

Distribution Future Energy Scenarios 2022

Local Authority:
Doncaster

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 Doncaster 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 Doncaster 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	0	0	0	0	0	0	0	0
Domestic	New dwellings	0	0	0	0	0	0	0	0	0
Electric vehicles	Electric vehicles	40	23 0	30 3	56 5	56 8	207 3	169 9	190 0	179 7
EV Charge Point	EV charge points	14	91	13 3	24 5	26 8	801	754	780	782
Heat pumps	Heat pump installations	2	24	38	10 8	16 8	289	374	738	709
Hydrogen electrolysis	MW (installed capacity)	0.0	0. 0	0. 0	0. 0	0. 0	0.0	0.0	0.0	0.0
Non domestic	Floorspace (metres squared) of new I&C developments	0	0	0	0	0	0	0	0	0
Other Distributed Generation	MW (installed capacity)	0.0	0. 0	0. 0	0. 0	0. 0	0.0	0.0	0.0	0.0
Resistive electric heating	Resistive electric heating units	8	16	12	12	12	41	21	23	28
Solar Generation	MW (installed capacity)	0.1	0. 2	0. 3	0. 5	0. 5	0.4	0.9	1.8	1.9
Storage	MW (installed capacity)	0.0	0. 0	0. 0	0. 0	0. 0	0.1	0.2	0.5	0.6
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

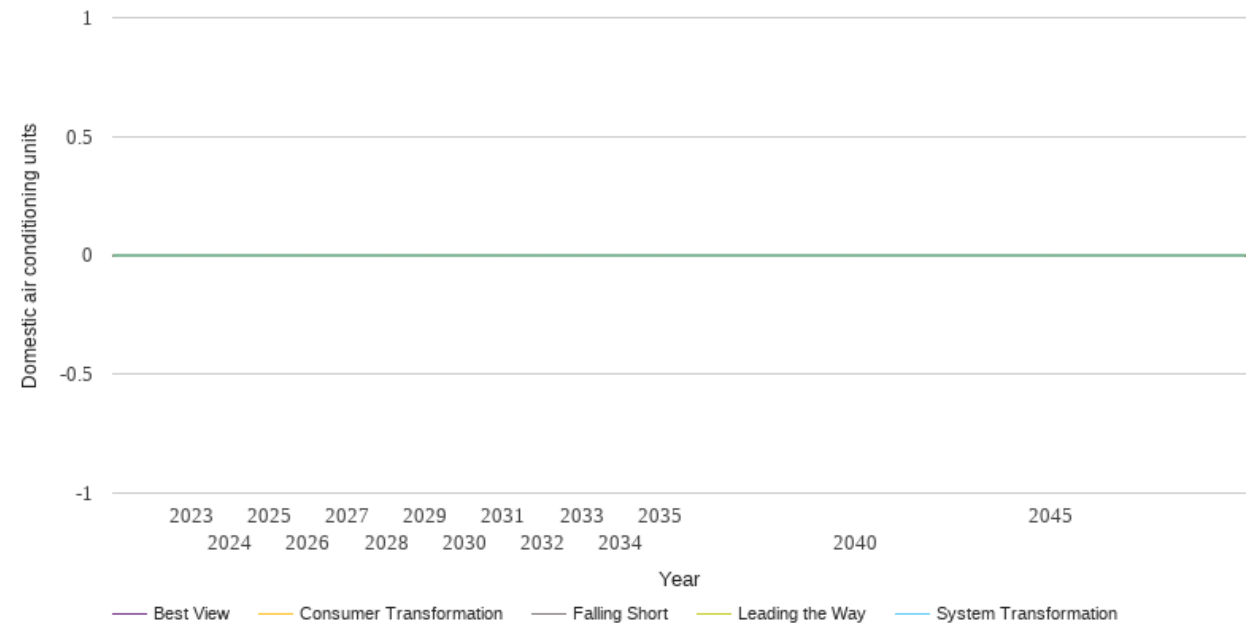
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

