	31506	9937
2040	17144	17116	43189	44251	17605
2045	23669	26027	55075	52202	24330
2050	31724	36729	61372	55785	32185



Technology Summary: Hydrogen electrolysis

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

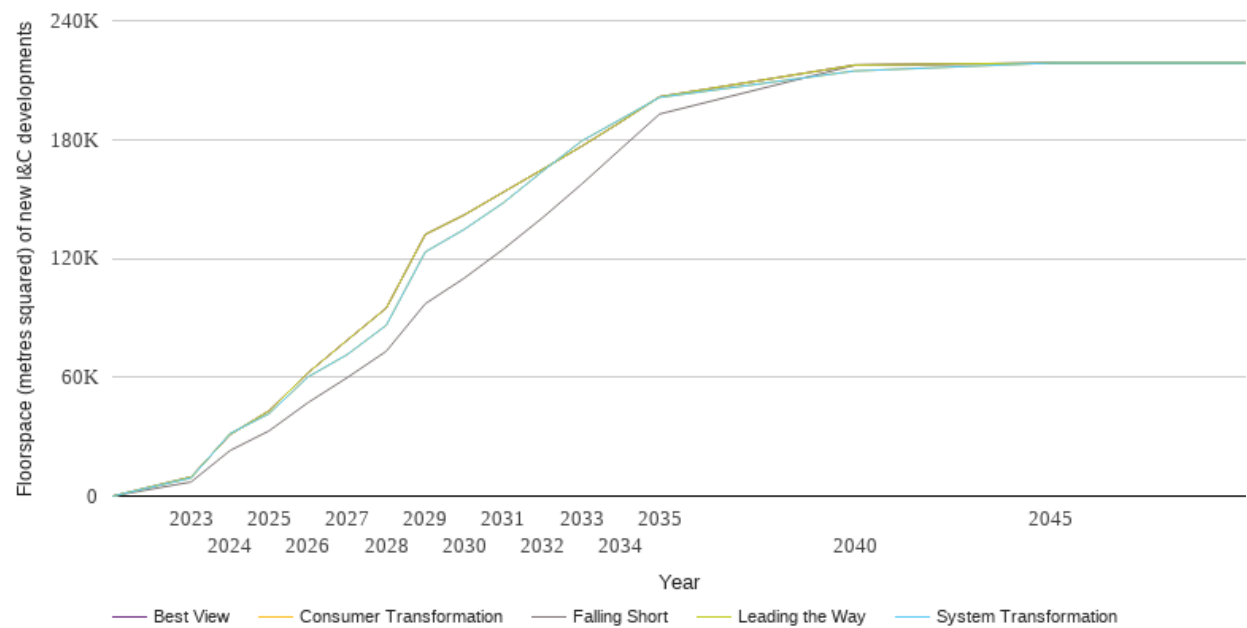
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.8	0.0	0.6	0.0
2027	0.2	2.1	0.3	1.3	0.2
2028	0.2	2.4	0.3	1.9	0.2
2029	0.4	3.4	0.6	2.9	0.4
2030	0.9	3.9	0.6	3.7	0.9
2031	0.9	5.6	0.6	3.7	0.9
2032	1.6	5.6	0.6	4.5	1.6
2033	1.6	5.6	1.3	4.5	1.6
2034	2.2	5.6	2.4	5.2	2.2
2035	2.2	6.8	2.9	5.2	2.2
2040	2.2	9.1	5.6	8.6	2.7
2045	3.4	12.7	7.2	11.5	5.6
2050	9.9	16.9	10.9	17.2	14.2



