

Distribution Future Energy Scenarios 2022

Local Authority:
Exeter

What are Distribution Future Energy Scenarios?

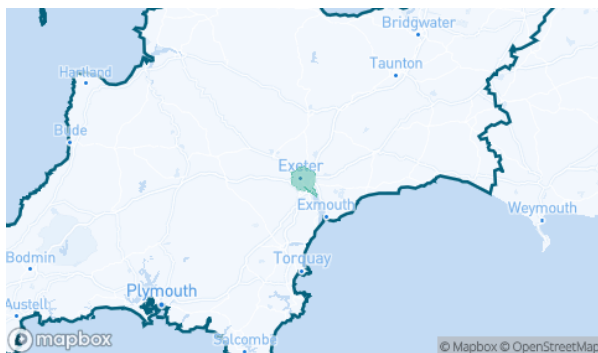
National Grid run Distribution Future Energy Scenarios (DFES) on an annual cycle for all licence areas, and represent a range of credible future scenarios of what could connect to the distribution network.

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 Exeter 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 Exeter 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	1002	2661	2332	2332	1002	30828	18030	18030	1002
Domestic	New dwellings	0	2788	2917	2917	3217	3826	3681	3681	3591
Electric vehicles	Electric vehicles	1452	1229 1	1514 3	2795 9	2789 1	91092	88517	90876	68034
EV Charge Point	EV charge points	761	5366	7636	1465 6	1587 4	45326	43055	44405	46547
Heat pumps	Heat pump installations	254	4667	3498	1057 7	1591 0	30159	33346	55277	48606
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	0.2	0.0	0.2	0.0	0.6	0.1	1.0
Non domestic	Floorspace (metres squared) of new I&C developments	0	4915 8	6882 0	6882 0	6898 7	16026 1	16001 1	16001 1	16026 1
Other Distributed Generation	MW (installed capacity)	33.3	14.4	13.3	14.4	12.5	11.4	24.8	6.0	36.2
Resistive electric heating	Resistive electric heating units	10202	8274	8105	8676	8242	4935	1926	5247	5484
Solar Generation	MW (installed capacity)	14.2	19.0	24.8	35.5	36.1	32.3	60.5	105.6	111.6
Storage	MW (installed capacity)	0.0	1.1	1.8	3.2	3.9	4.5	10.4	25.7	32.4
Wind	MW (installed capacity)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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

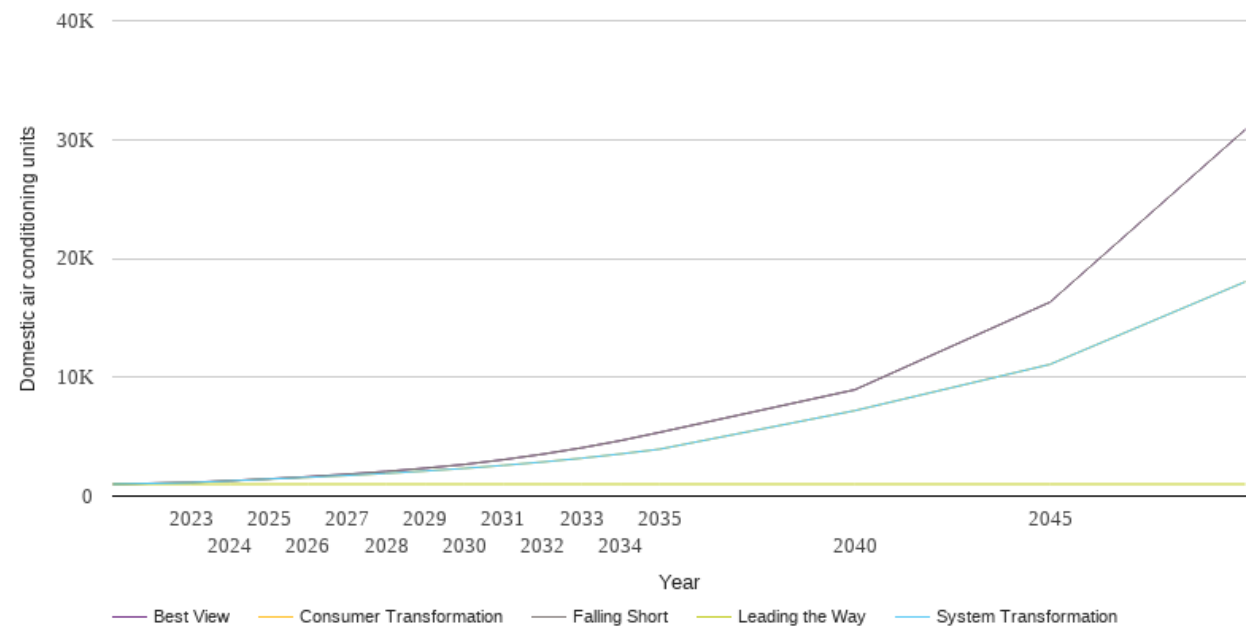
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

