

Distribution Future Energy Scenarios 2022

Local Authority:
Leicester

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 Leicester 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 Leicester 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	7279	18394	16451	16451	7327	136530	92244	92244	7415
Domestic	New dwellings	0	7536	8185	8185	9584	12217	12017	12017	11856
Electric vehicles	Electric vehicles	4478	28080	36173	66446	66502	227530	239784	245043	174706
EV Charge Point	EV charge points	1818	10946	16638	31981	34468	100123	102471	109082	108379
Heat pumps	Heat pump installations	1214	8631	7143	23597	35532	78209	85969	138182	121589
Hydrogen electrolysis	MW (installed capacity)	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.1	1.1
Non domestic	Floorspace (metres squared) of new I&C developments	0	102025	126677	126677	141029	197938	197909	197909	197938
Other Distributed Generation	MW (installed capacity)	9.2	11.5	9.2	9.2	4.3	10.9	1.6	0.0	7.2
Resistive electric heating	Resistive electric heating units	16743	14555	13963	14627	14198	9849	4720	9996	10382
Solar Generation	MW (installed capacity)	24.3	31.0	43.5	65.5	66.9	56.7	116.9	212.0	221.4
Storage	MW (installed capacity)	0.0	0.4	1.9	4.6	5.8	7.6	20.1	49.1	61.5
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

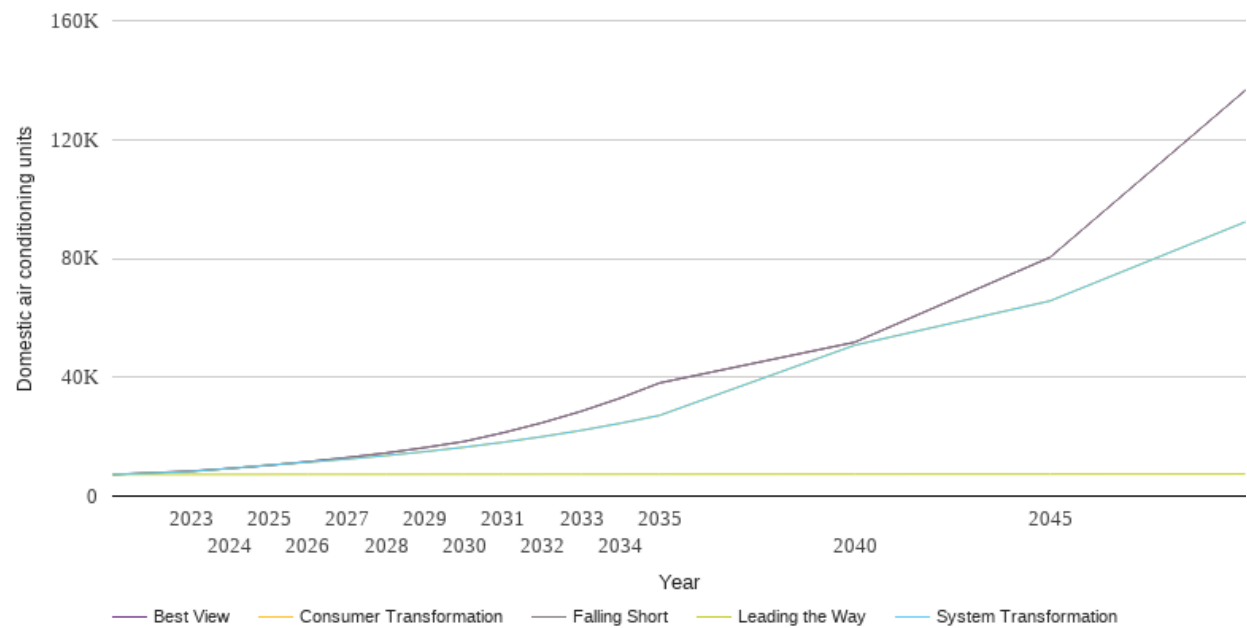
NGED is committed to continually improving the DFES process. To ensure the DFES projections fully capture local ambition, in 2022 we have appointed two DSO Strategic Engagement Officers to engage with local authorities. Any feedback will be incorporated into future Distribution Future Energy Scenarios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