Technology Summary: Non domestic

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

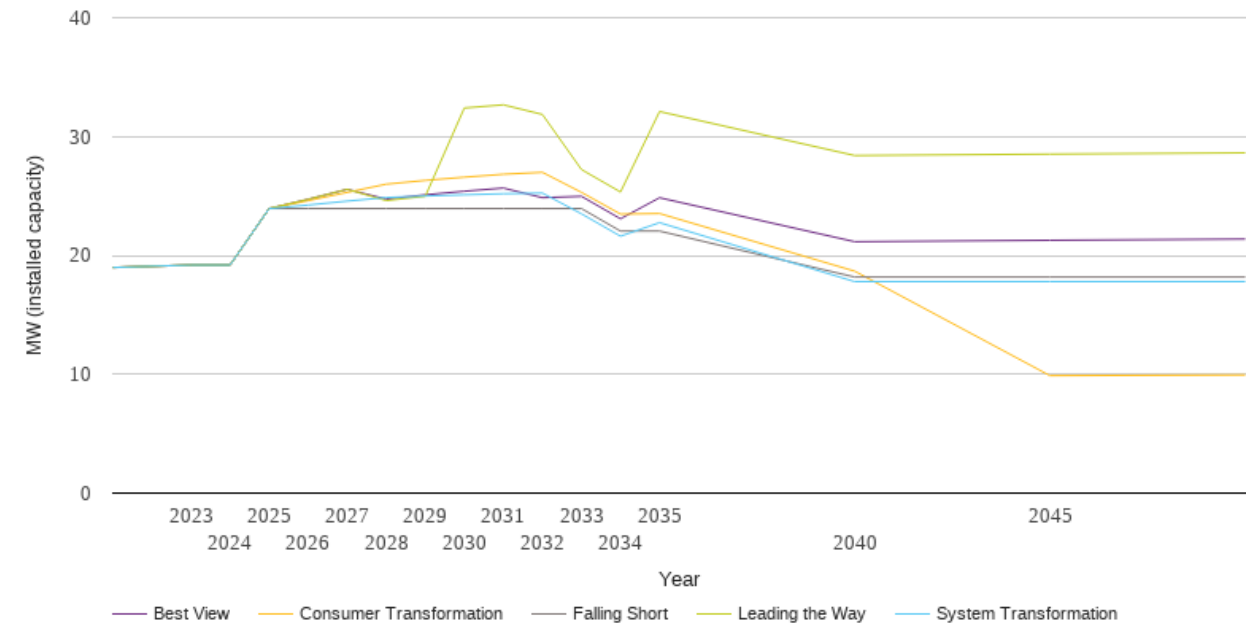
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	7124	9160	9160	9669	9669
2024	22992	31596	31596	31044	31044
2025	32948	41625	41625	43083	43083
2026	47248	60202	60202	62294	62294
2027	59790	71436	71436	78710	78710
2028	73112	86215	86215	94899	94899
2029	97120	123271	123271	132094	132094
2030	110042	134670	134670	141970	141970
2031	124677	148056	148056	153452	153452
2032	140461	163915	163915	164881	164881
2033	157393	179200	179200	176540	176540
2034	175169	190177	190177	188773	188773
2035	192865	201248	201248	201581	201581
2040	217493	214621	214621	217608	217608
2045	218642	218642	218642	218642	218642
2050	218642	218642	218642	218642	218642



Technology Summary: Other Distributed Generation

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

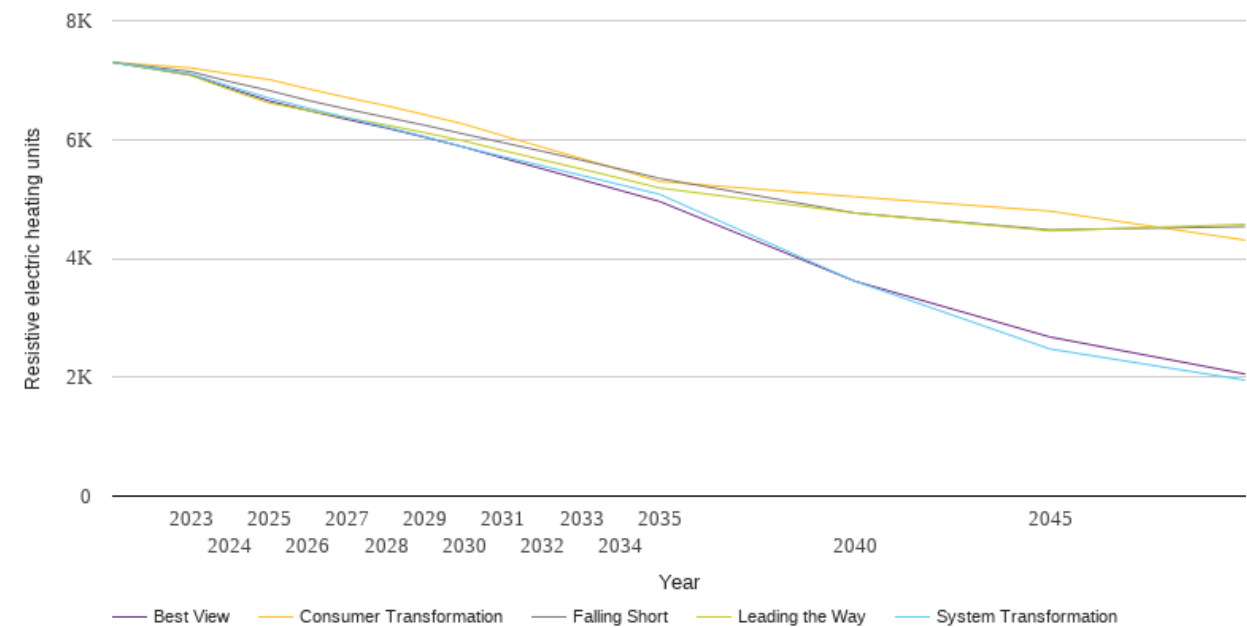
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	19.0	19.0	19.0	19.0	19.0
2023	19.2	19.2	19.2	19.2	19.2
2024	19.2	19.2	19.2	19.2	19.2
2025	23.9	23.9	23.9	23.9	23.9
2026	23.9	24.2	24.6	24.7	24.7
2027	23.9	24.6	25.3	25.6	25.6
2028	23.9	24.9	26.0	24.6	24.7
2029	23.9	25.0	26.3	25.0	25.1
2030	23.9	25.1	26.6	32.4	25.4
2031	23.9	25.2	26.8	32.7	25.7
2032	23.9	25.2	27.0	31.9	24.9
2033	23.9	23.5	25.3	27.2	25.0
2034	22.0	21.6	23.5	25.3	23.1
2035	22.0	22.8	23.5	32.1	24.9
2040	18.2	17.8	18.7	28.4	21.1
2045	18.2	17.8	9.9	28.5	21.3
2050	18.2	17.8	9.9	28.6	21.4