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

Technology Summary: Air conditioning

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

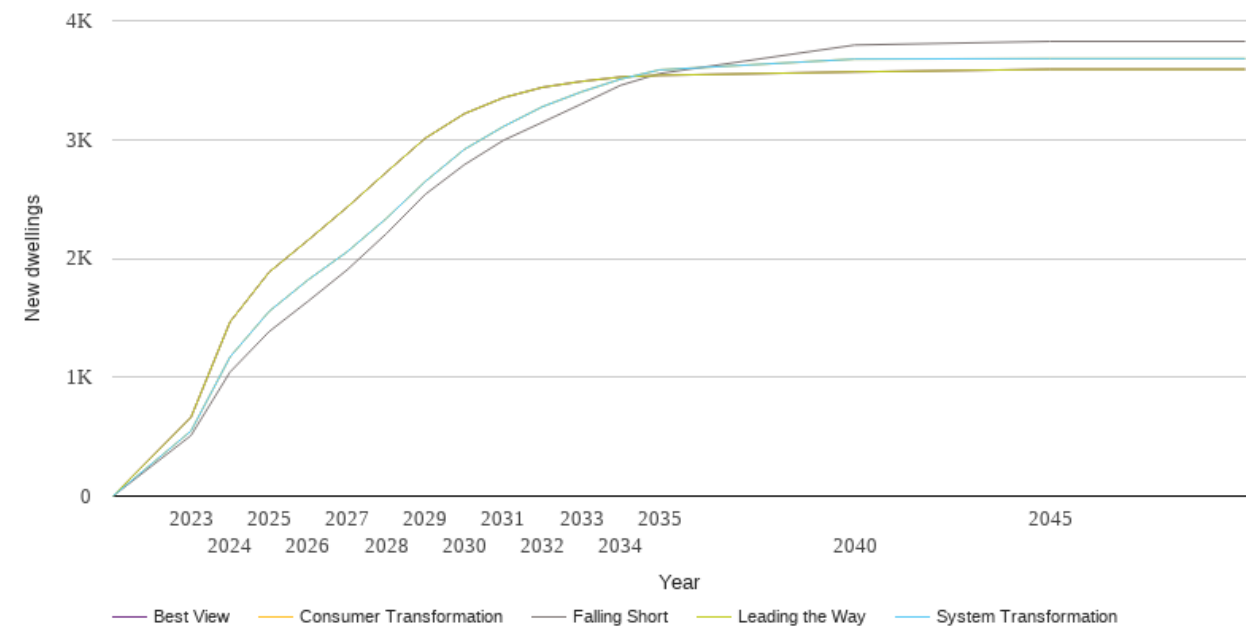
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1002	1002	1002	1002	1002
2023	1153	1136	1136	1002	1153
2024	1290	1275	1275	1002	1290
2025	1449	1436	1436	1002	1449
2026	1630	1575	1575	1002	1630
2027	1840	1731	1731	1002	1840
2028	2075	1910	1910	1002	2075
2029	2350	2111	2111	1002	2350
2030	2661	2332	2332	1002	2661
2031	3064	2584	2584	1002	3064
2032	3526	2867	2867	1002	3526
2033	4057	3185	3185	1002	4057
2034	4666	3546	3546	1002	4666
2035	5361	3945	3945	1002	5361
2040	8946	7190	7190	1002	8946
2045	16315	11082	11082	1002	16315
2050	30828	18030	18030	1002	30828



Technology Summary: Domestic

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

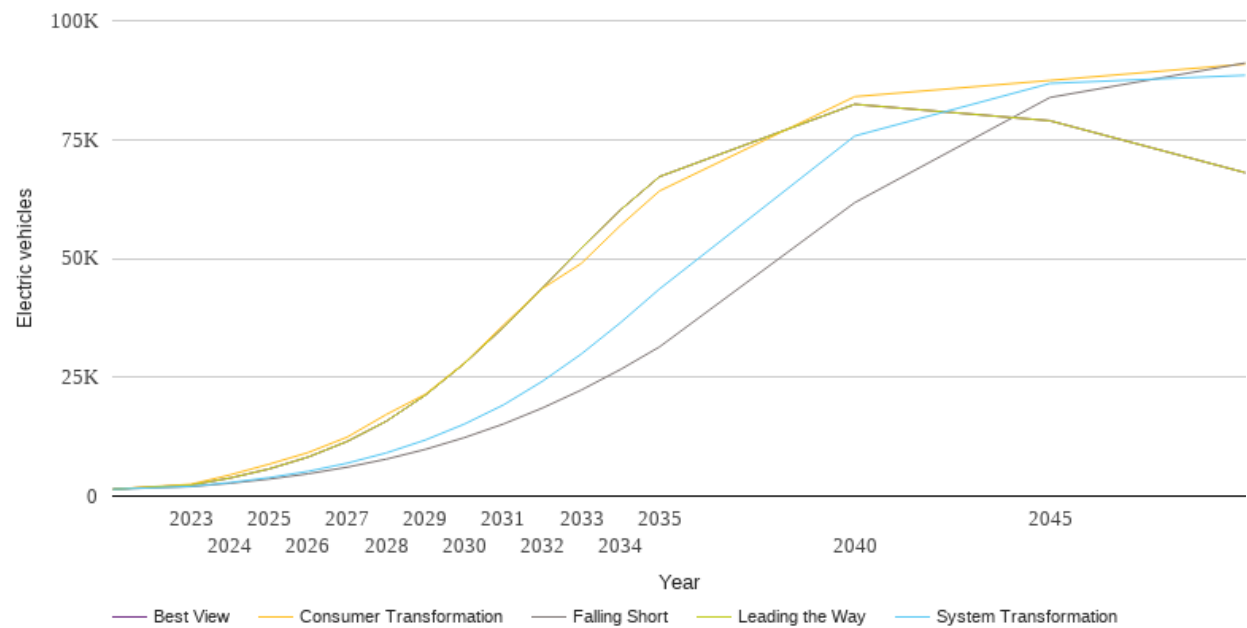
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	510	548	548	664	664
2024	1044	1171	1171	1466	1466
2025	1384	1554	1554	1884	1884
2026	1640	1820	1820	2154	2154
2027	1904	2056	2056	2431	2431
2028	2207	2335	2335	2724	2724
2029	2539	2647	2647	3011	3011
2030	2788	2917	2917	3217	3217
2031	2993	3109	3109	3352	3352
2032	3145	3276	3276	3439	3439
2033	3299	3401	3401	3489	3489
2034	3456	3508	3508	3526	3526
2035	3555	3586	3586	3540	3540
2040	3795	3677	3677	3569	3569
2045	3826	3681	3681	3591	3591
2050	3826	3681	3681	3591	3591