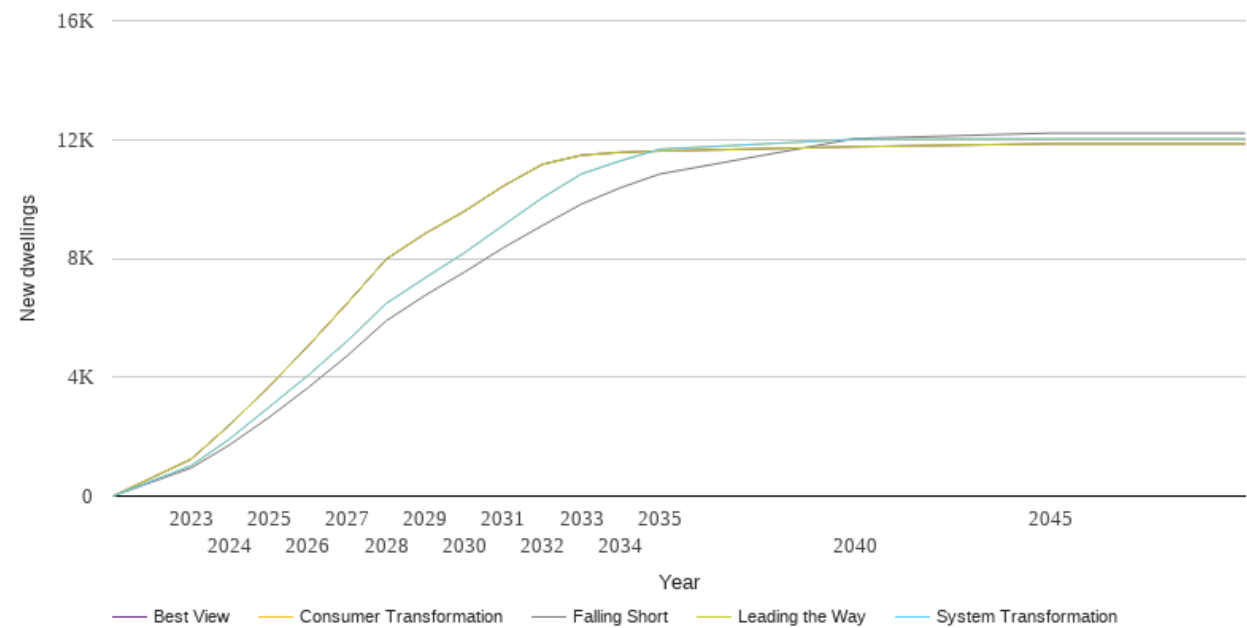
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	7279	7279	7279	7279	7279
2023	8396	8264	8264	7287	8396
2024	9309	9283	9283	7295	9309
2025	10370	10470	10470	7303	10370
2026	11577	11399	11399	7311	11577
2027	12962	12445	12445	7311	12962
2028	14520	13637	13637	7319	14520
2029	16340	14973	14973	7327	16340
2030	18394	16451	16451	7327	18394
2031	21334	18131	18131	7335	21334
2032	24700	20011	20011	7343	24700
2033	28564	22119	22119	7343	28564
2034	32995	24509	24509	7351	32995
2035	38061	27152	27152	7351	38061
2040	51786	50785	50785	7375	51786
2045	80340	65684	65684	7391	80340
2050	136530	92244	92244	7415	136530



Technology Summary: Domestic

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

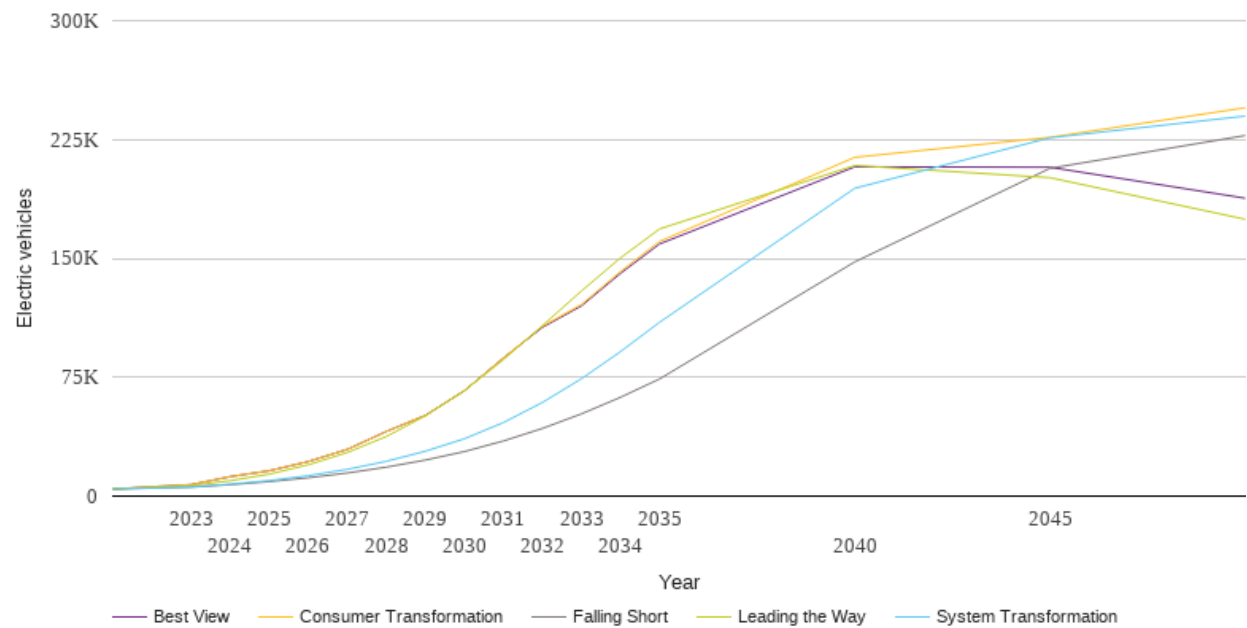
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	947	1022	1022	1240	1240
2024	1734	1935	1935	2410	2410
2025	2652	2995	2995	3688	3688
2026	3649	4065	4065	5053	5053
2027	4721	5216	5216	6489	6489
2028	5899	6482	6482	7974	7974
2029	6759	7347	7347	8839	8839
2030	7536	8185	8185	9584	9584
2031	8359	9117	9117	10436	10436
2032	9106	10040	10040	11165	11165
2033	9829	10844	10844	11472	11472
2034	10378	11284	11284	11570	11570
2035	10837	11673	11673	11611	11611
2040	12030	12010	12010	11760	11760
2045	12217	12017	12017	11856	11856
2050	12217	12017	12017	11856	11856