Technology Summary: Resistive electric heating

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

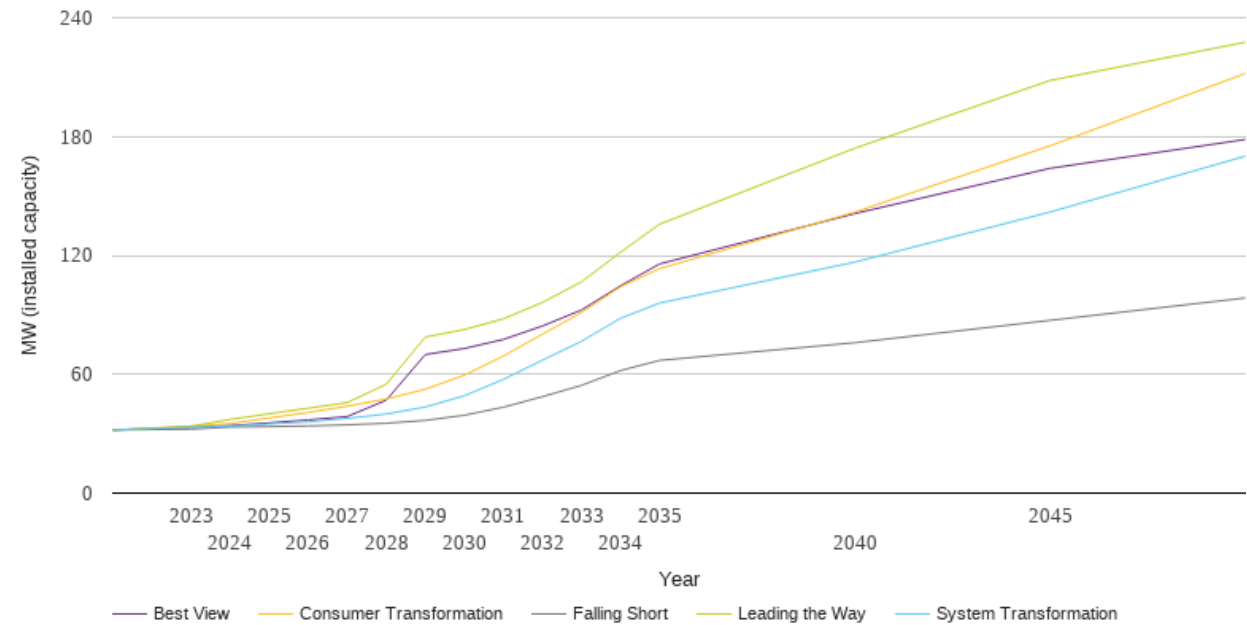
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	7299	7299	7299	7299	7299
2023	7142	7103	7205	7078	7085
2024	6973	6894	7102	6836	6863
2025	6824	6698	7010	6615	6650
2026	6658	6527	6853	6488	6489
2027	6511	6368	6706	6364	6338
2028	6374	6210	6569	6245	6195
2029	6238	6046	6416	6113	6037
2030	6091	5871	6257	5975	5871
2031	5947	5712	6063	5814	5686
2032	5802	5557	5871	5658	5507
2033	5653	5397	5681	5504	5324
2034	5501	5238	5490	5347	5143
2035	5346	5079	5294	5185	4958
2040	4763	3617	5038	4765	3617
2045	4480	2475	4795	4464	2677
2050	4536	1951	4307	4574	2054