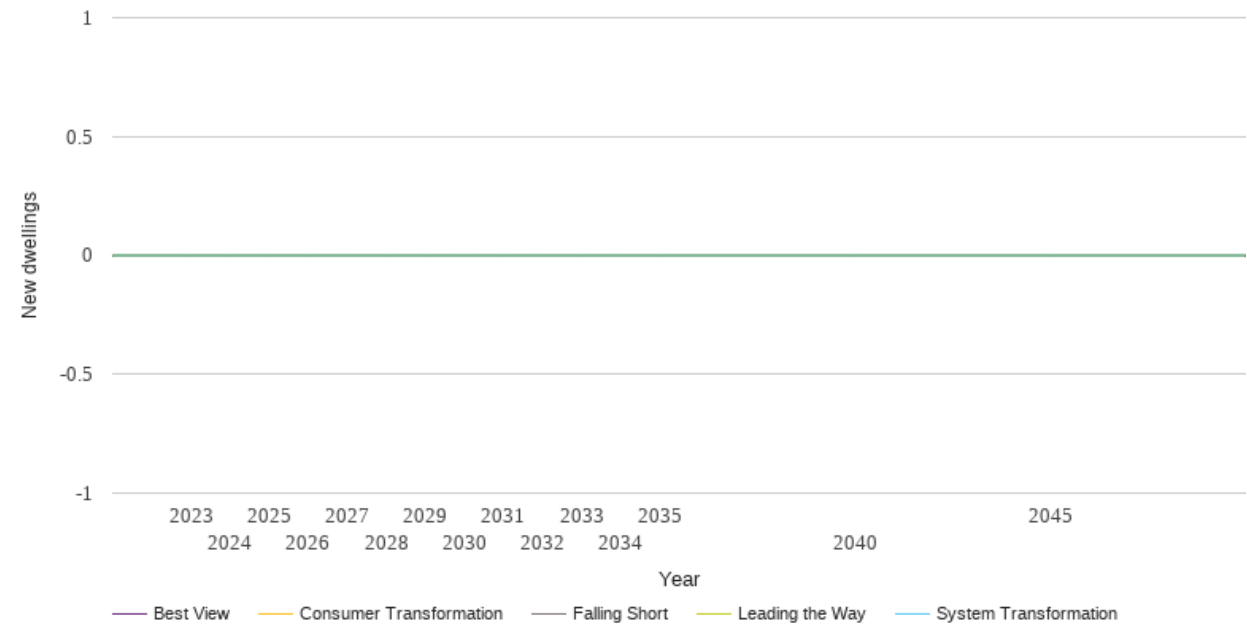
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	0	0	0	0	0
2025	0	0	0	0	0
2026	0	0	0	0	0
2027	0	0	0	0	0
2028	0	0	0	0	0
2029	0	0	0	0	0
2030	0	0	0	0	0
2031	0	0	0	0	0
2032	0	0	0	0	0
2033	0	0	0	0	0
2034	0	0	0	0	0
2035	0	0	0	0	0
2040	0	0	0	0	0
2045	0	0	0	0	0
2050	0	0	0	0	0