Technology Summary: Electric vehicles

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

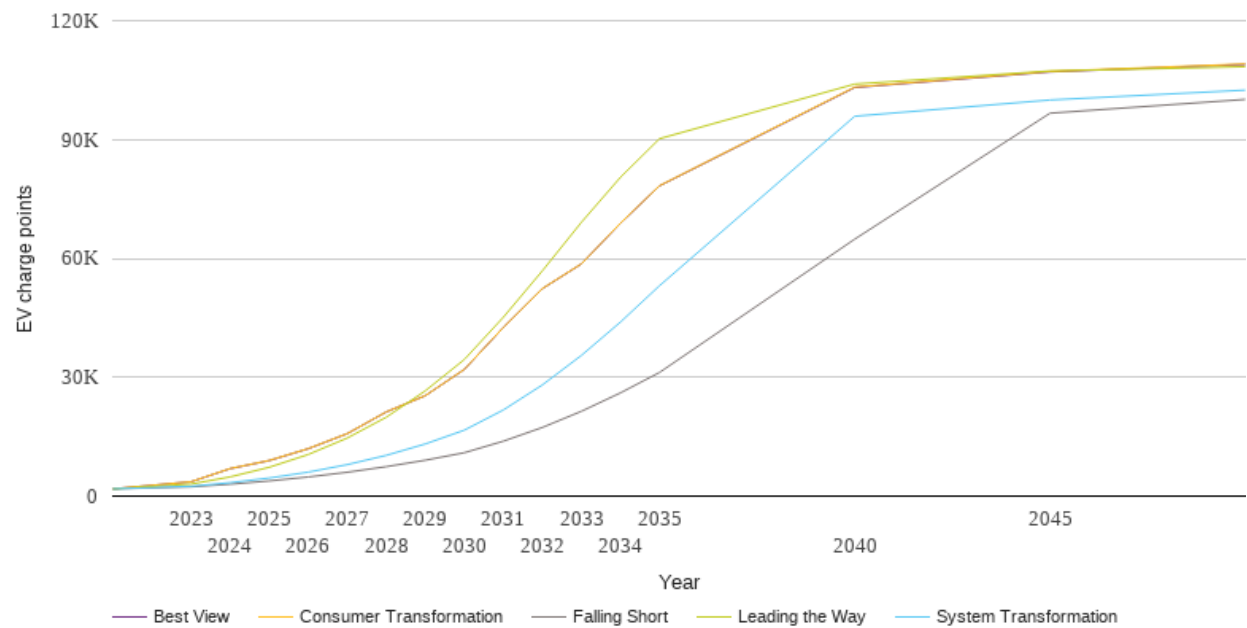
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	4478	4478	4478	4478	4478
2023	5666	5766	7220	6605	7220
2024	7208	7513	12254	9685	12254
2025	9138	9767	15966	13830	15970
2026	11560	12863	21747	19733	21756
2027	14577	16867	29432	27498	29446
2028	18262	21938	40736	37571	40754
2029	22730	28305	50866	50624	50889
2030	28080	36173	66446	66502	66473
2031	34780	46376	87106	86046	87138
2032	42696	59095	107141	107539	106486
2033	51896	74075	120886	129444	120051
2034	62342	91149	141707	150325	140529
2035	73914	109667	160730	168565	159113
2040	147783	194240	213762	208625	207761
2045	206823	226110	226381	200927	207519
2050	227530	239784	245043	174706	187979