Technology Summary: Electric vehicles

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

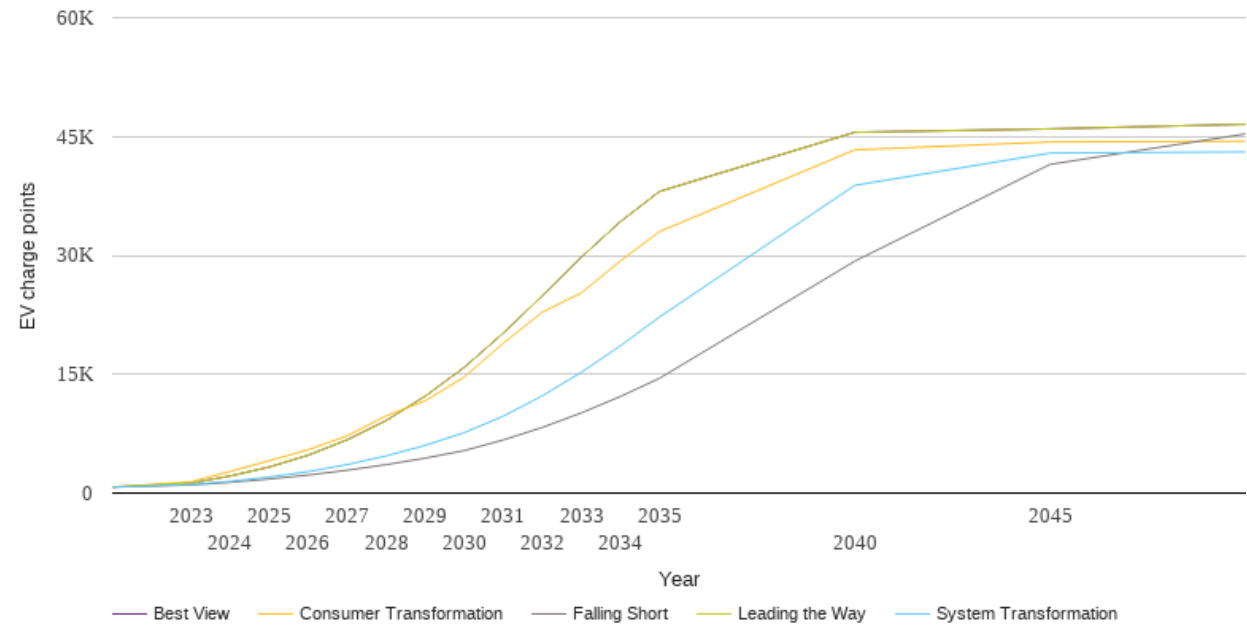
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1452	1452	1452	1452	1452
2023	1995	2041	2491	2332	2332
2024	2697	2845	4463	3797	3797
2025	3579	3886	6715	5713	5713
2026	4688	5207	9156	8210	8210
2027	6085	6921	12403	11496	11496
2028	7769	9080	17152	15735	15735
2029	9821	11794	21416	21223	21223
2030	12291	15143	27959	27891	27891
2031	15155	19173	35961	35474	35474
2032	18521	24152	43671	43785	43785
2033	22327	29912	48968	52179	52179
2034	26632	36480	56936	60195	60195
2035	31393	43573	64193	67190	67190
2040	61727	75746	84022	82416	82416
2045	83850	86796	87431	78954	78954
2050	91092	88517	90876	68034	68034