Technology Summary: Domestic

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

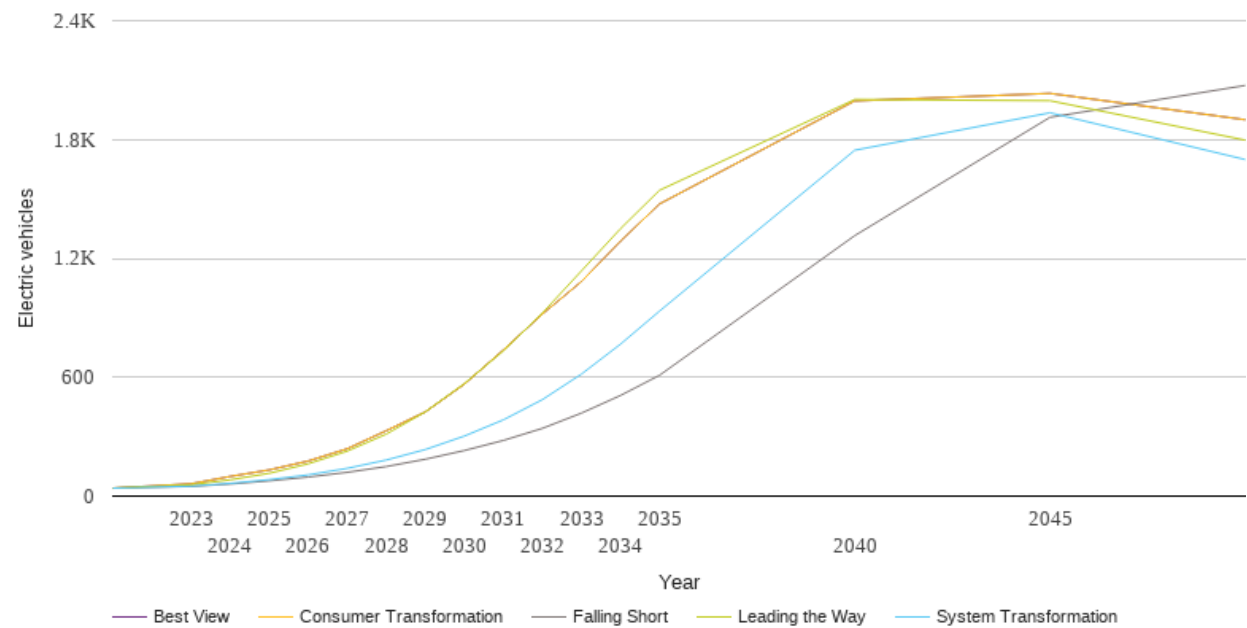
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	0	0	0	0	0
2024	0	0	0	0	0
2025	0	0	0	0	0
2026	0	0	0	0	0
2027	0	0	0	0	0
2028	0	0	0	0	0
2029	0	0	0	0	0
2030	0	0	0	0	0
2031	0	0	0	0	0
2032	0	0	0	0	0
2033	0	0	0	0	0
2034	0	0	0	0	0
2035	0	0	0	0	0
2040	0	0	0	0	0
2045	0	0	0	0	0
2050	0	0	0	0	0



Technology Summary: Electric vehicles

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

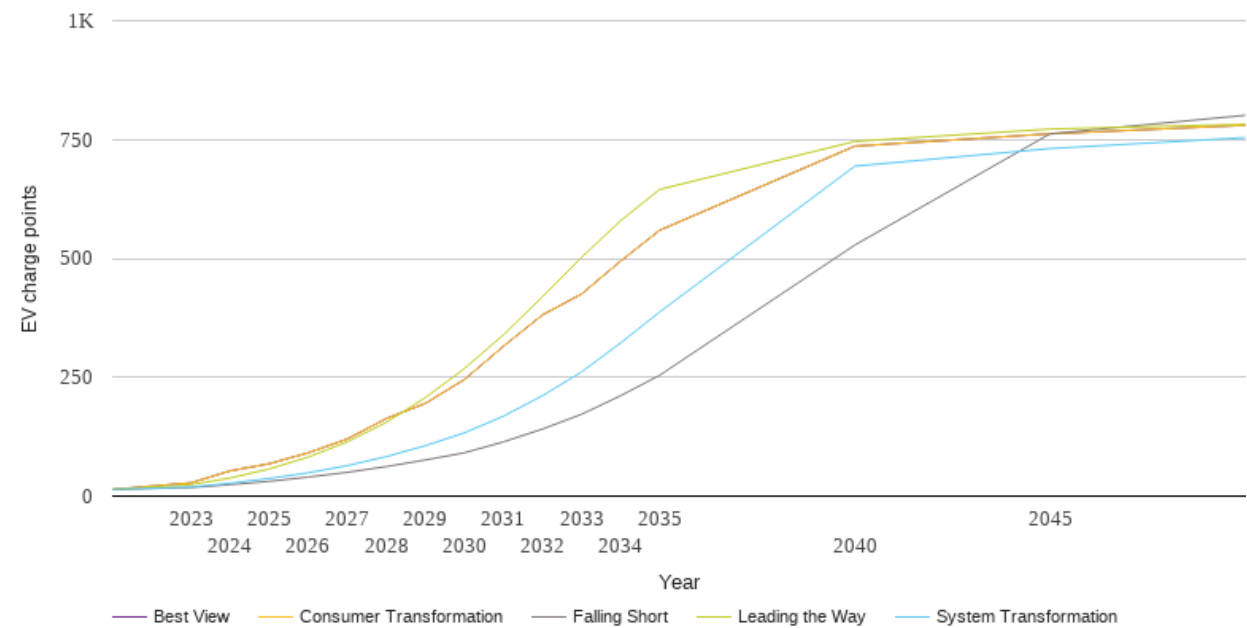
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	40	40	40	40	40
2023	49	50	62	57	62
2024	61	64	99	82	99
2025	77	83	132	115	132
2026	96	107	177	163	177
2027	120	140	239	227	239
2028	149	182	330	313	330
2029	186	235	425	425	425
2030	230	303	565	568	565
2031	281	385	738	733	738
2032	342	487	919	924	919
2033	419	616	1083	1137	1083
2034	508	767	1287	1350	1287
2035	610	934	1475	1544	1475
2040	1315	1746	1995	2002	1995
2045	1912	1935	2033	1996	2033
2050	2073	1699	1900	1797	1900