Technology Summary: EV Charge Point

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

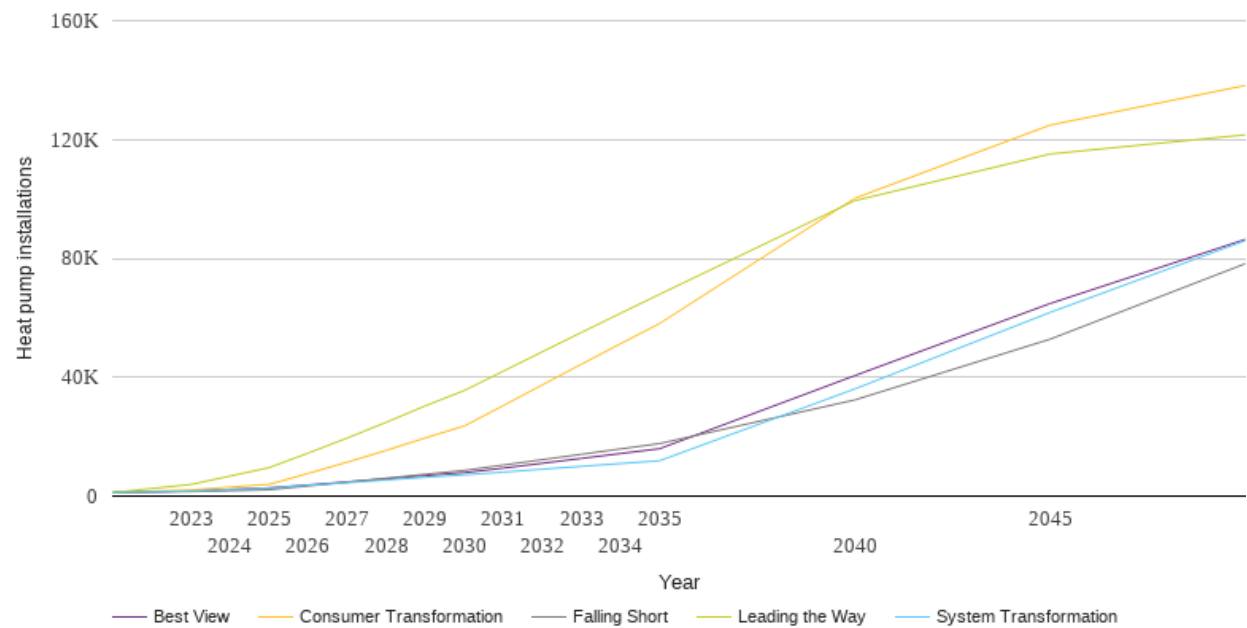
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1818	1818	1818	1818	1818
2023	2340	2471	3619	3040	3608
2024	3002	3381	6942	4837	6911
2025	3822	4554	8986	7266	8961
2026	4822	6044	11972	10486	11952
2027	6015	7941	15769	14644	15758
2028	7425	10283	21254	19902	21239
2029	9055	13159	25356	26576	25344
2030	10946	16638	31981	34468	31966
2031	13863	21746	42595	45152	42568
2032	17329	28066	52397	56871	52365
2033	21409	35520	58628	69127	58614
2034	26060	43933	68906	80482	68872
2035	31214	53111	78360	90211	78311
2040	64866	95878	103246	104000	103142
2045	96643	99983	107197	107302	107084
2050	100123	102471	109082	108379	108960



Technology Summary: Heat pumps

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

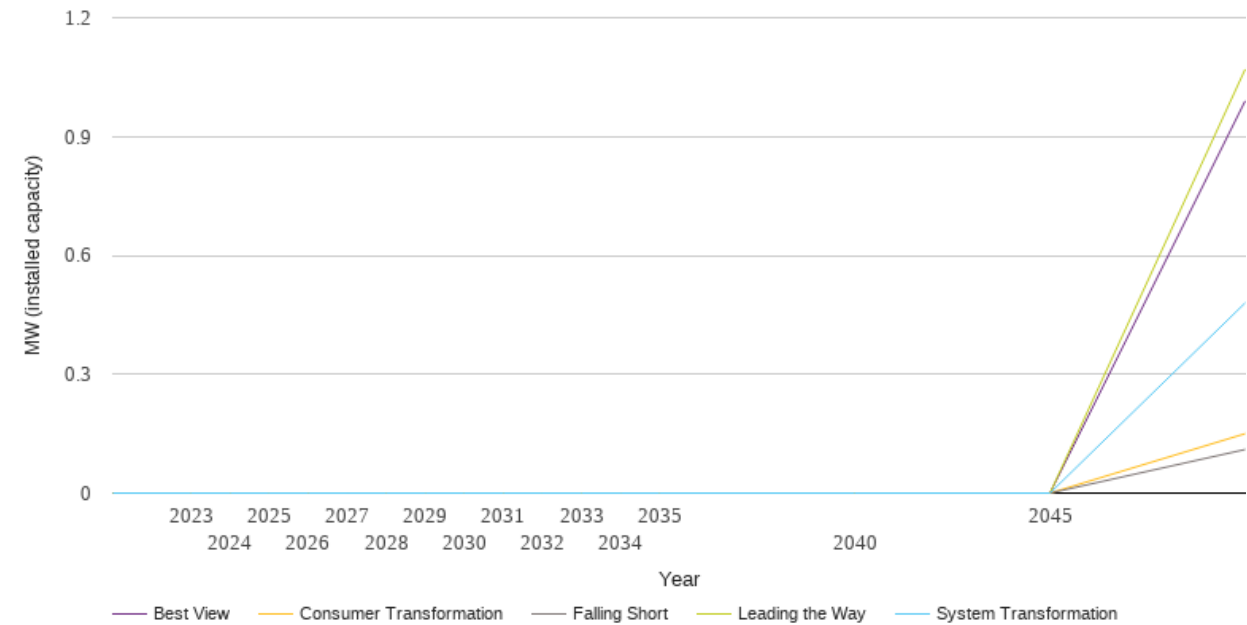
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	1214	1214	1214	1214	1214
2023	1514	1661	2066	3917	1661
2024	1814	2184	2996	6731	2184
2025	2124	2741	3953	9581	2741
2026	3408	3629	7621	14467	3734
2027	4700	4510	11410	19543	4743
2028	6012	5413	15385	24845	5806
2029	7333	6324	19589	30370	6897
2030	8631	7143	23597	35532	7879
2031	10438	8072	30466	42045	9428
2032	12258	9055	37434	48579	11050
2033	14068	10013	44397	55070	12687
2034	15871	10960	51263	61499	14317
2035	17673	11893	58046	67908	15940
2040	32361	36060	100229	99430	40543
2045	52790	61796	124846	115132	64798
2050	78209	85969	138182	121589	86372