Technology Summary: Solar Generation

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

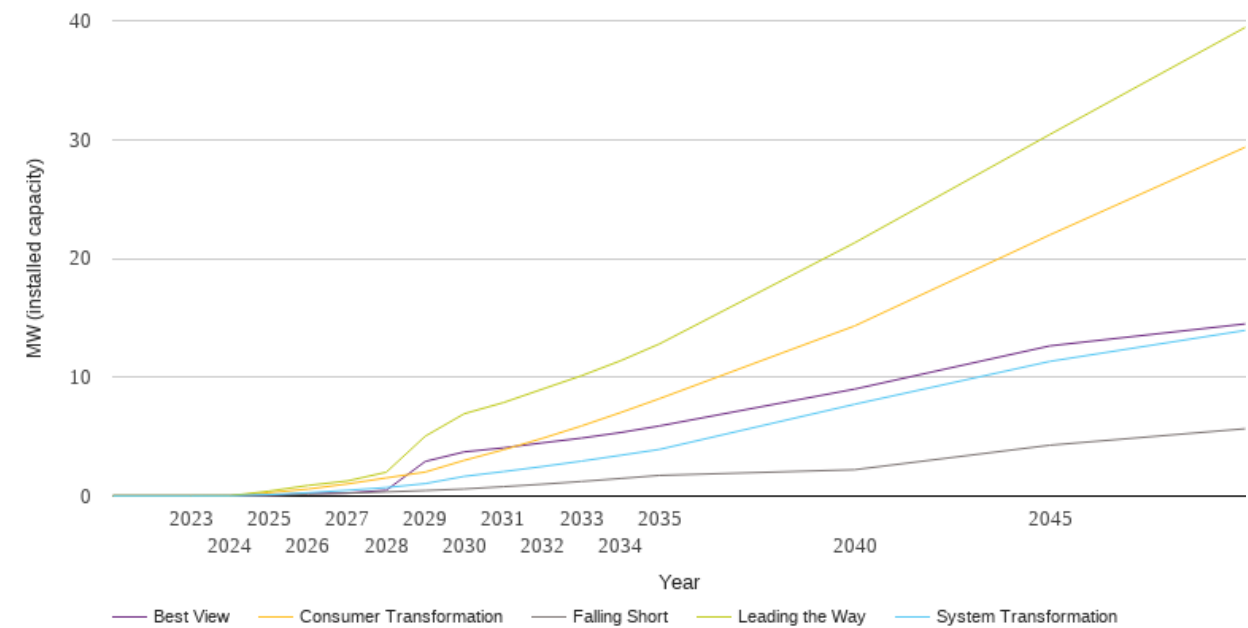
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	31.8	31.8	31.8	31.8	31.8
2023	32.3	33.3	33.8	33.8	33.3
2024	33.3	33.9	35.1	37.2	34.1
2025	33.6	34.9	37.9	40.0	35.4
2026	33.9	36.0	40.7	42.8	36.9
2027	34.5	37.7	43.8	45.7	38.6
2028	35.3	39.9	47.5	54.9	46.9
2029	36.7	43.4	52.4	78.8	69.9
2030	39.3	49.1	59.5	82.6	73.0
2031	43.3	57.4	69.2	87.9	77.6
2032	48.7	67.1	80.2	96.3	84.3
2033	54.4	76.6	91.2	106.6	92.4
2034	61.9	88.2	104.1	121.6	104.6
2035	67.0	95.9	113.3	135.8	115.7
2040	75.9	116.6	141.8	174.1	141.1
2045	87.2	141.9	175.3	208.3	163.9
2050	98.5	170.1	211.8	227.6	178.5