Technology Summary: EV Charge Point

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

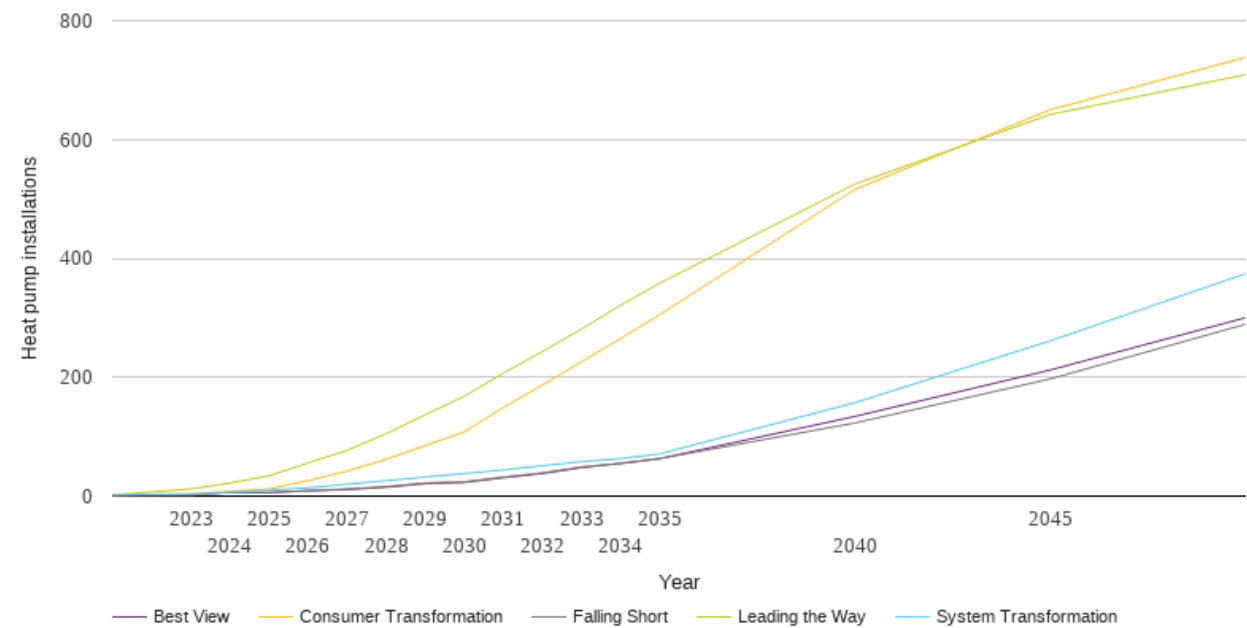
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	14	14	14	14	14
2023	18	19	28	24	28
2024	24	27	53	38	53
2025	31	37	68	57	68
2026	40	49	91	82	91
2027	50	64	120	114	120
2028	62	83	163	155	163
2029	76	106	195	207	195
2030	91	133	245	268	245
2031	114	168	315	339	315
2032	141	211	381	419	381
2033	172	261	425	502	425
2034	211	322	494	579	494
2035	254	387	559	645	559
2040	528	694	736	746	736
2045	762	731	762	772	762
2050	801	754	780	782	780