Technology Summary: Hydrogen electrolysis

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

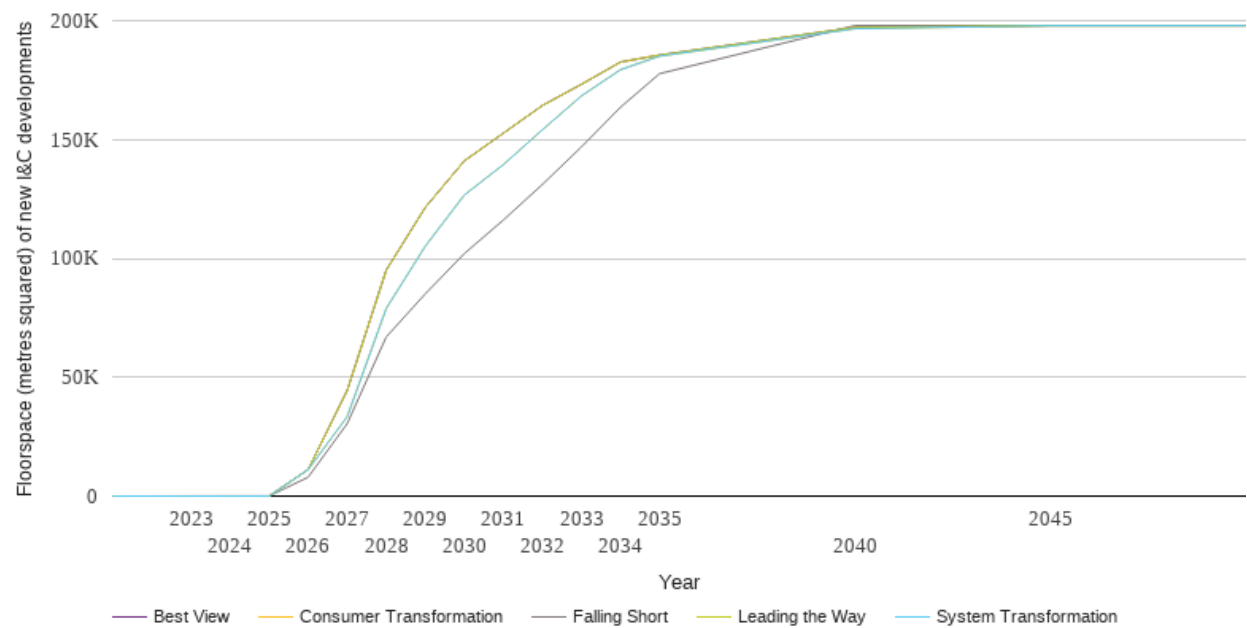
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.0	0.0	0.0	0.0	0.0
2026	0.0	0.0	0.0	0.0	0.0
2027	0.0	0.0	0.0	0.0	0.0
2028	0.0	0.0	0.0	0.0	0.0
2029	0.0	0.0	0.0	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	0.1	0.5	0.1	1.1	1.0



Technology Summary: Non domestic

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

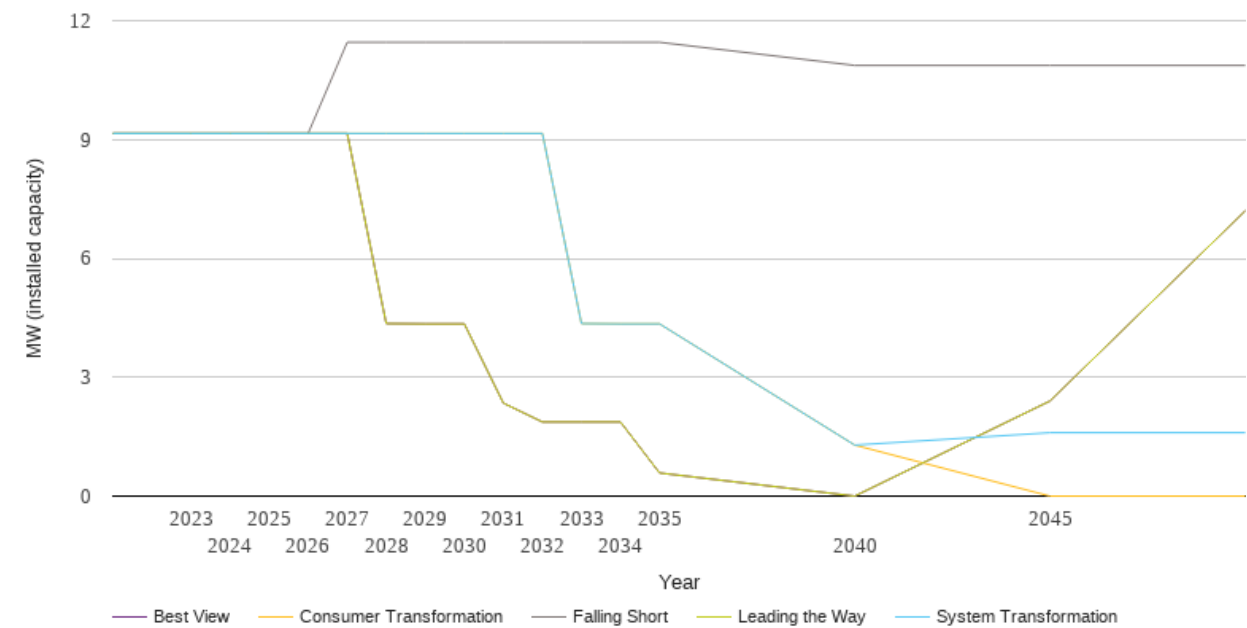
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0	0	0	0	0
2023	15	0	0	15	15
2024	30	0	0	30	30
2025	30	0	0	30	30
2026	7951	11139	11139	11169	11169
2027	30485	33425	33425	44474	44474
2028	66945	78946	78946	95098	95098
2029	85096	105145	105145	121437	121437
2030	102025	126677	126677	141029	141029
2031	116134	139450	139450	152670	152670
2032	131098	154110	154110	164320	164320
2033	146915	168343	168343	173243	173243
2034	163587	179373	179373	182594	182594
2035	177696	185092	185092	185538	185538
2040	197938	196627	196627	197169	197169
2045	197938	197909	197909	197938	197938
2050	197938	197909	197909	197938	197938