Technology Summary: EV Charge Point

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

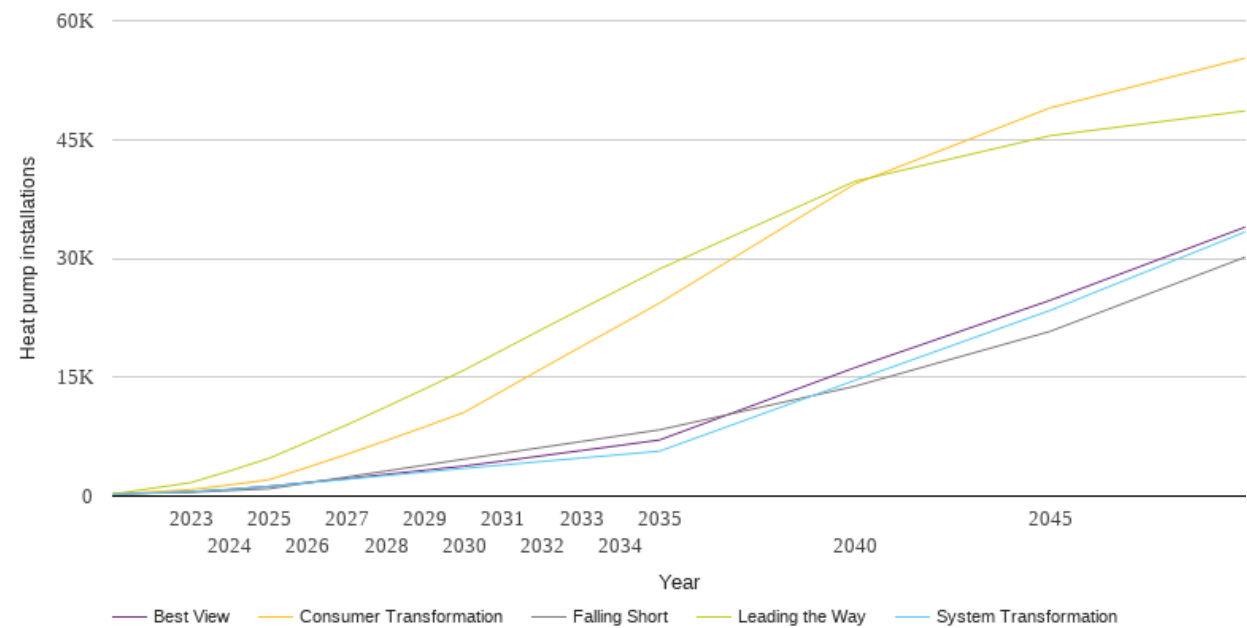
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	761	761	761	761	761
2023	1023	1069	1426	1267	1267
2024	1356	1484	2731	2152	2152
2025	1777	2022	4085	3286	3286
2026	2279	2708	5472	4782	4782
2027	2886	3597	7230	6726	6726
2028	3594	4691	9760	9159	9159
2029	4412	6024	11636	12243	12243
2030	5366	7636	14656	15874	15874
2031	6708	9716	18924	20198	20198
2032	8295	12280	22841	24917	24917
2033	10125	15255	25272	29797	29797
2034	12200	18595	29311	34275	34275
2035	14487	22221	33008	38073	38073
2040	29270	38838	43317	45535	45535
2045	41484	42911	44312	45965	45965
2050	45326	43055	44405	46547	46547



Technology Summary: Heat pumps

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

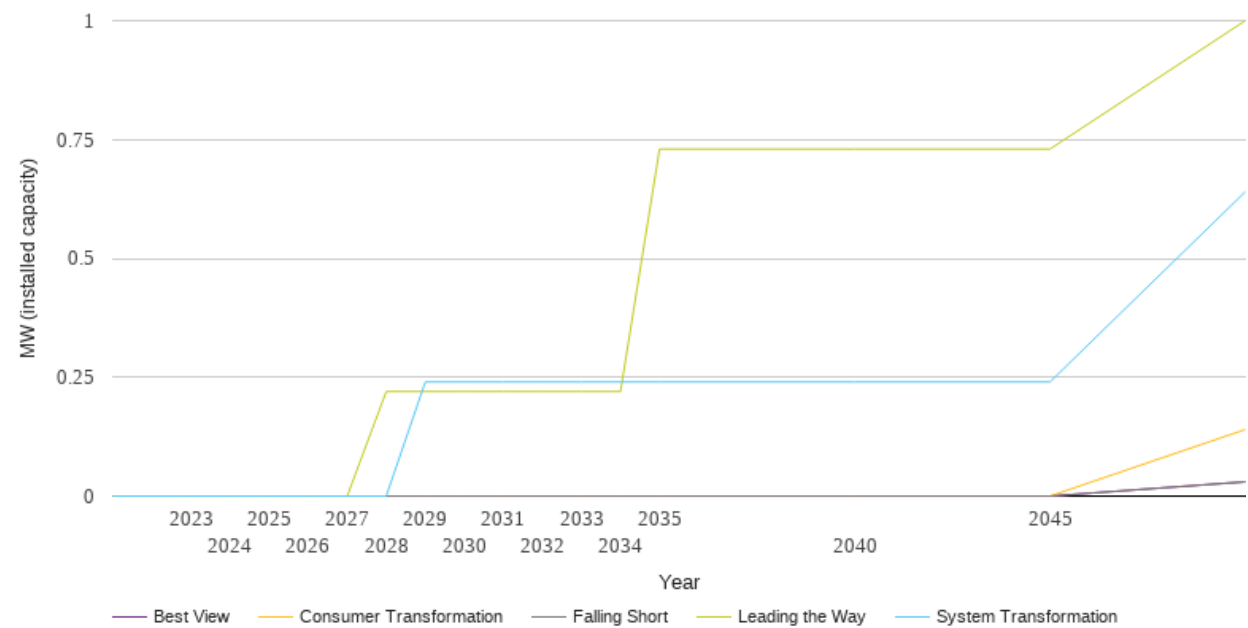
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	254	254	254	254	254
2023	475	544	823	1711	544
2024	698	850	1410	3188	850
2025	925	1226	2067	4771	1226
2026	1665	1681	3659	6871	1723
2027	2418	2126	5291	9007	2218
2028	3167	2590	7008	11271	2747
2029	3915	3044	8768	13561	3267
2030	4667	3498	10577	15910	3792
2031	5413	3934	13350	18499	4436
2032	6153	4374	16135	21079	5092
2033	6888	4808	18883	23617	5748
2034	7628	5236	21613	26131	6405
2035	8360	5669	24364	28657	7081
2040	13854	14597	39392	39720	16204
2045	20781	23425	48992	45479	24700
2050	30159	33346	55277	48606	33950