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	2	2	2	2	2
2023	2	3	4	12	2
2024	6	6	8	22	6
2025	6	10	12	34	6
2026	9	14	26	56	9
2027	12	20	42	77	11
2028	16	26	62	105	15
2029	22	32	85	137	21
2030	24	38	108	168	23
2031	32	44	149	207	31
2032	39	51	187	243	38
2033	49	58	226	281	48
2034	55	63	265	321	55
2035	63	71	305	358	63
2040	123	157	516	525	134
2045	197	261	650	642	212
2050	289	374	738	709	300



Technology Summary: Hydrogen electrolysis

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

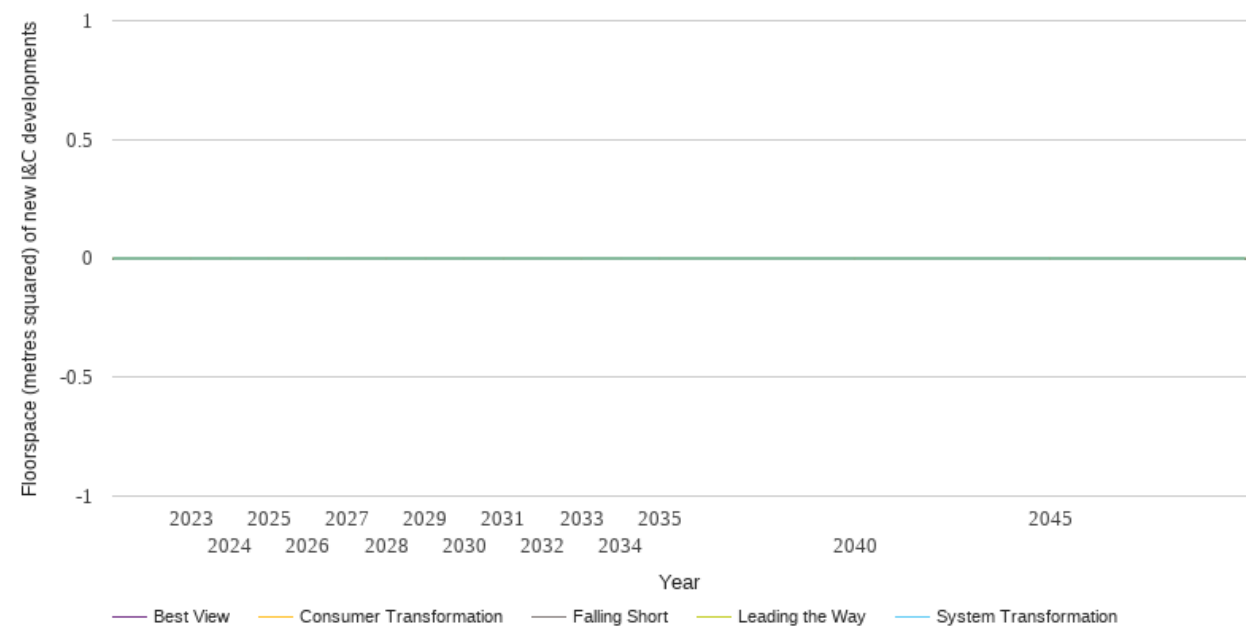
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0	0.0
2028	0.0	0.0	0.0	0.0	0.0
2029	0.0	0.0	0.0	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



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	0	0	0	0	0
2024	0	0	0	0	0
2025	0	0	0	0	0
2026	0	0	0	0	0
2027	0	0	0	0	0
2028	0	0	0	0	0
2029	0	0	0	0	0
2030	0	0	0	0	0
2031	0	0	0	0	0
2032	0	0	0	0	0
2033	0	0	0	0	0
2034	0	0	0	0	0
2035	0	0	0	0	0
2040	0	0	0	0	0
2045	0	0	0	0	0
2050	0	0	0	0	0