Technology Summary: Storage

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

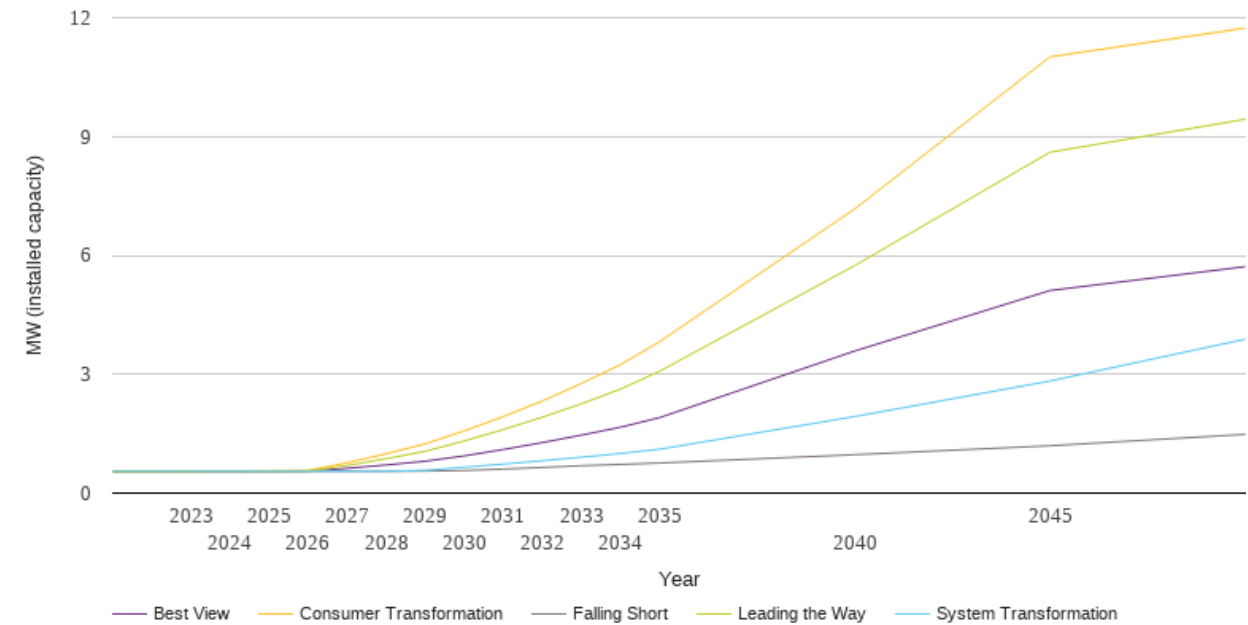
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.1	0.1	0.3	0.4	0.1
2026	0.1	0.3	0.6	0.9	0.2
2027	0.2	0.5	1.0	1.3	0.3
2028	0.4	0.7	1.5	2.0	0.5
2029	0.5	1.1	2.0	5.0	2.9
2030	0.6	1.7	3.0	6.9	3.7
2031	0.8	2.1	3.9	7.9	4.1
2032	1.0	2.5	4.9	9.0	4.5
2033	1.2	2.9	5.9	10.1	4.9
2034	1.5	3.4	7.0	11.4	5.3
2035	1.7	3.9	8.2	12.8	5.9
2040	2.2	7.7	14.3	21.3	9.0
2045	4.3	11.3	22.0	30.4	12.6
2050	5.7	13.9	29.4	39.4	14.5



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	0.6	0.6	0.6	0.6	0.6
2023	0.6	0.6	0.6	0.6	0.6
2024	0.6	0.6	0.6	0.6	0.6
2025	0.6	0.6	0.6	0.6	0.6
2026	0.6	0.6	0.6	0.6	0.6
2027	0.6	0.6	0.8	0.7	0.6
2028	0.6	0.6	1.0	0.9	0.7
2029	0.6	0.6	1.2	1.1	0.8
2030	0.6	0.7	1.6	1.3	0.9
2031	0.6	0.7	1.9	1.6	1.1
2032	0.6	0.8	2.3	1.9	1.3
2033	0.7	0.9	2.8	2.3	1.5
2034	0.7	1.0	3.2	2.6	1.7
2035	0.8	1.1	3.8	3.1	1.9
2040	1.0	1.9	7.2	5.7	3.6
2045	1.2	2.8	11.0	8.6	5.1
2050	1.5	3.9	11.7	9.4	5.7



National Grid Electricity Distribution PLC 09223384)
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