Technology Summary: Hydrogen electrolysis

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

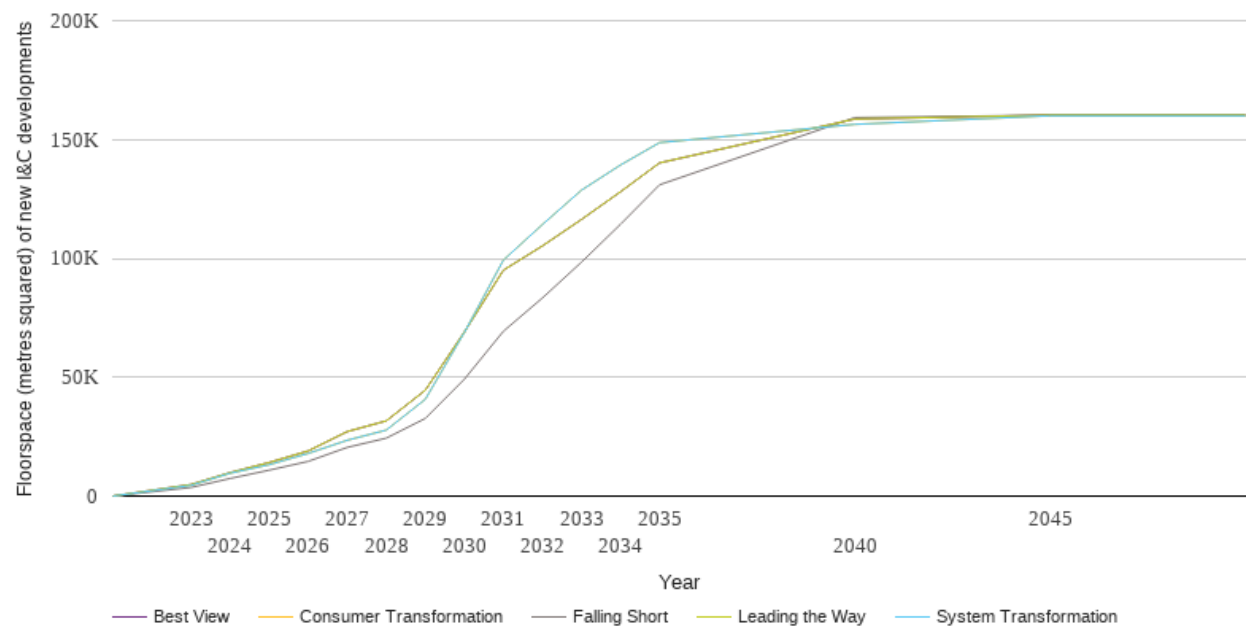
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0	0.0
2028	0.0	0.0	0.0	0.0	0.0
2029	0.0	0.2	0.0	0.2	0.0
2030	0.0	0.2	0.0	0.2	0.0
2031	0.0	0.2	0.0	0.2	0.0
2032	0.0	0.2	0.0	0.2	0.0
2033	0.0	0.2	0.0	0.2	0.0
2034	0.0	0.2	0.0	0.2	0.0
2035	0.0	0.2	0.0	0.7	0.0
2040	0.0	0.2	0.0	0.7	0.0
2045	0.0	0.2	0.0	0.7	0.0
2050	0.0	0.6	0.1	1.0	0.0



Technology Summary: Non domestic

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

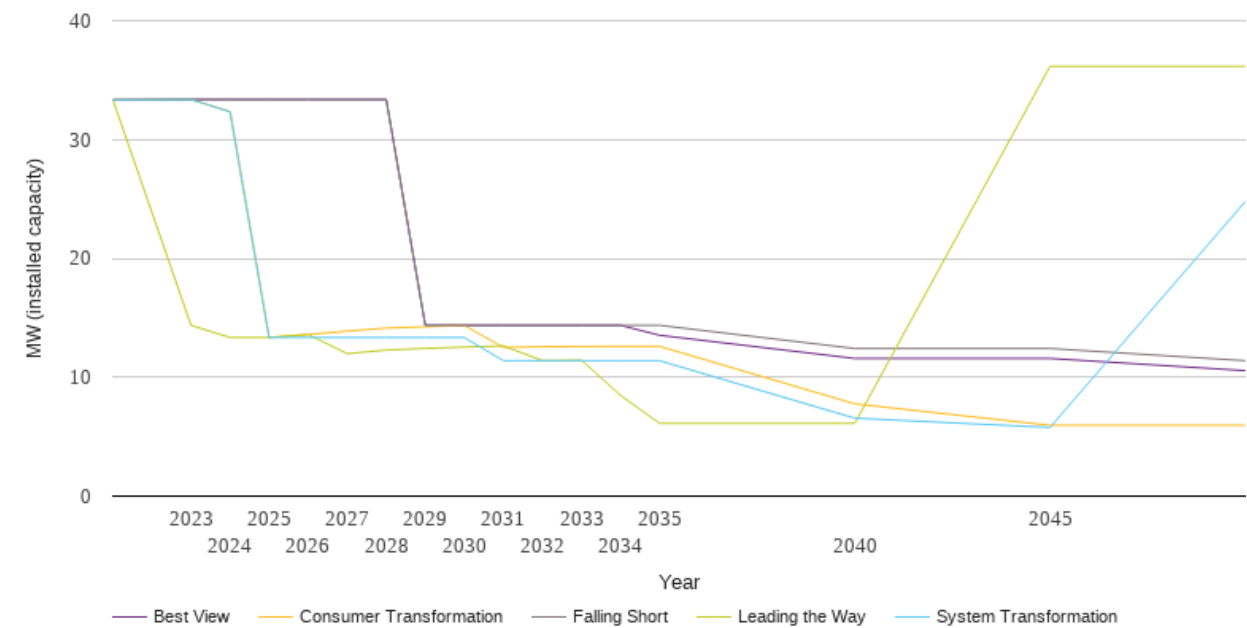
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	3625	4500	4500	4875	4875
2024	7400	9600	9600	9875	9875
2025	10900	13200	13200	14125	14125
2026	14600	17950	17950	19000	19000
2027	20482	23482	23482	27123	27123
2028	24364	27764	27764	31645	31645
2029	32664	40702	40702	44525	44525
2030	49158	68820	68820	68987	68987
2031	69331	99274	99274	95034	95034
2032	83350	114245	114245	105242	105242
2033	98403	128700	128700	116370	116370
2034	114339	139279	139279	128014	128014
2035	130958	148703	148703	140175	140175
2040	159228	156395	156395	158613	158613
2045	160261	160011	160011	160261	160261
2050	160261	160011	160011	160261	160261