Technology Summary: Other Distributed Generation

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

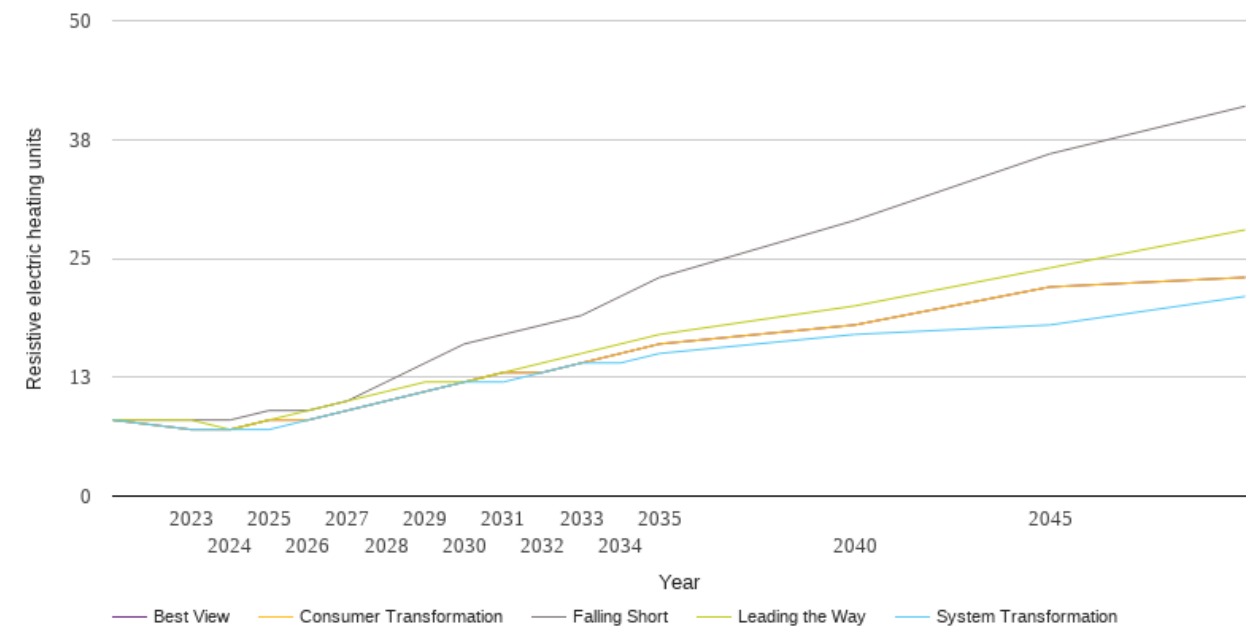
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0	0.0
2028	0.0	0.0	0.0	0.0	0.0
2029	0.0	0.0	0.0	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



Technology Summary: Resistive electric heating

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

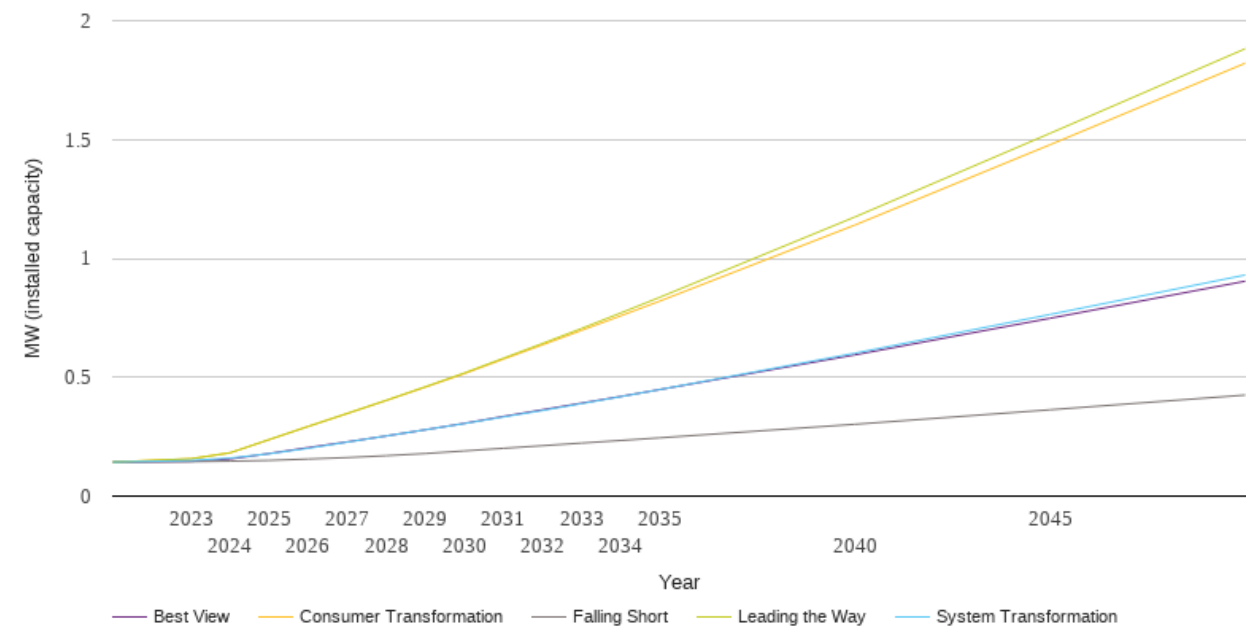
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	8	8	8	8	8
2023	8	7	7	8	7
2024	8	7	7	7	7
2025	9	7	8	8	8
2026	9	8	8	9	8
2027	10	9	9	10	9
2028	12	10	10	11	10
2029	14	11	11	12	11
2030	16	12	12	12	12
2031	17	12	13	13	13
2032	18	13	13	14	13
2033	19	14	14	15	14
2034	21	14	15	16	15
2035	23	15	16	17	16
2040	29	17	18	20	18
2045	36	18	22	24	22
2050	41	21	23	28	23