Technology Summary: Other Distributed Generation

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

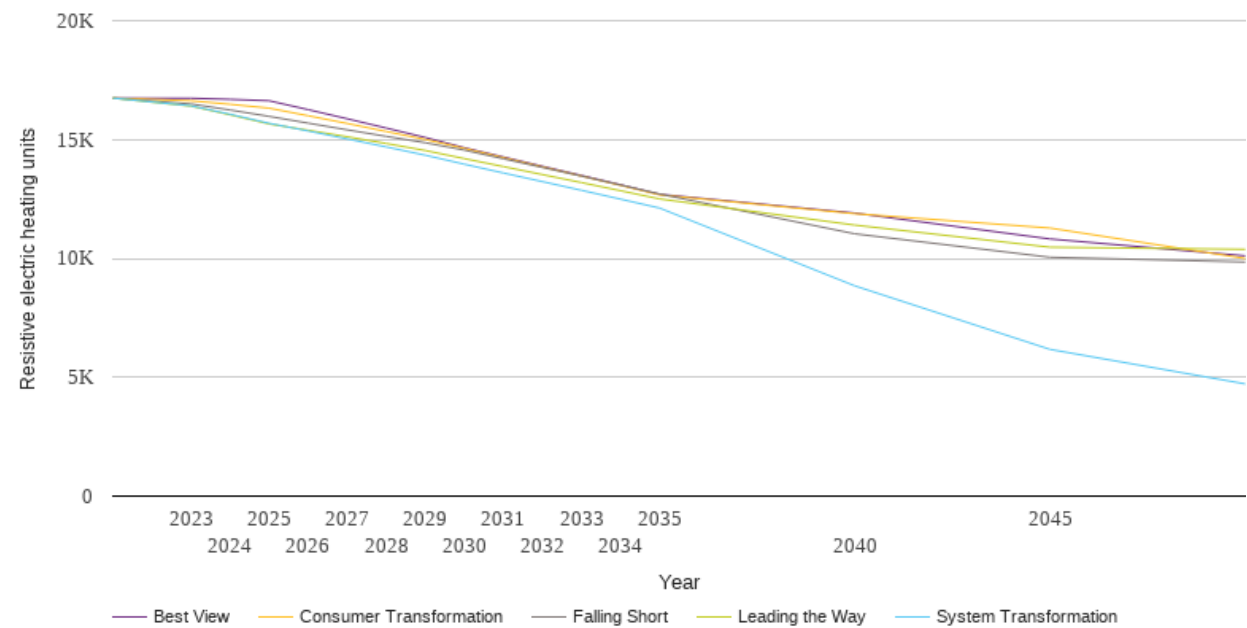
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	9.2	9.2	9.2	9.2	9.2
2023	9.2	9.2	9.2	9.2	9.2
2024	9.2	9.2	9.2	9.2	9.2
2025	9.2	9.2	9.2	9.2	9.2
2026	9.2	9.2	9.2	9.2	9.2
2027	11.5	9.2	9.2	9.2	9.2
2028	11.5	9.2	9.2	4.4	4.4
2029	11.5	9.2	9.2	4.3	4.3
2030	11.5	9.2	9.2	4.3	4.3
2031	11.5	9.2	9.2	2.3	2.3
2032	11.5	9.2	9.2	1.9	1.9
2033	11.5	4.4	4.4	1.9	1.9
2034	11.5	4.3	4.3	1.9	1.9
2035	11.5	4.3	4.3	0.6	0.6
2040	10.9	1.3	1.3	0.0	0.0
2045	10.9	1.6	0.0	2.4	2.4
2050	10.9	1.6	0.0	7.2	7.2