Technology Summary: Other Distributed Generation

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

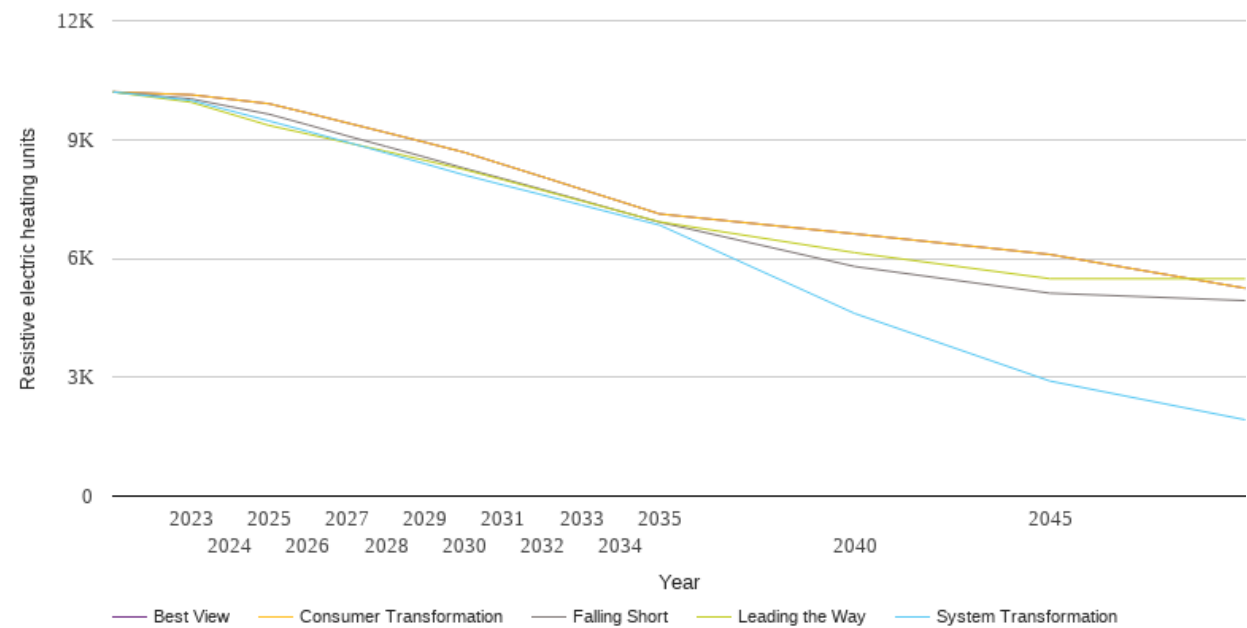
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	33.3	33.3	33.3	33.3	33.3
2023	33.4	33.4	33.4	14.4	33.4
2024	33.4	32.3	32.3	13.3	33.4
2025	33.4	13.3	13.3	13.3	33.4
2026	33.4	13.3	13.6	13.6	33.4
2027	33.4	13.3	13.9	12.0	33.4
2028	33.4	13.3	14.1	12.3	33.4
2029	14.4	13.3	14.2	12.4	14.4
2030	14.4	13.3	14.4	12.5	14.4
2031	14.4	11.4	12.5	12.6	14.4
2032	14.4	11.4	12.6	11.4	14.4
2033	14.4	11.4	12.6	11.4	14.4
2034	14.4	11.4	12.6	8.5	14.4
2035	14.4	11.4	12.6	6.1	13.5
2040	12.4	6.6	7.8	6.1	11.6
2045	12.4	5.8	6.0	36.2	11.6
2050	11.4	24.8	6.0	36.2	10.6