Technology Summary: Solar Generation

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

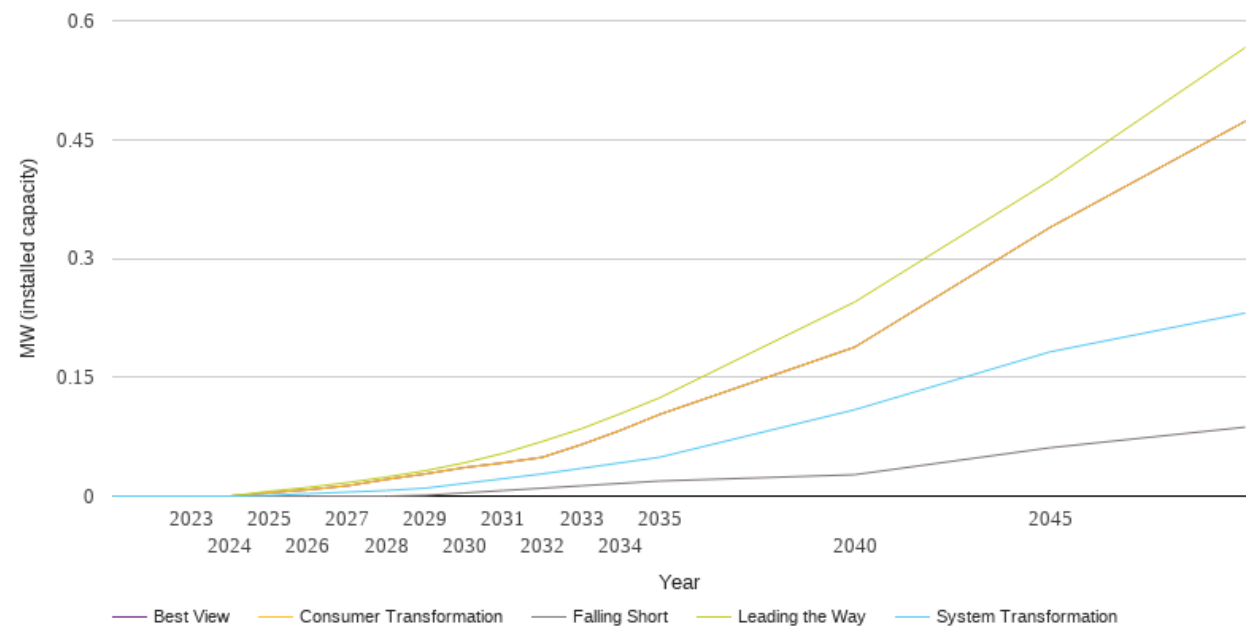
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.1	0.1	0.1	0.1	0.1
2023	0.1	0.2	0.2	0.2	0.1
2024	0.1	0.2	0.2	0.2	0.2
2025	0.2	0.2	0.2	0.2	0.2
2026	0.2	0.2	0.3	0.3	0.2
2027	0.2	0.2	0.3	0.3	0.2
2028	0.2	0.3	0.4	0.4	0.3
2029	0.2	0.3	0.5	0.5	0.3
2030	0.2	0.3	0.5	0.5	0.3
2031	0.2	0.3	0.6	0.6	0.3
2032	0.2	0.4	0.6	0.6	0.4
2033	0.2	0.4	0.7	0.7	0.4
2034	0.2	0.4	0.8	0.8	0.4
2035	0.2	0.4	0.8	0.8	0.4
2040	0.3	0.6	1.1	1.2	0.6
2045	0.4	0.8	1.5	1.5	0.7
2050	0.4	0.9	1.8	1.9	0.9