Technology Summary: Resistive electric heating

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

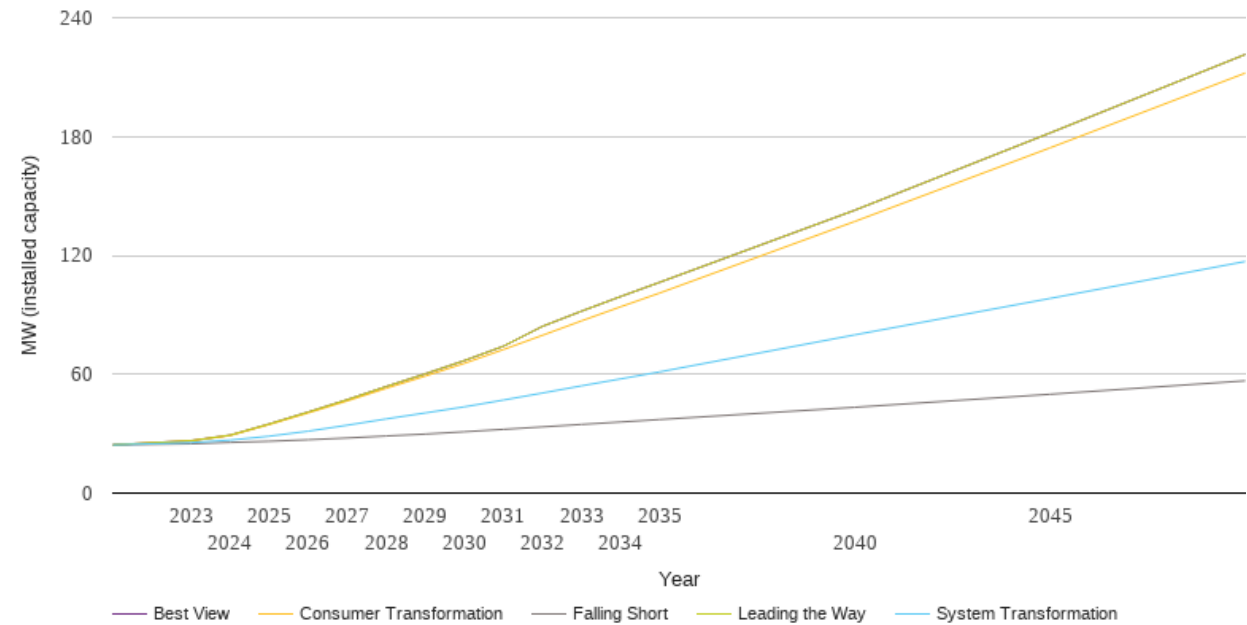
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	16743	16743	16743	16743	16743
2023	16498	16419	16630	16407	16737
2024	16243	16065	16484	16041	16691
2025	15975	15684	16321	15656	16631
2026	15690	15360	16001	15389	16258
2027	15408	15027	15677	15115	15874
2028	15133	14689	15338	14834	15483
2029	14866	14341	15003	14539	15085
2030	14555	13963	14627	14198	14656
2031	14190	13593	14237	13862	14266
2032	13827	13230	13848	13526	13875
2033	13462	12864	13464	13189	13490
2034	13088	12493	13071	12848	13098
2035	12710	12118	12672	12502	12696
2040	11034	8846	11881	11401	11907
2045	10047	6172	11277	10470	10818
2050	9849	4720	9996	10382	10107



Technology Summary: Solar Generation

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

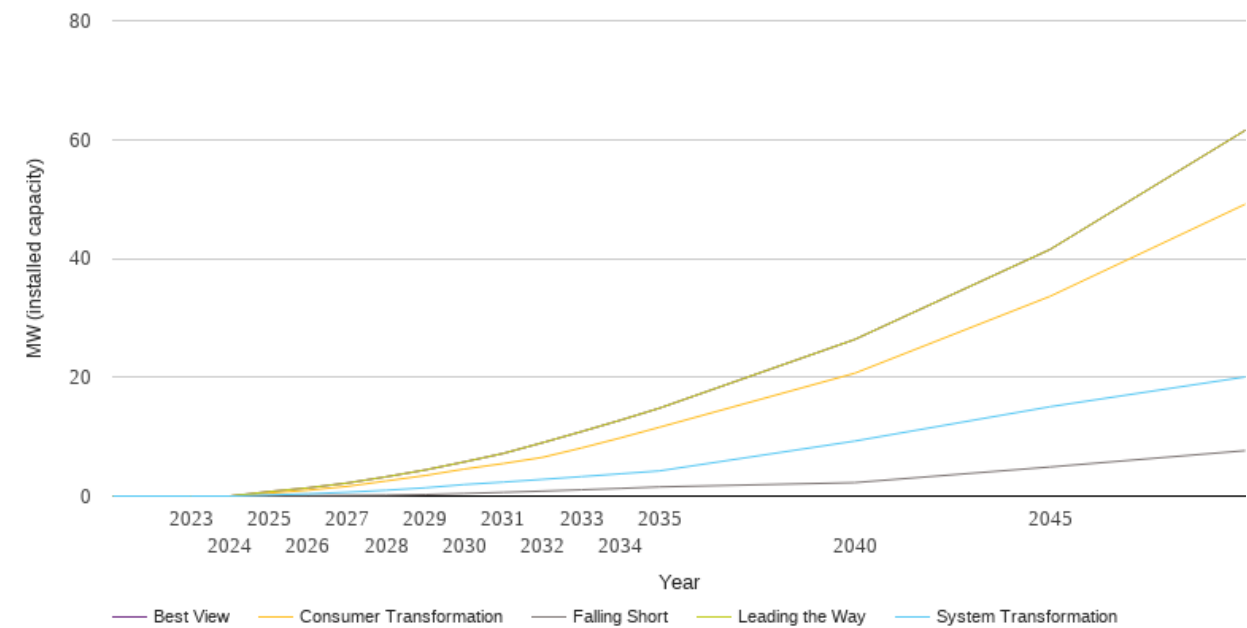
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	24.3	24.3	24.3	24.3	24.3
2023	24.9	25.5	26.4	26.4	26.4
2024	25.6	26.7	29.1	29.2	29.2
2025	26.1	28.7	34.6	34.9	34.9
2026	26.9	31.2	40.5	40.9	40.9
2027	27.8	34.3	46.5	47.2	47.2
2028	28.8	37.4	52.9	53.8	53.8
2029	29.8	40.5	59.1	60.2	60.2
2030	31.0	43.5	65.5	66.9	66.9
2031	32.2	47.0	72.5	74.1	74.1
2032	33.4	50.5	79.7	84.2	84.2
2033	34.7	54.1	86.9	91.8	91.8
2034	35.9	57.6	94.0	99.2	99.2
2035	37.1	61.2	101.0	106.4	106.4
2040	43.3	79.9	137.1	142.8	142.8
2045	49.9	98.3	174.3	181.8	181.8
2050	56.7	116.9	212.0	221.4	221.4