Technology Summary: Resistive electric heating

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

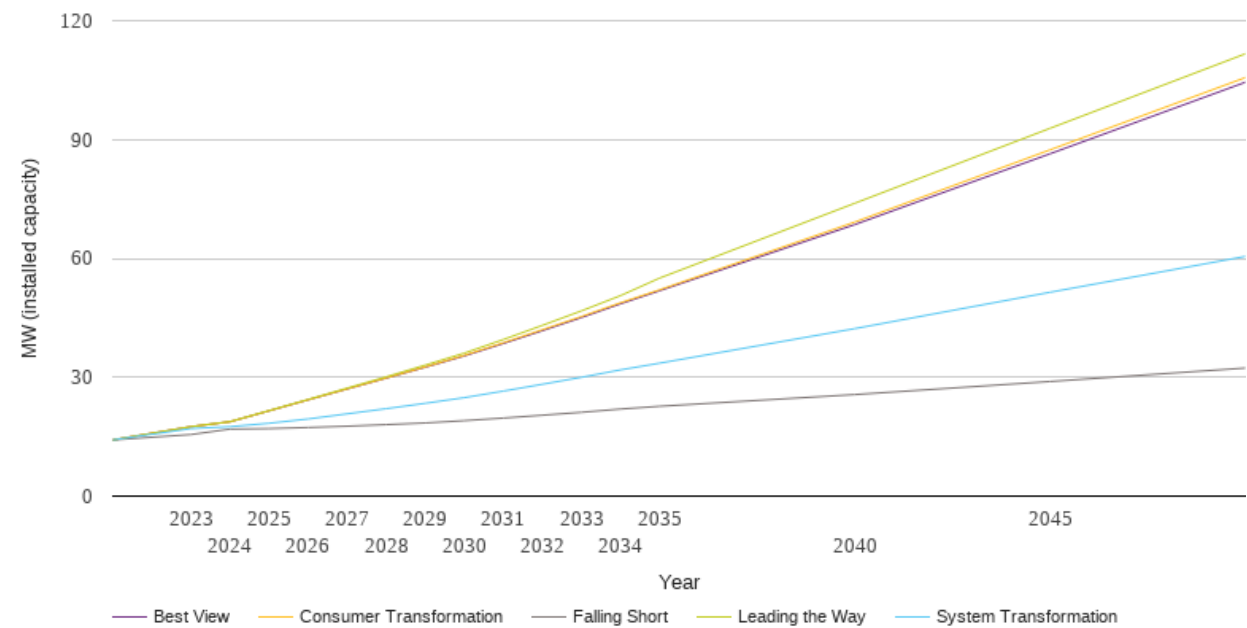
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	10202	10202	10202	10202	10202
2023	10027	9987	10130	9942	10130
2024	9831	9729	10019	9648	10019
2025	9639	9469	9904	9355	9904
2026	9369	9203	9666	9137	9666
2027	9091	8933	9420	8920	9420
2028	8824	8660	9175	8701	9175
2029	8553	8386	8928	8473	8928
2030	8274	8105	8676	8242	8676
2031	8010	7851	8367	7982	8367
2032	7739	7603	8059	7718	8059
2033	7467	7347	7746	7452	7746
2034	7189	7093	7436	7185	7436
2035	6914	6841	7123	6922	7123
2040	5795	4609	6619	6144	6619
2045	5121	2904	6099	5487	6099
2050	4935	1926	5247	5484	5247



Technology Summary: Solar Generation

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

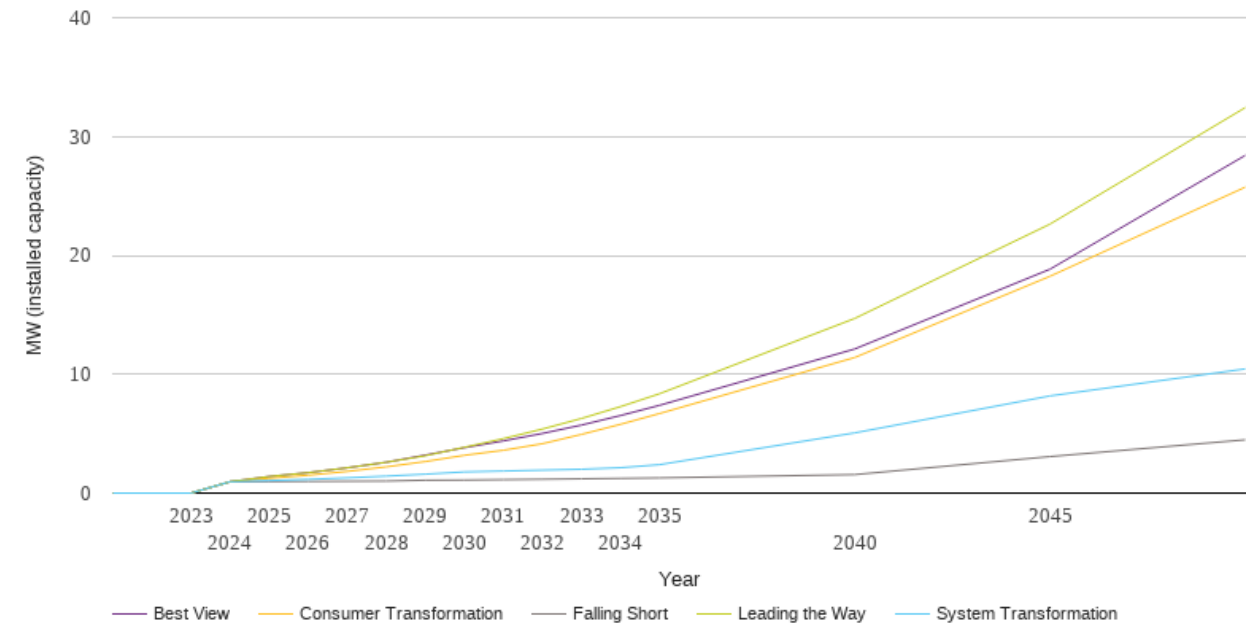
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	14.2	14.2	14.2	14.2	14.2
2023	15.5	17.0	17.5	17.5	17.5
2024	16.9	17.5	18.8	18.8	18.8
2025	17.0	18.4	21.5	21.6	21.5
2026	17.3	19.5	24.3	24.4	24.3
2027	17.6	20.8	27.1	27.3	27.0
2028	18.0	22.1	29.8	30.1	29.8
2029	18.5	23.4	32.6	33.1	32.5
2030	19.0	24.8	35.5	36.1	35.4
2031	19.7	26.5	38.7	39.5	38.5
2032	20.4	28.2	42.0	43.1	41.8
2033	21.1	30.0	45.3	46.8	45.1
2034	22.0	31.9	48.8	50.6	48.5
2035	22.7	33.5	52.1	55.0	51.8
2040	25.6	42.3	69.2	73.9	68.5
2045	28.9	51.4	87.4	92.8	86.4
2050	32.3	60.5	105.6	111.6	104.4