Technology Summary: Storage

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

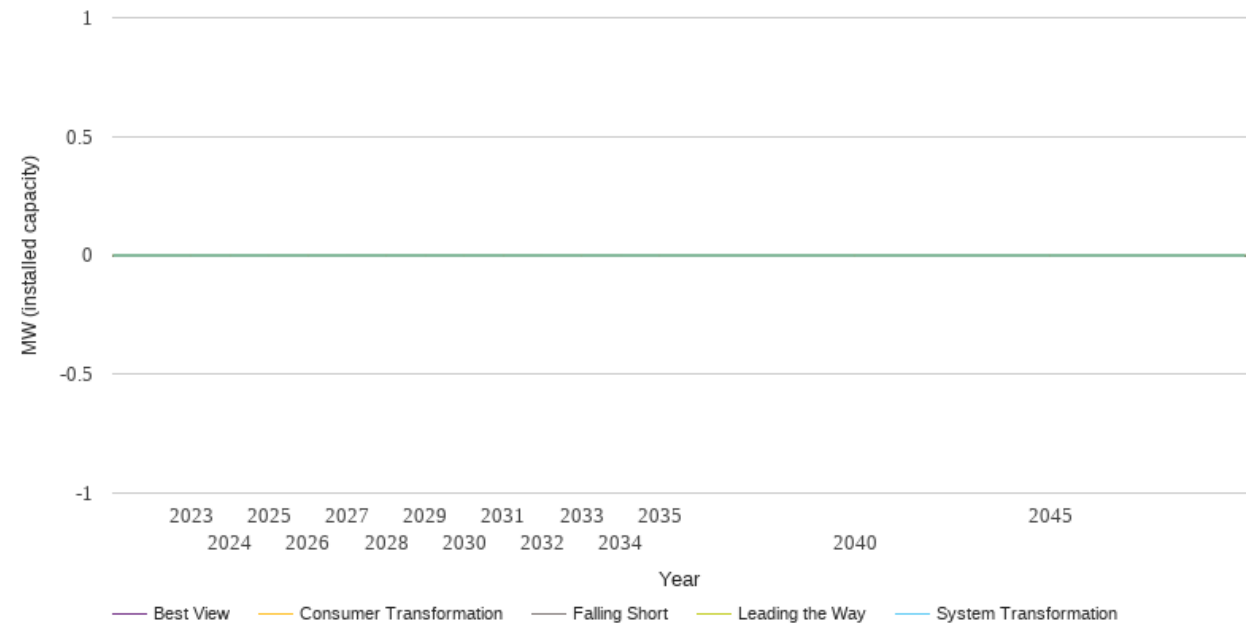
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0	0.0
2028	0.0	0.0	0.0	0.0	0.0
2029	0.0	0.0	0.0	0.0	0.0
2030	0.0	0.0	0.0	0.0	0.0
2031	0.0	0.0	0.0	0.1	0.0
2032	0.0	0.0	0.0	0.1	0.0
2033	0.0	0.0	0.1	0.1	0.1
2034	0.0	0.0	0.1	0.1	0.1
2035	0.0	0.0	0.1	0.1	0.1
2040	0.0	0.1	0.2	0.2	0.2
2045	0.1	0.2	0.3	0.4	0.3
2050	0.1	0.2	0.5	0.6	0.5



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	0.0	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))
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