Technology Summary: Storage

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

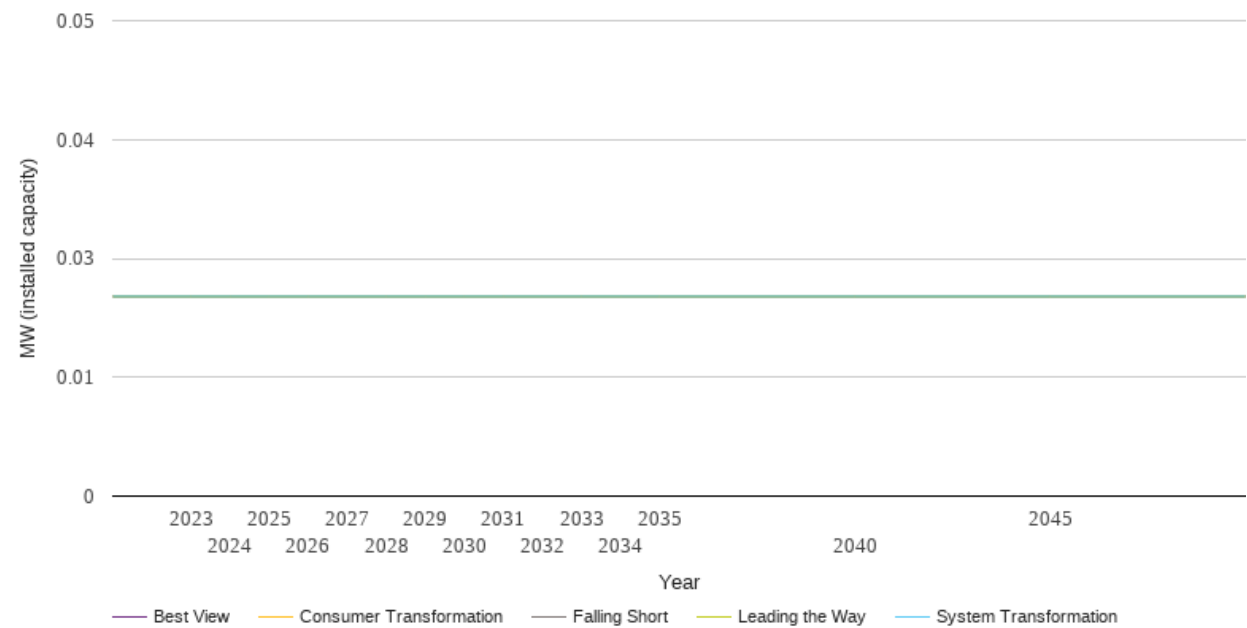
Year	Scenario				
	Falling Short	System Transformation	Consumer Transformation	Leading the Way	Best View
Baseline	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0
2025	0.1	0.2	0.5	0.7	0.7
2026	0.1	0.4	1.0	1.4	1.4
2027	0.1	0.7	1.6	2.2	2.2
2028	0.2	1.0	2.5	3.2	3.2
2029	0.3	1.4	3.5	4.4	4.4
2030	0.4	1.9	4.6	5.8	5.8
2031	0.6	2.4	5.5	7.2	7.2
2032	0.8	2.8	6.5	9.0	9.0
2033	1.1	3.3	8.1	10.9	10.9
2034	1.3	3.8	9.8	12.8	12.8
2035	1.5	4.2	11.6	14.8	14.8
2040	2.3	9.3	20.7	26.4	26.4
2045	4.9	15.0	33.6	41.5	41.5
2050	7.6	20.1	49.1	61.5	61.5



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



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