Technology Summary: Storage

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

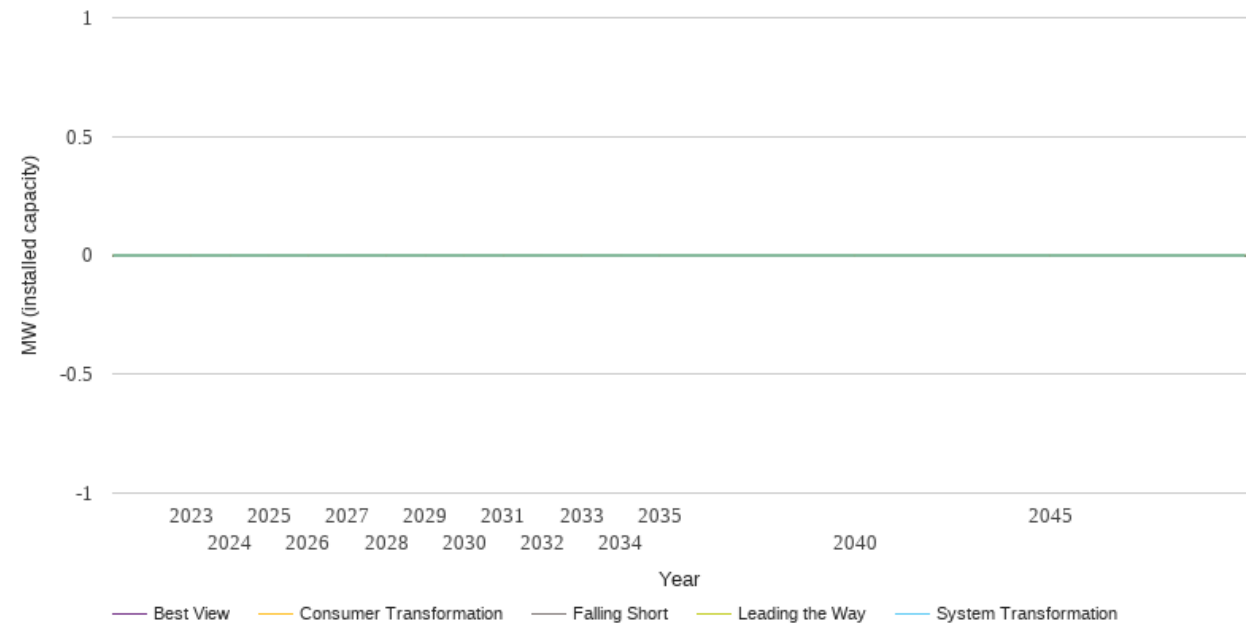
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.9	1.0	1.0	1.0	1.0
2025	1.0	1.0	1.2	1.4	1.4
2026	1.0	1.2	1.5	1.7	1.7
2027	1.0	1.3	1.8	2.1	2.1
2028	1.0	1.4	2.2	2.6	2.6
2029	1.1	1.6	2.7	3.1	3.2
2030	1.1	1.8	3.2	3.9	3.8
2031	1.1	1.9	3.6	4.6	4.4
2032	1.2	1.9	4.2	5.4	5.0
2033	1.2	2.0	4.9	6.3	5.7
2034	1.2	2.1	5.8	7.3	6.5
2035	1.3	2.4	6.7	8.4	7.4
2040	1.6	5.1	11.4	14.7	12.1
2045	3.1	8.2	18.2	22.6	18.8
2050	4.5	10.4	25.7	32.4	28.4



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	0.0	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	0.0	0.0	0.0	0.0
2030	0.0	0.0	0.0	0.0	0.0
2031	0.0	0.0	0.0	0.0	0.0
2032	0.0	0.0	0.0	0.0	0.0
2033	0.0	0.0	0.0	0.0	0.0
2034	0.0	0.0	0.0	0.0	0.0
2035	0.0	0.0	0.0	0.0	0.0
2040	0.0	0.0	0.0	0.0	0.0
2045	0.0	0.0	0.0	0.0	0.0
2050	0.0	0.0	0.0	0.0	0.0



National Grid Electricity Distribution PLC 09223384)
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))
National Grid Electricity Distribution (South Wales) Plc (company number 02366985))
(collectively, “NGED”)

nged.networkstrategy@nationalgrid.co.uk

